

Environmental Programs Office and Environment, Health, and Safety Office

The Environmental Programs/Environment, Health, and Safety (EHS) Headquarters Office works with senior leadership to establish MIT's vision for environmental stewardship together with policies for securing the health and safety of the MIT and larger communities. In keeping with MIT's values, EHS performance at MIT is expected to exceed the standard of regulatory compliance and embody the Institute's commitment to excellence as an environmental citizen of the world. EHS Headquarters oversees the Environment, Health, and Safety Office, sustainability programs, and EHS-related aspects of MIT's emergency preparedness, all providing critical support services for establishing and maintaining the high standard of day-to-day EHS performance at MIT.

Highlights

- Led the effort to develop MITAlert, the Institute suite of emergency messaging channels
- Managed MIT's efforts to implement behavior changes to reduce energy use, associated costs, and greenhouse gas emissions at MIT
- Developed a standard practice in collaboration with Facilities on ventilation and energy conservation that helps reduce energy use without adversely affecting the safety and health of occupants
- Integrated the EHS management system (EHS-MS) with the energy initiative and utilized the organization to advance energy savings programs such as fume hood sash management and increase recycling efforts in laboratories
- Improved key EHS programs in collaboration with Facilities in terms of both level of compliance and efficiency. The programs emphasized this year were confined space entry, control of hazardous energy sources, fall protection, universal waste, Massachusetts Water Resources Authority (MWRA) compliance, and commercial motor vehicle use
- Developed and implemented an Integrated Pest Management program for all of MIT's day care centers in collaboration with Human Resources and Facilities and our day care provider and pest control vendor
- Developed an Institute-wide controlled substance program to allow better oversight of compliance and exchange of best practices among the multiple users across the Institute
- Implemented an improved inspection program to provide a more consistent and efficient method to record, report, and correct findings
- Continued to reduce the cost and magnitude of hazardous waste generation
- Continued to reduce the cost and magnitude of injury and illness incidence
- Collaborated with MIT Police, several Institute committees, and the National Nuclear Safety Agency to increase the security of hazardous materials and operations at MIT using a \$380,000 grant for facility upgrades

FY2010 Goals

- Build out, enhance, refine, and test the MITAlert system and increase participation in the program
- Increase participation in the GreeningMIT program to induce cost savings and environmentally positive behaviors at MIT
- Collaborate with Facilities to establish written facility design standards related to EHS design features to enhance health and safety, more easily adhere to compliance regulations, and reflect best practices
- Collaborate with Facilities to improve key EHS programs— asbestos, contractor safety, air permits, and reduction of injury and illness—in both level of compliance and efficiency
- Implement a campus-wide Integrated Pest Management program in collaboration with Facilities, Human Resources, the Division of Student Life, Athletics, the Campus Activities Complex, and Food Services to realize opportunities for efficiency and effectiveness improvements
- Institute a campus-wide import/export program in collaboration with the Office of Sponsored Programs to allow for better oversight of regulatory compliance and exchange of best practices among the multiple exporters and importers across campus
- Implement an Institute-wide commercial motor vehicle program to allow for better compliance oversight and identify opportunities for efficiency gains
- Implement several new hazardous waste minimization initiatives to reduce the quantity of hazardous materials generated by MIT and improve cost effectiveness
- Collaborate with Procurement to develop a more effective and less costly way to track the purchase of chemicals heavily regulated by the Department of Homeland Security and the Environmental Protection Agency (EPA)
- Collaborate with the Undergraduate Research Opportunities Program (UROP) Office to develop a method to ensure that students are properly trained and supervised to perform their research safely

