

# **ENVIRONMENTAL HEALTH & SAFETY**

## **ANNUAL REPORT 2004 – 2005**

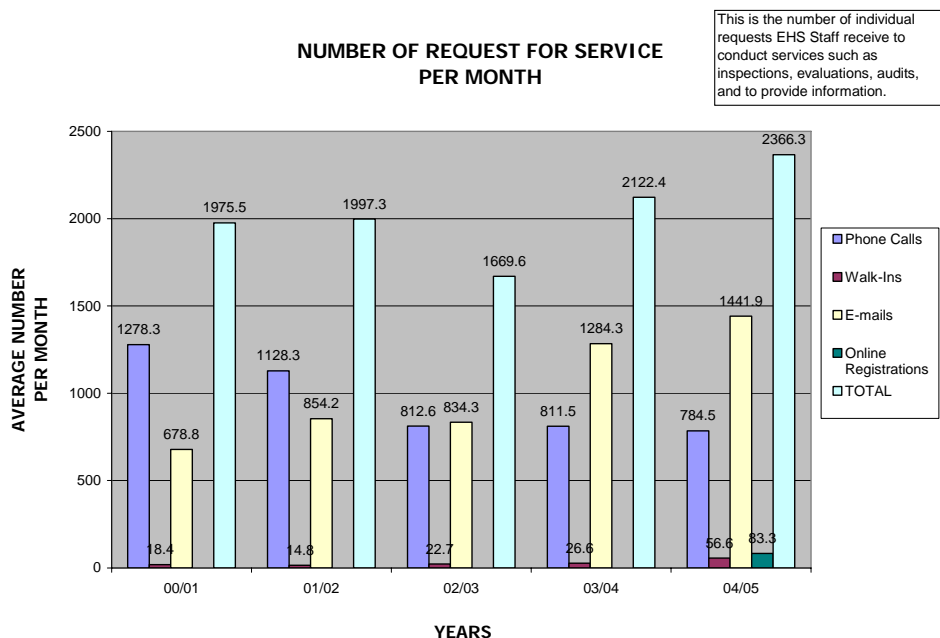
## Highlights of Accomplishments

The Environmental Health and Safety department continues to be involved in many strategic challenges affecting Penn State. These challenges are initiated by regulatory mandates, administrative planning, and increased needs on the part of the University. Health and safety initiatives within the research areas continue to necessitate ongoing and extensive services, and increased requests for services in all other areas of the University placed increased demands on EHS staff.

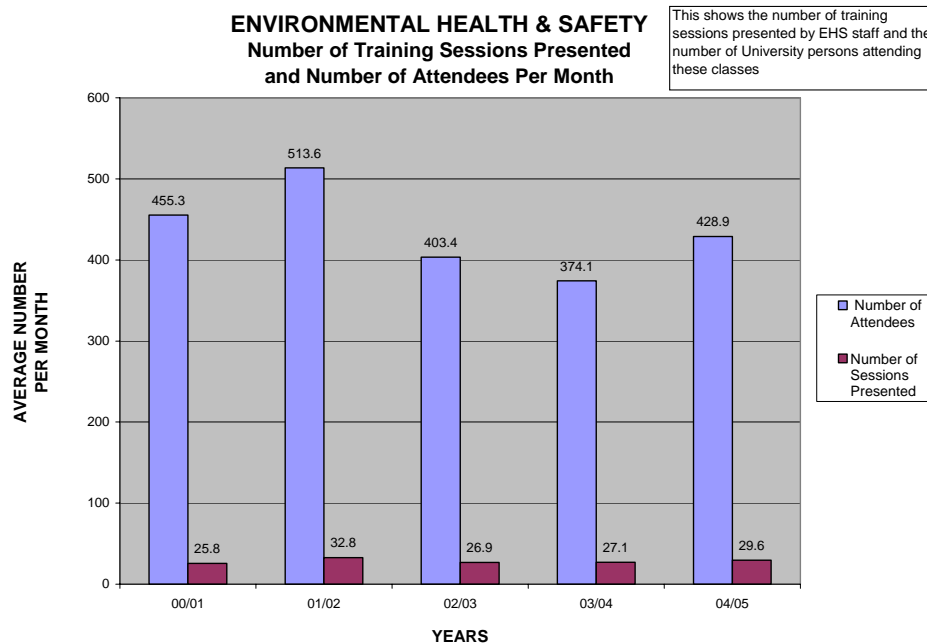
EHS is a leader in protecting the health and safety of the University community, and balances the demands for increased service, with providing quality response. Throughout all these challenges, EHS programs continue to be the standard of practice amongst our peer institutions. Day in and day out, EHS staff make critical decisions that impact the quality of the Penn State environment. We are extremely proud of our performance for the year, looking back with pride as we recognize our impacts on reducing risks, injuries, illness, and adverse impacts to Penn State. We look ahead to 2005/2006 with great optimism, but, at the same time, gearing up for new challenges facing our staff. Specifically, we see a number of significant challenges in the upcoming years - the increasing emphasis, with concurrent new facility construction for research and development uses, increased applications in Nanotechnology and more stringent regulations will require significant staff time to ensure work environments remain safe.

Highlights of our major accomplishments for this past year are:

- In 2004, EHS lead a University-wide initiative to implement a Chemical Management System that provides critical and useful information on the types and locations of hazardous materials stored and used in University facilities. During this past year, this initiative was completed as a pilot in the Life Sciences Building.



- The number of requests for service for EHS staff, as shown on the graph above, continued to increase for the third consecutive year. This is reflective of a program that is well-established and is seen throughout the University community as a resource that provides beneficial services. It also reflects the addition of two staff members with specific areas of responsibility that have been sorely needed. One of these positions is the Occupational Safety Program Manager who is in the process of developing a comprehensive accident prevention program. The second position is the Manager of Commonwealth Health and Safety Programs who is entirely responsible for coordinating EHS programs at non-University Park locations. As one example, this individual was able to provide location-specific training on the new Hot Work Permit program.
- The number of training sessions presented each month and the number of attendees for these sessions also increased over the last year as shown on the graph below. EHS staff continues to emphasize accountability of supervisors and work units to ensure required training of individuals is presented. This data shows the impact of those initiatives.



- Several new initiatives were directed at enhancing our safety programs for laboratories. These included the new Laser Safety Policy, complete with a web-based training program and a new Vital Building Information program which provides a frame work for emergency responders in the event of potential hazardous conditions within buildings. The new Chemistry Building and Life Sciences Buildings will be the first buildings having this information readily available. Additionally, in January 2004, EHS implemented a new program for University faculty and staff who ship hazardous materials and dangerous goods to locations off campus, using mail services, air transportation (such as Fed Ex or

UPS), courier, etc. This program provides all of the assistance needed to properly classify, document, prepare, and offer hazardous materials for shipment, and to properly handle and provide security for materials prior to shipment. In the spring of 2005, we saw a significant increase in the number of shipments from University activities which have continued to hold steady. Most of the individuals presenting materials for shipment are from laboratories.

