ENVIRONMENTAL HEALTH & SAFETY OFFICE

ANNUAL REPORT

FY 2013-2014

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Environmental Health & Safety (EHS)

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) developing new Occupational Safety courses in the University-supported ICON training software, (2) conducting a customer satisfaction survey of EHS chemical safety program customers, (3) initiating the use of mobile auditing, and (4) Tier II reporting.

1. **New Occupational Safety Courses Developed and Updated Course Content.** Six (6) new courses were completed and are now hosted in ICON. They were created to fill a gap when the UI/EHS decided to discontinue the services of ClarityNet, a training course provider we contracted with for the previous 5 years. Also, related to this issue, twenty-seven (27) ICON courses that were already available to the UI community were evaluated extensively and updated. This was completed over three years and entailed significant effort by several EHS staff.

2. **EHS Chemical Safety Customer Satisfaction Survey.** EHS conducted a survey intended to assess client satisfaction with the chemical programs that EHS provides for their workplace safety needs. The survey was sent to approximately 2400 faculty and staff. About 300 individuals completed the survey, providing valuable feedback that EHS will use to make improvements, wherever possible. Areas addressed in the survey responder comments included chemical hazardous waste services, the Department of Homeland Security's Chemicals of Interest, the chemical inventory/tracking system, fume hoods, LabNews, the safety advisor team, training, the EHS website, and communications with laboratories. Overall, comments were very positive and supportive of EHS's chemical safety programs.

3. **Mobile Auditing**. EHS's Safety Advisor Team (SAT) began using tablet computers for performing laboratory reviews in research areas. This is a significant change in the way EHS performs laboratory reviews and it is anticipated that, in the future, this technology will save time and effort, not only for EHS staff, but for laboratory staff and researchers as well. Time savings and efficiencies are expected as more features of the system are made available to users. In addition to including all inspection questions, EHS ICON course completion data can now be queried and matched to lab personnel training requirements. Advisors request lists of personnel and their associated activities from each lab, enter the information into the system, and run a report that identifies lab staff training records that are missing. Entering staff names takes a significant amount of the safety advisors' time this first year, but that effort should be reduced in coming years, when primarily personnel changes will need to be updated in the system. This has already been recognized as a benefit for lab managers and PIs, as they no longer need to produce copies of staff training records from the HR My Training site as part of the lab review. Also in coming months, PIs and lab managers will be able to log into the system and respond to audit deficiencies (findings) and close out audits by providing missing documentation or fixing deficiencies.

4. **Tier II Reporting.** The Department of Natural Resources changed its online system for facilities that need to submit Tier II reports. In previous years, two primary reports were submitted for the UI main and Oakdale campuses, along with a couple of additional reports for smaller locations; each area was considered a facility. However, this year each building where reportable amounts of Tier II chemicals were used or stored was determined to be a 'facility.' While this required significant effort to add the required information for each building into multiple reports, when chemicals were reported per building vs. large campus areas, fewer facilities exceeded the reportable thresholds. This reporting method meant that thirty-six Tier II reports were filed (vs. 5 last year), but it produced a more representative view of the locations of chemicals, which provides a better service for local emergency responders.

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/diagnostic specimens 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. This 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 FY14:

- Reviewed 314 protocols submitted primarily from Animal Protocols (AP) and Hazard Containment Protocols; in addition, one material transfer agreements (MTA) was reviewed.
- Updated the web-based Basic Biological Safety course.
- Updated the web-based Advanced Biosafety course.
- Added new web-based course for proper use of Biosafety Cabinets.
- 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 five investigators for documentation of their laboratories or other authorization, related to funding or ordering materials from suppliers.
- Hired a new Biosafety Specialist to provide support for the Biosafety Section.
- Hired a new Associate Biological Safety Officer, after a resignation.
- Evaluated five injuries/possible exposures, non-bloodborne pathogen related.
- Reviewed registration documents for the human pluripotent stem cell committee and program; one proposed research project was 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 that may impact the biological safety programs.

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 FY14:

- Reviewed use and approved the purchase of 22 new BSCs.
- Scheduled 594 BSCs for certification.
- Scheduled certification of 21 horizontal flow cabinets.
- Scheduled formaldehyde or vaporous hydrogen peroxide (VHP) decontamination of 47 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 90 cabinets.
- Worked with PIs and ENV to obtain 57 quotes for service.
- Updated BSC web documents.
- Validated 3 BSC decontaminations performed by ENV service technicians.

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 FY14:

- Reviewed and/or updated 24 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 in order that they have knowledge of and 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 FY14:

- Reviewed the online Shipping Infectious Substances/Diagnostic Specimens, With or Without Dry Ice course and the Shipping With Dry Ice course to ensure compliance with the 2014 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 FY14:

- Approved 164 new non-exempt rDNA protocols.
- Approved 87 amendment requests to active rDNA protocols.
- Reviewed ACURFs and ACURF amendments to ensure all recombinant work is registered with the IBC.
- Reviewed 351 non-exempt protocols and 27 exempt protocols.
- Held 27 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: 295.
- Each month, notified PIs of expired protocols. (Protocols are approved for a maximum of 3 years.) Inactivated 118 expired protocols from further review. In addition, inactivated 32 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 registered 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.
- Worked with Research Information Systems (RIS) and Division of Sponsored Programs to revise monitoring grant/contract emails and review process.
- Communicated change in NIH/OBA's Risk Group classification of *Pseudomonas aeruginosa* to research staff.
- Received approval from NIH/OBA for the cloning of two toxin genes.
- Initiated the creation of a new rDNA database and registration document with RIS.
- Implemented an interview schedule to review exempt rDNA research for labs without an approved rDNA protocol.

- One possible exposure and one non-compliance incident were 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). Carol McGhan, EHS Director and James Walker, Associate VP for Research for Regulatory Affairs, serve as alternate ROs; Rachel White, formerly Associate BSO, served as an alternate RO during her employment. 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 properly transfer agents that are isolated from clinical samples and required agency reporting.

Activities and Accomplishments for FY14:

- Maintained the list of current active/approved individuals who are allowed access to the BSL3 rooms/areas.
- Updated the 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.
- Submitted amendment requests to CDC in order to update our registration, as necessary.
- Submitted Form 2s, 3s, and 4s to CDC, as necessary.
- An inspection in April was conducted by the DHHS's Select Agent Program as part of the UI's three-year renewal of our entity's registration. As of the completion of this annual report, no report from the inspectors has been received. However, the UI's registration has been renewed, based on acceptable responses to findings from the inspection, once the inspectors' findings have been received.

- 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.
- Exempt select agent toxin users were reminded of documentation requirements for transfers of exempt quantities of toxins. One user had transferred toxin and provided the due diligence form.
- 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 first annual Suitability Assessment Review meeting to review all Tier 1 users.
- Conducted monthly audits of all BSL3 laboratory facilities.
- Participated in the CDC renewal inspection of all registered facilities.
- Reviewed 16 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 to CDC.

Biological Safety Program Goals for FY15:

- Conduct annual laboratory audits of BSL2/3 laboratories with active rDNA protocols.
- Implement the new UIRIS rDNA database and continue to develop the new rDNA Registration Document with RIS.
- 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.
- Interview, hire, and train a Biosafety Specialist and Associate Biological Safety Officer.
- Train the recently hired Associate Biological Safety Officer.
- Work with OnSite to revise the BSC and Biological Inventory Modules to meet current needs; format and import BSC and inventory database information into OnSite Modules for use.
- Perform annual suitability evaluation with the Suitability Assessment Review Committee.
- Create an online tutorial for the rDNA Registration Document and rDNA amendment submissions.

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 OS section establishes best practices by focusing on process-driven approaches to safety rather than addressing safety as a separate element of business and operations.

Campus wide programs administered by the OS section include:

- Supporting the University of Iowa Hospital and Clinics (UIHC) and the department of Human Resources (HR) in their partnering with the Occupational Safety and Health Administration (OSHA) during their routine or incident based inquiries and inspections
- Exposure Assessment and Maintenance of Exposure Records
- Illness and Injury Prevention
- Respiratory Protection and Personal Protective Equipment
- Asbestos
- Indoor Environmental Quality
- Hearing Conservation
- Lockout and Tagout of Hazardous Energy
- Confined Space Entry Programs
- Student Use of Hazardous Equipment and Machines
- Administrative Reviews and Services

Additional services provided for the UIHC include industrial hygiene exposure assessments, indoor environmental quality investigations, and subcommittee work associated with the Environment of Care Committee. Services are coordinated with the UIHC Safety and Security Office.

Administrative Audits

The OS administrative reviews provide ongoing contact with the business and finance operations, service departments, and academic sectors on campus where hazards inherent to their operations warrant closer inspection. The OS reviewer sends a process flow chart to the unit or department contacts and schedules an onsite review. Once the review is completed, items that need to be corrected are tracked to completion. When the corrections have been made, a memo of the final results is distributed to the unit or department contact and director.

Activities & Accomplishments for FY14:

During fiscal year 2014, the OS section conducted sixty (60) departmental reviews. All units were reviewed for compliance with the following Iowa Occupational Safety and Health (IOSH) and National Fire Protection Agency (NFPA) standards:

- Emergency Preparedness
- Housekeeping/Access and Egress
- Personal Protective Equipment
- First Aid
- Flammable and Combustible Storage

The following list provides the number of departments that were reviewed by the category of OSHA regulation.

- Hazard Communication – 59 departments
- Bloodborne Pathogens – 25 departments
- Lockout/Tagout – 47 departments
- Machine Guarding – 46 departments
- Electrical Safety – 29 departments
- Powered Industrial Trucks (Fork Trucks) – 24 departments
- Hazardous Waste – 13 departments
- Hot Work – 25 departments
- Asbestos Awareness – 6 departments
- Fall Protection – 4 departments
- Hearing Conservation – 7 departments

The Occupational Safety & Health Administration (OSHA) substantially revised its Chemical Hazard Communication standard in 2012 through the adoption of a 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. All affected departments completed the GHS training by the regulatory deadline of December 2013.

Occupational Safety online training courses are offered by EHS for thirty-one (31) topics. A two-year project was initiated to review and upgrade all ICON courses with the addition of six (6) new courses. This project was completed in March of 2014.

Students Working With Machinery & Equipment

The 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, administered by the OS section, covers departmental areas and activities in which students use large industrial powered equipment as part of professor-led academic class projects. The program was initiated in 2011 in response to a serious accident that occurred at another institution.

Activities & Accomplishments for FY14:

A total of seven (7) shops and studios were audited spanning seven (7) academic colleges and departments. When necessary, follow-ups were performed to ensure 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 FY14:

The OS section provided risk control related support to the following University and UIHC department committees:

- FM Safety Steering Committee
- The UI Pharmaceuticals Safety Committee
- The College of Dentistry Nitrous Oxide Oversight Committee
- The Workplace Occupational Safety and Health Working 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 amount 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 and include 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 that occurred in their department and conducts an analysis with a focus on addressing loss control activities. The OS section also performs an in person annual review of OSHA recordable injuries with departments that have consistently high numbers of injuries.

Activities and Accomplishments for FY14:

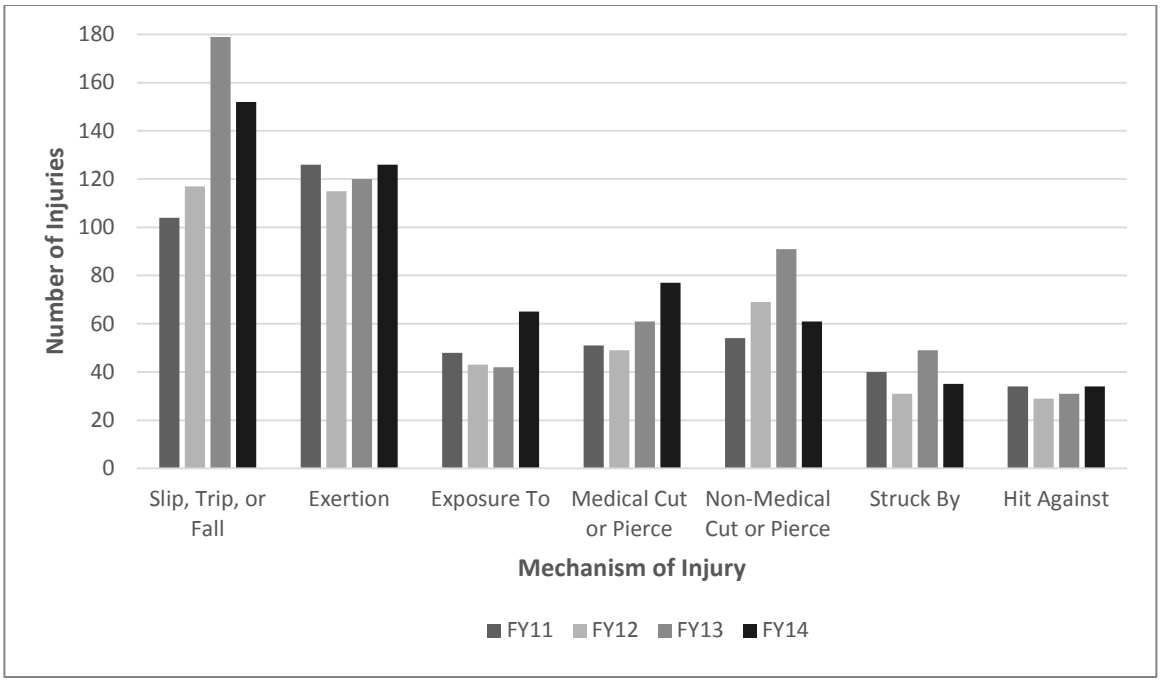
Reviewed 1576 FROI reports for accident type classification filed by University employees through the University HR injury reporting and workers compensation system.