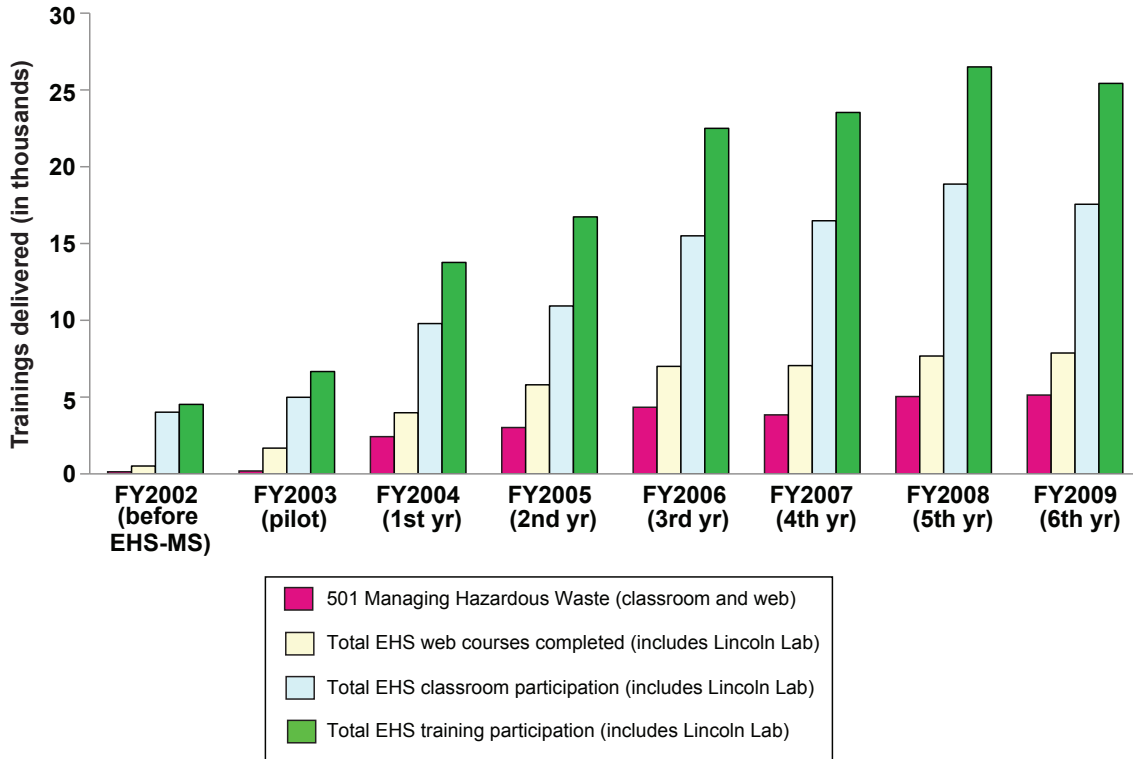
Training

Training is a key component of the EHS management system. EHS presently provides training for more than 25,500 individual sessions annually (Figure 1).

Since FY2002, 13,895 individuals have taken at least one EHS course. In FY2009, 2,109 took a course for the first time, and 6,802 individuals were active in the EHS training system.

This is the third year we have tracked EHS core course metrics across the Institute. Completion rates have been consistently high for most courses.

Figure 1. Number of EHS course trainings* delivered, FY 2002–FY2009



* Trainings refers to one participant in one course; an individual may be a participant in more than one course.

Accomplishments

EHS Performance Awards. As a way of recognizing exceptional EHS training and inspection performance, the EHS Office announced the winners of this year’s department, lab, and center (DLC) EHS Performance Awards in September 2008. The average core EHS training completion rates for the award recipients are shown below.

Training Completion Rates for Award Recipients

Center for Environmental Health Sciences (small DLC)	100%
David H. Koch Institute for Integrative Cancer Research at MIT (large DLC)	97.4%
Microsystems Technology Laboratories (large DLC)	96.7%

Other groups recognized for high EHS performance were the Department of Biological Engineering, the Clinical Research Center, the Institute for Soldier Nanotechnologies, and the Plasma Science and Fusion Center.

MIT roles-based classes. EHS figured in the Institute’s roles-based classes with a presentation on EHS services in courses developed for new managers and administrative officers. A power outage scenario piloted in the new manager’s course last year was integrated into both classes this year.

Initiatives

Building 68 lab group training effort. The EHS lead contact for biology and the EHS coordinator have been piloting an integrated EHS training effort in the lab group setting over the past year. To date, they have provided EHS training to 10 underperforming lab groups in the Department of Biology. Emergency response and inspection results are integrated into the regulatory required modules such as bloodborne pathogens and managing hazardous waste. This customization of the modules to the lab's needs allows for highly relevant, collaborative training that is more a problem-solving discussion than traditional one-way training. The experience has confirmed for both researchers and EHS trainers that this format results in highly relevant, effective training.

Training Alignment Team infrastructure initiatives. EHS staff members participated in three MIT training technology infrastructure projects. These projects, spearheaded by the Training Alignment Team, were designed to:

- Enable data feeds to MIT's data warehouse for all training, both web-based and live courses. This initiative makes comprehensive training reporting available to department management through the data warehouse using BrioQuery.
- Upgrade the functionality of the central MIT training website and update the site's content. In addition to refreshing training data content, the site update will deliver a calendar view of all training currently available, as requested by MIT users.
- Develop a proposal to provide MIT with an integrated e-learning system to comprehensively administer training requirements and monitor training progress across all departments and functions. This proposal was presented to the Administrative Systems and Policies Coordinating Committee (ASPCC) in June and is currently under consideration.

