CASE

Laboratory Safety Committee

Annual Report Fiscal Year

2002-2003

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INTRODUCTION

This report is submitted to the President and appropriate members of the administrative staff of Case Western Reserve University (CASE), as required by the Laboratory Safety Committee (LSC) operating guidelines. Its contents cover the period from July 1, 2002 through June 30, 2003.

EPA RCRA INSPECTION

In preparation for the Ohio Environmental Protection Agency (OEPA) waste inspection, a strategy was developed to anticipate possible areas of non-compliance for in-house assessment and processing of the inspector's requests. Audit forms used by the OEPA were used for reference during internal inspection audits. The procedure facilitated inspection of the waste facilities and processes, implementation of any necessary corrective actions, and development of new compliance procedures.

On 6/17/2003, the OEPA Hazardous Waste Division inspected the facilities and found no violations.

OHIO DEPARTMENT OF HEALTH (ODH) LICENSE

At present, CASE maintains five certificates of registration for:

- The Department of Transportation (DOT)
- The OEPA for Hazardous and Infectious Waste
- The United States Department of Agriculture (USDA)
- The Center for Disease Control (CDC).

The following premises are covered by the Infectious Waste registration: DeGrace (Biology), Millis, Morley, Smith, Rockefeller, Bingham, Glennan, Olin, White, Wickenden, Med East (Robbins), Pathology, Nursing, Dentistry, Health Services, and Biomedical Research Building (BRB). Hazardous Waste registration covers: DOA990, Morley, Millis, University West, Cedar Service Center, and West Campus (formerly Mt. Sinai).

CERTIFICATE OF REGISTRATION	EXPIRATION DATE	PURPOSE
US DOT Research & Special Programs	6/30/2004	Hazardous Waste Transport
OEPA Generator of Infectious Waste	12/4/2003	Infectious Waste
OEPA RCRA Hazardous Waste Management	12/4/2003	Hazardous Waste
USDA High Consequence Agent Program	Submitted 3/12/2003	Animals/Plants

CDC Select Agent Program	Submitted 3/12/2003	Humans/Bovine Spongiform Enchemlopathy (Prospective)

OSHA COMPLAINTS

11/8/2002 – Complaint # 204-257-471

Notice of safety and health hazards: Complaint: 1) air contaminants in Adelbert Hall, 2) noisy environment, and 3) ergonomic injuries. This complaint was investigated and no problems were identified. A report of these inspections and assessments was made to OSHA in writing, posted on 11/15/2002 and the matter was closed.

6/23/2003 – Complaint # 204-547-905

Notice of safety and health hazards: Complaint: 1) odor complaint from renovations of the Sears Building and 2) work sites with open cables and wires. The work site was inspected, and the perceived hazards mitigated. A report documenting the inspections and assessments was made to OSHA in writing, posted on 7/1/2003, and the matter was resolved without issue of an OSHA violation.

LABORATORY SAFETY COMMITTEE (LSC)

The 2002-2003 LSC membership is listed below. The President of the University must approve the voting membership of the Committee.

VOTING MEMBERS

Dr. Jeffrey Glass Dept. of Chemical Engineering AW Smith Bldg. Term Expires: 9/9/2004 Left University: 6/2003	Dr. Yu-Chung Yang Dept. of Pharmacology HG Wood 348 Term Expires: 9/9/2004	Dr. John Durfee Dept. of Vet Research Services Animal Resource Center Term Expires: 9/9/2004
Mr. Paul Holter Dept. of EECS Bingham Bldg. 107 Term Expires: 9/9/2004	Dr. Lawrence Sayre Dept. of Chemistry Millis Science Ctr. 414SA Term Expires: 9/9/2004	Dr. David Samols Dept. of Biochemistry HG Wood 475 Term Expired: 9/9/2004
Dr. Morton Litt Dept.of Macromolecular Science KHS Bldg. Term Expires: 9/9/2004	Dr. Clive Hamlin Dept. of Pathology Pathology 204 Term Expires: 9/9/2004 Chairperson: 9/9/2004	Dr. David Sedwick Director of DOES Service Building, 1st Floor
Dr. Morris Burke Dept. of Biology Biology Building Terms Expires: 9/9/2004	Dr. Eric Arts Dept. of Infectious Diseases BRB 1037 Term Expires: 9/9/2004	

