

# ENVIRONMENTAL HEALTH AND SAFETY

Case Western Reserve University, Department of Environmental Health and Safety  
Annual Report 2015-2016

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## **Mission Statement**

### Case Western Reserve University Department of Environmental Health and Safety

We protect the Environment and the university by acting in a regulatory responsible manner that both respects personnel and the research objectives of the community

We protect the Health and Safety of the CWRU community by providing the support and knowledge required to maintain a healthy and safe workplace

## **Notable Accomplishments 2015-2016**

### No Regulatory Violations or Citations were issued in 2015-2016

#### Completion of Base Fire Evacuation Plans

All building on campus now have a base evacuation plan and have been drilled. Efforts to update marking, mapping, and a catalog of building captains are moving forward. This culminates three years of efforts by our single FTE dedicated to fire safety. We are starting the second round of drills in the month of August 2015.

#### Review of all CHP and ECP plans

In past years, the safety plans submitted to EHS were placed on file but were not extensively reviewed by EHS. As part of the EHS Liaison program an effort was made to provide extended personal service to the laboratories in support of their research safety activities. The biosafety officer and a lead chemical safety technician are now reviewing all ECP and CHP plans. The plans are then reviewed in depth. This has generated hundreds of contact hours between EHS and the respective laboratories outside the fines of the formal inspection program.

#### Implement Flood Mitigation Plans for Millis

A cooperative program was put in place between Risk Management, EHS, and Facilities to fund the replacement of devices that utilize water cooling. The program is divided in two major categories that include passive and active cooling devices. A total of 6 million gallons of water usage each year was eliminated and an insurance savings of 330k was realized. The total expenditure for the program was 100k with complete payback accomplished before the end of the first year.

#### Completion of Migration to T4 of the EHS Website

The EHS website was completely rewritten and migrated to T4. The new website was constructed from scratch with the help of EHS staff and Marketing and Communications.

## **OBJECTIVES 2015-2016**

Implement Customer Satisfaction Survey	Deferred to 2016-2017
Finish conversion of EHS website and associated training	Completed
Improvement Plan for training compliance	Nearing Completion
Implement Flood Mitigation Plan in Millis	Completed
Completion of Full Year Zero Based Budget	Completed

## OBJECTIVES 2016-2017

**EHS Objectives:** Each year EHS strives to develop a portion of the many programs for which it has responsibility. The following global objectives are set for the calendar year 2016-2017

1) Work to understand the needs of EHS clients through the use of survey tools and one on one meetings

- a) How does EHS impact research and what can be done to reduce regulatory burden while maintaining regulatory compliance
- b) What can EHS bring to the table to value add researcher's day to day activities

2) Finish roll out of basic website and then build upon it to produce a one stop shop for researchers in regards to compliance documentation and training. This is a stretch goal and may take several years. The basic website is complete and we are starting to roll out the web based document and inventory systems in HP Assist this year.

3) Provide development opportunities to staff designed to allow them to become better leaders in EHS

4) Collect success stories in regards to the ability of EHS to collaborate and support the community

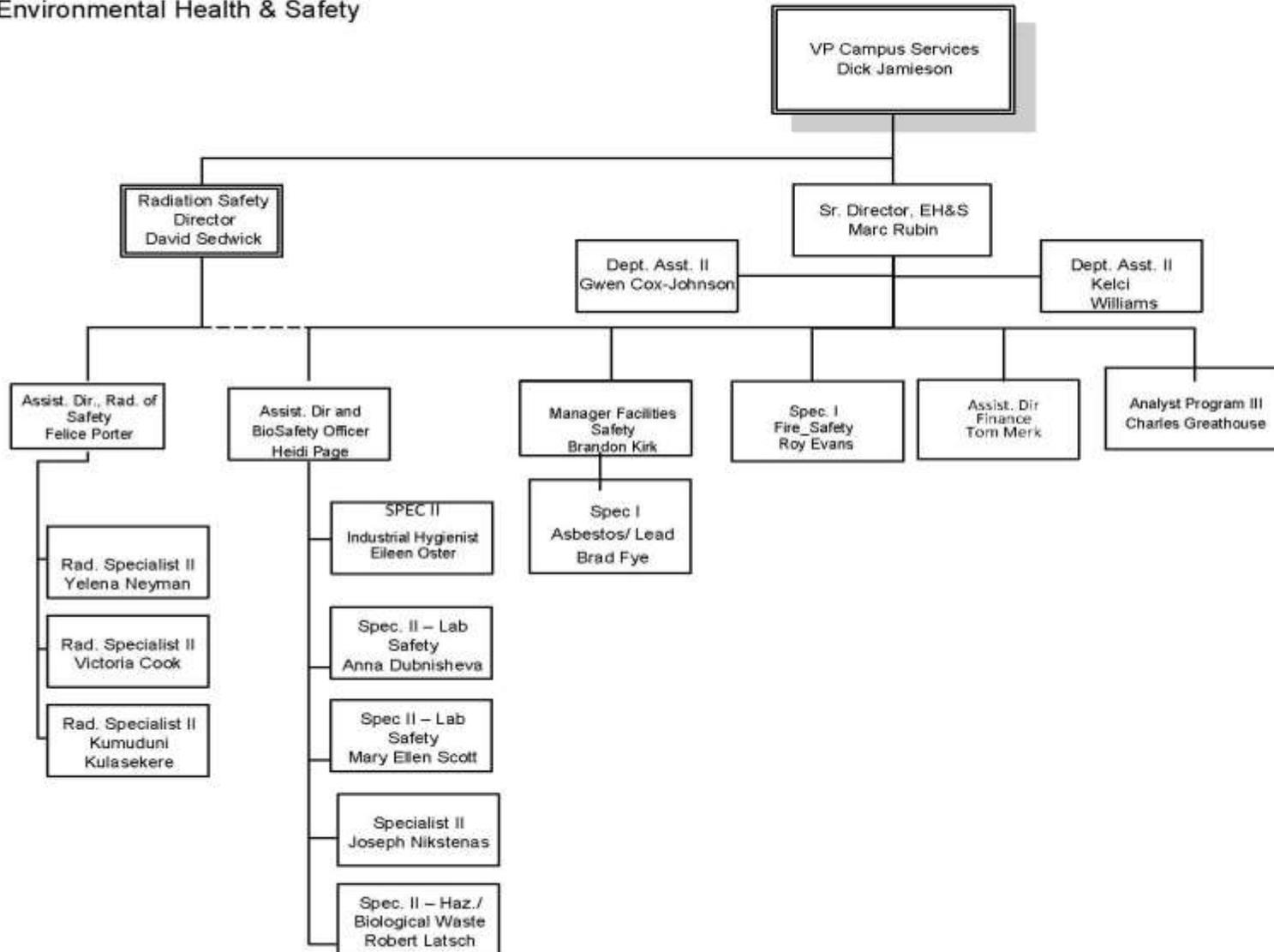
5) Work with student safety groups to improve safety culture on campus