- EHS continues to provide health and safety support for students, ranging from fire safety programs in residence halls to hazard assessments/approvals for student club sports and student activities at both University Park and many campus locations. These activities and reviews are vital to ensure the safety of our students in their extracurricular activities and residence hall usage.
- EHS continued leading the University's comprehensive lighting program, with a pro-active approach through a coordinated effort of many University units. Many lighting improvements and enhancements have been made during the years working cooperatively with others, that lead to the development of a program that is well-received by students, faculty and staff. Twice a year lighting surveys, which include student leadership, are conducted to evaluate areas of concern. Fewer and fewer areas are being identified, indicating that our pro-active approaches are successful. A new web site, specifically designed in 2004, (<http://www.ehs.psu.edu/occhealth/lighting.cfm>) continues to be updated to reflect that status of this program.
- Environmental compliance oversight of regulated activities continued, with a high level of compliance in fuel handling, hazardous waste management, asbestos management, x-ray producing equipment usage, and radioactive materials handling. The high level of compliance demonstrates many factors, including administrative support of EHS programs, faculty and staff commitment and accountability to implement and, equal, if not more important, the dedication and hard work of the EHS staff.
- One of the strong points of EHS is our ability to coordinate programs through partnering with faculty, staff and students. In one particular instance, EHS has taken the leadership role in the biodegradable/biodiesel program. Initially targeted as a pollution prevention initiative to reduce environmental impacts from fuel releases to the environment, this program has grown to a University-wide initiative which includes the conversion of all equipment in the College of Agricultural Sciences to biodegradable oils and student involvement in the department of Chemical Engineering to look at establishing a process to increase the production of fuel oils from cooking fuels for University use.
- Major renovations to Chandlee Laboratory, a building used for over forty years as the major chemistry facility, necessitated a strategic approach to the identification and management of residual "contamination" present throughout the infrastructure. In a coordinated and very in-depth approach, and working closely with OPP

Project Management, a streamlined process was implemented to ensure the safety of workers and occupants throughout all phases of the renovation. During recent discussions with our counterparts in the Big Ten, it became clear that we, unknowingly, established and implemented a procedure that others are still working on.

One overriding accomplishment that cannot be overlooked is the ongoing implementation of our existing programs. Many of these, including the radiation protection program for radioactive materials use, fire safety, and asbestos, to name a few, have become integrated into the day-to-day operations of the University. EHS staff commitment and success can easily be overlooked. This report will provide a program-by-program review of all EHS areas and it will become readily apparent the extensive nature of managing new and existing programs.

### Program Area Reports

#### *Asbestos*

In its 27<sup>th</sup> year, the Asbestos Management Program continues to ensure the protection of our employees, students and the environment from exposure to hazardous levels of asbestos. A comprehensive program that includes written specifications for construction and renovation projects, hazard assessment, awareness training, proper work practices, and routine inspections to verify compliance, has achieved tight control of asbestos hazards and is often considered the benchmark program by our peer institutions.

This past year, EHS provided direct oversight of 300 asbestos removal projects, including those conducted by the in-house OPP asbestos removal crew and third party qualified contractors. Surveys conducted by EHS and a third party oversight consultant, including visual inspection and air monitoring, showed that all asbestos material was being handled in a safe and controlled manner, and in accordance with strict state and federal regulations. Air monitoring was conducted to look for any asbestos inside and outside of areas where work was conducted and to ensure that job sites were clean following construction or renovation. The third party monitoring is redundant to both OPP/contractor and EHS staff surveys, but also ensures an added level of assurance that all areas are safe. In no case, were unsafe levels of asbestos measured.

Communication of program requirements is an important element of the program. EHS staff regularly attends OPP job meetings, which have established an open line of communication between EHS and contractors and OPP in-house staff. Working directly with building occupants on asbestos concerns allows our staff to be pro-active in avoiding possible hazards during maintenance and removal activities. EHS also provides training to satisfy both safety and regulatory requirements. Asbestos awareness training was provided to over 100 from various units.

## *Biological Safety*

The Biological Safety Program ensures proper use of biohazardous materials, regulatory compliance and a work place and environment free of the hazards associated with biological materials. These materials include infectious materials used in University laboratories, and their disposal, and also infectious materials that can occur through growth of mold or other biological processes.

The Biosafety Officer (BSO) continues to take a lead role in the Institutional Biosafety Committee, providing ongoing oversight of these programs, with monitoring and reporting at monthly meetings of up-and-coming issues in the ever-changing world of biological safety. The BSO reviews research proposals, performs risk assessments for employees working with animals, and inspects laboratories to ensure safe work practices. In this oversight role, 166 laboratories were inspected with no significant deficiencies found, and 238 new employees were evaluated and determined to not be at risk for animal related illness or exposure. These inspections and evaluations show that areas using biological materials or working with animals continue to be safe for University employees and students.

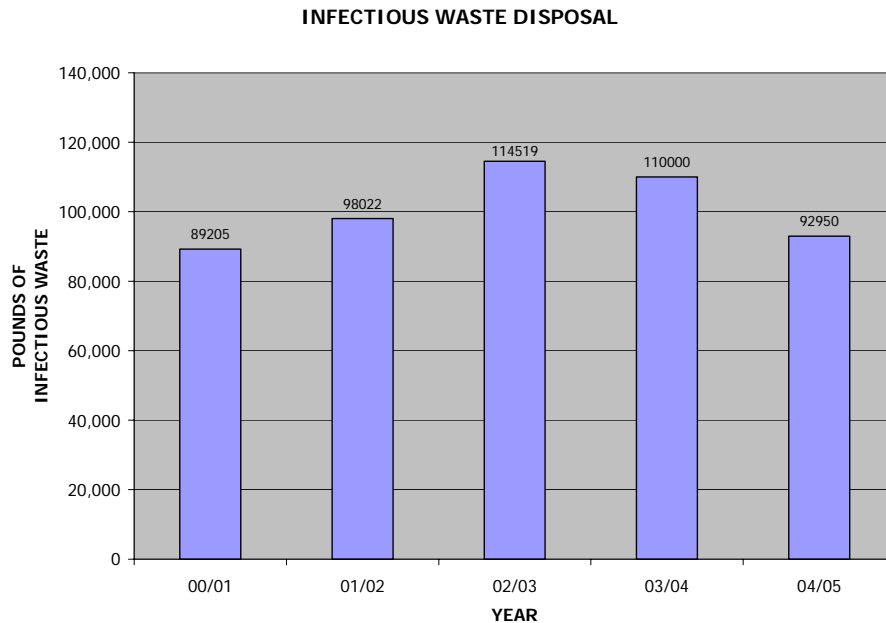
Ongoing oversight of our previously-established Water Incursion Program continued. Through these efforts, the BSO ensured that potential mold and biological growth from water and moisture effects were eliminated. Implementation of these procedures throughout University units responsible for maintenance and facilities management is event through EHS oversight efforts. This program requires ongoing diligence.

The BSO is also responsible to provide blood borne pathogen and right-to-know training to new faculty, staff and students. This training prepares individuals to properly handle biological hazards and directs them on where to find information on chemical hazards. This year, two new methods for providing this training were developed: a DVD on blood borne pathogens specifically targeting janitorial staff was rolled out, and a power point program for right-to-know training replaced an outdated video. By expanding our methods of communication, we are able to better facilitate bringing information to our university community. Input from attendees of these programs has been positive.

An important aspect of working with biohazardous materials is ensuring that where those materials “pose a severe threat to public health and safety”, i.e. select agents that have been defined by regulations as, microorganism (virus, bacterium, fungus, rickettsia) or toxins listed by the CDC, that there is a well thought out plan for security and handling. Such a plan was developed this year by EHS to prepare for future research using these materials and to ensure safe use of toxic materials that, although currently do not meet the threshold quantities, are handled safely.

EHS continues to manage infectious waste disposal to ensure protection of the environment and our community. During the past year, the University disposed of 92,950 pounds of infectious waste, as shown in the graph below. The total amount of

infectious waste generated is lower again this year than previous years. This is primarily due to diligence in keeping unnecessary materials out of the waste stream. Two examples are soil that is used to grow genetically modified plants and glass laboratory items. The soil, once autoclaved, no longer represents a biological hazard and need not be collected as infectious waste. Also, assays using large numbers of glass test tubes, along with glass pipettes, are being used by fewer laboratories, resulting in less material being generated as infectious waste. Disposable plastic lab ware has largely replaced these items.