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

Table 1: Comparison of injuries by mechanism and fiscal year

Mechanism	FY11	FY12	FY13	FY14
Slip, Trip, or Fall	104	117	179	152
Exertion	126	115	120	126
Exposure To	48	43	42	65
Cut or Pierce	54	69	91	61
Struck By	40	31	49	35
Hit Against	34	29	31	34

Figure 1: Comparison of Injuries by Mechanism and Fiscal Year



The OS section reviews the number of OSHA recordable injuries by fiscal year in comparison to the number of recordable injures 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, excluding UIHC employees.

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

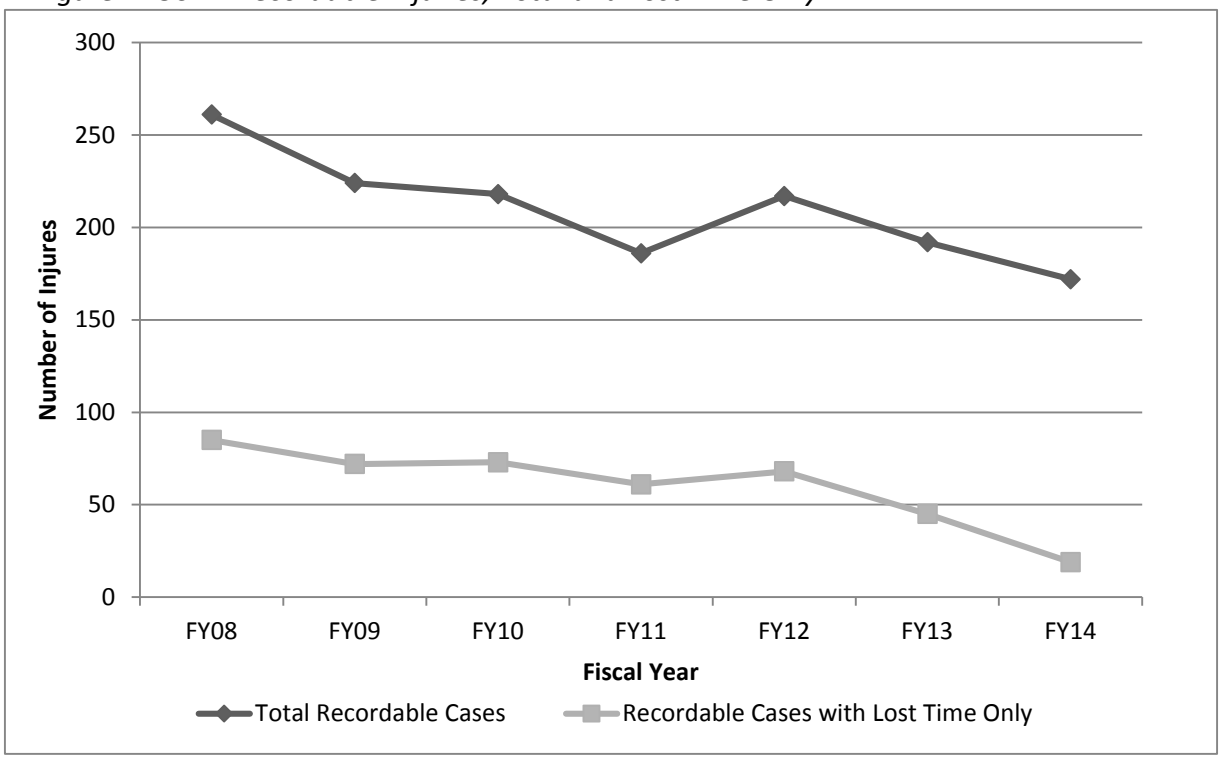


Figure 3: OSHA Recordable Injuries Rate, Total and Lost Time Only

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:

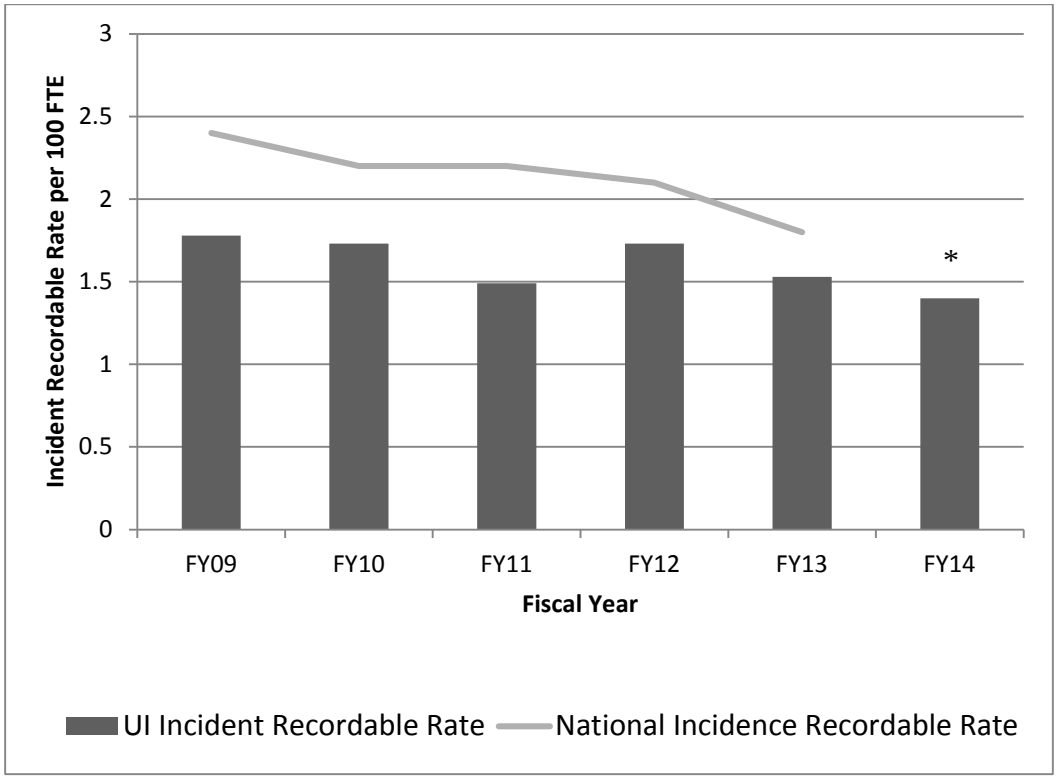
$$\text{OSHA Incident Rate} = \frac{\text{Total number of injuries x 200,000}}{\text{Number of hours worked by all employees}}$$

University Human Resources reported that the total number of hours worked by all employees for FY14 was 23,259,640.

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.

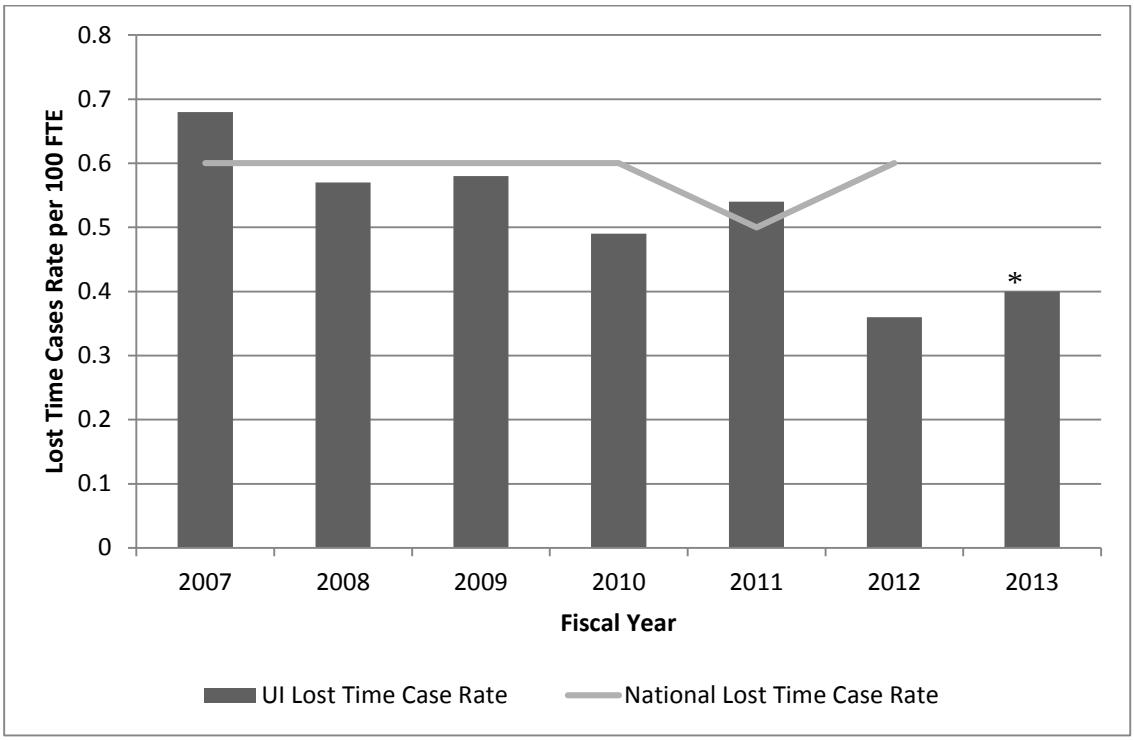
In comparing the 2008-2013 IR and LTC average rates for the UI to rates for universities nationwide (Figure 4 and 5), the UI has been below the national average.

Figure 4: OSHA Recordable Injuries Rate, National and UI rates by Fiscal Year



**National Data was not available for FY14 at the time of this report*

Figure 5: OSHA Lost Time Case Rate, National and UI rates by Fiscal Year



**National Data was not available for 2013 at the time of this report*

EHS formally investigates a subset of injuries each year. In FY13, the OS section conducted fifty-eight (58) investigations outlined by mechanism of injury in the table below.

Table 2: FROI Investigations by Mechanism FY14

Mechanism of Injury	Number of Investigations
Allergic Reaction	1
Animal Bite	3
Burn	2
Caught In	1
Chemical Burn	4
Cut	15
Exertion	14
Exposure To	10
Noise	1
Slip, Trip, and Fall	3
Struck By	3
X-Ray Exposure	1

The OS Section staff performed an annual review with University departments that reported a relatively high number of recordable injuries. The departments included in these additional reviews were: Facilities Management's Custodial Services, University Housing and Dining's Custodial Services, Hillcrest Marketplace Dining Services, Campus Dining Operations, and University Laundry Services. A summary review of each injury was presented to each department and control strategies were developed in conjunction with department and area managers and OS section advisors. The topics of consideration were as follows:

- 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
- Opportunities for control strategies
- The status of the department's injury investigation process and return to work program
- Areas of focus for department administrators, including day to day performance management and safe work practices

Ergonomics

The ergonomics program identifies physical stressors in the University and UIHC work environments that can contribute to musculoskeletal disorders. Once identified, efforts can be made to reduce or eliminate the identified stressors. The program involves assisting departments in the implementation of ergonomic programs, conducting group training when requested, and performing workstation evaluations for individuals suffering from known musculoskeletal symptoms or injuries. The program was relocated to HR central in December of 2013 and is beyond the purview of the OS section for the second half of FY14 and into the future.