6) Develop solid SOPs for Compressed Gas use on campus

7) Develop comprehensive evacuation plans for handicapped persons



Environmental Health & Safety



## DEPARTMENT DESCRIPTION

The Department of Environmental Health and Safety is charged with maintaining a safe work environment for more than 6,000 employees and 10,000 undergraduate and graduate students who work and/or live in over 100 buildings at CWRU and at 5 other major Northeastern Ohio research locations. In addition to the Ohio-based research, EHS shares safety responsibility for its personnel in locations worldwide.

EHS works to balance federal, state and local safety regulations with the requirements of research. At times these tasks appear to conflict with each other and require innovation to achieve the needs of both a safe work environment and productive research community. EHS's customer service approach distinguishes its activities from the strict regulator approaches of yesteryear.

Dissemination of safety information is accomplished through cooperative interactions with its customers (faculty, staff and students) through, formal training, consultation, and safety document creation and maintenance, inspection and oversight activities that are encompassed in the activities of the EHS department. Audit through inspection acts as the feedback mechanism used to measure the level of compliance and the level of community understanding achieved through departmental education and consult efforts.

In a complex environment, however, accidents sometimes occur. In these cases EHS is called upon for emergency response, mitigation of hazardous situations and forward planning where possible to avoid similar future incidents. Departmental services in and following emergencies include in house hazmat response as well as planning with external agencies for larger emergency situations. EHS works closely with internal emergency management, plant, police and security departments as well as with external agencies to generate cooperative plans and responses. Part of this effort with external agencies is directed toward familiarizing governmental regulatory and response organizations with our institutional resources and response workers. This effort provides needed groundwork for synergistic responses during emergencies.

EHS is staffed by six main sub-groups that encompass biological, chemical, facilities, fire, construction, and radiation safety concerns

Safety Services Staff



## Biological Safety

The Biosafety program at CWRU employs a multifaceted approach to ensure safe and responsible laboratory practices while maintaining compliance with the various Regulatory agencies to whom we are responsible. The program consists of the following areas:

- Maintain compliance with NIH, OSHA, CDC, USDA, DOT, FAA, DHS and DEA regulations as they pertain to training, handling, transporting, and shipping biological materials and DEA Controlled Substances.

Work with laboratories to prepare for USDA and CDC permitting inspections

- Review of Exposure Control Plans, IBC protocols and IACUC protocols for the use of biohazardous materials and to ensure proper controls and procedures are in place to protect researchers as well as the greater University community.
- Educate investigators on the biological hazards in their laboratories, current Best Practices, post exposure measures and changing Regulations.
- Collaborate with University Health Services to provide a robust Occupation Health Monitoring program including recommended prophylaxis and post-exposure treatments based on specific biohazards.
- Provide personal consultations on best work practices, engineering controls and personal protective equipment based on specific biological hazards.
- Ensure proper function of and decommissioning of the High Containment (BSL-3) Laboratories on Campus.
- Maintain an up-to-date inventory of the Biohazardous Materials on the CWRU campus.
- Provide specific training and work practice recommendations to the Animal Resource Center staff who will come in contact with contaminated materials.
- Develop written policies on the handling of specific Biohazardous materials

## Chemical safety

With over 1,500 campus locations designated as hazardous material use areas, chemical safety is by far the largest program incorporated under EHS. Areas that fall under the chemical safety program include medical research labs, chemistry and engineering labs, construction and maintenance sites and clinical areas such as dental, nursing and Health Services.