Inspections

The EHS-MS Audit/Inspection program is a key component of the management system that monitors and promotes the effectiveness of regulatory training and compliance as well as good practices to achieve environmental sustainability. This program consists of three tiers of inspection designed to assess performance, correct problems, and prioritize areas for improvement.

The Level I inspection is conducted by the DLC person assigned that role and is reviewed at the time of the Level II program. The Level II program is a DLC-wide inspection conducted twice each year in research DLCs, and on an annual basis in nonresearch areas, by the local DLC EHS coordinator and the EHS Office. Two rounds of Level II inspections were conducted in research areas and one in nonresearch areas in 2008. An updated inspection system application was launched in the second half of 2008. The Level III audit is a third-party audit conducted on a two-year cycle that can be focused on the overall system or a specific element. Currently, the MIT Audit Division serves as the independent auditor and conducts audits on selected EHS-MS elements on an annual basis.

Ongoing Programs

Level II System Upgrade

Level II system users reported that the original system was inefficient and confusing and that it represented an obstacle to having an effective EHS inspection program. A system design team with representatives from the Information Services and Technology Department (IS&T), EHS, and the Working Committee developed a user requirement document for an enhanced and more efficient Level II system.

The revised system was launched in late 2008, and results indicate significant improvement in the areas of completion rates and performance consistency. In addition, the desire for maintaining a shadow data system has been reduced.

Faculty Research Protocol Support and Compliance Committees

The EHS Office's support for protocol development and review is integral to the MIT faculty's ability to undertake safe and legally compliant research. There are six faculty research oversight committees with significant EHS implications: the Committee on Use of Humans as Experimental Subjects, the Institutional Animal Care and Use Committee, the Radiation Protection Committee, the Committee on Toxic Chemicals, the Reactor Safeguards Committee, and the Committee on Assessment of Biohazards (CAB). These committees fulfill specific federal regulatory requirements in the areas of human subjects and research animal protections and the safe use and containment of radioactive, chemical, and biological materials at MIT. The faculty chairs of these committees are members of the Institute Council on EHS, which oversees MIT's EHS performance and the implementation and effectiveness of the EHS management system. The EHS Office participates in all six faculty research oversight committees and provides administrative support for the Radiation Protection Committee and CAB.

The EHS Biosafety Program and the Lincoln Laboratory (LL) administration established an internal LL Biosafety Committee. This committee focuses on development and implementation of site-specific safety policies and procedures. All protocol reviews and approvals are the purview of CAB.

The EHS Biosafety Program also administers the Institutional Biosafety Committee and provides biosafety services for Draper Laboratory. In addition, the Institute's Radiation Protection Committee functions as the Whitehead Institute's Radiation Committee, while the EHS Radiation Protection Program provides radiation safety services. The Radiation Protection Program also supports Draper Laboratory's Radiation Protection Committee and provides radiation safety services.

Increase in Biological Research at MIT

Over the last 10 years, there has been continued growth in the number of faculty members engaged in biological research at MIT. This growth is a reflection of the increased funding in biological research, the fundamental applicability of the ongoing MIT bioresearch, and the overall excitement in understanding and developing biological systems using new technologies. Staff members in MIT's Biosafety Program work hard to maintain strong relationships with MIT faculty and to keep abreast of their wide-

ranging research so that the Institute's programs remain as relevant as possible yet provide the appropriate level of oversight to ensure compliance while keeping the paper burden on investigators as low as possible.

The number of new faculty engaged in biological research is up by 14 percent. The National Institutes of Health (NIH), which funds biological research only, is now the single largest source of research dollars at MIT. This is reflected in the growth of both the faculty and the student body (undergraduate, graduate, and postdoctoral fellows). This growth is expected to continue since MIT provides a unique research atmosphere that encourages cross-disciplinary approaches to understanding, manipulating, and detecting biological systems.

The projected growth in research space utilized for biological research at MIT has fulfilled expectations. This growth is not simply due to new building space; rather, we have also seen the renovation of a number of nonresearch spaces (e.g. the labs in the Media Laboratory building) into biolabs.

In 2010, there will be 180,000 sq ft of additional assignable bioresearch space in the David H. Koch Institute for Integrative Cancer Research (Building 76), along with 134,993 sq ft of additional space in Buildings E17, E18, E19, and E25. Also, there will be 163,000 sq ft of additional assignable research space in the renovated Media Lab (it has not been determined what percentage of this space will be allocated to bioresearchers).