EX-OFFICIO MEMBERS

Kenneth Basch VP of Campus Planning & Operations Adelbert 325	Richard Dell Asst. Director of Safety Services. Service Building, 1st Floor	Marc Rubin Engineer - DOES Service Building, 1st Floor
George Cadwallader Director of Facilities Management Glennan Building 310	Richard Jamieson Director of Campus Services Crawford Tower 215	

GUESTS

Carol Grove Director of UH Safety Dept. UH Lowman Hall 321	Christian LaMantia Asst. Director of Res. Admin. Adelbert Main 4	

SUPPORT STAFF

Felice T. Porter Q/A Specialist - DOES Service Building, 1st Floor	Shirley Mele Office Supervisor - DOES Service Building, 1st Floor	Virginia LaGuardia Department Asst. - DOES Service Building, 1st Floor

The Committee met on three occasions during the last fiscal year to review program concerns and act on other business. Major business considered by the LSC included:

- Emergency Response Plans
- Subcommittee Updates
- LSC Guidelines
- BSL-3 Facilities
- Bio-terrorism Issues – New Select Agent Regulations
- Departmental Chemical Hygiene and Exposure Control Plans
- New buildings and the Affiliation with University Hospitals
- Audits
- Liaison Program

LSC PERFORMANCE & RECORD AUDITS

The LSC guidelines were updated, as were the audit functions of the Committee. The Committee promotes oversight and accountability of the Safety Services programs through its auditing of Department procedures and records. All areas considered for audit by the LSC are listed below and the focus of individual auditors on specific areas in 2002-2003 is identified with the auditor's name.

AREA AUDITED	LSC AUDITOR
Chemical Hygiene Plan & Exposure Control Plan	Lawrence Sayre
Chemical Hood & Biosafety Cabinets	Jeffrey Glass
Bloodborne Pathogen Program	
Industrial Hygiene/ Indoor Air Quality Program	Paul Holter
Training Program	Yu-Chang Yang
Respirator Program	
Clearances Program	
Regulated Chemicals (Formaldehyde, Benzene, Methylene Chloride, Vinyl Chloride)	
Hazardous Chemical Waste Program	
Incident Reports	
Website	
Inspections	
Protocols	
Infectious Material Shipment/ DOT Shipment	
Chemical/Biological Laboratory/ DOA & Morley Waste Facility	

These audits were conducted at various times throughout the fiscal year. This process resulted in audit of more than 80 files and examination of the program areas listed above during the past year.

The Committee generally felt that the audit process was successful. Records were easily accessed and reviewed. The program was found to be efficient. Further, Committee members felt that productive interaction among Committee members and the staff during the audit process helped expedite the process.

AUDIT PROGRAMS

There are two layers of audit, one by the LSC and one by the DOES Internal Auditor. The audits are utilized on an ongoing basis to ensure that the office program, regulatory

oversight, and technical response responsibilities of the Safety Services division are met. The Internal Auditor reviews all departmental records and programs on a periodic basis throughout the year.

ANNUAL PROGRAM AUDIT REPORT SUBMITTED BY THE CHAIRPERSON

As noted on the table above, the LSC members involved in audits were: Mr. Paul Holter (Electrical Engineering and Computer Science), Dr. Jeffrey Glass (Chemical Engineering), Dr. Yu-Chung Yang (Pharmacology) and Dr. Lawrence Sayre (Chemistry). Four audits were performed:

- Industrial Hygiene & Indoor Air Quality
- Chemical Hoods & Biosafety Cabinets
- Training Program
- Chemical Hygiene & Exposure Control Plans

The auditors found that the DOES-created guidelines and record keeping procedures were excellent. Compliance mechanisms were appropriately applied and laboratory inspections were sufficiently frequent and thorough. Areas where improvement might best be focused were identified as follows:

- Industrial Hygiene & Indoor Air Quality
    - Objective analysis was not always performed following air-quality complaints.
    - Written reports were not provided on a consistent basis and it could not always be determined from the records who received these reports.
    - Some Standard Operating Procedures (SOP) must be updated.
- Chemical Hoods & Biosafety Cabinets
    - It is unclear from the records what the policy is to ensure timely repair of hoods that are in frequent use when they do not pass inspection guidelines.
- Training Program
    - Examples were found of employees on payroll who had not been trained as required, or else had allowed training to lapse, sometimes severely.
- Chemical Hygiene & Exposure Control Plans
    - A good system does not appear to exist to identify which faculty require a Chemical Hygiene Plan (CHP). This has led to the apparent situation where some faculty members have never filed their required CHP.
    - Follow-up to ensure correction of infractions found during laboratory-inspections is not consistent.