- Maintains campus wide compliance with OSHA, EPA, TSCA, ODH, DOT, IATA, FAA, EAR, ITAR, DHS, DEA, DOD, NFPA, BOCA, as well as local and state agencies
- Assists with APHIS, CDC, USDA, FDA and other drug and biosafety agencies
- Conducts safety training for all students, faculty and staff
- Conducts laboratory inspections annually
- Provides on-one-on consultation with laboratories regarding safety plans
- Provides environmental testing and occupational testing support
- Provides facilities with air testing equipment
- A review of all chemical safety protocols for the use of hazardous materials, to ensure that proper controls and procedures are in place to protect researchers as well as the greater University community
- Education of campus students, faculty, and staff in the chemical and physical hazards associated with their daily routines, and the proper hazard controls used to protect themselves
- Collaborates with University Health Services to provide a robust occupation health monitoring program including recommended treatment and post-exposure treatments based on specific chemical and physical hazards
- Provides consultation on best work practices, engineering controls and personal protective equipment based on specific chemical and physical hazards
- Assures proper function and decommissioning of all hazardous work environments on campus
- Verifies up-to-date chemical or hazard communication plans, unique to each hazardous material use area, are current. This includes inventory of hazardous chemicals and annual site-specific training and review date
- Providing specific training and work practice recommendations to specific campus departments including, but not limited to, police and security, facilities, contractors, custodial and athletics
- Assures compliance with all hazardous waste regulations
- Facilitates the removal of all hazardous waste
- Provides respiratory protection training, and fit testing
- Provides advice on the use of hazardous materials in laboratories and construction sites
- Conducts indoor air quality and other IH assessments
- Reviews upcoming legislation and provides senior management compliance advice
- Works actively with local, state, and federal agencies to provide preplanning for emergency response situations
- Provides limited hazmat response to small releases of materials
- Provides HVAC controls testing for laboratory engineering controls such as fume hoods

## Inspections

### A. Chemical Fume Hoods:

- a. Student Assistant Pilot Program: This program has been a complete success in continuing the front line determination of the safe working conditions for one of the most important engineering controls in our laboratories. Two part-time student employees and one newly minted doctoral student have learned the behind the scenes technical aspects of fume hood testing and provided EHS with on-the floor input of employee use and status of our laboratory fume hoods. Most importantly the needed follow-up on the repairs for the fume hoods have been tracked and retested. From the later valued input not only have several long-standing issues have come to the forefront (need for fume hood monitors, efficient and focused decreased of higher velocity fume hoods across campus and a need for better education of fume hood usage, but the pathways to improving these conditions are implemented.
  1. Metrics on repairs are in place listing the reason for hood failures and turnaround time for repair comparing 2015 to 2016.
  2. A new approach to safer hood use was completed by simply changing the style and message of the fume hood sash sticker, resulting in a major paradigm shift to a safer and lower sash position being used by the researchers with the added bonus of energy savings.
  3. Assistance provided from the pilot program allowed focused attention with long standing issues in other areas of safety and the resulting collaboration with both IH and support from safety management improved conditions of formaldehyde-phenol exposures in the anatomy labs which is on-going, improved ventilation in basement of pathology, inspection related cleanup of cold room issue in biology, and cleanup of ancient storage areas in Rockefeller.
  4. ASHRAE of new hoods is current. On-site utility program for fume hoods has streamlined data analysis and fans systems are now being added to data.
  5. Individual items: perchloric acid hood in KHS, set for conversion and waiting for funding, located another perchloric acid hood in White, worked with Bud Morris on blocked hood ducts in Bioenterprise, worked with Erika Weilcko in retraining proper hood use in 6<sup>th</sup> floor labs of White and worked with LCS on chem fume hoods and BSC.
  6. Repair requests for hoods that are sent directly to facilities are now being forwarded to EHS as per agreement with customer service, CSH.

## Shipping Hazardous Material and Export Control

- a. Our shipping program is expanding in the area of awareness of the need for compliance to federal regulations in proper transporting of hazardous materials and for screening materials, hazardous and nonhazardous, for export.
  - 1. Improvement in tracking the shipments from the University is needed. Additional efforts in spreading the word through lab safety training has been in progress.
  - 2. Retraining process could be improved by a class focused on updates and adding summaries of labeling, packaging and documentations.
  - 3. Coordination with other shipping centers on campus would be beneficial in assisting researchers in procuring shipping supplies.
  - 4. DOT training records and reminders could be added to our current system for automatic email reminders and certificate generation.

### Reproductive Policy

- a. Currently, the majority of notifications for assistance in this area comes from the voluntary declaration of pregnancy from employees working with radioactive materials.
  - 1. Consider expanding the awareness of this program to employees working with other hazardous materials, through lab safety trainings.