This growth of bioresearch at MIT coupled with the development of several new research technologies (synthetic biology, nanoparticle delivery of biological materials, development and use of human embryonic stem cells) will challenge Biosafety Program staff to develop the needed expertise to provide the appropriate level of collaboration and oversight for these projects while maintaining the expected level of performance in all other areas. This is an exciting and interesting challenge for the EHS Biosafety Program.

Select Agent and Toxin Program

This program, recently reregistered with the Centers for Disease Control and Prevention (CDC), will require far more frequent attention than it has in the past. Because regulations are being more broadly interpreted by inspectors, the entire Select Agent team must focus on fulfilling all of the annual requirements completely and clearly and with a wider interpretation than first accepted.

The program remains relatively stable in size and complexity. We continue to see monthly requests for security renewals of one to two registered personnel. Also, we continue to conduct annual retraining sessions and manual reviews and tests of the security program.

Radiation Programs

Radioactive Material Authorization and Machine Registration Program

This program remains the main link between the EHS Radiation Protection Program (RPP) and the licensed material user community within the academy. RPP continued its strong presence in the academy during the past year. There continues to be an increase

in the demand for experimental reviews involving laser and radio frequency (RF) sources at Lincoln Laboratory and Millstone Hill.

All uses of radioactive material and radiation-producing equipment are thoroughly reviewed by RPP and approved by the MIT Committee on Radiation Protection on an ongoing basis. There are currently 133 authorizations, of which seven are new and 65 were renewed or amended during the past year.

Service programs including control/security of materials received at the Institute, collection and management of low-level radioactive waste, worker and environmental radiation monitoring, laboratory surveys and sample analysis, radiation worker training/retraining, instrument calibration, packaging/transport of radioactive samples, and emergency response are in effect to serve the authorized projects. There are approximately 600 registered low and medium radiation labs, for which approximately 14,000 regulatory required radiation surveys were performed.

Analytical X-ray Program

Radiation Protection Program staff performed annual inspections on all analytical x-ray systems. There are currently 27 analytical x-ray units. RPP provides area radiation monitors for these installations. In addition, the program audits the medical and dental x-ray installations at MIT Medical and provides dosimeters/training to workers.

Laser Safety Program

By taking advantage of the Level II inspection program within the EHS management system, RPP's laser safety program works at improving implementation of the regulatory requirement for all Class 3b and Class 4 lasers. There are approximately 1,200 lasers in our current inventory. Registration includes a safety/risk analysis of the laser system by EHS staff, development of standard operating procedures by the laser users, and training of all laser workers. The laser safety program is allowing a stronger link to the academy similar to the radioactive materials authorization program. There has been a continued increase in laser hazard analysis and reviews for projects being done at the Lincoln Lab Flight Facility and for laser use in aircraft.

Radio Frequency Sources

There continues to be an increased demand for review of RF safety plans for sources at Lincoln Lab and Millstone Hill. The Lincoln Lab RF safety committee and RPP have produced a draft rewrite of the RF safety program including registration of all sources. The Haystack Ultrawideband Satellite Imaging Radar (HUSIR) project at Millstone Hill is back on track and requires increased measurements/surveys by RPP. There were several RF hazard projects including measurements in and around aircraft during the past year. Due to the logistics of operating the aircraft and radar systems on the ground, these measurements were made between 10 pm and 4 am.

Hazardous Waste Metrics

FY2009 marked the first year the hazardous waste program began consolidating flammable solvents, the largest single waste stream. This change has allowed the program to accomplish two important goals: lowering the price per unit and providing prompt waste collection service. One indicator of this success is the reduction of the hazardous waste unit cost. The savings realized from this effort are estimated to total \$50,000 annually when fully implemented.

The overall service also improved in FY2009 with the addition of two solvent recycling units in the Department of Chemistry. The EHS Office worked with two principal investigators in Chemistry to provide them with a waste reduction solution for their waste solvents and a secure supply of critical chemicals for their research.

FY2009 continued the trend of unprecedented waste generation due in part to growth in both research and infrastructure. To address this issue, a goal of waste reduction was set for the hazardous waste program using a balanced scorecard approach. Other efforts to reduce waste while lowering disposal costs continued in FY2009. Cylinder devolving, scrap metal recycling, solvent recycling, and oil recycling initiatives eliminated unnecessary hazardous waste from being sent for disposal, and important resources for future use were recycled. These efforts combined to recycle 52,000 pounds of hazardous waste with a savings of \$44,000.