RESPONSE TO ANNUAL AUDIT

This year, in response to audit inquiries, the Safety Services office (SSO) initiated the following procedural modifications.

The Committee also decided to institute an audit procedure whereby four areas will be audited in detail each year until all programs are audited and selected audits of procedures within all areas will then be instituted. This memo summarizes DOES responses to the LSC audit of four areas that were reviewed.

- Industrial Hygiene & Indoor Air Quality Program: DOES staff notes that there are currently no field-testing methods that are practical and available that will determine the root cause of all odors. However, DOES staff routinely tests for a variety of organic substances when responding to odor complaints and results of these tests are kept on file in the Safety Office. Presently, post odor complaint communication is carried out by phone. In the future, written responses to individuals that have registered an odor complaint will be sent when any perceived health issues are involved. All complaint responses are recorded and DOES response to these audits is checked routinely by staff. The SOP for responding to odor complaints was updated.

- The program for collaboration with Plant Services for maintenance of Safety equipment such as fume hoods was reviewed and a plan to ensure rapid response to such complaints was instituted. It should be noted that some situations regarding hood performance involve building issues that are not easily resolved. In these cases, hood use is restricted and an individual program for safe use of a specific compromised hood is initiated.

- Training Program: Employees found to be out of training compliance receive an email reminder four times and are phoned directly before the department chair is contacted. If there is still no response, then the responsible Dean is notified. In practice, the level of enforcement has never reached a Dean, since Office attempts to maintain communication have successfully encouraged compliance among faculty, staff, and students.

- Chemical Hygiene & Exposure Control Plans: Over the past year, a new Committee was established by DOES to ensure that all PIs and laboratory workers are properly identified. Through the new Employee Compliance Committee, DOES and other involved departments now have better access to identification of new Faculty members, Scholars and Fellows upon their arrival at the University. Further, the Committee has also worked out procedures to better track change in job status (example research associate being converted to faculty) that affect Safety-related responsibilities.

- Follow-up of serious inspection issues includes staff involvement until issues are resolved. Other issues are noted and taken up at the next inspection if progress is not made.

The SSO thanks the LSC for the audit of its safety activities over the past year.

SAFETY SERVICES OFFICE (SSO)

STAFFING

In Fiscal year 2002-2003, the SSO operated under University approval as part of DOES with the following staff positions:

Director (1)	Assistant Director (1)
Engineer (1)	Loss Prevention Specialist (1)
Specialist Positions (4)	2nd shift Specialist (1)
Department Assistant (1)	Student (2)
Specialist Position (2) – future	Plant Safety Specialist (1)

The DOES infrastructure continues to recruit individuals to Specialist positions to improve the Department's knowledge base and provide for more flexible response to emergencies and other issues. A 2nd shift Specialist position was established over the past year to meet night service and security needs

SPACE AND EQUIPMENT

The SSO is located at 2220 Circle Drive in the Service Building on the 1st Floor. Safety Services operates a Safety laboratory equipped with industrial hygiene and chemical hood sampling equipment, mercury vacuum equipment and spill and emergency response supplies. Equipment also includes instruments for the quantification of contaminants in air samples for odor responses, EPA audits, and identification of unknown chemicals.

NEW BUILDINGS

In the coming year, two new buildings housing laboratories will come on line that will increase the workload for DOES personnel, the Research Tower (RT), an extension of the Medical School, and the Wolstein Research Building (WRB) that is owned jointly with University Hospitals (UH). The Research Tower (RT) officially opened on March 20, 2003 but will not be in its final configuration until 2004. The WRB, which is approximately the same size as the Biomedical Research Building (BRB), will be occupied by 2003-2004. The Safety Program for the WRB will be developed for 70-100 Principal Investigators who will be serviced by two new Safety Services employees.

COMMITMENTS

At present, the SSO is meeting its commitments to conduct various programs necessary to maintain compliance with present local, state, and federal regulatory programs. These commitments include waste pickups, inspections, incident responses, and training. The

programs have had significant impact through provision of safety compliance, education, and awareness to all student, faculty, and staff.

Regulatory compliance areas managed include DOT and IATA for transport of goods, all EPA RCRA programs for environmental chemical releases and waste disposal, all OSHA programs for employee safety, and NFPA fire code audit and program development. Program compliance has varying requirements at the local, state, and federal levels. Faculty responsibilities are aided by training in Chemical Hygiene Plan development for their laboratories.