### Review of CHP

- a. This program has been addressed in the review of the teaching documents in biology labs and engineering labs in Rockefeller. CHPs as they are returned to EHS are also reviewed along with those for researchers whose CHPs have lapsed.
  - 1. A search for a more streamlined, on-line CHP is being reviewed. On-line programs from UH are available, as well as an improved model from ACS.
  - 2. An SOP template for chemical processes is in place.
  - 3. An effort to move the SDS information from the computer into a practical SOP that is used at the bench is being addressed in Lab safety training.
  - 4. Continue to use pre-inspection notification with summary of CHP requirements

## **Industrial Hygiene and indoor air quality**

1. Annual monitoring for formaldehyde exposures to medical students and staff from the embalming fluids used in the gross anatomy labs is ongoing. An evaluation of the initial exposure monitoring from 2015 following neutralization procedures indicates a reduction of exposure levels to 40-50% from historical monitoring prior to the implementation of the neutralization procedures by medical school faculty and staff. Although the neutralization was very effective for reducing airborne formaldehyde exposures, damage to the cadaver tissue was observed in the spring and anatomy department personnel could not use the point injection neutralizations for the 2016-2017 academic year. It was reported that improved housekeeping procedures have been implemented in the four anatomy labs and limited trials of a different neutralization chemical (Infutrace), applied by spraying rather than point injections, will be undertaken. EHS will continue to conduct air monitor to determine the effectiveness of the new techniques.
2. There are currently no permissible exposure limits for isoflurane. Isoflurane is used in select animal surgery areas at CWRU. The ongoing monitoring of isoflurane exposures is conducted to evaluate a new process or set-up, or if conditions which have the potential to affect exposure levels is implemented. Without definitive regulatory guidance, EHS works closely with researchers to ensure that isoflurane exposures are maintained to the lowest practical level. Ventilation, veterinary equipment, and procedures are evaluated to maximize the collection of waste anesthetic gases.
3. During routine lab inspections, it was noted that appropriate signage and written procedures were not in place in laboratories found to be using hydrofluoric acid. In addition, the location of appropriate antidotes was not easily identified. New signs were delivered to laboratories known to be using HF, written standard operating procedures were sent to laboratories, and improved reporting requirements for the purchasing of HF is being developed.
4. During routine lab inspections, several labs were found to have compressed gas cylinders which lacked either proper monitoring, ventilation, or fire safety procedures. Carbon Monoxide gas, ammonia gas, and hydrogen gas cylinders were found in CWRU labs without required monitoring. Ammonia gas cylinders were moved into walk-in hoods and carbon monoxide cylinders were removed from the lab. Proper storage, use, and grounding of flammable hydrogen gas cylinders is currently under review.
5. We have conducted indoor air quality testing in several buildings on campus following occupant concerns. Many of the concerns raised are related to building ventilation issues or odors. In general, building ventilation in the rooms inspected is maintained within ASHRAE standards. Wherever building related issues were identified, EHS has worked closely with facilities to identify and correct problems contributing to indoor air quality concerns or odors in campus buildings.

### **Respiratory protection**

1. EHS works closely with various departments to develop or maintain respiratory protection programs in compliance with current OSHA regulations. An understanding of the hazard, job requirements, and potential exposure is evaluated to ensure that the appropriate regulatory standard is followed. The department provides training, medical evaluations and respirator fit testing for personnel who require respirators during their work. We have also worked closely with various departments to evaluate the risks and potential exposures to employees.
2. The department continues to provide medical evaluations, training, and fit testing of medical students who are required to wear N95 respirators during their away rotations, typically in the third year. EHS is reviewing suggestions that the medical students receive their initial respirator training and fit testing during their 2<sup>nd</sup> year prior to their clinical core rotations. This will be evaluated with medical school staff in the near future. The need for respirators for the new PA program will need to be evaluated.
3. EHS continues to support the excellent respirator program in place for the Animal Resource Center personnel, including researchers using the BSL3 facilities. The department works closely with researchers and ARC staff to determine the appropriate level of respiratory protection based on a review of potential hazards, job responsibilities, and working conditions. Use of other personal protective equipment has been evaluated by EHS and ARC staff and some modifications to donning and doffing procedures were implemented for BSL3 users last year.
4. Although initial asbestos operations and maintenance training of some of the facility employees was conducted in 2014, respirator training, fit testing, and medical evaluations for these employees was found to be insufficient and/or delinquent. This year, facility personnel designated for work with asbestos were fit tested for half face air purifying respirators. Although fit testing was conducted for some of the facilities employees, the medical evaluations conducted do not meet the OSHA regulations for personnel working with asbestos and can't be used for that purpose until additional medical exams and training are conducted. An integrated respiratory protection program for the facility staff has not been developed and is expected to be completed once the evaluation of facility employee job responsibilities has been completed. Select facility employees were trained and fit tested for the use of N95 respirators while working in the BSL3 facilities. Select facility employees are also using respirators during exhaust fan maintenance.
5. Although concentrations of formaldehyde in the gross anatomy labs has been consistently found to be below the permissible exposure limit, several students have requested training and fit testing for the voluntary use of respirators to further reduce exposures to formaldehyde. EHS has assisted in the selection and training on the use of respirators in the gross anatomy labs.