Activities and Accomplishments for FY14:

The OS section conducted seventy-eight (78) evaluations for individuals who had developed musculoskeletal symptoms or disorders that negatively impacted their daily work activity. A number of

these individuals were being treated by their private physicians. In the majority of cases, the site evaluations helped to improve the individual's condition, thereby improving overall work activity. A breakdown of the locations serviced by OS through the ergonomics program is found in table 3 below.

Table 3: Ergonomic Evaluations by Locations

Location	Number of Evaluations
UI Office Staff	28
UIHC Office Staff	50
UI Laboratories	1
UI Other	0
UIHC Other	0
Total	78

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 aging 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 FY14:

- Conducted thirteen (13) indoor environmental quality investigations.
- Collected and interpreted results of fifty-eight (58) 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 FY14:

- Performed Respirator Program Administrator services for EHS respirator programs; reviewed and updated the Oakdale and downtown office programs; and provided a summary report to the EHS Director.
- Conducted a program review of thirteen (13) departments with required respirator programs.
- Provided thirteen (13) 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 with confined space entry programs
- Developed two (2) Iowa Courses On-line (ICON) training courses, one for noise and the other for welding; performed reviews and updates of six (6) ICON respirator training courses.

- Performed an additional thirty one (31) industrial hygiene evaluations for a variety of purposes on miscellaneous issues to assess hazards, conduct air monitoring when needed, and recommend appropriate controls. Evaluations included the collection and interpretation of one hundred and eighty nine (189) chemical samples and real time measurements. These evaluations included exposure determinations for respirator use, workplace exposure evaluations for formaldehyde, Polychlorinated Biphenyls, chlorine, and isocyanates, fume hood exhaust, disinfectant products, evaluation of asbestos programs or disturbance of asbestos containing material, decommissioning of workspaces, and electrical arc flash hazards.
- Generated and reviewed nineteen (19) internal Standard Operating Procedure for respiratory protection, post-flood building assessment, machine guarding, indoor environmental quality, PCB sampling, hearing conservation, ergonomic measurements, heat stress, workplace safety audit, thermal imaging of water intrusion, sample preparation, Hazard Communication, Injury and Illness reporting, Forklift safety, ladder use, confined space entry, lead sampling, asbestos management, and electrical hazards.
- Performed five (5) emergency responses with the Chemical Safety staff providing sampling and remediation recommendations.
- Conducted area noise level monitoring in three (3) areas: the Lindquist Center Data Facility, Pomerantz Family Pavilion, and the John Colloton Pavilion.
- Conducted individual noise dosimetry monitoring for two (2) employees in the Environmental Waste department at the Environmental Management Facility.

Occupational Safety Section Goals for FY15

- Continue to participate in University, UIHC, and department committees for risk control related to occupational safety and health.
- Provide support as ex-officio members to the Workplace Occupational Safety and Health Working Group and sub work groups.
- Continue supporting University and UIHC needs in the occupational safety including injury and illness prevention, training, mediation, and safety audits.
- Onboard the incoming Manager of the Occupational Health Section.
- Continue to interface with the new FM Safety Officer to meet FM.
- Upgrade fifteen (15) OS online training courses to improve the presentation format and include hazard examples from on-campus sources.

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 staff established a Generator Team that meets regularly to manage waste generator issues and develop new procedures and methods to improve waste collection efficiency and management.
- The Environmental Section's recycling program, recycled 1,485 gallons of used oil; 875 lead-acid batteries weighing 17,439 lbs; 1,326 other hazardous batteries weighing 578 lbs, and 920 pieces of lead shielding weighing 842 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 FY14:

- Hazardous chemical waste: a total of 27,364 containers were collected from 660 waste generators during 3,937 visits. Waste amounts varied in size from a few milligrams to 55 gallons.
- Radioactive waste: a total of 662 containers were collected from 72 waste generator sites during 194 visits. Waste consisted of liquids, solids, and patient therapy waste.
- Biohazardous waste: a total of 22,447 containers were collected (excludes waste generated at UIHC); 20,259 collected by contractor; 2,188 collected by EHS.
- Unknown analysis: 47 unknowns from 20 locations were analyzed and identified.
- Cleanouts: completed 65 laboratory cleanouts generating 9,864 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 FY14:

Hazardous Chemical Waste

- Processing:
  - Bulking – 12,570 items were commingled together into 453 drums last fiscal year.
  - Recycling – 1,485 gallons used oil; 875 lead-acid batteries weighing 17,439 lbs; 1,326 other hazardous batteries weighing 578 lbs, and 920 pieces of lead shielding weighing 842 lbs.
  - DEA Controlled Substance destruction – 105 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 42 truckloads containing such waste were taken to the Iowa City Landfill.

- Other:

	FY12		FY13		FY14	
Process	**Weight (kg)**	**Items**	**Weight (kg)**	**Items**	**Weight (kg)**	**Items**
Neutralization	936	603	838	648	1,138	1,203
Non-hazardous Gases Vented	101	38	111	22	148	15
Non-hazardous-to IC Landfill	1,030	1,634	1,406	759	1,273	1,584
Sewered	7,626	3,476	6,237	2,924	6,753	3,790

- 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 $0.62/kilogram (kg), labpacks cost $15.76/kg], EHS minimizes the number of labpacks created. Last year 122 labpack drums were filled with 3,578 items weighing 1,729 kg.
- Contractor Shipments and Disposal:
  - Twelve shipments of hazardous chemical waste were completed and sent to off-site EPA permitted facilities.
  - One mixed waste (chemical and radioactive hazards) shipment of 1 drum.
  - Eleven barrel/labpack shipments totaled 601 drums.
- See attachments for statistical and graphical information.

Radioactive Waste

- Saved approximately $25,700 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 254 containers in 7 drums along with 29 individual smaller containers were discharged for a total of 254 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 6 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 994 pieces were collected.
- Refuse is created during the extensive processing of RWMP, which is disposed of through landfilling. Last year 42 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 5 drums of short-lived waste were processed.
- A compactor is used to compact short-lived dry waste to minimize storage space prior to being sorted; 12 drums of dry waste were filled and compacted to reduce the volume of waste being stored until it is ready for sorting, etc.
- Completed four radioactive waste shipments of 22 drums, including:
  - 1-dry waste barrel;
  - 1-hazardous scintillation cocktail vial;
  - 14-non-hazardous scintillation cocktail vials;
  - 5-dry waste in yard-boxes, and

- 1 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 22,447 containers of waste (excludes waste generated at UIHC); 20,259 collected by contractor; 2,188 collected by EHS.

Monitoring Activities

The radioactive waste management program performs significant internal monitoring directed toward contamination control, environmental monitoring, and personal dosimetry. Contamination control includes extensive use of wipes and survey instruments.

Activities and Accomplishments for FY14:

- Surveys - more than 8,000 surveys are performed annually.
  - Vehicle – surveyed after each use – 103 times – using 1,030 wipes.
  - Facility – surveyed on a weekly basis – 52 surveys – using > 1,500 wipes.
  - Containers – surveyed > 650.
  - Lead shielding – surveyed prior to disposal – 920 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 FY14:

- 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, bio accumulative 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 FY14:

- 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.
- Completed and submitted biennial hazardous waste report for EPA.
- Performed the following waste minimization activities:
  - Conducted regular solicitation of waste coordinators at each generator site.
  - Performed waste segregation and micro-management.
  - Conducted waste training and education activities.
  - Performed waste generator assessments, which allowed direct one-on-one communication with generators. To date, thirty one different waste minimization techniques are in use.
  - 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.
  - Generated an annual historical summary of waste disposal costs and submitted it to the Associate Vice President for Research, Regulatory Affairs.
  - 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 Material Safety Data Sheets (MSDS) 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 FY14:

- Compliance evaluation inspections by EPA were conducted 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 is still reviewing the inspection results, as of the date of this report.
- 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 416 audits of laboratories that generate hazardous waste.
  - Completed 227 audits of non-laboratory areas that generate hazardous waste.
  - Completed 303 audits of areas where Universal Waste is accumulated.
- MSDS solicitations: over 1,000 MSDS were solicited from manufacturers; currently, over 19,000 separate MSDS are part of the EHS's collection of this information.

Goals and Initiatives for FY15:

- Facility operations: receive no violations from EPA; complete quarterly self-RCRA inspections.
- Conduct additional spill exercises that implement use of an SCBA.
- Create plan to increase recycling of unused chemicals.
- 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.
- Initiate EPA decommissioning and closure of the hazardous waste storage area known as Facility C.

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 FY14:

- 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 FY14.
- 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

The DPH-BRH conducts an on-site inspection of a portion of the University's broadscope radioactive materials license each year including: a review of UIHC's Positron Emission Tomography Imaging Center, Nuclear Medicine and Department of Radiation Oncology; UI research labs, and the UI's increased controls program for radioactive materials in quantities of concern.

Activities and Accomplishments for FY14:

- EHS participated in the IDPH-BRH's on-site inspection of the University's radioactive material license and radiation safety program from October 22 – 25, 2013. No violations or concerns were identified within the scope of this inspection.
- EHS provided mammography physicist services to UIHC's Department of Radiology and 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 on November 11 & 12, 2013. No violations or concerns were identified within the scope of these inspections.
- EHS provided mammography physicist services to the UIHC's Iowa River Landing (IRL) facility and participated in the IDPH-BRH's MQSA inspection of the IRL's mammography program on November 12, 2013. No violations or concerns were identified within the scope of the inspection.

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 FY14:

- Meetings were held on December 17, 2013 and June 3, 2014. Reviewed and approved four quarterly UI/UIHC ALARA reports.
- Reviewed and approved RSO's evaluative summaries of each of 26 radiation safety audits, noting and initiating corrective action for a total of 11 items of non-compliance (4 items at the UIHC and 7 items in the UI research labs). There were 11 fewer UIHC violations identified in the FY14 audits than during FY13 due to the suspension of the thyroid bioassay requirement following I-131 therapy administrations, and the development and usage of automated reminders for the completion of time sensitive requirements.
- Reviewed the 2013 COMPLY radionuclide air emissions report noting that the UI/UIHC emissions (0.3 mrem/yr) were well within regulatory limits (10 mrem/yr).
- Reviewed and approved submission of the radioactive materials license renewal application to the IDPH-BRH.
- Reviewed and approved the Annual Radiation Safety Program Report for FY13.
- Reviewed the 2013 annual radioactive materials license inspection report.

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 FY14:

- Four quarterly and one special meeting were held during FY14.
- Reviewed and approved 4 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 49 patients whose conservatively calculated skin dose exceeded the 300 rad adult threshold and none that exceeded the 100 rad pediatric threshold during the 7,373 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 6 new radiation oncologists and approved them as authorized users in the department of Radiation Oncology.
- Reviewed the credentials of 1 new medical physicist and approved him as an authorized medical physicist and radiation therapy physicist in the department of Radiation Oncology.
- Reviewed the credentials of 1 graduating resident in Nuclear Medicine and approved her as authorized user without clinical privileges.
- Reviewed the credentials of a new nuclear cardiologist and approved him as an authorized user in Nuclear Cardiology.
- Reviewed the 2013 COMPLY radionuclide air emissions report.
- Reviewed the 2013 annual radioactive materials license inspection report.

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 FY14:

The MRPC held 19 meetings and approved 46 new research applications and 21 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 FY14:

- No RDRC meetings were held during FY14 because no RDRC protocols were submitted or remained active.
- The Committee Chair submitted annual membership summary to the FDA on January 6, 2014. There were no changes in committee membership.

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 FY14:

- The BSRPC reviewed and approved 6 new UI applications for the non-medical use of RAM through their mail ballot process.
- The RSO reviewed and approved 71 non-medical use application amendments.
- Completed 84 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 46 new applications and 21 application amendments.
- Maintained the application files for 118 principal investigators with 55 active medical research-use applications.
- The table below compares this fiscal year's medical use application activities with that of past years.

Activity	FY12	FY13	FY14
New Protocols	47	52	46
Amendments	24	19	21

2. Basic Science Applications

Activities and Accomplishments for FY14

- Processed 6 new applications, 5 cancellations, 11 inactivations, 71 application amendments, and completed 84 application renewals.
- Maintained and managed 95 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.

Activity	FY12	FY13	FY14
Renewals	94	99	84
Amendments	110	63	71
Cancellations	10	10	5
Inactivation	5	9	11
Reactivations	0	0	2
New Authorizations	4	9	6
Active Authorizations	102	104	95
Total Inactive Authorizations	148	120	130

3. Other Support Activities

Activities and Accomplishments for FY14:

- 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 survey, bioassay, RAM receipt and delivery and instrument calibration programs.
- Radioactive Waste – Four quarterly limited scope audits which review all operations at least once per year.