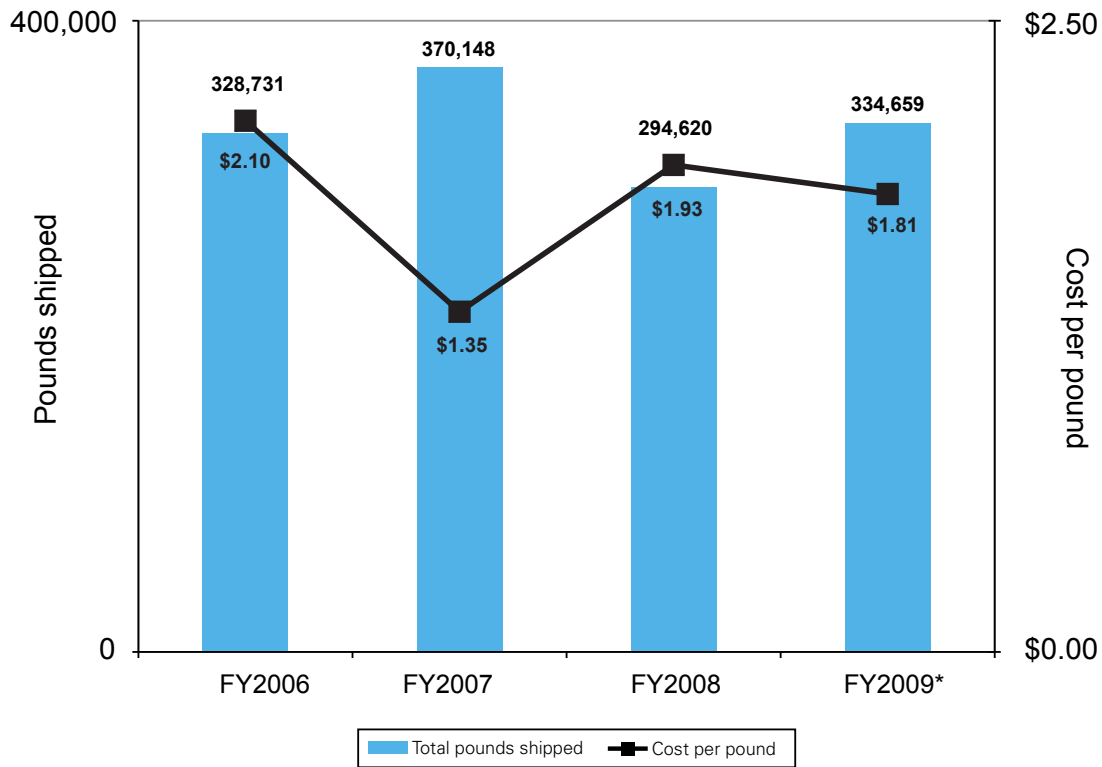
Despite all of these efficiencies, MIT increased its hazardous waste generation as compared with the previous fiscal year. Overall, hazardous waste generation (measured in pounds) at MIT increased by 14 percent. Figure 2 shows a four-year trend of hazardous waste generation and disposal costs per unit. There was a \$0.12 reduction in cost per unit of waste disposed in FY2009, continuing the overall trend of reducing the price per unit since FY2006.

Ergonomics

The EHS Office has collaborated with MIT departments, labs, and centers to reduce repetitive stress and other injuries and lost workdays. The intended outcomes are an increase in productivity, a reduction in medical and disability costs, and, most importantly, reduced discomfort and improved function for members of the MIT community. The Ergonomics Committee, an ad hoc collaborative effort of the MIT Libraries, IS&T, Human Resources, Facilities, Lincoln Laboratory, the Whitehead Institute, and MIT Medical, including a student representative, is led by the EHS Office. In FY2005 the committee introduced a web-based training and assessment tool course. Since the launching of the site, 1,368 users have taken the training. There were 108 onsite visits in FY2008. A follow-up survey indicated that more than 90 percent of users experienced improvements in their work environment.

The ergonomics web page was completely revised to make it more user friendly, and new topics on material handling, laboratory ergonomics, and hobbies were added.

Figure 2. Total pounds of waste shipped from MIT's main hazardous waste accumulation area, and cost per pound, FY2006–2009*



* Totals not final

Construction Safety Program

This is the seventh full year of the EHS Office's collaborative effort, with funding from the Department of Facilities, to provide EHS expertise to new construction and renovation projects. The objectives of the program are to assure that EHS requirements are addressed for new construction and renovations, to protect the MIT community during construction and renovation activities on campus, and to strengthen MIT's relationship with the Cambridge authorities responsible for regulating these activities. The advantages of the program include fewer regulatory inspections, fewer time delays, and cost savings. During FY2009, six major projects and 26 renovations were reviewed.