### *Chemical and Laboratory Safety*

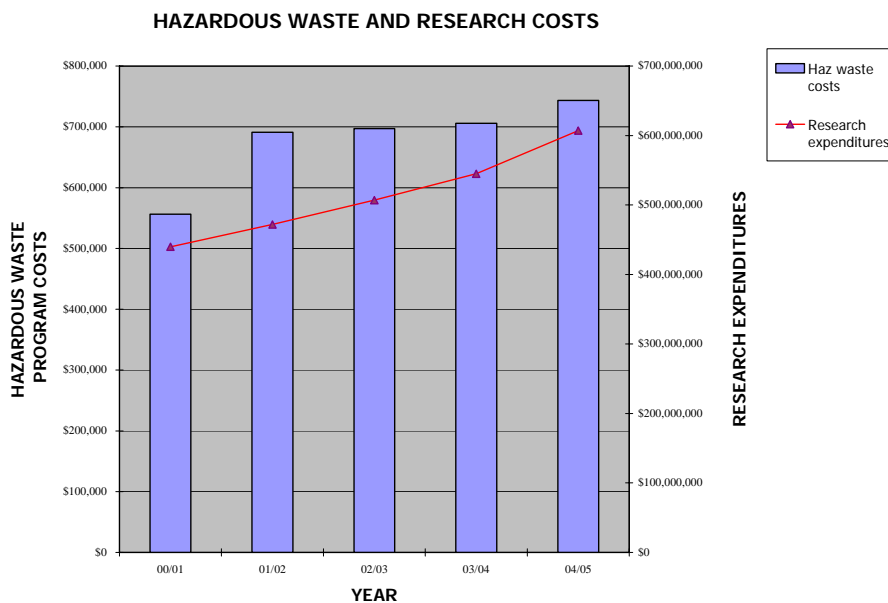
The Chemical Safety program, through training, safety partnerships, hazard evaluation, and work place audits ensures a safe workplace for conducting the cutting edge research that has become so integral to the University.

Laboratory oversight plays a critical role in communicating and ensuring that appropriate safety practices are being followed. All labs on campus are inspected annually, at a minimum, by EHS and greater than 90% are in compliance with program requirements. In addition to inspecting all laboratories, EHS evaluates risk for specific experiments and provides recommendations on appropriate design, engineering controls and personal protective equipment. Twenty-seven experimental procedures were evaluated, including experimental design issues related to hydrogen as an alternative fuel; toxic materials use, i.e. isocyanates, lead, hydrofluoric acid, chromium, and safe use of nuclear magnetic resonance units. Additionally, EHS has developed a tool for researchers to verify that their labs are in compliance with regulations specifically identified by granting agencies. Many times during the year, EHS is required to "certify" these laboratories and we have seen an increase in the number of grants requiring this approval. We are expecting the number of certifications to continue to increase. This EHS involvement in laboratory operations confirms that overall, employees and students are working in a safe laboratory

environment and not over exposing themselves or the environment to hazardous chemicals.

Required training for laboratory personnel continues to be offered every week in the EHS offices, in addition to on-site departmental training sessions at the beginning of each semester. As important as it is to ensure lab workers are well informed, it is equally important to ensure that physical plant workers who work in those areas are also well informed on hazards; area services and maintenance workers were provided training on working safely in laboratories. A process was developed for limiting access in those areas where researchers had concerns about contamination issues and this information was provided to the appropriate OPP workers.

Effectively and efficiently managing hazardous waste ensures employee safety and environmental protection, in addition to meeting our regulatory requirement to minimize hazardous waste. Hazardous waste program costs, as shown in graph below, have remained fairly constant despite greater than 10% annual increases in research expenditures and increased transportation/handling costs for disposal. This has resulted from maximizing cost saving measures such as bulking of waste to take advantage of reduced costing for bulk containers over individually packaged smaller containers, maximizing container packing efficiency, and choosing disposal options carefully.



EHS has developed and implemented a number of emergency preparedness and response plans for dealing with hazardous materials incidents. These plans address the uses of chemical, radiological, and biological materials, with emphasis on appropriate emergency prevention measures, and include response and notification procedures in the event of an incident. Through continued EHS training and oversight, these procedures have been incorporated into facility operations to ensure proper and timely implementation of appropriate protocols. These plans are consistent with the approach the University has

taken on responding to emergencies. Through a tiered response, actions are related to the nature of the incident. At the first level, EHS requires University employees who use or store hazardous materials to be trained in procedures to reduce the potential risks of spills or releases. Many of these facilities also maintain spill containment and cleanup materials in the event of an incident. Furthermore, for fuel-handling facilities, EHS requires spill absorbent materials be readily available. EHS staff has trained thousands of University employees, including student non-employees, in hazardous materials management practices. At the second level, EHS staff is trained and available to respond to hazardous materials incidents. EHS maintains a large supply of spill absorbent materials, portable curbing to protect drains, and pop-up pools to contain spills. All calls to University Police to report spills/releases are relayed to EHS personnel (24-hours/day). University Police also have spill response materials and have been trained in their use.

Lastly, Penn State has a Pennsylvania-certified Hazardous Materials Response team (Hazmat team) who can respond with a complement of twenty-three individuals in the event the incident is beyond the capabilities of the EHS staff.

Areas on the University Park campus that store large quantities of hazardous materials and all non-University Park locations are required by DEP to have a Preparedness, Prevention and Contingency (PPC) Plan that provides for anticipating and preparing for possible releases of hazardous materials. This includes a total of forty-five areas. Areas covered receive training and are audited at annually.

The University stores extremely hazardous substances in quantities that exceed EPA mandated planning thresholds in a limited number of locations at University Park. The Emergency Planning and Community Right to Know Act require PSU to have Emergency Off-Site Response Plans. These plans detail the storage and use of the extremely hazardous materials, as well as the responsibilities of the various emergency responders in the event of a release. These are written in coordination with the Local Emergency Planning Committee. This past fiscal year marked the addition of a new plan for the water treatment plant. Proactive planning ensures that appropriate personnel, equipment and materials have been strategically considered and prepared to help prevent a release or to respond in the event of an accident.

EHS, in conjunction with the Office of Research Protections and Animal Resource Program, developed an Animal Issues Response Plan that includes operational procedures for the implementation of proper and timely response to emergencies involving animals. This includes vandalism, theft, arson, release of animals, acts of bioterrorism, fire, and exotic disease outbreaks. This plan is an element of the University's overall Emergency Operations Plan. Subsidiary to it is the Animal Resource Program's Emergency Operations Plan that includes facility-specific procedures.

EHS continues to emphasize the development of written preparedness and prevention plans for many contingencies that affect the University's health and safety.

### *Commonwealth Campus Health and Safety*

EHS has provided support to Penn State's Commonwealth Campuses since its inception. In October 2004, EHS added a new position, Manager, Commonwealth Health and Safety Programs, to provide primary support for the health and safety programs at Penn State's Commonwealth Campuses. The Commonwealth Campus EHS program uses the resources and expertise of the EHS department to ensure the health and safety of students, faculty, staff and visitors at each campus. Safety policies and procedures are established by Environmental Health and Safety to support our "Let No Harm Be Done" philosophy and apply to all university locations including the Commonwealth Campuses.

During the past year, visits were made to all campus locations, including the Dickinson School of Law and the Penn State Great Valley School of Graduate Professional Studies. These initial visits were made to meet key personnel at all campuses and to introduce the Manager, Commonwealth Health and Safety Programs. At the same time, EHS asked for feedback on ways to further support the health and safety programs at all campuses. Based on the information obtained, a plan was established to address needs based on potential risks.