## Construction Safety

- The construction safety program at CWRU focuses on keeping all employees safe while construction projects occur on campus. The principal responsibility of this program is to monitor construction sites and contractors to ensure compliance with state and federal regulations pertaining to health and safety standards in the workplace. This objective is achieved by using the following disciplines:
  - Provide regulatory support for the control of hazards on the job site that might affect the CWRU community.
  - Provide the removal, to the extent possible, of hazards prior to handing over job sites to contractors except as detailed in contract agreements
  - Provide support to the project by maintaining a visible presence in the field and to have continued availability to assist the project manager with safety related issues.
  - Communicate and assist the project managers to ensure all safety expectations are understood and met.
  - Regularly review and be familiar with all applicable legislation and standards to ensure compliance.
  - Provide support, direction, and resource to all project managers and contractors working at CWRU.
  - Organize, schedule, and perform required right-to-know safety training for all contractors prior to working on campus.
  - Participate in the investigation of incidents on campus to determine root cause, and to put effective actions in place to help ensure repeated incidents do not occur.
  
- Goals achieved fiscal year 2015:
  - Worked with contractors across campus to minimize safety deficiencies on the jobsite. Visited over 100 contracted jobs this past year.
  - Completed Crawford 4<sup>th</sup> floor abatement over critical data center. No interruptions occurred to the CWRU community during that project.
  - Continued to complete full building asbestos surveys.
  
- Goals for fiscal year 2016
  - Complete overhaul of the confined space program at CWRU. Identify, mark, and implement a procedure for approximately 175 spaces on campus.
  - Sync the contractor Right-To-Know training with access services contractor badges. This will help us identify who has been trained in a more organized fashion and will ensure the contractors that haven't been trained - get trained before they can work on campus.
  - Continue to complete over 150 asbestos and lead jobs per year without employee exposure.

## Facilities Safety

- The facilities safety program at CWRU is responsible for the health and safety of all plant and maintenance staff members. Comprised of over 80 facility and grounds members, the facility safety program must ensure those members are in compliance with local, state, and federal health and safety standards while performing their daily work tasks. This program includes:
  - Providing OSHA, EPA, DOT, and other training as required by law. This includes right to know, confined space entry, drivers training, lock-out tag-out, fall protection, injury prevention, and many other topics annually.
  - Provides lift truck and powered industrial equipment training.
  - Provide training in hazardous materials handling such as asbestos, lead, mold, and chemical waste.
  - Conducts inspection and remediation for lead, asbestos, and mold.
  - Conducts Job Safety Analysis of all facilities worker functions
  - Providing in-the-field assistance to all maintenance personnel regularly as well as when a safety concern arises.
  - Conducts accident and injury investigations and performs root cause analysis to prevent reoccurrence of the incident.
  - Provide respiratory and hearing protection training and equipment selection.
  - Supervises the entry of facilities personnel into confined spaces.
  - Reviews MSDS sheets of materials used on campus for safe application
  - Conducts crane inspection and foundry inspection annually to maintain compliance with the OSHA crane and hoist standard.
- Goals Achieved Fiscal Year 2015
  - Completed implementation of the Arc Flash Safety program for facilities electricians. This has been a deficiency for over 25 years here at CWRU. The electricians were outfitted with personal Arc Flash gear and were given extensive training by the manufacturer.
  - Facilities have received all new Lock out Tag out for all electricians. Conducted a LOTO lunch and learn for the electricians to show them their new equipment and to update them with any new field information.
  - Hearing Training was provided for the ARC and for all facility personnel. All hearing letters have been passed out and a copy has been given Health Services for each individual's records.
- Goals For Fiscal Year 2016
  - The facilities safety handbook is currently being reviewed. We are looking at completing Job Hazard Analysis for all trades within facilities. I have already spent a week in Zone 1, Zone 2, and Zone 3 shadowing each trade while they conduct their daily activities. Zone 4 will be shadowed in September. After completion Chris, Graham, and I will update the facilities handbook.
  - The annual campus crane inspections have been completed. Only 1 minor deficiency was found during the inspection process.
  - Facilities uniform safety handbook to be updated by year's end.
  - Continue the Arc Flash Safety program for facilities HVAC technicians.

## Fire Safety

The Fire and Life Safety Program at CWRU is tasked with the following:

- Hot Work Inspections: brazing, cutting, grinding, soldering, torch applied roofing, welding, etc.)
- Red Tag: anytime fire protection equipment is taken out of services for any reason a red tag permit must first be issued by the Fire and Life Safety Specialist
- Fire Safety Training: All Resident Advisors go through a fire prevention safety course
- Fire Extinguisher Training: Training is available free of charge for any university employee. All maintenance workers are required to attend once per year
- Fire Drills: Four fire drills occur yearly for all resident halls and Greek Life houses. During the summer semester a variety of campus academic buildings will also have a fire drill
- Clery Act Reporting: The Fire and Life Safety Specialist is responsible for all Clery reporting on the CWRU Campus in the fields of arson and fires that occur in resident areas. The Clery Act requires all colleges and universities that participate in federal financial aid programs to keep and disclose information about crime and safety practices on and near their respective campuses
- Fire Inspections: All resident halls and Greek Life houses common areas are inspected two times per year for fire code violations by the Fire and Life Safety Specialist. All other University buildings are inspected on rotation. Any time a member from FM Global, the University insurer carrier, or a member of the Fire Department wishes to inspect a building the Fire and Life Safety Specialist will accompany them
- Special Events: Any time a special event is planned on campus that requires a building to change its everyday floor layout/occupancy, when outdoor tents are being used, or hazardous materials (propane for grilling/heat, fireworks, etc.), the Fire and Life Safety Specialist is involved in the planning process
- Building Emergency Plans: The Fire and Life Safety Specialist is tasked with writing, testing, and updating building specific emergency plans.