Activities and Accomplishments for FY14:

- Twenty-six program audits were completed.
- Audits identified a total of 9 items (4 UIHC & 5UI) of regulatory or University safety policy non-compliance. 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 FY14:

- Performed 100 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.
- The reduction in the number of thyroid bioassays performed since FY12 was due to the Executive Committee's policy change that eliminated the local requirement for Nuclear Medicine technologists to receive a thyroid bioassay each calendar quarter, and the regulatory variance granted by the IDPH-BRH on February 11, 2013, which eliminated the requirement specified in IAC 641-41.2(39) for individuals to obtain a thyroid bioassay within 4 days of preparing or administering an I-131 therapy dose to a patient.

Bioassay Type	FY12	FY13	FY14
Thyroid	154	109	76
Urine	22	23	24
Total	**176**	**132**	**100**

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 FY14

- Issued a total of 17,682 dosimeters to a monthly average of 847 individual participants.
- Only a total of 61 (7.2%) 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, 5.4 % were either returned late for processing or not returned. Comparisons to the past two fiscal years are given below.

Activity	FY12	FY13	FY14
Dosimeters Issued (annual total)	17,678	17,853	17,682
Individual Participants (monthly average)	846	851	847
Lost/Late Dosimeters (annual average %)	5.3%	6.2%	5.4%
Percentage Issued to UI Personnel	8.5%	8.5%	7.6%
Percentage Issued to UIHC Personnel	91.5%	91.5%	92.4

- The number of individual dosimeter program participants decreased 0.5%, from FY13 while the total number of dosimeters issued decreased by 0.96%.
- The number of late/lost dosimeters decreased from 6.2% to 5.4%. The Radiation Section will continue to focus effort on further reduction of late/lost dosimeters.
- Dosimetry records from 1995 to present have been converted from an outdated format to PDF format and securely stored and backed up on the network drive. All historic exposure records are now securely stored and backed up.

ALARA Program

Dosimetry and bioassay results are reviewed by EHS to ensure exposures are maintained **A**s **L**ow **A**s **R**easonably **A**chievable (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 FY14:

1. External Radiation Exposures

A. UIHC Dosimeter Participants

- Seventeen UIHC participants recorded exposures (2.2% of the total UIHC dosimeter participants) that exceeded the monthly ALARA Level I limits (4% of the annual regulatory limits). Of these, 12 were whole body deep dose exposures (11 of which were determined to be falsely elevated due to improper dosimeter use), 2 lens of the eye, and 3 extremity exposures.
- A total of four UIHC participants recorded exposures (0.5% of the total UIHC dosimeters participants) exceeding ALARA Level II limits (8% of the annual regulatory limits). Three of these were deep dose exposures that were determined to be falsely elevated due to improper dosimeter use. One was an extremity exposure.
- Each quarter EHS performed a review of the dosimetry wear practices and dose records of up to three user groups which was included in the quarterly ALARA Reports that are reviewed by the HRSRG and Executive Committee.

B. UI Dosimeter Participants

- One UI dosimeter participant recorded exposures (1.6% of the total UI dosimeter participants) that exceeded the monthly ALARA Level I limits (4% of the annual regulatory limits).This individual recorded both a whole body shallow and lens of eye exposures.

C. ALARA Totals

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

 # Reports Exceeding ALARA Level I Action Levels

Whole Body Deep Dose Equivalent	PET Imaging Center	1
	Adult Cardiac Cath Lab (improper use)	7
	Vascular Surgery (improper use)	3
	Pain Management Clinic (improper use)	1
	Total Level I Whole Body Deep	**12**
Whole Body Shallow Dose Equivalent	Physiology (UI)	1
	Total Level I Whole Body Shallow	**1**
Lens of Eye Dose Equivalent	Interventional Radiology	1
	Diagnostic X-ray (possibly flawed dosimeter)	1
	Physiology (UI)	1
	Total Level I Lens of Eye	**3**
Extremities Dose Equivalent	PET Imaging Center	3
	Total Level I Extremities	**3**
Total FY14 Level I ALARA Exposures (11 falsely elevated due to improper use)		**19**

 # Reports Exceeding ALARA Level II Action Levels

Whole Body Deep Dose Equivalent	Cardiology (improper use)	1
	Interventional Radiology (improper use)	2
	Total Level II Whole Body Deep	**3**
Extremities Dose Equivalent	PET Imaging Center	1
	Total Level II Extremities	**1**
Total FY14 Level II ALARA Exposures (3 were falsely elevated due to improper use)		**4**

2. Internal Radiation Exposures

Thyroid Bioassays

- During FY14 EHS performed 76 thyroid bioassays. None of the thyroid bioassay results exceeded 10% of our 125 mrem committed effective dose equivalent ALARA limit.

Urine Bioassays

- During FY14, EHS performed 24 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) COMPLY Program. The COMPLY 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 FY14:

- Based on the University's total annual radioactive material inventory from January 1 through December 31st, 2013, the COMPLY Program calculated an effective dose equivalent (EDE) of 0.3 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 3% 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 FY14:

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

EHS staff members met with UIHC ETC personnel to provide guidance about where to send samples for potentially radioactively contaminated patients. After discussion with ETC personnel and State Hygienic Lab personnel, it was determined that samples should be sent to the State Hygienic Lab.

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 FY14:

1. Room Survey Program

- Performed a total of 989 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.

Activity	FY 12	FY 13	FY14
UI Surveys	545	481	452
UI After Hours Security Checks	62	604	528
UIHC Surveys	10	8	9
Total Surveys	**617**	**1,093**	**989**

2. Compliance Assessment Program

- Currently there are 171 UI labs posted for non-medical use of radioactive material, representing a 16% decrease in the number of posted UI research labs from FY13. A total of 5 regulatory compliance violations were observed by EHS during 980 surveys of non-medical use research labs conducted in FY14. The compliance violations occurred in 5 different labs under the use authorization of 4 out of the 95 active principal investigators (4.2%). The non-compliance violations consisted of 3 first time violations for radioactive materials security, 1 first time violation for recordkeeping and 1 second time violation for security. Violation notices were sent to the principal investigators and each of the violations were corrected. No third violation/suspension notices were issued.
- Each lab in which a security violation was identified has had a follow-up security check performed and EHS is satisfied that the problem has been corrected in each case.

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 deposting 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 FY14, six (6) principal investigators have used the new laboratory closeout procedure to decommission their labs.

4. Air Sampling Activities

- Air samples were taken in conjunction with two non-medical research usages of Actinium-225 in FY14. One positive result was found with a corresponding dose to individual of less than 1% of the annual limit. Follow up surveys and discussions with the lab occurred to determine the cause of the exposure; the lab altered their experimental procedure to decrease the potential for airborne exposure.

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 FY14:

- A summary of activity is given below.

Sealed Source Leak Tests	FY12	FY13	FY14
UI	101	108	112
UIHC	268	269	241
Totals	**369**	**377**	**353**

- Performed 122 ambient radiation level surveys and 362 physical inventories.
- A total of 23 new sources were added to the inventory (4 UI & 19 UIHC) during FY14, while 13 sources were disposed of or returned to the original manufacturer (4 UI & 9 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 FY14:

- A total of 164 instruments were calibrated and 14 instruments were tagged out of service. A comparison of the last three fiscal years is given below.

UI Activity	FY12	FY13	FY14
Compliance Calibrations	118	106	103
Tagged Out of Service	19	15	13

UIHC Activity	FY12	FY13	FY14
Compliance Calibrations	59	58	61
Tagged Out of Service	0	0	1

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 283 registered x-ray units in the UIHC/UI's inventory. The current inventory of x-ray units by type is shown below:

106 Diagnostic or Therapy Units
151 Dental Units
9 X-Ray Diffraction Units
5 Electron Microscopes
7 Bone Densitometer Units
3 Research X-Ray Units
2 Veterinary Units
283 Total Units

Activities and Accomplishments for FY14:

- Conducted X-ray compliance inspection surveys of all medical and dental diagnostic X-ray units in service as well as 22 research related X-ray units and 5 bone densitometer units in the University's X-ray inventory. Details for the past three fiscal years are as follows:

X-Ray Unit Inspections	FY12	FY13	FY14
Dental	88	104	149
UI	18	18	17
UIHC	87	92	97
Iowa River Landing	NA	4	4
Totals	**193**	**218**	**267**

- Identified 5 minor items of equipment non-compliance within the UIHC and 13 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.
- Assisted with decommissioning of certain areas of DSB by removing equipment and structural shielding. Worked with the project coordinator to complete work at specific intervals to avoid project delays. The significant increase in the number of new dental x-ray units was due to the College of Dentistry's building expansion and remodeling.
- Performed compliance testing for all clinical and research CT units at UIHC.
- Evaluated a prototype orthopedic CT unit designed exclusively for the knee and lower leg. The production model of this unit was recently installed in Orthopedics Radiology at UIHC.
- Provided mammography physicist services to the UIHC to include MQSA equipment compliance checks for the two digital screening units, one stereotactic breast biopsy unit, one computed radiographic unit, and four tomographic mammography units.
- Evaluated and commented on the Joint Commission's proposed changes to Radiology requirements, specifically those related to equipment quality control and personnel qualifications.
- The EHS mammography physicist assisted in the successful accreditation of the new tomosynthesis mammography unit at Iowa River Landing as well as the annual MQSA inspection.
- 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 11 - 12, 2013. No violations or concerns were identified within the scope of these inspections.
- 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 FY14:

- Provided construction shielding plans for the UI's Pappajohn Biological Discovery Building (PBDB), Oakdale Vivarium, , College of Dentistry, VA Medical Center (VAMC), and UIHC's Pain Clinic,

Orthopedics, Nuclear Cardiology, Digestive Disease, Children's Hospital, Iowa River Landing (IRL), and Iowa State Penitentiary. 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, Digestive Disease, the UI's Pappajohn Biological Discovery Building (PBDB) and the VA Medical Center. Consulted and provided shielding evaluations for remodeling projects for the UIHC's Departments of Radiology Orthopedics, Adult Cath, PET, Peds Cath, and Digestive Disease, the UI College of Dentistry, VAMC, and Oakdale Vivarium.

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 FY14:

- Radioactive Materials Receipt and Delivery: a total of 354 items of radioactive material were processed and delivered to UI or UIHC facilities. Receipt totals from previous fiscal years are provided below for comparison.

# Receipts	FY12	FY13	FY14
UI	456	311	229
UIHC	114	136	125
Total	**570**	**447**	**354**

- Radioactive material inventories were maintained within the University's license limits.
- Radioactive Materials Shipments: 17 packages were shipped for UI (2) and UIHC (15) personnel. RAM shipment totals from previous fiscal years are provided below for comparison.

# Shipments	FY12	FY13	FY14
UI	5	3	2
UIHC	15	6	15
Total	**20**	**9**	**17**

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 FY14:

- A total of 1,164 radiation safety courses were completed during FY14, representing a 5.3% increase over FY13 totals. A total of 722 radiation safety courses were taken by UI employees and 442 courses by UIHC employees. A total of 147 individuals (120 UI & 27 UIHC employees) completed laser safety training during FY14. A breakdown in course participation is given below.

UI Radiation Safety Training						
Basic Rad Safety	**Rad Safety Refresher**	**Rad Safety Ancillary**	**Rad Waste Management**	**RAM Shipping**	**Research Laser**	
197	327	169	20	9	120	
UIHC Radiation Safety Training						
Rad Oncology	**Nuclear Medicine**	**Y-90 Micro spheres**	**Rad Safety Ancillary**	**General X-Ray**	**X-Ray for Fluoro**	**Medical Laser**
52	14	65	154	77	80	27

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 FY14:

- Therapy patient activities and historical comparison are provided below:

Therapy Procedure	**FY12**	**FY13**	**FY14**
I-125 Eye Plaque Brachytherapy	23	43	34
I-125 Prostate Brachytherapy	10	6	3
Ir-192 Brachytherapy	0	0	1
I-131 Radiopharmaceutical Therapy	44	32	40
Y-90 Radiopharmaceutical Spheres	12	12	15
Lu-177 Radiopharmaceutical Therapy	3	1	16
Intraoperative Radiation Therapy (IORT)	11	28	31
TOTAL Therapy Procedures	**103**	**122**	**140**

- No reportable medical events occurred during FY14.

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 61 research lasers registered with 23 investigators at the UI and 24 medical lasers registered to 7 departments at UIHC.