Incident Reporting and Investigations

The EHS Office continues to work with DLCs to encourage use of the incident reporting and investigation system, which centralizes and electronically links all information related to an incident, facilitates data handling, and provides online access to reports on injuries to Facilities management, EHS Office staff, and EHS coordinators at the DLCs.

The incidence rate of total recordable injury and illness cases for calendar year 2008 is shown below, along with data for the previous five years. This rate continues the downward trend from the previous year, and is well below the calendar year 2007 (latest

available data) incidence rate for private industry and less than the incidence rate for colleges and universities. We estimate that the reductions in our rates since 2003 have saved the Institute almost \$500,000.

Cost Savings from Reductions in Numbers of Days Missed Owing to Injury and Illness

Year	Number of days missed	Number of full-time equivalents	Cost of full-time equivalents	Cost if days missed were same as in 2003	Cost savings
2003	2,721	13.605	\$816,300	\$816,300	\$0
2004	2,295	11.475	\$705,713	\$836,708	\$130,995
2005	2,079	10.395	\$654,885	\$857,115	\$202,230
2006	1,385	6.925	\$448,740	\$881,604	\$432,864
2007	2,124	10.62	\$705,380	\$903,644	\$198,264
2008	1,375	6.875	\$468,053	\$926,235	\$458,182

Enhanced Delivery of EHS Services

Inventory of Chemicals of Interest

As part of the ongoing regulatory monitoring and reporting requirement for the Department of Homeland Security (DHS), EHS updated its web pages about DHS and chemical security to reflect the changes to the Chemical Hygiene Plan template agreed upon by the Committee on Toxic Chemicals. One of these changes is the requirement that all labs working with chemical hazards on campus maintain a chemical inventory. This decision, though not an endorsement of the ChemTracker inventory system that is provided to labs free of charge by the EHS Office, has nonetheless prompted a steady stream of labs to consider use of the system as a viable long-term inventory solution. EHS Tech Support also manages access permissions for all of the users in the 259 labs that currently have some inventory in ChemTracker. Use of the ChemTracker inventory software continues to gradually increase.

Customer Satisfaction Surveys

Upon completion of a RequestTracker service request, EHS solicits customer satisfaction feedback. We actively use this information to improve our service. In FY2009, EHS received 826 service requests via RequestTracker.

Support for Special Off-Campus and Special Projects

The EHS Office provided significant support to off-campus activities over the past year, including those related to the Bates Linear Accelerator facility's decommissioning, environmental activities for the Real Estate Office's portfolio properties, and the Haystack Ultra-wideband Satellite Imaging Radar Upgrade Project.

Bates Linear Accelerator

As part of the revised mission for the Bates Linear Accelerator, MIT joined in partnership with L-3 Communications in a project sponsored by TSA to investigate the feasibility of using neutrons in a cargo screening application. The Bates Radiation Protection Program staff served on the project team responsible for overseeing the safe operation of the machine during its four months of operation in FY2008.

Nuclear Reactor Laboratory

The EHS Office's Reactor Radiation Program supports the Nuclear Reactor Laboratory (NRL) in its efforts to keep radiation exposures and releases to a minimum and well below any regulatory requirements. Key accomplishments during the year are described below.

Radioactive Waste Management

- 25 tons of solid radioactive waste shipped for treatment and disposal
- 60 cubic feet of resin shipped for treatment and disposal
- Competitive bid process led to cost savings of more than \$20,000 for NRL
- Management of the analysis and disposal of approximately 350 gallons of liquid radioactive waste collected over the past two decades

ALARA (As Low as Reasonably Achievable) Program

Since March 2008, Reactor Radiation Protection staff members have worked closely with the NRL staff to enhance the facility's regulatory required ALARA Program, whose goal is to reduce radiation exposures to as low as reasonably practical. The major successes achieved include:

- A 30 percent reduction in the collective dose from the previous year
- An increased level of awareness pertaining to dose reduction, which is now one of the priorities in conducting the day-to-day operations of the MIT Reactor
- Enhanced communication of work activities coupled with the ALARA process, resulting in the practical application of a number of specific dose reduction techniques
- Implementation of methods to measure programmatic effectiveness and a system to ensure that future resources are applied to sustain dose reduction activities

Novartis-MIT Center for Continuous Manufacturing Project

The final design was completed and construction started on this \$4 million, 2,500 sq ft facility in FY2009. EHS provided safety, environmental, and industrial hygiene expertise to the project. The facility was designed to support research on continuous manufacturing processes for Level III compounds of highly toxic materials. EHS provided guidance on high-performance hood selection and specialty enclosure design and participated in developing commissioning and operational specifications for the facility.