## Radiation Safety

The University is authorized to use radioactive material by the State of Ohio, which became an Agreement State on August 31, 1999. Radioactive material is extensively used in the several hundred biomedical research laboratories on campus. Compliance with the complex controls and regulations governing the use of radioactivity is the primary goal of the radiation safety program. Support of research compliance and safety for faculty, staff, students, and the public is essential.

The Director of Radiation Safety is the University RSO who has a direct reporting relationship with upper University management and works under direction of the University Radiation Safety Committee as mandated by federal and state radiation Safety Agencies. At the regulation level within the University, the RSO, Assistant RSO and radiation safety staff and the radiation safety program receive authority through the Radiation Safety Committee as required for Broadscope Radiation Safety License holders for use of radioactive materials.

The Radiation Safety Office within EHS is responsible for safe use of all radioactive materials and use of radiation generating equipment. The radiation safety group maintains strict compliance within the University and among its outside vendors with all of its license conditions as approved by the State Department of Health Radioactive Materials and Radiation Generating Equipment offices.

Like the rest of EHS, the Radiation Safety office has a strong service-oriented culture that assists faculty and staff with development of safe experimental procedures, response to accidental spills and possible radiological exposures and other radiological incidents. The Radiation Safety Office also supervises purchase and tracking of all radioactive materials that enter and leave our Institution, meets programmatic requirements for personnel training, and takes care of all radioactive waste materials management. The Radiation Safety Program surveys all authorized radioactive materials user's laboratories three times each year and perform unannounced inspections of laboratories for violations involving radioactive materials security. The program is audited throughout the year by the Radiation Safety committee for procedural compliance and once each year for general record compliance of its operations. The program is also formally audited for compliance by its own staff throughout the year and by State Regulatory Offices for compliance of both its radioactive materials and radiation generating equipment procedural compliance on a periodic basis.

Authorized use of radioactive materials is granted directly following review by the Radiation Safety Committee and RSO approval and can be suspended at any time for cause by the Radiation Safety Committee and the Radiation Safety Office. For this reason, the Radiation Safety Office and the Authorized User community expend considerable effort to ensure that compliance issues do not interfere with the University research mission and that goals of this program can be expeditiously met.

Laboratory Safety Committee Audits  
Safety Services Laboratory Programs  
2015-2016

**Assignments:**

CHP/ECP	Kim Volarcik
Hoods/Biohoods	Clive Hamlin
Incidents	Gregory Tochtrop
Respirators	JC Scharf-Deering
Protocols	Thomas Gray
Clearances	Andrea Romani
Waste Facility	John Protasiewicz
Licensing	John Protasiewicz
Training	Emily Pentzer
Regulated Chemicals	Andrea Romani
Waste Program	Kathrine Howard
Website	John Durfee
Inspections	Clive Hamlin
Biosafety	Thomas Gray
IH/IAQ	Katherine Howard
Shipping	Emily Pentzer

## **Inspections:**

SOP is outdated and needs update: Agreed

The issue of two databases has been a problem. It resulted from a usability standpoint that remains to be resolved. Until that is resolved if ever we have moved completely off the HP Assist program to Filemaker. This was the program we used for 20 years prior to HP Assist and it serves us well. I have no plans to return to HP Assist until there is a very compelling reason to do so.

A suggestion to accept the inspections of sister organizations safety office was brought forward. The idea has merit and is being set in motion. This will reduce the volume of work to some extent. We will then set the laboratories we place in to this status on a rotation such that we will still perform our own inspections at an interval to be determined but not to exceed 3 years.

## **CHP/ECP**

30 files were looked at randomly and 6 were found to lack a signature.

An additional audit of all CHP and ECP was done by the Senior director and the following was found. 429CHP and 429 ECP were identified. Of this 122 were found to be 2 years or more out of date. The breakdown is as follow: Due in the year listed:

2016-145	33%
2015-160	37%
2014-74	17%
2013-21	5%
2012-15	3%
2011-3	>1%
9 older than 2010	2%

87% of the plans are up to date or within 1 year of compliance. The remaining 13% need to be contacted and brought into compliance.

## **Regulated Chemicals**

The regulated chemicals program shows 141 lab groups using the major regulated chemicals formaldehyde, methylene chloride, and benzene per the data collected. 39 new users were identified and trained. No further analysis is offered.

The regulated chemicals program is in need a better data collection and follow up. Part of this needs to be a visit to the identified labs to identify how they use the material and if chemical monitoring is required to determine an exposure. This process was started in the 2016-2017 year. Further, better collection means are required. The identified number of labs using methylene chloride and formaldehyde is a gross understatement of the actual usage in the laboratories per chemical inventory and general knowledge. A revamping of the regulated chemicals process to better capture all OSHA regulated chemicals is warranted.