Activities and Accomplishments for FY14:

- 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 12 UI research groups utilizing 17 lasers and 8 UIHC departments utilizing 24 lasers. Several UI laser labs are still inactive as a result of the 2008 flooding in IATL.
- EHS met with two new research laser users to register equipment and provide guidance for establishing a safe laser use environment.
- Working with UIHC's Capital Management to correct problems with laser area entryway controls in the Main Operating Room and MOR East.
- Developed a safety procedure for the use of UV-C room sterilizers recently purchased by UIHC. Also helped evaluate the specific safety considerations for such units from three different vendors.
- 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 alternate 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 FY14:

EHS dedicated 0.67 FTE to the management of radioactive waste during FY14. This effort is broken down as follows:

UI	0.30 FTE
UIHC-Pathology	0.03 FTE
UIHC-Radiology	0.30 FTE
VAMC	0.04 FTE

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

Summary (UI & UIHC)	**FY12**	**FY13**	**FY14**
# Pick-Ups	242	184	177
# Items Radioactive Collected	767	644	616
# Pieces Lead Shield Collected	2,149	1,172	994
Activity Collected – Curies	.690	0.283	0.271
Summary (UI & UIHC)	**FY12**	**FY13**	**FY14**
# Containers Shipped Off-Site	21	33	22
# Liquid Barrels Discharged	4	6	7
Activity Discharged to Sewer (Curies)	0.040	0.058	0.102

# Shipping Containers Generated*	FY12	FY13	FY14
Animal Carcass	3	0	0
Dry Waste	17	16	19
Liquid Waste, Aqueous	8	6	5
Liquid Waste, Mixed	1	1	0
LSC Vials (Hazardous)	2	0	1
LSC Vials (Non-hazardous)	14	17	22
Other	0	0	0
Sharps	0	1	1
Total Containers	**45**	**41**	**48**

* 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 savings resulting from in-house processing and/or material segregation of radioactive materials is listed below.

# Processed	FY12	FY13	FY14
Patient Linens Decay-In-Storage (containers)	7	3	0
Sharps Decay-In-Storage (containers)	63	41	47
Dry Waste Decay-In-Storage (drums)	52	9	5
Dry Waste Incineration (containers)	43	66	70
TOTAL	**165**	**119**	**82**

# of Drums Eliminated from Radioactive Waste Burial	FY12	FY13	FY14
Dry Waste Decay-In-Storage	52	9	5
Sharps	4	.5	3
Dry Waste Incineration	4	5	5
Total	**60**	**14.5**	**13**

Waste Processing Cost Savings	FY12	FY13	FY14
Dry Waste Decay-In-Storage	$62,400	$ 14,700	$ 8,200
Sharps Decay-In-Storage	$ 14,000	$10,500	$ 17,500
Total Savings	$ 76,400	$ 25,200	$ 25,700

Radiation Safety Program Goals for FY15

- Prepare for implementation of the NRC's new security requirements for radionuclides in quantities of concern that were published on March 19, 2013, in the new 10 CFR Part 37 – Physical Protection of Category 1 & 2 Quantities of Radioactive Material. The Part 37 requirements go into effect for agreement states by no later than March 19, 2016.
- Provide shielding analysis and design consultation for the UIHC's new Children's Hospital project regarding x-ray and laser safety requirements.
- Provide radiation safety consultation and monitoring during construction of the new 8th floor addition to the UIHC's Pappajohn Pavilion and new Children's Hospital.
- Continue to work with OnSite to develop paperless radiation safety audits using mobile computer tablets and providing customized reporting and online customer access to the HP Assist database.
- Provide shielding verification analysis for the new PBDB as the new x-ray and MRI equipment is installed.
- Increase frequency of laser safety audits to once every twelve months.
- Provide input regarding dose minimization initiatives for CT and other modalities in Radiology.
- Continue the transfer of paper radiation safety records and files to an electronic, searchable format.

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 FY14:

- Numerous hazard assessments were conducted throughout the year to evaluate safe material handling, review chemical use with animals, or investigate an individual or area concern. Examples include assessments for isoflurane anesthetic agent, hazardous gases including boron trichloride and other oxidizing/corrosive gases used or created in a micro-fabrication facility process, closed system silica/silicate dust generation and filtering controls, hydrogen gas use in molecular beam epitaxy equipment, containment for studies investigating MPTP neurotoxin, and carbon filtration adequacy for isoflurane anesthetic vaporizer system, safe hydrogen fluoride handling, safe antineoplastic drug handling, and safe cyanide compound handling.
- Approximately 100 chemical hazard assessments were conducted in FY14; a significant number of these were conducted as part of the formal OAR ACURF Hazardous Agent Review process.
- 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 investigation.
    - Three samples were taken for formaldehyde.
    - Mercury concentration in air was measured by direct reading instrument in three areas.
    - Toxic gases in air (including hydrogen sulfide and carbon monoxide) were measured by direct reading instrument for one building area.
    - Volatile organic vapors in air were measured by direct reading instrument for one work area.
    - A sample of unknown material was collected and sent for analysis to identity materials in one building 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 107 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 FY14:

- The chemical inventory system, OnSite's Chemical Safety Assistant (EHSA), was used throughout FY14. The following is a breakdown of some EHSA data categories.
    - Number of chemical owners/PIs 547
    - Number of total Users 1,331 #
    - Number of buildings 165
    - Number of rooms 2083
    - Number of inventory items 165,958

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

- Four in-person training sessions were provided.
- Conducted a verification of research labs' inventory account information (PI's, 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 FY14:

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 two new safety advisors.
- The team was utilized to collect and disseminate information throughout the year.
- The safety advisors conducted 390 bio/chemical lab reviews. In addition, 13 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. Forty-six (46) 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 eight general categories and tracked to help correlate problems within general health and safety programs or areas. Of the eight categories, the highest numbers of findings were in areas that included training, chemical management, and personal protective equipment.
- Of the labs reviewed in FY14, the most common number of findings per review was zero (41%), followed by one (20%), and two (19%).
- 59% 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 inadequate chemical hygiene plan (CHP) annual review documentation.
- Notable improvements in FY14 include:

    - 4.8% improvement in the category entitled 'chemical storage or segregation needs improvement.'
    - >3% improvement in the category entitled 'secondary containment not used for hazardous waste stored on the floor' and 'expired peroxide-former found or peroxide-former not periodically tested.'
    - 2.5% improvement in the category entitled 'EHSA not used or needs improvement.'
- Notable trends toward improvement over three years (FY11 through FY14):
    - 14% improvement in 'respirator use evaluation needed.'
    - 11% improvement in 'training is incomplete.'
    - 5.5% improvement in 'access to updated Exposure Control Plan needed'; and
    - ~5% improvement in 'fume hood blocked and used for experiments'.
- 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. Essentially the same percentage of the labs completed all the outstanding items found during the lab review in FY14 as compared to last fiscal year.
- The safety advisors conducted 314 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 'PPE not worn by personnel (gloves, goggles, lab coats)'.

<u>Mobile Inspection Development Activities (2014)</u>

- Identified a tablet computer that would work well for the team.
- Worked with VPR IT to get EHSA software installed on tablets and desktops.
- Implemented the ability to create permits in EHSA.
- Added a new inspection type in EHSA.
- Translated all lab review questions plus associated recommendations into EHSA software; included creation of violation codes and review categories.
- Worked with IT to integrate e-mail capability between EHSA and the UI e-mail directory.
- Created a lab review comprehensive report and 2 reports for PIs including deficiency list report and no deficiencies found report.
- Created a test PI in EHSA to facilitate training and testing.
- Conducted extensive testing to assure all review items appear in results and display clearly on reports.
- Created an SOP for Safety Advisor Team users of the tablets and mobile auditor program.
- Revised communication templates for labs and documents for scheduling lab reviews and reporting results.
- Revised internal process for review of lab review results prior to issuing to labs.
- Trained all advisors on use of tablet and how to use inspection software; individual practice and mock audits.
- Training Requirement Query/Reporting Feature Activities included:
    - Arranged for all EHS ICON course data to be shared with EHSA daily.
    - Prepared a training needs assessment document to collect information from labs
    - Set-up EHS ICON courses in EHSA.
    - Revised communications for labs to include training information.
    - Created the capability to query lab personnel by PI to identify personnel missing required EHS training.

    - Advisors began entering lab personnel lists and matching training required with data from training needs assessments; reports of staff missing training were created for discussion at lab reviews.
- Created numerous reports to allow extraction of data/statistics from EHSA for internal reporting purposes in order to allow for future retirement of Excel audit tracking spreadsheets.
- Added Lab Safety Rounds as an inspection type and followed steps listed above for Mobile Inspection Development to prepare for mobile lab safety rounds.

Other SAT Activities included:

- Attended training on the following topics: “Changes to UCLA's Lab Safety Program” and “Bloodborne Pathogens (What You Need to Know to Prevent Disease Transmission in the Workplace).”
- Planned for managing the SAT workload of a retiring safety advisor.

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 FY14:

- Completed the annually required Facility Safety Plan Status report to USAMRMC; EHS provided site visits, follow-ups, and coordinated USAMRMC safety plan information for 16 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 FY14:

- All chemical safety online training modules were reviewed/revised.
- Chemical safety resources added in FY14 included guidance documents for safe hydrofluoric acid handling, pyrophoric reagent safety, oil bath safety, and broken glass injury prevention.
- 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 FY14 included:

- A Safety, Health and Waste Management program and process evaluation was completed for the State Hygienic Laboratories.
- A chemical use evaluation was conducted as part of planning for a satellite vivarium facility.
- Gas cylinder storage was investigated for a building dock area with limited storage space.
- A fume hood dripping condensate from a corroded exhaust duct was evaluated to determine if the condensate was a chemical rather than water.
- Total quantities of flammable liquids were determined for investigators moving to a new research building.
- Significant assistance was provided to a student professional chemical engineering organization with coordinating receipt of chemicals and of detailed chemical safety issues for a regional Chem-E car competition hosted by University of Iowa and attended by chemical engineering students from multiple institutions.
- Assisted a lab with a concern about particulates entering the lab via supply air.
- Chemical safety and management issues were reviewed in 390 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 21 new lab respirator use evaluations were completed in FY14. As of the date of this annual report, EHS records show there are approximately 175 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 two 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 FY14:

- 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 at each EHS bio/chemical lab review.
- Chemical safety section staff provided personal consultations, coaching and education for individual laboratories on:
  - Cuts, punctures, and piercings while handling glass apparatus or razors.

- Splashes from phenol-chloroform reaction mixture, splattering from electrophoresis gel.
- Glove disposal related to improving safety at unattended chemical use benches and computer stations.
- Improving storage of lab coats to minimize exposure to contaminants.
- Improving the types of gloves worn for a specific purpose (e.g., cut resistant gloves or thermal resistant gloves).
- Improving the use of safety glasses or goggles, especially while working with liquids.

- PPE 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 chemical use 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 FY14:

Fume Hood Program

- The annual test cycle was rearranged from a 3-month summer rotation into a 12-month rotation to better accommodate EHS and FM workloads.
- The annual test cycle of all fume hoods on campus was completed and the report was issued in January 2014 to 20 departments and colleges, as well as to FM and UIHC.
- 909 hoods were visited, with 870 chemical fume hoods measured for hood face velocity:
  - 830 hoods passed
  - 27 hoods were designated for restricted use only
  - 10 hoods failed
- Seventy-two (72) referrals were made to maintenance (FM Work Control Center and UIHC) for issues such as failed hoods or other airflow problems, problems with lights, 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.

Fume Hood Program Report	1/2014
Number of departments receiving report	20
Total number of hoods tested	870
Number of hoods passed	830
Number of hoods failed	10
Number of hoods restricted	27
Number of referrals made to FM	72
Number of hoods under construction	6
Number of hoods inaccessible	14
Number of hoods not in use	19
Number of hoods removed or decommissioned since previous year	16

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:

- MERF construction of a GMP facility
- Trowbridge Hall implement energy conservation measures
- CB implement energy conservation measures
- ML facility energy study
- BBE retro-commissioning study
- BSB retro-commissioning study
- PBDB Turnover Work Group
- MEB facility energy study
- MERF Retro-commissioning study
- Transgenic/BRSF facility
- Seaman's Center implement energy conservation measures

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 FY14:

ER-RTK

- RTK Report was completed and distributed to appropriate UI, local and state emergency authorities AutoCAD files (in PDF format) are stored on 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 collection for ER-RTK. 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 2014.