During the past year, EHS provided support to campuses in a variety of areas, including asbestos abatement, biological safety oversight and special waste disposal pickups, ergonomic assessments, fire protection services, indoor air quality assessments, oil spill prevention and tank upgrades, and radiation protection services. To meet laboratory needs, EHS developed a Lab Safety Handbook to be used as a source of basic laboratory safety information. EHS staff also conducted inspections of eye washes, fume hoods and safety showers and provided training on a variety of programs. These included fire prevention training for maintenance personnel involved in welding and metal grinding and soldering activities (Hot Work), spill prevention and response training, and chemical safety/waste handling procedures. EHS staff also developed a DVD video training program on blood borne pathogens that should allow the Commonwealth Campuses greater flexibility in training. If this initial training DVD is successful, EHS intends to develop additional video training materials that can be used at Commonwealth Campuses.

EHS monitors accident reports at the campuses, looking for trends and opportunities to prevent future accidents from happening. EHS also coordinates annual inspections by Penn State's insurance carrier (PMA) to provide an independent assessment of safety at Commonwealth Campuses and provide recommendations for improvement, if appropriate.

This is an exciting time for EHS in working closely with campus locations. In being the advocate for EHS services, the Manager of Commonwealth Health and Safety, is leading a new initiative that has been needed for many years.

## *Environmental Protection*

EHS is responsible for several areas of environmental protection: oversight of environmental site assessments for planned property purchases, the Storage Tank Management Program, oil spill/release response, pesticide use and management, and oversight of two environmental clean-ups – the Fire Training Site and the Biglerville gasoline release. Our goals are primarily to protect the environment through the elimination of contamination by potentially hazardous materials, but they also include the protection of people from environmental exposures, ensuring regulatory compliance, and protecting the University's assets.

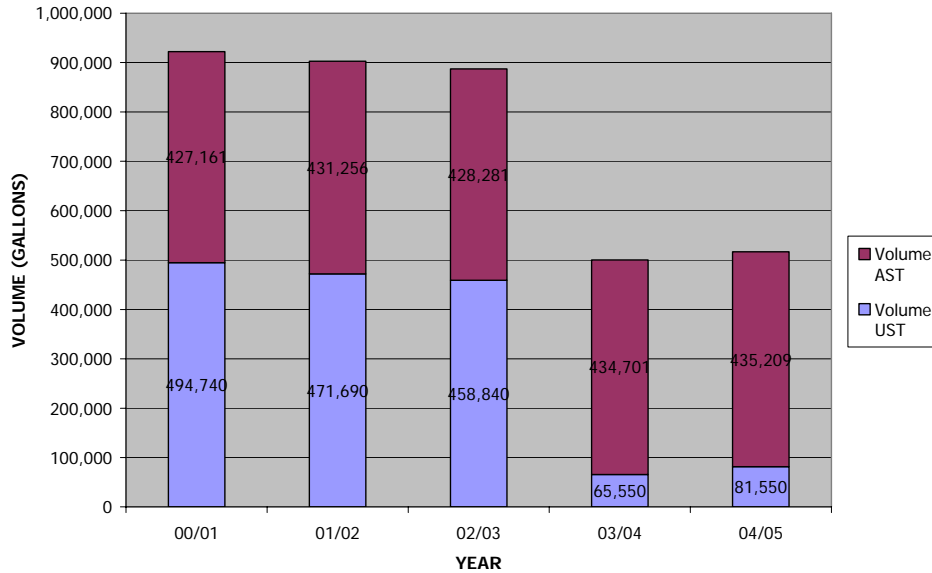
Environmental site assessments (ESAs), either formally by a third party or EHS site reviews are performed on properties that PSU would like to acquire either through purchase, gift, or by lease in order to determine if there are any significant environmental issues associated with the property. EHS also performs evaluations of buildings to determine if there are any health and safety issues for future occupants. During this fiscal year, EHS provided these services for ten properties; significant environmental issues were identified at four of these, two of which remain on-going. In addition, we completed the use of an assessment tool which aids in deciding if a third party ESA is required for a particular property. This process has protected the University from acquiring properties with environmental issues while maintaining costs to obtain this information to a reasonable level.

The Storage Tank Management Program works with the regulated community to monitor all aspects of fuel and tank management including: oversight of tank removals and installations, regulatory compliance, Spill Prevention, Control, and Countermeasures (SPCC) Plans, training of individuals that have storage tanks at their facilities, and audits of those facilities to assess compliance with the program. The audits are redundant to the inspections performed by tank facility personnel; the level of compliance with the most important requirements of the program is quite high.

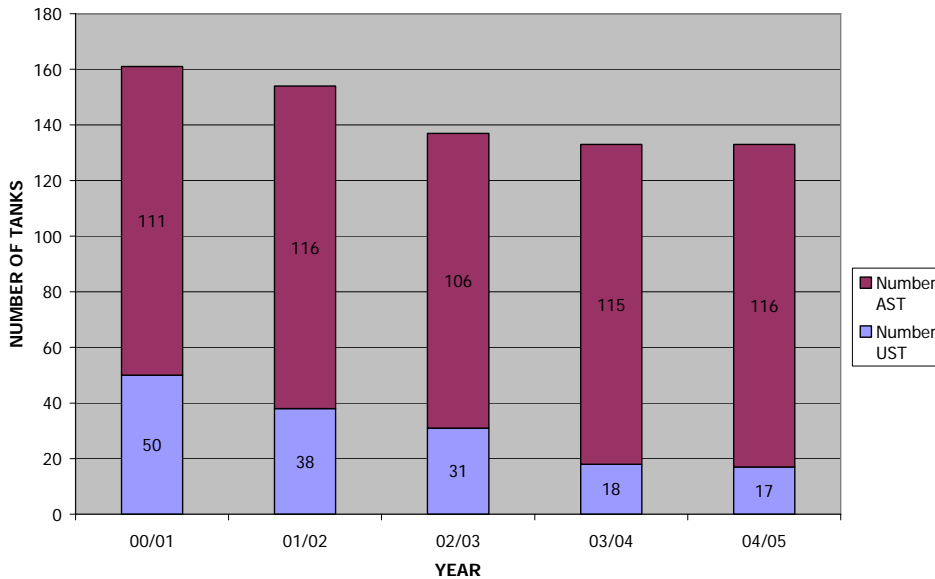
This year saw the completion of the removal of single-walled underground storage tanks (USTs) that do not have leak monitors. These tanks represented our largest environmental risk because of the possibility of release without detection. We will continue to prioritize removing the remaining single-walled USTs.

At the end of the fiscal year, the University had 516,759 gallons of storage volume in 133 tanks. This was an increase in storage volume from last year largely due to the completion of a tank removal/replacement during the fiscal year change. The graphs below illustrate the trends in both storage tank volume and number of tanks, which has been becoming more stable, and the emphasis on UST removal over the past several years:

**STORAGE TANK VOLUME VERSUS TIME**

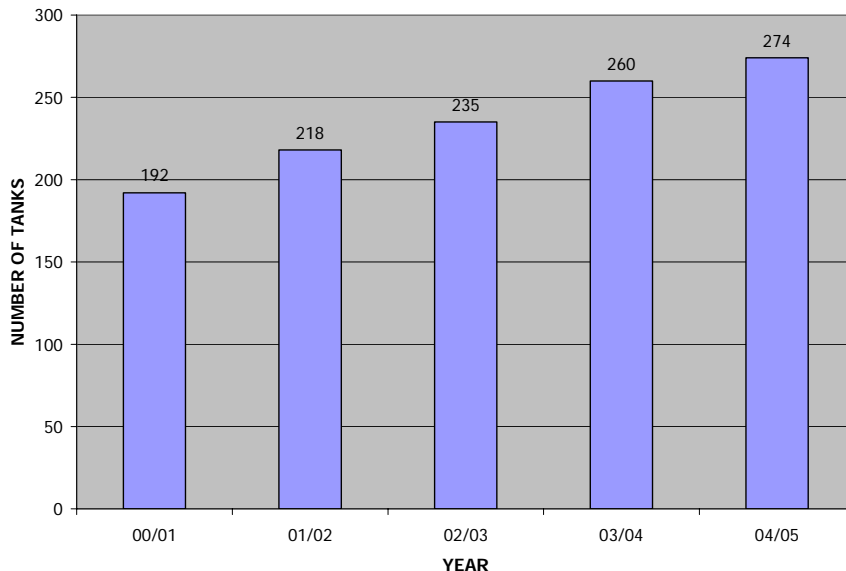


**NUMBER OF STORAGE TANKS VERSUS TIME**



Removal of older storage tanks continues to be a priority. When possible, alternative fuels are used for heating, which eliminates the need for the tank. During 2004/2005, EHS provided oversight for the removal of fourteen storage tanks. This included two abandoned storage tanks that had not been previously identified. The graph below shows the cumulative number of tanks removed:

CUMULATIVE NUMBER OF TANKS REMOVED



EHS continues to conduct audits on the implementation of the SPCC requirements, and to train individuals in proper fuel handling techniques. In addition, last fiscal year we identified the need to institute procedures and to train more people in emergency spill response, particularly during the second and third shifts. This year a procedure was developed with the Physical Plant Work Control Center and the Physical Plant janitorial workers were trained to provide emergency spill response. During 2004/2005, a total of 681 people were trained at thirty-eight locations.

Spill awareness at the University continues to be elevated through training and program oversight. Notification to EHS indicates that the training has been very effective and results in the proper handling of spills. During the fiscal year, forty-five oil spills were reported to EHS. Of those, twenty were caused by contractors or other non-PSU employees, who were required to either clean-up the release or to reimburse the University for the spill clean-up. Sixteen of the PSU oil releases were the result of hydraulic line breaks. In response, last year PSU began to use biodegradable hydraulic oil in the college of Agricultural Sciences equipment. Two of the hydraulic releases this year were of this type of oil, which is vegetable-based enabling easy cleanup and disposal. The oil has been tested in various types of equipment for a year and we are now ready to expand its use throughout the University. In addition, we plan to investigate the use of biodegradable hydraulic oil in elevators, beginning with a few that have underground components. All of these efforts further OPP's commitment to environmental stewardship.

EHS is responsible for two ongoing environmental clean-ups, the Fire Training Site and the Biglerville gasoline release site. The Fire Training Site oversight involves monitoring of the groundwater recovery and treatment system installed in the Big Hollow well field in June 2001 to contain low levels of chlorinated solvent contamination. To date, the

system has removed over 152 pounds of volatile organic chemicals (VOCs), mostly cis-dichloroethene. The concentrations in the recovery wells have continued to decrease, while we have seen an increase in some of the monitoring wells. We plan to increase the monitoring network this year in an attempt to more clearly delineate the ground water concentrations in the area.

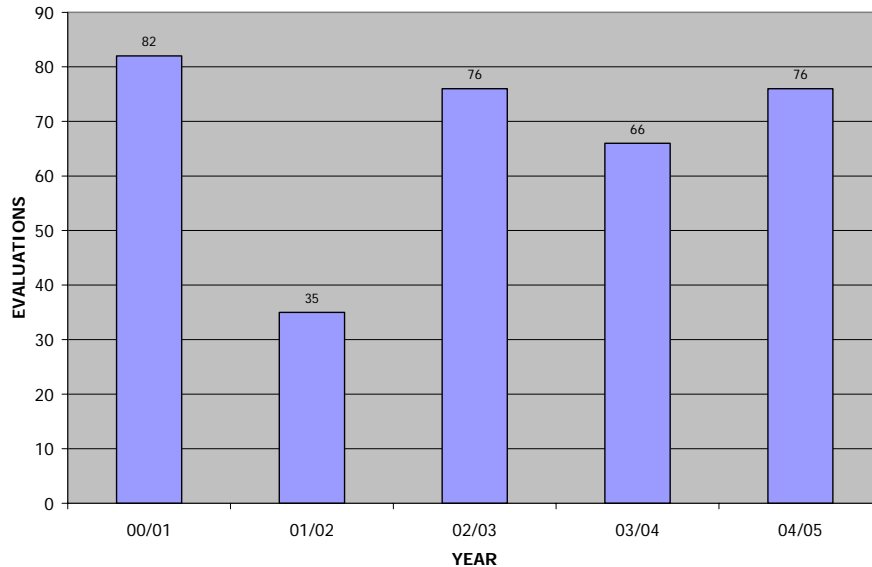
A gasoline underground storage tank at Penn State's Biglerville Fruit Research and Extension Center was leaking when it was removed in July of 1994. All active treatment systems were terminated in February 2004. Groundwater monitoring efforts to date indicate that this release was successfully remediated, with an anticipated completion of this cleanup during the next fiscal year.

A new initiative underway is the Pesticide Management Program. This program will provide a coordinated approach to the many regulatory state and federal requirements, as well as to ensure that safe practices for the storage, use, and disposal of pesticides are followed. A draft of this program was completed this fiscal year. During the next year, the program will be further developed for implementation.

*Ergonomics*

Ergonomic and Repetitive Strain Injury management continues to be an important function within EHS. These injuries can cause significant loss or disruption of function in affected employees, along with impacts at home and at the worksite. Personal work site or work activity evaluations are key aspects of injury management, along with coordination with medical providers, Risk Management, safety officers, supervisors and affected employees. The number of evaluations over the past several fiscal years can be seen in the graph below. EHS continues to perform over sixty five evaluations per year. Work site issues identified are often easily corrected without expensive equipment and frequently similar problems are seen from area to area, i.e. reaching for repeatedly used equipment (such as a mouse or phone), poorly positioned equipment requiring awkward posture, cradling telephones, etc.

**ERGONOMIC EVALUATIONS PER YEAR**



To facilitate injury prevention, on-site Ergonomics and Back Safety Awareness training sessions are conducted either on request or by targeting areas seen to be more at-risk. Some work units, such as the Office of Physical Plant, have integrated this program into new employee orientation training. Based on injury statistics, the library was identified as an area of focus for work practice evaluation and training. Overall, this past year approximately 200 employees from various units were trained.

In order to gauge the success of our work site interventions, this past year EHS conducted a customer survey. This quantitative assessment confirmed positive qualitative measures seen and revealed that greater than 80% of injured employees showed improvement following the implementation of EHS-identified corrective measures.

### *Fire Protection and Prevention*

The goal of the Penn State Fire Protection and Prevention Program is to provide a fire safe environment to students, faculty, staff and visitors. To achieve this goal, activities including fire safety education, facility inspections, special events review and fire incident analysis are routinely performed.

One proactive approach to preventing fires is supported by university-wide Fire Safety Education Programs which continued to be a major component of the Fire Protection and Prevention program. Individuals who receive fire safety training help to maintain the low occurrence of actual fires within the university. Approximately 1,300 individuals affiliated with the university participated in fire safety training during this fiscal year. Programs included hands-on fire extinguisher use, building fire evacuation planning, residence hall fire safety, workplace fire prevention measures, conducting work place fire safety inspections, hot work procedures and other general and specific fire safety topics.

Automatic fire suppression sprinkler systems have long been known to provide an increased level of fire safety to building occupants. All new construction of student residence buildings has automatic sprinkler systems installed during construction. EHS, Physical Plant Project Management and Auxiliary Services have been working together during the installation of sprinkler systems in existing University Park and non-University Park residence halls. This retrofitting work includes the installation of sprinklers in all areas and upgrading the building fire/smoke detection and alarm systems.