Lincoln Laboratory Special Projects

The Microelectronics Lab, the main chemical use facility at Lincoln Laboratory, is changing its process that requires EHS to conduct testing for decommissioning old equipment and commissioning ventilation for new equipment. EHS is investigating solutions to diesel exhaust reentrainment in the C-409 CVD lab. Lincoln Laboratory had installed air intake carbon filters, but the life span of the filters was unacceptably short.

Properties with Environmental Concerns

MIT and the MIT Investment Management Company (MITIMCo) own, partially own, or have some responsibility for approximately 130 identified contaminated sites under the Massachusetts Contingency Plan (MCP) regulatory program. These sites are primarily associated with redevelopment efforts in Cambridge, although a few are associated with oil or fuel spills. As a result of filling and historical industrial use, most construction projects involving soil removal in Cambridge are MCP sites. Most of these sites have been effectively closed, but 10 sites, primarily associated with construction projects, were considered active at the end of this fiscal year. EHS provides policy and practice guidance and reviews consultants' work products involved in the cleanup and remediation of these sites. This helps to ensure quality work products and efficacious remediation of the sites.

Superfund

MIT and Lincoln Laboratory are listed as potentially responsible parties for three major cleanup activities overseen by government that had significant activity during the year. Two sites are managed under the federal Superfund law, and one is under Massachusetts state jurisdiction. MIT was identified as a potentially responsible party by other such parties involved in a site in New York State and was offered a de-minimus closure by the state regulatory program. Counsel reviewed and rejected the offer because it did not provide sufficient protection.

Westgate

PCBs have been detected in exterior building materials (i.e., caulking and adjacent concrete/brick) and some soil samples at the Westgate Complex. While an evaluation performed by MIT and outside experts showed that leaving these materials in place without disturbing them does not present an imminent health risk, the PCBs could be transported to other locations and/or media (e.g., groundwater or surface water); hence, this past year all contaminated caulking and soils were removed, and epoxy resins were used to encapsulate PCBs in the building surfaces. Generally, there is a risk of buildings built prior to 1979 containing PCBs. These buildings are receiving increased oversight by EHS when renovations are planned.

Regulatory Interactions

MIT is subject to both scheduled and unannounced regulatory inspections by 15 federal, state, or city agencies. FY2009 was a particularly active year in this regard. The following are summaries of the results of these visits.

Massachusetts Department of Environmental Protection

Consent Order for Generators on Campus

Following a Massachusetts Department of Environmental Protection (MADEP) inspection, the Institute was issued a consent order for installing two emergency generators serving the Simmons Hall dormitory that were not in conformance with good engineering practices. MIT has agreed to install, operate, and maintain diesel particulate filters certified by the California Air Resources Board (Level 3) on each generator to mitigate particulate emissions on an expedited schedule as specified.

Consent Order for Generators at Lincoln Laboratory

A third-party audit by the Air Force determined that Lincoln Laboratory had installed an emergency power generator without proper permits. The lab self-disclosed this violation to MADEP and, with assistance of the EHS office, submitted appropriate documentation.

Investigation of Construction Waste

MADEP investigated allegations of improper dumping by a vendor of waste materials generated at an MIT demolition and construction project. The investigation included a record review in which MIT records were matched to the records at the disposal sites, employees were interviewed, and MIT standard operating practices were reviewed. MIT was able to provide satisfactory responses in all categories.

Occupational Safety and Health Administration

One visit (compared to three in FY2008) by the Occupational Safety and Health Administration (OSHA) to MIT in the past year resulted in three citations and fines and highlighted some of the many complex health and safety concerns associated with work at the Institute. These OSHA visits reinforced the importance of the health and safety components of the EHS management system. During the visits OSHA investigated the following: injury and illness reporting procedures, operation of forklifts, and our hazard communication program. Two additional complaints were received by OSHA and resolved by EHS without an inspection.

Massachusetts Department of Public Health

The Massachusetts Department of Public Health radiation control program inspected our program once and there were no items of noncompliance.

Nuclear Regulatory Commission

The Nuclear Regulatory Commission conducted two routinely scheduled inspections of the nuclear reactor and one special investigation of an exposure incident. Two Level 4 (lowest) citations were issued and have since been resolved.

Emerging Issues

Nanotechnology

EHS is establishing a close collaboration with MIT faculty and staff who are conducting research in the area of nanoparticles, and we are closely monitoring studies on potential health effects and waste issues as well as public perceptions of potential new hazards presented by nanoparticles. EHS is at the forefront in characterizing potential exposures to nanoparticles in collaboration with the Department of Work Environment at the University of Massachusetts, Lowell.