Updated In AutoCAD	# Buildings	# Floor Plans	# New Maps
East Campus	88	378	121
Hawkeye Campus	21	37	4
Off Campus Coralville	8	18	10
Off Campus Iowa City	12	16	3
Off Campus Lake MacBride	10	21	10
Off Campus Muscatine	1	1	1
New Buildings	9	9	9
University Research Park	40	75	8
West Campus	108	435	100
TOTALS for ER-RTK AutoCAD	**297**	**990**	**266**

- A total of 990 floor plans where updated for the ER-RTK 2014 Report. 266 new floor plans were formatted for the ER-RTK 2014 report and 297 cover pages where updated for each building.
- Additionally, 297 buildings and 990 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.

  The ERRTK improvement process for 2014 included:
- An Apple iPad was used in the field to update maps and record notes during building audits using the AutoCAD WS 360 program. 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 meet 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 they presently have stored chemicals.

Tier II

- Completed the Tier II report; copies were provided to local, county and state emergency and disaster service organizations.
- Used information from the chemical inventory system to verify locations and amounts listed in the Tier II inventories; The ER-RTK report data were also used for Tier II preparation.
- 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-six Tier II reports were filed in FY14 compared to two the previous year. After consultation with IDNR, it was determined that each building will now be considered a "facility". This necessitated adding facility information for each building in which reportable quantities of Tier II chemicals were used or stored. Chemicals were entered separately for each facility, instead of campus wide. This significantly reduced the amount of chemicals that were required to be reported, as chemical quantities were summed on a per building basis versus the entire campus, leaving fewer chemicals that exceeded the reporting thresholds. This also yielded a more representative picture of chemicals by location.
- There are currently 51 active participants who routinely provide updated chemical data for Tier II reporting with 137 chemicals in reportable quantities.
- 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; query of 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.

- 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.
  - 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.
  - 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 vender to correct errors in the programming and data tables.
- No material was determined to exceed a threshold reportable quantity in FY14. 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 FY14:

- 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 FY14:

- 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 14 campus incidents/inquiries. Nine incidents involved chemical spills, including three with mercury, and one incident for each of the following substances: acetone, sewage, Selectricide 12G, 2-bromopyridine, water from sink drain and metal contaminated solvent waste stream.
  - Three of the incidents involved odors; one from a drain cleaner, one from alcohol and one from bleach. All odors were the result of air flow moving the odors from point of origin to nearby areas. One incident involved a needle and syringe being placed upon a UI van and was disposed of by EHS personnel. One incident involved a brown foam coming out of an air handler drain and involved water/drain cleaning chemicals.

- Eleven of the incidents involved research laboratories or buildings, one incident involved a college of nursing van, one incident involved the crawl space under McBride Hall and the final incident occurred at the EMF.
- DPS was involved in one of the 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 FY15:

- 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 compliant with DHS COI 60-day 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 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.
- 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-two spill carts will be located in the building.
- Inspect all of the University buildings including those purchased or leased in FY14.
  - Provide building emergency contact information for each building on the actual map to make it more user friendly to personnel using the map for emergency response.
  - Review each building map/floor plan available from FM for changes prior to conducting physical audits of buildings for 2015 RTK Report.
  - Replace iPad with a tablet computer for conducting building audits.
  - Create or revise SOPs for: Using AutoCAD to create floor plans for the ER-RTK Report; overall creation of ER-RTK Report; and TIER II process, use of IDNR TIER II reporting software, and creation of TIER II 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 FY15:

- Continue to develop and refine the mobile auditing process for the laboratories.

- Complete Biological and Chemical internship for new field safety advisors.
- Initiate the training of the new Biological Safety Specialist to serve as a member of the safety advisor team.
- Continue unscheduled lab visits (Lab Safety Rounds) for the purposes of both improved lab follow-up and to create opportunities for questions from researchers.
- Develop a plan for implementing the web access feature for labs in EHSA. This feature allows labs to login to EHSA to view their lab review results and enter corrective action items for discrepancies.
- Complete applicable training opportunities as they become available.

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. These activities are performed by the HR Unit Rep and Administrative Services Coordinator with oversight provided by the OVPR Compliance Unit Business Manager.

Activities for FY14:

Approximately 3710 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 51 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 402 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 1,817 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 566 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 668 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 159 hours were spent on production and distribution of the bi-monthly Lab News newsletter and other publications.
- **Staff Training Records Program.** Approximately 47 hours were spent on the administering of internal training and professional development records for EHS staff.

Activities and Accomplishments for FY14:

HR Unit Rep

- Participated in the recruitment and onboarding of five open positions: an Environmental Safety Coordinator, two Biosafety Specialists, an Associate Biological Safety Officer, and an Occupational Safety Manager.

- Assisted with the transition of two staff retirees.
- Reconciled monthly leave records for the Office of Animal Resources.
- Assisted staff with implementation of online performance review system.

Administrative Services Coordinator

- Assisted biosafety staff with BSC certification scheduling.
- Assisted HSO unit with monthly leave reconciliation.
- Served as Wellness Ambassador for EHS.
- Successfully transitioned to sending electronic rDNA review letters documents.
- Organized and set up several webinars for EHS staff.

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 FY14

Approximately 1,054 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 ClarityNet training and maintaining ICON training by updating/adding new courses.

- ICON Training Course Activities
  - 14,951 courses were completed.
  - 87 courses are available.
  - Reset 87 course grade books on January 1, 2014 to provide proper course completion date stamping in the individual's HR Training record.
- ClarityNet Activities
  - 2,445 courses were completed. The ClarityNet contract ended on March 31, 2014, and was not renewed. Therefore, course numbers for FY14 represent only 9 months.
  - 42 courses were available.
  - Coordinated with 9 Departmental Administrators.
  - The following departments had access to the training courses.
    - Facilities Management
    - University Housing
    - Iowa Memorial Union
    - Business Services
    - Risk Management
    - 24 other small groups – managed by EHS
  - ClarityNet was discontinued April 1, 2014.

Administrative Section Goals for FY15:

HR Unit Rep:

- Continue to assist with implementation of the Talent Management System.
- Continue to periodically attend EHS section staff meetings.
- Continue to provide assistance with HR transactions for other VPR compliance units.
- Update and maintain documents under the sub-certification HR & Financial processes.

Administrative Services Coordinator:

- Continue using electronic process to send and follow up with rDNA letters each month.

- Continue to assist HSO unit with monthly leave reconciliation.
- Continue role as Wellness Ambassador for EHS.
- Keep EHS staff training records organized and up to date.
- Sign up for professional development courses such as the WISK series.

Web/Training Administrator:

- Continue to maintain and update website
- Attend web liaison meetings organized by OVPR Webmaster.
- Develop/update SOP for yearend course updating process.
- Maintain accessibility in website and online training in compliance with UI Accessibility policy.
- Work with EHS staff to identify and create additional e-forms for website.

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.

Type	FY14	FY13	FY12	FY11	FY10	FY09	FY08	FY07	FY06	FY05	FY04	FY03	FY02
Classroom								408	589	552	484	684	1719
CD								0	0	121	187	137	59
Self-Instruction								620	424	394	712	907	408
VA Self-Instruction			97	103	118								
VA In-Service		26	28	141									
Web - ICON	14,951	12,965	9988	9337	10519	9714	7599	7840	6461	4692	4052	2632	2436
Web -ClarityNet	2,445	3,019	3609	3963	3141	4979	4518	2441					
Total	**17,396**	**16010**	**13722**	**13544**	**13778**	**14693**	**12117**	**11309**	**7474**	**5759**	**5717**	**4360**	**4622**

The following table summarizes the training statistics for each EHS course.

ICON Courses	Number	ClarityNet Courses	Number
Advanced Biological Safety	40	Aerial Lifts	11
Aerial Lifts	3	Arc Flash: Safety Awareness	3
Analytical X-Ray Equipment	19	Asbestos Awareness	204
Asbestos Awareness	75	Back Safety (Video)	229
Basic Biological Safety	719	Bloodborne Pathogens	139
Biological Safety Cabinets	61	Bloodborne Pathogens for Custodians	390
Bloodborne Pathogen Refresher	1195	CHE6- Chemical Handling Safety - Flammables	1
Bloodborne Pathogens, CPH	72	Chemical Handling Safety - Basic Principles	1
Bloodborne Path., FM, Housing, Dining	10	Chemical Handling Safety: Corrosives	1
Bloodborne Pathogens, Lab	621	Confined Space Entry	33
Bloodborne Pathogens, Non-Lab	461	Defensive Driving	279
Chemical Fume Hoods	108	Defensive Driving: 15-Passenger Vans	57
Chemical Storage Safety	169	Disposable Respirators: Exposure Control	5
Compressed Gas Safety	148	Electrical Safety	85
Confined Space Non permit	26	Eye Protection: See the Whole Picture	0
Confined Space Prohibited	13	Fall Protection	52
Contingency Plan Training	10	Fire Safety	7
Controlled Substances Research	12	Fire Safety:There's No Second Chance	5
Electrical Safety	10	Forklift Certification	17
Electron Capture Detector	20	Forklift Safety	2
Ergonomics - Back Safety	159	Groundskeeping Safety: Be A Pro!	1
Ergonomics - Computer Use	247	Hand Safety: It's in Your Hands	55
Fire Extinguishers	259	Hazard Communication: Identifying the Dangers	9
Forklifts	35	Hazard Communication: The Road to Safety	202
Formaldehyde Safety	360	HazCom: In Sync with GHS	4

ICON Courses	Number	ClarityNet Courses	Number
GHS Labels and SDSs	3504	Hearing Protection	77
Hand Safety	6	Indoor Cranes	2
Hazardous Waste for Labs	1123	Ladders	86
Hazardous Waste for Non-Labs	38	Lead Safety	2
HazCom	204	Lockout/Tagout	36
Hearing Conservation	112	Machine Guarding	43
Indoor Cranes	2	Office Ergonomics	7
Intro to RCRA Training	2	Office Safety	0
Lab Chemical Safety	894	Oxyfuel Gas Cutting: The Sure Cut	0
Ladders and Stairs	66	Personal Protective Equipment	46
Laser Safety - Research	120	PPE: Don't Start Work Without It	53
Laser Safety - UIHC	27	Respiratory Protection	56
Lead Safety Awareness	10	Scaffold Safety	12
Lockout/Tagout Safety	47	Slips, Trips and Falls: Taking the Right Steps	147
Machine Guarding	77	Small Spills and Leaks	0
Nanomaterials Research Safety	27	Target Zero: Pro-Active Safety Attitudes	54
Nuclear Medicine Staff	1	Working Safely With Power Tools	32
Office Safety	156	**Total**	**2445**
P.E.T. Imaging Staff	13		
Pandemic Influenza Dust Mask	2		
PPE Awareness for Labs	913		
PPE Awareness for Shops	89		
Rad Safety 3JPP Staff	57		
Rad Safety CRC Staff	1		
Rad Safety for 3RCP	93		
Rad Safety for FM Staff	169		
Radiation Oncology Staff	52		
Radiation Safety - CS Staff	3		
Radiation Safety, Basic	164		
Radiation Safety, Refresher	327		
Radioactive Materials Shipping	9		
Radioactive Waste Management	20		
RDNA Research, NIH Guidelines	336		
Respirator Dust Mask	43		
Respirator PAPR Hood or Helmet	45		
Respirator PAPR Tight Fit Face	13		
Respirator Tight Fit Facepiece	37		
Respirator Voluntary Use	218		
Safe Trailering	45		
Safety Leadership	9		
Safety Procedures for UI	35		
SAIC Radiation Safety	1		
Sealed Sources Radiation Safety	22		
Shipping Infectious Substances	203		

ICON Courses	Number	ClarityNet Courses	Number
Shipping with Dry Ice	202		
SPCC: Oil Spill Prevention	8		
Spill Preparedness Response	137		
Stem Cell Research	7		
Tool Safety	76		
Toxins, Select Agent Quantity	33		
UIHC Radiation Awareness	1		
UIHC Radiation Safety, Security	4		
Universal Waste Management	33		
Walking and Working Surfaces	23		
Welding and Cutting	18		
X-ray Safety - General	72		
X-ray Safety – Limited	5		
X-ray Safety for Fluoroscopy Staff	80		
Y-90 Microspheres Rad Safety	65		
Total	**14951**		

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

Staffing

A summary of staffing associated with each section for FY14 appears below. The organizational chart for EHS may be found in the attachment section.