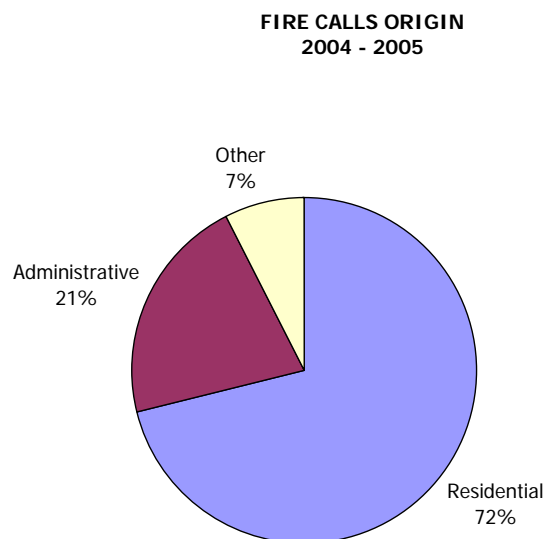
Four additional residence halls and attached facilities totaling 321,264 sq ft were retrofitted with automatic fire suppression sprinklers during fiscal year 2004/2005. These were Atherton, Hastings, Stone and Snyder halls. Since 2001, sixteen (1,417,712 sq ft) of the forty-four existing residence halls (3,131,843 sq ft) at University Park have been provided with automatic fire suppression systems. During this past fiscal year, the University completed the retrofitting of all residence halls at non-University Park locations with sprinklers. It is anticipated that all of the residence halls throughout the University system will be retrofitted with fire sprinkler systems at the end of 2008.

The new Eastview Terrace Residence Halls were completed during Fiscal Year 2004/2005. The complex consists of seven residence halls that are totally protected with automatic sprinkler systems. EHS was involved with the design of the site for emergency response issues and also building evacuation planning.

The total number of fire related alarms and incidents recorded at University Park totaled 228 for fiscal year 2004/2005. This total number includes fire alarms, smoke odor investigations, fires reported as out, vehicle fires, ground cover fires and similar type incidents. This is a 16% increase from the total of 197 recorded during fiscal year 2003/2004. This increase can be attributed to the upgrading of fire alarm systems in the retrofitted residence halls and the additional Eastview Terrace housing units. New fire alarm systems provide monitoring of all fire detection devices including individual rooms. Replaced systems did not have the capability of monitoring individual student rooms so alarms could have activated with no notification outside of the room.

Additionally there has been an increase of fire alarm activations caused by the use of cooking equipment involving the kitchens in the White Course Apartment complex and microwaves in residence hall rooms. Many of these “nuisance” alarms have been attributed to the making of microwave popcorn. Fire Alarm trends will continue to be monitored with focused training programs and educational literature being provided in an effort to decrease the number of alarms.

The majority of fire calls (72%) at University Park originated in residential occupancies which include the Residence Halls, Apartments and Hotels. Twenty-one percent (21%) originated in other occupancies which include laboratories, administrative offices, athletic facilities, classroom buildings and storage buildings. The remaining 7% were vehicle and outside fires such as trash containers and vegetation (see pie chart below). This has been consistent over the past several years.



Property dollar loss associated to fires totaled approximately \$977,700 for fiscal year 2004/2005. The largest single loss occurred at the Stuckman (SALA) building. An arson fire on Easter morning March 27, 2005 caused an estimated \$975,000.00 in damages. The building was still under construction at the time of the fire and although the fire was contained to a single media center significant smoke damage occurred. The individual responsible for the fire was identified and arrested for arson. Two other fires occurred involving laboratory drying ovens. One fire was attributed to the placing of a flammable material in the oven while the other originated when cardboard boxes were placed on top of the oven by the flue.

Several new Fire Protection initiatives were started during fiscal year 2004/2005. These initiatives are designed to further reduce the threat of fire to the University Community.

The Hot Work Permit Program was developed and is currently being implemented throughout the university. This program provides the worker with a checklist of items which need to be verified prior to performing any type of hot work.

Another initiative involves gathering vital building information that can be used by emergency response personnel when dealing with an emergency at a specific building. Buildings are evaluated and the vital information is placed in a book which is located in a lock box on the exterior of the building. The box is keyed to allow access to emergency personnel only. The first buildings selected for this initiative included the New Chemistry Building and Life Sciences Building. Vital information was gathered and a format for the information book was developed in conjunction with University Police. Other buildings identified for this program include the New Information Sciences and Technology Building, Field Maintenance Building and Steidle Building.

### *Hazardous Materials Response*

In 1985, the University-based hazmat team was established. Since that time, the team has played a wide variety of roles. Initially seen in an emergency response capacity only, the Hazmat Team has since grown into an organization that is considered by many individuals at the state level as the benchmark for all teams, with direct involvement in regional and strategic emergency response planning. During the spring 2005 recertification process, the Pennsylvania Emergency Management Agency (PEMA) reported that the Team had achieved a standard of excellence for others to emulate. In order to achieve this, there was a significant increase in the number of PEMA required performance-based skills (107).

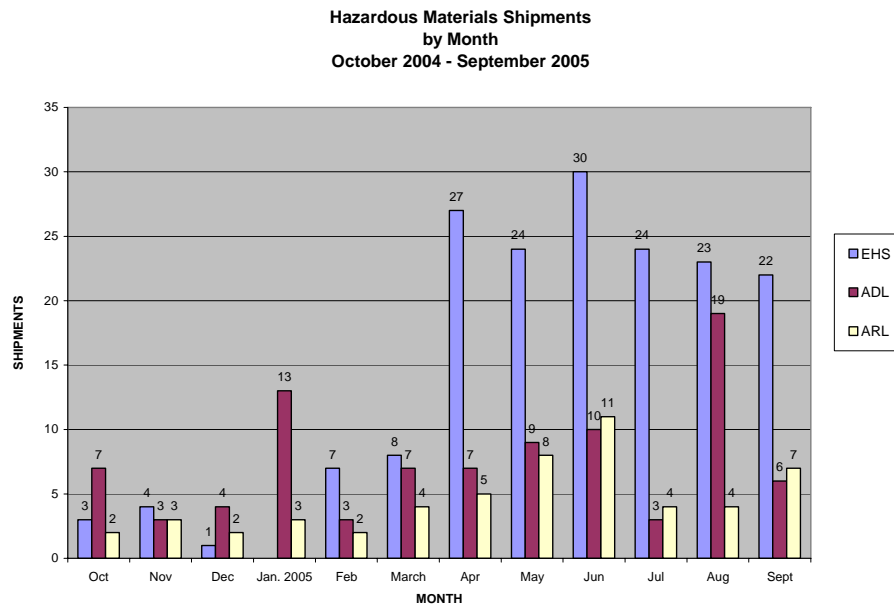
During the last fiscal year, the team responded to four calls, all of which were in locations outside of State College. Although the number of responses was less than in previous years, the Team maintained a high level of activity to further enhance emergency response capabilities within the county. These activities included training of fire companies on eight different occasions and additional Team training in the use of new, specialized monitoring equipment and personal protective clothing.