New Stormwater Regulations

MADEP has proposed new permitting requirements for stormwater that will significantly affect development options for properties the Institute and MITIMCo hold and could require a multimillion-dollar investment in new infrastructure. The EHS Office has been actively involved with the government affairs office and the Department of Facilities, as well as other institutions and the Association of Independent Colleges and Universities in Massachusetts (AICUM), in providing comments to MADEP on these proposals in an attempt to develop a more workable and effective regulatory package.

Global Warming Solutions Act

In August 2008, Massachusetts governor Deval Patrick signed the Global Warming Solutions Act, new legislation that requires the state and regulated entities to reduce emissions of the greenhouse gases that cause global warming by between 10 percent and 25 percent by 2020 and 80 percent by 2050.

The EHS Office registered the MIT Cambridge campus with the Massachusetts Department of Environmental Protection in April 2009 and reported estimated 2008 fossil fuel combustion CO₂ emissions for our stationary sources (boilers, generators, etc.). Calendar year 2009 CO₂ emissions must be reported by April 2010 and will include emissions from stationary sources as well as mobile sources (vehicles, lifts, etc.).

New Cooling Water Discharge Permit

EPA has required MIT to apply for coverage under a new general permit for cooling water discharges to the Charles River to replace an individual discharge permit the Institute has been operating under since the 1970s. There is one remaining use of river water for cooling on campus. The EHS Office assembled the necessary operational and environmental data and applied for coverage under the new permit. The new permit will require weekly instead of monthly monitoring. The EHS Office coordinated efforts to cost-effectively collect the data required for this monitoring.

New MWRA Industrial Wastewater Discharge Permit

MWRA issues a permit that covers wastewater discharges from the entire campus excluding the Central Utilities Plant, which has its own permit. This five-year permit was renewed in FY2009, and the new permit writer requested significantly more detailed information about operations and discharges. The EHS Office collected and compiled

data and submitted the application for the renewal because the facilities engineer historically responsible for this was on medical leave for many weeks prior to deadline.

New Department of Transportation Hazardous Materials Regulations Final Rule in Federal Register

On January 14, 2009, a new final rule was published in the Federal Register related to requirements for the transportation of batteries and battery-powered devices. This new rule has prompted the EHS Office to evaluate used battery collection across the campus and to become more involved in battery packaging methods by overseeing the new universal waste vendor and working jointly with the Department of Facilities.

Emergency Management and Notification

Enhanced emergency preparedness and notification are emerging issues in the college and university sector across the nation. EHS is leading an effort among several groups to increase preparedness and response capability at the campus and beyond. Beyond local campus police forces and emergency responders, the need to coordinate all participants in campus operations into a cohesive emergency management organization has been demonstrated at several campuses across the country since 2001. EHS has recognized this need and is working to lead these enhancements at our campus.

Vulnerability Assessment

MIT recently used an all-hazards approach to complete an assessment of disaster potential funded by the Federal Emergency Management Agency (FEMA). The assessment was conducted by Hua Li, a graduate student in the Engineering Systems Division under the direction of Professor George Apostolakis. The assessment involved the elicitation of expert views from more than 60 stakeholders and use of a value tree and process to rate the severity (disutility) and likelihood of scenarios that could affect our campus and operations. The results of this study have informed EHS, Facilities, and other groups as we prioritize mitigation of disaster potentials here.

Emergency Notification

In April 2008 MIT introduced MITAlert, a system designed to provide emergency responders with contact information and the ability to notify community members in the event of a critical crisis on campus. A campaign to raise awareness and participation was implemented in April, with another campaign planned for late summer 2009. To date, MIT emergency responders have collected about 25,000 contact points including email addresses and cell phone numbers. In late 2009, EHS and IS&T plan to commence a project to comprehensively improve our notification and data collection systems.

Emergency Management

EHS is leading an effort to train members and improve our Emergency Operations Center, designed to muster the operational resources of MIT in a time of emergency. In August 2007, we combined a tabletop drill with a test of our notification capabilities. Results of this test began the development of the MITAlert system mentioned above.

More drills and exercises continue to be performed. MIT uses the National Incident Response System as a model for our emergency management.

Emergency Communications

A discovery effort was completed by EHS to determine who the key communicators are during a major emergency. From this process, emergency leaders have obtained specific predirectives to immediately notify the community directly in a time of a severe emergency. Predrafted notification scripts have been developed for specific critical emergency scenarios to save time and assist responders. Also, emergency leaders have met with MIT's executive leadership to review communication roles and responsibilities of responders and executives during a time of emergency.

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More information about the Environment, Health, and Safety Office can be found at <http://web.mit.edu/environment/>.