Occupational Safety

The section was staffed by the following individuals: Kate Kendall – Occupational Safety Manager; Robin Lindenboom and John Anderson – Occupational Safety Specialists. Julia Lippert, temporary position. The section has a total of 4 FTEs.

Administrative Services

The section was staffed by the following individuals: Carol McGhan –Director; Sarah Tallman – Compliance Unit Business Manager (0.5 FTE); Andrea Domsic – Administrative Services Coordinator; Merry Ibsen – Secretary III/HR Unit Representative; and, Christal Quigley – Clerk IV/Web - Training Administrator. The section has 4.5 FTEs.

Environmental Programs

The section was staffed by the following individuals: Jim Pyrz – Environmental Safety Program Manager; Michelle Kempf – Secretary III (0.5 FTE); Jeff Montgomery – Environmental Safety Specialist; William Murray – Environmental Safety Compliance Specialist; Tim Weber – Senior Environmental Safety Coordinator; Justin Swafford and James Bechtel – Environmental Safety Coordinators. The section has a total of 6.5 FTEs.

Radiation and Hospital Safety

The section was staffed by the following individuals: Joe Graves – Assistant Director/Radiation Safety Officer; Gordon Axt – Assistant Radiation Safety Officer; Laurie Scholl and Joey Michael – Health Physicists; Joe Hawk – Radiation Safety Specialist; Jeff Olson – Radiation Safety Assistant; Barb Vitense – Clerk IV; and a Student Office Assistant. The section has a total of 7.0 FTEs.

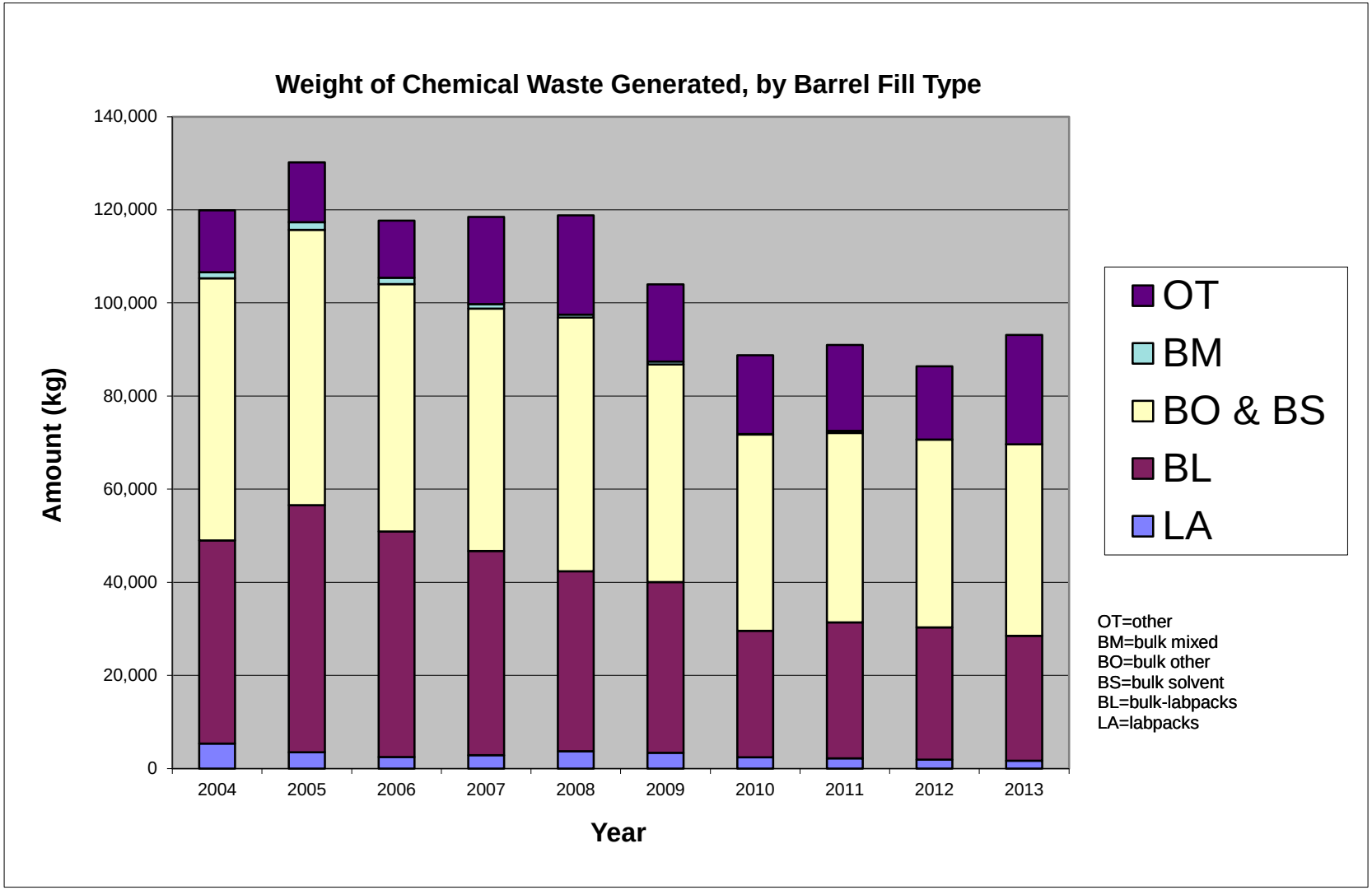
Chemical Safety

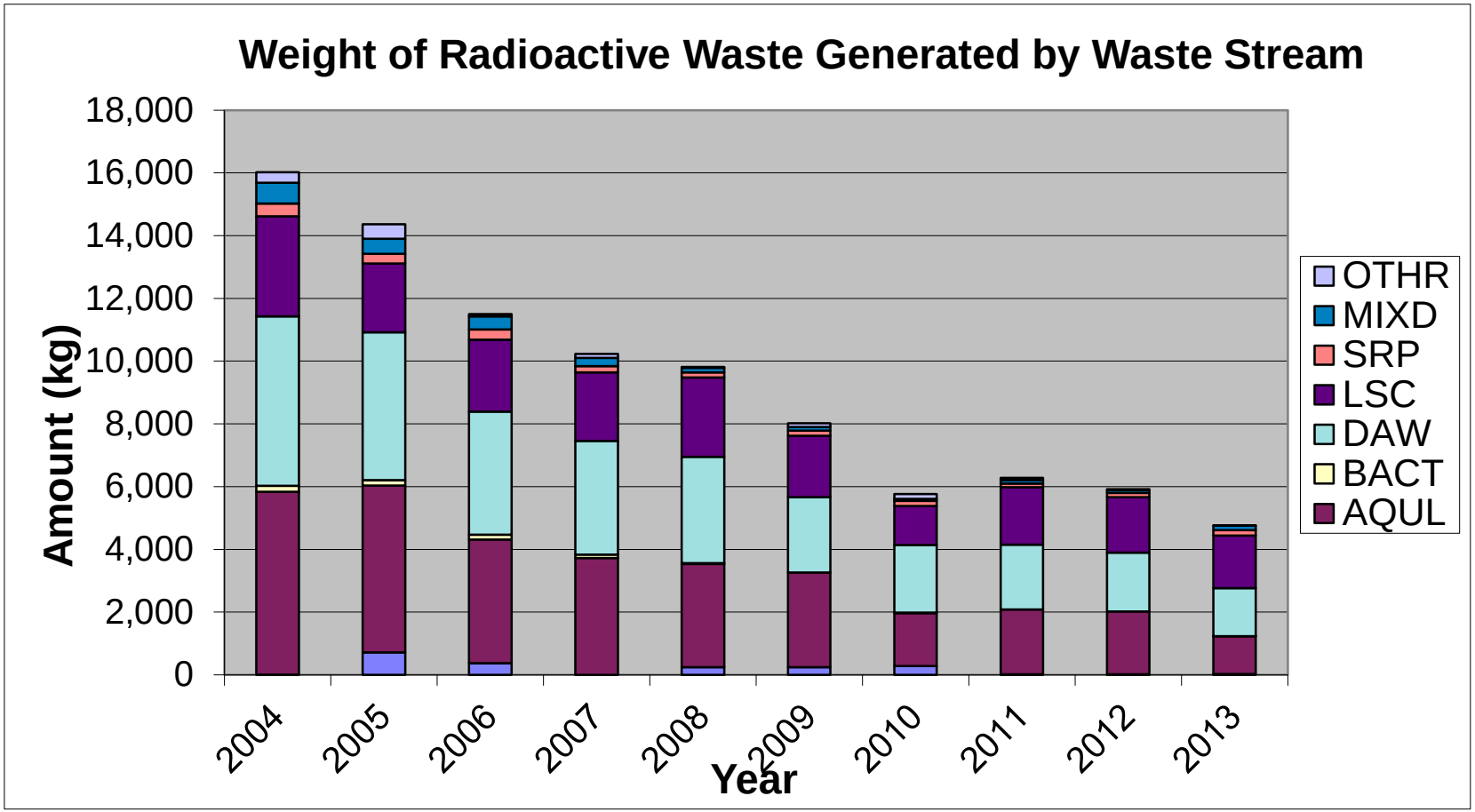
The section was staffed by the following individuals: LuAnn Hiratzka – Chemical Hygiene Officer; Rick Byrum – Emergency Preparedness Specialist; Periyasamy Subramanian – Senior Chemical Safety Specialist, Industrial Hygiene; Rachelle Justice – Senior Chemical Safety Specialist; Laurie Taylor – Chemical Safety Specialist (0.75FTE); and a Student Safety Assistant. The section has a total of 4.75 FTEs.

Biological Safety

The section was staffed by the following individuals: Haley Sinn – Biological Safety Officer/Responsible Official; Rachel White – Associate Biological Safety Officer; Deborah Kratz – Senior Biological Safety Specialist, and Tyler Shaffer, Biological Safety Specialist. The section has a total of 4.0 FTEs.

ATTACHMENTS


Weight of Chemical Waste Generated, by Barrel Fill Type
Amount (kg)
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
Year
OT
BM
BO & BS
BL
LA
OT=other
BM=bulk mixed
BO=bulk other
BS=bulk solvent
BL=bulk-labpacks
LA=labpacks


Weight of Radioactive Waste Generated by Waste Stream
Amount (kg)
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
Year
OTHR
MIXD
SRP
LSC
DAW
BACT
AQUL

Radioactive Waste Generation Statistics - University of Iowa Environmental Health & Safety Units = Drums (Unless Otherwise Noted

.

Waste Type			1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Animal			153	87	68	45	3	11	1	9	2	4
Ash			3	7	5	5	5	2	0	2	0	0
Bactec Vials												
Dry (Box) - 0.1 Yard Box						115	105	131	90	123	129	103
Dry (Box) - Yard Box												2
Dry (Drum)-Long			49	38	30	18	11	12	7	9	7	3
Dry (Drum)-Short			139	122	105	97	88	87	61	63	48	45
Dry (Drum)-Total			188	160	135	115	99	99	68	72	55	48
Liquids-Aqueous			48	53	45	36	42	34	29	37	28	26
Liquids-Mixed			18	20	17	12	15	10	9	10	8	5
Liquids-Total			66	73	62	48	57	44	38	47	36	31
LSC Vials (Mixed)			107	92	74	58	51	37	28	20	18	15
LSC Vials (Nonhaz)			10	3	3	2	1	3				
Sharps-Long			0	5	3	3	2	2	2	2	3	1
Sharps-Short			10	8	6	5	3	5	1	6	1	2
Sharps-Total			1	0	2	3	3	2	3	8	4	3
Sealed Source									1	1	2	1
Total			528	428	353	394	326	331	229	282	246	207
Waste Containers (excludes lead)			6,282	5,265	4,738	4,153	3,703	3,373	2,745	2,186	2,523	2,092
Lead shielding (pieces)			61	2,120	3,651	4,283	2,843	3,333	2,629	3,198	3,270	2,356
Incoming Packages			3,932	3,693	3,329	3,417	3,424	3,284	3,008	2,308	2,137	1,843
Waste Type			**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Animal			0	17	7	0	5	7	5	5	12	0
Ash			0	0	0	0	0	0	0	0	0	0
Bactec Vials					2	1	0	1	0	1	0	0
Dry (Box) - 0.1 Yard Box												0
Dry (Box) - Yard Box			15	8	7	5	6	5	4	5	4	5
Dry (Drum)-Long			3	5	3	5	5	4	3	3	3	2
Dry (Drum)-Short			42	36	29	30	20	20	13	13	10	6
Dry (Drum)-Total			45	41	32	35	25	24	16	16	13	8
Liquids-Aqueous			35	25	21	18	17	16	11	8	6	5
Liquids-Mixed			6	6	4	1	1	0	1	0	1	1
Liquids-Total			41	31	25	19	18	16	12	8	7	6
LSC Vials (Mixed)			13	13	14	13	8	8	3	9	0	0
LSC Vials (Nonhaz)								19	15	19	19	18
Sharps-Long			2	3	3	2	1	1	1	0	0	1
Sharps-Short			1	1	0[a]	0	0	0	0	0	0	0
Sharps-Total			3	4	3	2	1	1	1	0	0	1
Sealed Source			1	2	1	1	0	1	0	0	0	0
Total			118	116	91	76	63	82	57	63	55	38
Waste Containers (excludes lead)			1,904	1,812	1,468	1,366	1,255	1,129	925	865	776	664
Lead shielding (pieces)			2,818	3,532	2,386	2,097	2,444	2,192	2,061	2,532	1,773	984
Incoming Packages			1,442	1,207	1,254	1,147	1,001	817	766	385	501	264

a= short-lived sharps are now being held for decay, and subsequently shipped to Stericycle