## Hazardous Materials Shipping

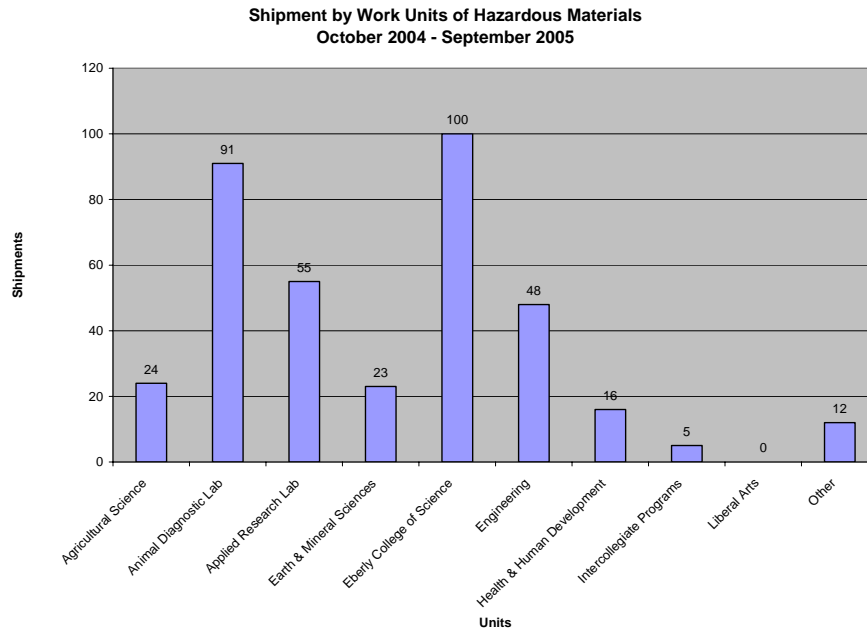
The Hazardous Materials Shipping Program is designed to help University Faculty, Staff, and Students achieve optimum safety and compliance with federal and international regulatory requirements when shipping hazardous materials. These materials include chemicals found in laboratories, infectious materials from humans and animals, and radioactive materials.

This program provides training and assistance to laboratory staff to properly classify, document, prepare, and offer hazardous materials for shipment, and to properly handle and provide security for materials prior to shipment. EHS is responsible to package and prepare appropriate documentation to ensure safe shipment and regulatory compliance of these materials.

EHS saw a significant increase in the number of hazardous materials offered for shipment as the result of marketing efforts and partnering with academic deans to ensure awareness of the need for proper hazardous materials shipping. This resulted in a three-fold increase in the number of packages properly shipped this year, as shown below.



The graph below shows the distribution of work units who generate these materials for shipment. It is clear from this graph the significant contribution from research and development laboratories.



### *Industrial Hygiene and Indoor Air Quality*

*"Industrial hygiene: That science or art devoted to the anticipation, recognition, evaluation, and control of those environmental factors (stresses) arising in or from the workplace which may cause sickness, impaired health and well being, or significant discomfort among workers or among citizens of the community" The American Industrial Hygiene Association*

EHS focused on several areas of industrial hygiene this past year where programs have been ongoing and there is continued EHS oversight to ensure a safe working environment. Respiratory protection, confined space entry, hearing conservation, and lead management are all programs that have been implemented to ensure employees are not exposed to unsafe levels of hazards, to ensure regulatory compliance and to ensure protection of the environment.

The respiratory protection program is firmly established in OPP and the College of Agricultural Sciences where the vast majority of respirators are used. Work areas and activities in these areas were thoroughly evaluated to identify respiratory hazards and to determine respirator need. As a follow-up activity, 140 individuals were trained on proper use and care of respirators, and fit tested on individual respirators. EHS continues to observe compliance with this program in many areas and will continue its oversight. Other isolated areas using respirators have been identified and are being evaluated, with recommendations made to reduce hazards and to select appropriate respiratory protection types.

The University's confined space program controls entry at all University locations, to ensure that employees and third parties do not enter these areas which can pose immediate hazards to their life and health. The University has a significant number of confined spaces, which include any enclosed area with only one entrance, and/or where hazardous vapor, dust or fumes may accumulate, and/or where oxygen may be deficient. Examples of confined spaces are tanks, vessels, silos, storage bins, hoppers, vaults, pits (greater than four feet deep), boilers, compartments, ducts, sewers, pipelines, distribution tunnels, manholes, grease traps, dumpster trucks, trenches, and diked areas. Entry is limited to University personnel who are well trained and familiar with established program requirements, and trained contractors. Forty five workers were trained this past year and entry procedures were reviewed.

The University's hearing conservation program includes monitoring of exposures, assessing work areas and establishing procedures for annual training and hearing testing to ensure that noise exposures are below hazardous levels and regulatory compliance is maintained. During the previous year, EHS targeted the College of Agricultural Sciences to enhance implementation of the hearing conservation program. This year, EHS targeted the Office of Physical Plant. Between these two work units this represents a significant number of potentially exposed employees. This past year approximately 200 employees were provided testing and training. This coming year approximately 500 employees will be added from OPP.

The lead management program controls exposure to unsafe levels of lead paint and dust that can result from maintenance, cleaning and renovation activities. EHS manages exposure by identifying lead containing materials through hazard assessments, establishing procedures for safe handling, coordinating oversight of contractor and in-house projects, conducting training for employees who may work near or with lead, and providing health exposure assessments. This past year forty employees were trained. These measures continue to ensure that no employees, students, contractors or visitors are overexposed, that there has been no adverse impact to the environment, and no regulatory violations.

The indoor air quality program endeavors to provide work areas that are healthy and productive and to ensure employees are not exposed to unsafe levels of indoor air contaminants. Twenty-five indoor air quality (IAQ) evaluations were performed throughout the University this past year. Several of the evaluations this past year were large scale and centered on discomfort from high levels of humidity and enhanced environmental sensitivities. Generally, fewer overall complaints were traced to inadequate fresh air supply or chemical or biological contamination than in previous years. The continuing emphasis on proper fresh air input has shifted the focus of remedial action to proper air distribution, temperature control, and humidity control. In all cases, recommendations were made to address deficiencies and testing confirmed that University work areas are safe to work in.

This program was further enhanced when EHS staff qualified and became certified as a Certified Indoor Air Quality Professional (CIAQP).

## *Radiation Safety*

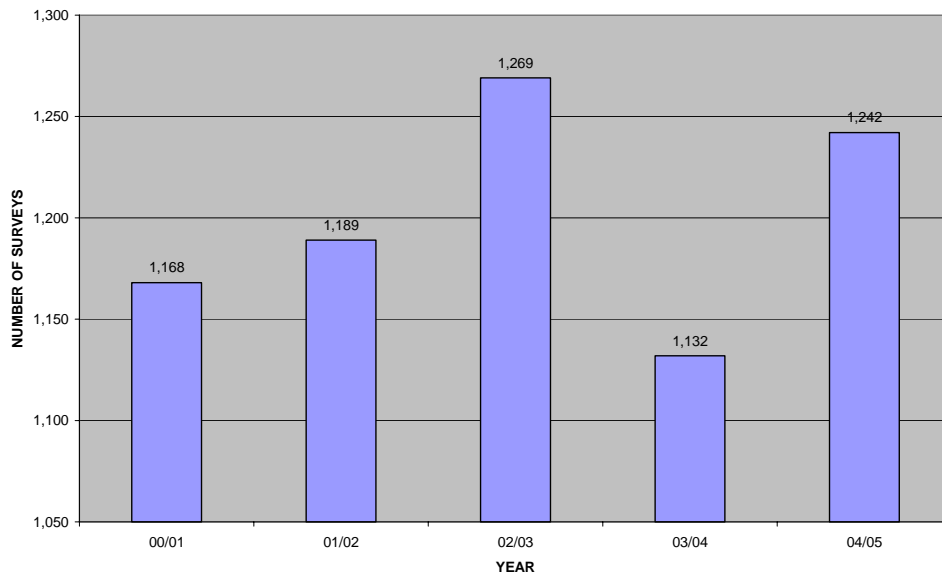
The radiation safety program consists of three major programs – use of licensed radioactive material, laser safety and x-ray producing equipment safety. Many of the core goals of the EHS radiation protection program are established by federal regulation. Other goals are established by the University's responsibility to ensure a safe work environment for our community. Beyond these basic goals, the EHS radiation protection staff takes pride in their ability to support and encourage research and teaching that utilize radiation.