## **IH**

The Industrial Hygiene program encompasses varied and wide range of services that include indoor air quality, compliance monitoring, tracing of odor complaints, and other related work.

A major thrust of the program has been identification and monitoring of anesthetic gas users. This portion of the program has made a good start but has more work to accomplish a full inventory and monitoring repertoire.

The OSHA regulated chemicals program is expanding to include the full list. Major focus has been placed on the largest user groups formaldehyde, methylene chloride, and benzene. Since anatomy uses large quantities of formaldehyde major emphasis has been placed in this area. As was report last year efforts were taken to find alternate methods to HVAC to reduce exposures. These methods were deployed with great results reducing levels by 53%. Unfortunately, this method also resulted in damaged tissue unusable for the program. Alternate methods are now being addressed.

Additional assessments in noise were accomplished in two areas. Once was an SEM microscope and the other was a music practice area.

Areas that need improvement include better defined SOPs and a general IAQ manual. Tightening of the collection methods used to determine regulated chemical laboratories is required. Better

## **Respirators**

The respirator program is divided into two major areas focusing on facilities use and laboratory use. The largest users of respirators are facilities worker in the asbestos, hvac, and plumbing trades. The largest set of users in the laboratory are medical school anatomy class participants and teaching staff. This portion of users is largely voluntary use users as defined by the OSHA standard. These same students eventual go on to receive additional N-95 training prior to leaving for residency.

In previous years in response to the flu concerns widespread N-95 training was conducted. This has largely ceased. Most users of N-95 are workers in biological laboratories and animal surgery. The audit defines the mandatory users more clearly. Refer to the audit for further detail.

No issues were noted during the audit.

## **Incidents**

A database is used to hold all incidents reports that EHS responses to. The following items were noted during the audit. The SOP at this point needs to be updated. The last date was 12/12/2014. All incidents examined were determined to be resolved.

No other issues were noted in the audit.

## **Clearances**

The clearance program is aimed at making sure that hazards are removed or placed in a safe condition prior to allowing work or non-lab workers to enter an area, dispose of equipment, move items, or otherwise effect repairs. 1174 clearances were addressed in the calendar year.

No other issues noted.

## **Waste Facilities**

The hazardous waste facilities house the materials prior to disposal.

No issues were noted

## **Chemical Waste Program**

The Chemical waste program handles the removal of all hazardous, non-hazardous, regulated drug, construction waste and other related chemicals from the campus. As secondary program handles the recycling of lead, mercury, lightbulbs, and batteries. The long term contractor Chemical Analytics was purchased by Stericycle. The level of service suffered as did the error rate. As a result, a new RFP was sent out and Chemtron was selected to replace Stericycle. This change resulted in numerous changes some of which resulted in mailing address and paperwork issues. These have been resolved and the operation has regained its previous level of quality.

Disposals-742

Relocations-333

Repairs-27

Cleaning-20

Decommissioning-20

Machine Shop-32

No issues were identified by the audit.

## **Licensing**

All licenses are up to date and posted

## **Training:**

Senior Directors response:

The training audit is looking at the complete training program and is detailed below. As noted EHS trains over 8,000 employees, students, contractors, volunteers, and visitors each year. Keeping track of those trained who require retraining can be a challenge. An effort has been underway for over a year to purge the database of persons who have left the campus, where one time contractors, volunteers or other non-academic persons who required training at one point. The process has been complicated by the fact that the records we are sorting come from as far back as 1995 and predate the present database. Further, requirements for training have changed over time as well as the course given. This has resulted in the need to go over the existing data very carefully so as not to exclude someone who is still required to train.

The OSHA regulations require that training records be maintained 30 years past the last date of employment. Therefore, no records are deleted but are instead placed into an archive condition.

Further complicating this process, some investigators are employees of other institutions but have CWRU employees in their laboratories. Thus we cannot simply use the payroll to determine if a PI is still active with CWRU employees, a dual, or more appointment.

Once the cleanup is completed which is nearly complete at this time, all records for persons found to no longer be on campus or in another role not requiring training will be archived from the system. This will remove almost 50% of the 12,000-person legacy database. Because of the way this is to be done, if we find an error in the archive we can bring the person back to active status easily.

In the process of this cleanup, a careful look at the PIs was conducted to determine if there are PIs or fellows that might not have been captured in the training system. A number were found. Additionally, about 15% of PIs were found to be out of date for lab standard training with 36 PIs 5 years or more out of date. The 4 oldest were 10 years out of date. Two of those responded that they no longer have a laboratory. The delinquent PIs are being notified at this time directly by the Senior Director of their need to retrain. Response in a two-week period for the most delinquent was 33%. The larger pool 2-5 years out of date comprise 85 PIs. This group is also being contacted directly. The total pool size is 584 PIs.

At the end of a three notice sequence, the chairs of the PIs will be notified for assistance in compliance followed by the research office and Provost office.