University of Iowa Environmental Health & Safety
Historical Waste Collection Statistics Summary

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Chemical Waste												
Stops	1,931	2,541	2,992	2,728	2,831	2,786	2,819	3,026	3,277	3,454	3,511	3,633
Containers	11,893	12,326	13,556	12,556	15,913	18,853	21,054	21,198	22,077	25,519	25,275	29,211
Weight (kg)	52,868	60,259	62,531	75,810	70,768	77,162	66,444	86,113	103,611	121,134	119,960	127,095
Radiation Waste												
Stops	2,533	2,756	2,596	2,104	1,816	1,581	1,358	1,177	1,117	942	934	798
Containers (excludes lead)*				6,283	5,259	4,738	4,153	3,703	3,373	2,745	2,786	2,523
Lead shielding (pieces)				61	2,120	3,651	4,283	2,843	3,333	2,629	3,198	3,270
Total containers	7,759	8,159	8,578	6,344	7,379	8,389	8,436	6,546	6,706	5,374	5,984	5,793
Weight (kg) (excludes lead)	57,667	58,654	62,324	38,951	33,577	28,787	26,526	22,102	21,648	20,802	19,811	17,163

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Chemical Waste											
Stops	3,464	3,735	3,593	3,324	3,702	3,517	3,783	3,903	4,039	3,824	3,951
Containers	22,108	26,047	26,872	24,216	27,543	28,950	26,847	21,739	27,166	22,514	24,865
Weight (kg)	118,038	119,888	130,177	117,494	118,446	118,192	103,980	88,744	90,974	88,479	93,122
Radiation Waste											
Stops	659	644	556	451	412	365	336	292	249	238	189
Containers (excludes lead)*	2,092	1,904	1,812	1,468	1,366	1,225	1,129	925	865	776	664
Lead shielding (pieces)	2,356	2,818	3,532	2,386	2,097	2,444	2,192	2,061	2,532	1,773	984
Total containers	4,448	4,722	5,344	3,854	3,463	3,669	3,321	2,986	3,397	2,549	1,684
Weight (kg) (excludes lead)	17,560	15,830	14,194	11,502	10,178	9,886	8,017	5,766	6,174	5,918	4,764
Biohazardous Waste	EHS assumed this program responsibility mid-year 2007										
Total Containers						28,846	27,873	27,671	26,417	26,001	26,142
Total Weight (lb)						1,018,432	930,921	842,858	783,722	804,263	780,305

*Collection and accounting method changed in 1995. Lead shields are accounted for separately.

Annual Statistical Summary of Radiation Safety Program

	FY 01	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07	FY 08	FY 09	FY10	FY11	FY12	FY13	FY14
Investigators														
Non-Human Use	199	193	175	162	167	147	134	139	138	125	114	102	104	95
Human	120	95	95	101	120	111	116	119	125	122	90	96	110	118
Applications														
Non-Human Use	199	193	175	162	167	147	134	139	138	131	114	102	104	95
Human Use	230	164	164	181	197	205	207	202	222	228	101	122	139	55
# of PIs Ordering Packages	151	148	136	120	130	127	104	100	90	82	79	70	54	57
Package Delivery (*item count)														
UI	2531*	2032*	1822*	1458*	1226*	1172*	1025	953	750	719	580	456	311	229
UIHC	385	212	210	173	157	173	139	136	161	143	65	114	136	125
Total	2916	2240	2032	1631	1383	1345	1164	1089	911	862	645	570	447	354
Routine Surveys	1848	1834	1762	1415	1241	1296	1587	902	1277	1108	739	617	1093	989
UI	1794	1776	1645	1252	1184	902	784	695	690	602	522	545	481	452
UIHC	54	58	62	55	47	51	44	38	40	42	36	10	8	9
Non-routine Security Checks	0	63	55	108	10	343	759	169	547	464	181	62	604	528
Total Radiation Labs	380	336	338	326	299	285	264	264	236	198	177	183	204	171
Badges														
Per Year	25986	25681	26463	24,273	23640	22,621	18,430	18,420	18,117	17,075	16873	17,678	17,853	17,682
Per Month (UIHC)	2166 (1039)	2140 (990)	2122 (1131)	2023 (1246)	1970 (1284)	1885 (1287)	1536 (1280)	1535 (1284)	1510 (1298)	1423 (1249)	1406 (1264)	1,473 (1,347)	1,488 (1,379)	1,474 (1,362)
Badge Participants														
Per Year	16372	15874	15120	13824	13752	12588	10320	10044	9840	9564	9864	10,152	10,212	10,164
Per Month (monthly average)	1364	1323	1260	1152	1146	1131	860	837	820	797	822	846	851	847
Staff Trained														
UIHC	1319	719	1255	1302	841	983	964		160	414	404	378	464	442
UI	1032	1849	1243	1161	1101	1318	1319		506	712	790	811	641	722
VAMC	56	56	63	53	46	29	12		253	180	244	125	130	80
Instrument Calibrations	296	287	279	255	248	222	189	188	180	176	187	177	164	164
UI	216	210	209	171	165	147	133	129	125	124	128	118	106	103
UIHC	53	49	49	55	55	57	56	59	55	52	59	59	58	61
Repairs	3	6	8	4	2	0	0	0	1	0	0	0	0	0
ALARA Evaluations														
Operational Level	111	97	121	138	130	119	138	132	---*	---*	---*	deleted	NA	NA
Level 1	10	11	15	21	26	17	22	11	18	14	14	19	12	19[#]
Level 2	4	7	4	9	21	4	3	7	5	7	9	6	2	4[##]

ALARA Levels changed beginning FY09 – Operational levels discontinued. --- Information no longer available.

[#]11 Were Falsely Elevated Due To Improper Use [##]3 Were Falsely Elevated Due To Improper Use

	FY 01	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07	FY 08	FY 09	FY10	FY11	FY12	FY13	FY14
Sealed Source Leak Tests Total	169	198	247	236	238	235	248	317	382	601	413	369	377	353
UI	93	104	107	103	111	122	118	129	116	158	126	101	108	112
UIHC	76	98	140	133	127	113	130	188	266	443	287	268	269	241
VAMC	0	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
X-ray unit compliance tests Total	153	160	183	183	183	181	187	183	181	198	193	193	218	267
UI	57	71	82	84	86	80	82	80	80	100	105	106	122	166
UIHC	96	89	101	99	97	101	105	103	101	98	88	87	92	97
IRL	0	0	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	4	4
Laser Safety Audits														
UI/UIHC				35/56	27/28	32/30	45/32	38/28	43/24	35/21	35/22	26/22	20/23	17/24
Bioassays Total	196	115	277	239	248	174	186	170	159	92	151	176	132	100
Urine/Thyroid	56/140	46/69	73/198	44/195	65/183	26/154	28/158	21/149	11/148	15/77	18/133	22/154	23/109	24/76
UIHC Activities														
Total Patient Surveys	116	164	152	153	145	125	138	136	142	122	114	103	122	140
Cesium –137	44	33	36	39	23	3	0	0	0	0	0	0	0	0
Cs-137/Ir-192	1	1	5	0	0	0	0	0	0	0	0	0	0	0
Iodine-125 (total)	10	18	54	51	42	51	73	51	57	52	47	33	49	37
Iodine-125 (prostrate)									28	22	15	10	6	3
Iodine-125 (eye plaque)									29	30	32	23	43	34
Iodine-131	31	51	49	50	59	57	60	70	73	55	54	44	32	40
Iridium-192	4	10	5	0	0	0	3	2	0	0	1	0	0	1
Gold-198	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phosphorous-32	1	2	2	0	0	0	0	0	1	0	0	0	0	0
Palladium-103	24	25	0	0	0	0	0	0	0	0	0	0	0	0
Sm-153	1	2	0	0	2	0	0	0	0	0	0	0	0	0
Strontium-89	0	2	1	0	0	0	1	0	0	0	0	0	0	0
Tc99m	0	18/2	0	0	0	0	0	0	0	0	0	0	0	0
Y-90				13	18	14	1	13	11	15	12	12	12	15
Re-188				NA	1	0	0	0	0	0	0	0	0	0
Lu-177	Not Previously Available											3	1	16
Intraoperative Radiation Therapy (IORT)	Not Previously Available											11	28	31

EHS Metrics:

Biosafety, Chem Safety Occupational Safety

	FY08	FY09	FY10	FY11	FY12	FY13	FY14
Biological Safety Program Summary							
Biosafety Cabinet (BSC) Certifications				442	506	561	594
Horizontal Flow Cabinets Tested				20	22	17	21
BSC Decontaminations				55	62	50	47
BSL3 Room Decontaminations				2	1	0	0
Bio exposure/needle stick injury evaluations	4	8	22	27	12	11	4
New rDNA/IBC Non-exempt Protocols Approved	186	206	179	158	170	177	164
rDNA/IBC Non-exempt Protocols Reviewed	216	236	199	241	297	304	351
rDNA Annual protocols reviewed (1st & 2nd year review)	364	323	321	311	292	279	295
rDNA/IBC Exempt Protocols Reviewed	170	196	150	109	86	77	27
Reports to NIH/CDC – potential exposures	2	2	2	3	3	19	5
USDA permit application inspections				2	2	2	1
BSL3 Protocols reviewed	16	15	14	12	14	16	16
hPluripotent Stem Cell protocols reviewed/approved*				1	2	1	1
Occupational Safety & Health Program Summary							
Departmental OS Reviews Conducted	45	45	45	72	89	63	60
Departmental Reviews – Student Use of Machines (Machine Shops) **					17	7	7
Departmental Reviews – Required Respirator Programs				13	13	13	13
Departmental Reviews – Confined Space Programs		3		7	0	10	18
Incident Reports Reviewed	1785	1821	1534	1426	1,499	1,571	1,576
Formal Incident Investigations	6	5	112	134	82	85	58
Ergonomic Evaluations	358	305	256	249	247	151	78
Indoor Environmental Quality Investigations	18	25	17	17	25	21	13

EHS Metrics:

Biosafety, Chem Safety Occupational Safety

IEQ samples collected			20	20	42	84	58
	FY08	**FY09**	**FY10**	**FY11**	**FY12**	**FY13**	**FY14**
Office reviews completed**					144	131	31
Fits tests completed			52	41	47	51	47
Quantitative			38	33	32	34	34
Qualitative			14	8	15	17	13
Asbestos Programs reviewed			3	6	6	6	7
IH evaluations performed			18	56	61	67	31
Samples collected/interpreted			61	61	79	214	189
Noise Monitoring Exposure/level Assessments	17	14	20	53	66	17	5
Chemical Safety Program Summary							
Hazard Assessments Conducted	40	29	29	40	46	52	100
Personal and Area Chemical Monitoring (samples/measurements taken)	5	21	16	22	7	21	9
Chemical Inventory System (# of PIs/users)	400			590/1030	530/1400	554/1363	547/1331
No. of inventory items				83,000	103,000	111,700	165,958
Fume Hood Evaluations	773	764	664	892	863	876	870
# of hoods referred to FM	112	65	45	163	126	138	72
Bio/Chemical Lab Reviews Conducted (Safety Advisor Team)	388	384	364	379	358	394	390
Spill Response Consultations			11	18	11	18	14
# PIs sponsored by USAMRMC/DOD	16	17	17	17	18	15	16
Respirator Program lab use reviews new/current total users	124			100	75/140	32/164	21/175
***New program - 2011; ** new program - 2012**							