EHS must ensure that all exposures to licensed radioactive material are as low as is reasonably achievable and that all operations with radioactive material are in accordance with regulatory requirements. In addition, EHS must ensure that there are no adverse implications to the environment from the use, handling, storage, or disposal of radioactive materials.

EHS's plan for achieving these goals involves a wide range of complementary tasks. First, EHS ensures that each person who works with radioactive materials has been trained prior to starting work with the material and provided an annual newsletter to refresh their memory on some of the details. This year over 300 took part in the introductory training and over 650 certified that they had completed the annual retraining. In addition, specific one-to-one training is provided to individuals working with special devices or working with significantly more radioactive material than normal.

EHS requires researchers to plan their radiological work by conducting in-depth proactive reviews of research proposals. This helps reduce the amount of material used and ensures that researchers do not start projects that they have not thought through. In addition this tends to reduce the toxicity of the final waste collected. In our oversight role, we performed over 1,000 inspections, consistent with previous years and as shown in the graph below, to verify that researchers were performing their post-use surveys and not contaminating their work environment or themselves. These audits found that greater than 98% of the laboratories were fully compliant with all NRC and DEP regulations and PSU requirements. In addition, one NRC inspection found no safety concerns or problems.

### SURVEYS OF RADIOACTIVE MATERIALS USE IN LABS



As further verification of the amount of radiation exposure personnel receive from licensed radioactive materials, EHS monitors the exposure of about 150 individuals and has installed about fifteen area monitors. These area monitors help show that there were no unexpected releases of radioactive material and that members of the general public were not exposed. The personal dosimeters assigned to those who use the most radioactive material indicated that only two individuals exceeded 10% of the NRC's annual limit for radiation workers. Similar dosimeters posted outside some buildings indicated exposures in those areas were not greater than the normal background fluctuations.

EHS staff, as required by the NRC, performed an in-depth audit of the radiation protection program and corrected minor deficiencies that were identified. As part of the normal process of this review of the program, minor process changes were implemented to improve efficiency and compliance.

The NRC also inspected one of the University's four radioactive material licenses and found no problems.

For the laser safety program, EHS began the implementation of our new policy which requires that all lasers capable of producing injury be registered with EHS. Once registered, EHS can perform a proper safety analysis in accordance with international standards. These standards indicate proper labeling of equipment, the correct personal protective equipment, proper interlocks, and training for individuals. EHS staff is in the process of inspecting laser equipment to verify that proper warning labels and required housing interlocks are in place.

During this past year, we developed an inspection database to track lasers, uses of lasers and, to guide in our oversight role. We conducted inspections in a number of work units and found no major issues identified. Extrapolations from current information indicate that most issues can be corrected with documented training, inexpensive postings, better standard operating procedures, and a few inexpensive interlocks.

EHS continued the implementation of our safety program for x-ray producing equipment. We ensured that all individuals who work with radiation producing equipment have been trained by EHS prior to starting work with the device. This year approximately ninety persons took part in this training. EHS staff performed about eighty compliance inspections verifying that the researchers were not being exposed to radiation levels greater than what is reasonably achievable. In addition, these inspections verify that standard operating procedures are available and that users of the device have been trained in its use. Audits of these areas found greater than 98% of the laboratories were fully compliant with all regulations. As further verification of the amount of radiation exposure personnel receive from machine produced radiations, EHS monitors the exposure of about 250 individuals and eight areas. No individuals exceeded the regulatory limits. The area monitors demonstrated that there are no locations in which members of the public could be exposed. In addition, the Radiological Protection Section of the Pennsylvania Department of Environmental Protection inspected one of the devices and found no safety concerns or problems.

### *Safety/Accident Prevention*

EHS hired an Occupational Safety Manager this past year to develop a comprehensive occupational safety and accident prevention program. The goals of the occupational safety and accident prevention program are to minimize the number of work-related injuries and illnesses, ensure compliance with appropriate safety standards, and proactively identify and control potential workplace hazards.

With the addition of this new position, it was possible to begin implementing some new initiatives University-wide. Risk-based analysis was used to identify the need for several new, comprehensive programs, including Lockout/Tagout (LOTO), Electrical Safety, and job site analysis procedures to eliminate workplace hazards. These programs all focus on high risk activities that have the potential to result in serious injuries. We also began the development of a broader Accident & Injury Prevention Program (AIPP) initiative. This program is based on a template that provides the framework for managing safety activities conducted within each work unit and at campus locations. The template has been completed and work will proceed on implementing this initiative in selected work units during the upcoming report year.

Injury reports continue to be analyzed in order to identify trends and determine where to most effectively focus occupational safety efforts. Strains were the most common type of injury at the University during the report year, accounting for 22% of all cases. Contusions (14%) and lacerations (13%) followed sprains as the next most prevalent

types of injury. The body parts most frequently injured were fingers (10%), followed by the lower back area (8%) and knees (7%). The most common causes of injury were manual lifting (9%), falls/slips at the same level (5%), and being cut or injured by hand tools or utensils (5%).

One of the key initiatives implemented this year was within the Office of Physical Plant. This involved the identification of workplace hazards as the first step in a comprehensive safety program within this organization. A hazard identification checklist has been developed and supervisors are responsible for using this form to conduct inspections of their work areas on a routine basis. They are also responsible for ensuring that appropriate corrective actions are taken in response to all hazards noted. A total of 258 inspections have been completed during the first six months that this program has been in existence. In addition to these routine inspections, technical service employees have been provided with a "Pre-Work Safety Checklist" that can be used to identify potential hazards prior to beginning assigned work.

A comprehensive electrical safety program has been developed and is being implemented within OPP where the vast majority of the electrical work is conducted. This program has been founded on the principle of avoiding energized work unless it is absolutely necessary. When energized work must be completed, safe work procedures have been established to protect employees. This program will be rolled out to other work units and campus locations in early 2006 after feedback from the OPP pilot program is assessed. A written LOTO program was completed during the report year and a focus group of affected parties was formed to work on the implementation of this program. The primary goal of the focus group is to ensure consistent LOTO procedures meeting OSHA standards are developed across the entire University.

#### Goals for 2005-2006

1. Continue the implementation of the Chemical Management System to other work units within the University system.
2. Continue to coordinate regional and state-wide EHS "roundtables" to facilitate sharing of information between Colleges and Universities.
3. Complete the pilot EHS database so it can continue to be expanded into a comprehensive program for all staff to use.
4. Produce additional Blood borne Pathogen training methods, such as DVDs for at-risk employees.
5. Develop a specification to address mold remediation by third parties in the event this is needed.
6. Continue to expand and implement occupational health and safety training for individuals working with animals.
7. Develop a process to formulate an OPP Indoor Air Quality management plan to address commonly encountered issues.
8. Audit industrial hygiene programs to ensure compliance.

9. Evaluate the OPP design process to ensure that asbestos and other hazardous materials are maintained in the forefront to avoid cost overruns.
10. Expand asbestos awareness training to all appropriate individuals at campuses.
11. Utilize available data through CINCH to identify areas needing ergonomic and safety program enhancements.
12. Implement the comprehensive safety management program for all locations.
13. Training will be provided to all employees covered by the LOTO program and an assessment of the effectiveness of the program will be implemented.
14. Expansion of the laser safety program to other areas of the University.
15. Continue to improve regulatory compliance within radiation safety programs.
16. Enhance proactive approach to Commonwealth campus EHS programs.
17. Complete and introduce the Pesticide Management Program.
18. In conjunction with Housing staff, develop a fire safety “door hanger” for distribution in the residence halls at new arrival.
19. Include additional buildings in the Vital Building Information program.
20. Recruitment additional members for the Hazmat team.