A parallel process is in place for the staff, students, and other non PIs requiring training. A new process was instituted to follow the same follow-up procedure as non PIs to prevent the reoccurrence of this backlog of required training. Over all training compliance for the PIs is 79%. Related is the CHP/ECP plans. The compliance level for these is 85% current. 13% less than 5 years out of date, and 2% older than 5 years out of date. The same follow-up procedure for training is being conducted for the CHP/ECP component.

Actual Audit is below:

### **1. Is the Standard Operating Procedure Current?**

Each training program has its own standard operating procedure that utilize OSHA standards if available, or relevant CFRs. Plant safety is handled separately. The procedures examined were found to be current.

### **2. Training Programs and Requirements**

For Hazards Communication, Laboratory Standard, Bloodborne Pathogens, and Respirator, each employee is initially trained in person. Thereafter, persons re-train annually online, provided that they are within thirty days of the anniversary of their last training. A current standard operating procedure was on file.

- Bloodborne Pathogen and Respirator training is renewed annually (Federal requirement)
- OSHA Laboratory Standard and Hazards Communication training is renewed annually (a CWRU requirement)

There are a number of other trainings that are conducted by the EHS Department. They include:

- Hazardous Materials Shipping (DOT/IATA) training is required to be taken every 3 years for DOT and every 2 years for IATA. CWRU requires both trainings to be conducted together every 2 years.
- Vehicle Safety Training (Drivers Training) is required at the time assignment and only needs to be taken once.
  - Formaldehyde training is required for those working with this “regulated chemical.” This only has to be taken once, and anytime there is a change to the regulation. Laboratory Safety must be taken prior to formaldehyde training.
  - Plant and Maintenance Safety training is conducted monthly for all those working in this field. The topics vary each month and are relevant to the safety of the tasks that are performed by this group. Some of the relevant topics are:
    - Safety Training for Plant and Maintenance, which includes Hazards Communication, Biohazards with Bloodborne Pathogens and Ancillary Radiation.
    - Stairways and Ladder Safety
    - Hand and Power Tool Safety
    - Slips, Trips and Falls
    - Scaffolding Safety
    - Hot Works
    - Lockout Tagout
    - Confined Space
    - Powered Industrial Truck
    - Hearing Conservation

- Training for Police and Security is conducted annually (in-person initially, then retraining online) and includes Hazards Communication, Biohazards with Bloodborne Pathogens and Ancillary Radiation.
- Training for Custodial Workers is conducted annually (in-person initially, then retraining online) and includes Hazards Communication, Biohazards with Bloodborne Pathogens and Ancillary Radiation.

**4. Enforcement of Training Requirements.**

Past-due warnings are sent for retraining by an automatically generated e-mail. Delinquency past this point is dealt with on a case-by-case manner.

**5. Number of employees trained per year.**

From July 1, 2015 to June 30, 2016, a total of 7,992 trainings were conducted. Here are examples of training totals.

- Bloodborne Pathogens: 2537
- Laboratory Standard: 2828
- Hazards Communication: 792
- Respirator: 124
- Drivers Training: 167
- Fire/Fire Extinguisher Training: 476
- Plant and Maintenance: 688
- Hazardous Materials Shipping: 75
- Formaldehyde: 184
- Other Trainings: 121

**6. Number of “in-person” trainings this year.**

There have been 4188 employees trained in person from July 1, 2015 to June 30, 2016.

**7. Number of “online” (Blackboard) trainings this year.**

There were 3804 employees trained online between July 1, 2015 and June 30, 2016.

**9. Number of delinquencies in each training area?**

In total, the database showed 3277 retraining delinquencies before June 30, 2016: 1,241 in Bloodborne Pathogen training, 1,262 in Laboratory Standard training, 5 in Respirator

training, and 769 in Hazards Communication. The current database does not take into account employees who have left the university, volunteers, contractors, or any others who no longer need training.

#### **10. Has enforcement policy been used?**

Reminder emails have been issued to advise personnel of expired training, but no one has been removed from service because of persistent delinquency. The PI is contacted first, followed by the chair of the PI's department. Ultimately, the Dean of the requisite college may also be contacted.

(Senior Directors Note: This process was not followed for PIs. A New process was implement to fill this gap in 2016)

#### **Website**

An audit of the website was conducted. The website was sequentially rewritten and relaunched. The audit of the new website was conducted by a team of Marketing and Communications workers.

No other issues found at this time.

#### **Protocols**

No issues noted

#### **Biosafety**

No issues noted

#### **Shipping**

No issues noted

## **Chemical and Biosafety Hoods**

The SOP lacks the Senior Directors signature. Removal of UV lights needs to be mentioned. Records are in order.

Response: The Fumehood program should be split off as a separate audit from the Biohood program. While related they are distinct.

The Fumehood program on the EHS side is generally in good shape. There are however a lot of issues with repair time, replacement of air flow monitors, replacement of old hoods, air balancing, and other facilities issues outstanding. A 100-page report was generated that documents these issues and a meeting was held to discuss. Some improvement was made but there are many issues remaining. A second meeting will be held shortly as we will be in the second printing of the update. Many of the issues will require capital projects to complete. EHS hopes to support the apportionment of such funds to address the issues.