DOES WEB SITE & NEWSLETTER

The DOES web site (http://does.cwru.edu) gave integrated web-based access to DOES services and information. Information on training classes, on-line retraining, department updates, and safety manuals were also supplied. Conversion of the safety manuals to an Adobe Acrobat format allowed users to download the document, and, either read or print appropriate sections for use in their laboratories.

The DOES newsletter was filled with articles that were designed to keep the campus community abreast of safety issues and concerns. It covered the latest government regulations and addendums, addressed concerns that were found during laboratory inspections, and answered questions frequently asked by laboratory personnel.

Links for several forms and training information on the DOES website were updated in 2002-2003 for safety programs that included:

- Laboratory Safety Retraining
- Formaldehyde Standard
- Benzene Standard
- Methylene Chloride Standard
- Vinyl Chloride Standard
- Physical Safety Manual
- Sign and Label Order Form
- 1910.134 Appendix D Respirator Standard
- Respirator Medical Evaluation Questionnaire
- Chemwatch for MSDS information

SAFETY LIAISON PROGRAM

As part of a Safety Liaison Program, staff members visit all University laboratories to offer them Department services and stimulate productive relationships with the research community. This effort allowed the Department to review and improve performance through direct interface with the research community operation and through streamlining development of user-friendly procedures. Correspondence for this program included

quarterly visits to laboratories by the DOES Staff. The department received an average of three inquiries, requests, complaints, and/or concerns that were addressed daily through its department email address (does@po.cwru.edu).

ADMINISTRATIVE PRIORITIES

At the present time the Department is developing a detailed Office Procedures Manual. As part of this process, the Department is in the process of reviewing all office procedures. The intent is to establish comprehensive office SOPs. This project concentrates on data entry, safety triage, and electronic data handling procedures (for example, the office has begun to scan all waste sheets and outdated MSD sheets into computer databases). The office staff also continues to update its OSHA Laboratory Standard and Bloodborne Pathogen (BBP) training to enable better understanding of critical DOES programs and thus improve their ability to triage phone inquiries and to provide informed answers to non-technical questions.

EMPLOYEE COMPLIANCE COMMITTEE

As noted in the audit response described above, the SSO formed a new Employee Compliance Committee, which includes representatives from all departments that hire laboratory personnel (Human Resources, Student Employment, Spherion Temporary Employment, Health Services, and Medical School). This Committee has been instrumental in streamlining the orientation process so that all employees are aware of the training requirements. Through this Committee accurate and up-to-date information is ensured for DOES on faculty and staffing distribution throughout the University. In the past, faculty, post doctoral fellows, research associates, research scholars, students, volunteers, research assistants, and staff involved in job category changes were among the groups of employees that were difficult to identify or contact for training due to various hiring avenues utilized when they joined the University or changed University positions.

ORIENTATION PROGRAM

The Orientation Program was established with Human Resources to ensure that new employees to CASE had a general awareness of the services that were provided by DOES. This program determines the safety training classes that employees must attend to promote safety in laboratories and other work place sites. We addressed 565 new employees at 50 Staff Orientations sessions held every Tuesday. CASE faculty were contacted on an individual basis and presented with information concerning safety. The intent was to emphasize the importance of safety on the campus for each faculty and staff member in order to promote and advocate safe working practices.

TRAINING

A major effort has been placed on increasing and modifying the training programs of the SSO. The SSO has made strides recently to contact individuals requiring new and annual training. The SSO has also reevaluated and rewritten the examinations used in training and has identified new areas and methods of training. Appropriate paperwork and record keeping has been maintained for all training presentations and sign-offs on declination statements for the BBP Standard.

Training was offered in the Laboratory Standard and a number of specific chemical standards included Formaldehyde, Methylene Chloride, Vinyl Chloride, and Benzene. Training was both internet-based and lecture-based using PowerPoint presentations in the SSO or on-site at various campus locations.

Feedback from classes and online sessions attended indicated that the overall impact of safety training on the university community was positive. Both initial and retraining classes were offered on a weekly basis. During the past year, the SSO held classes in the following major areas: Laboratory Safety, Right-to-Know, and BBP. More than 4000 individuals were trained in various safety areas over the year. Most retraining was accomplished over the Internet. More than 800 individuals or 30% of all training increasingly utilized online training in BBP, Formaldehyde Safety, Benzene Safety, and Respirator Safety. The SSO also presented four State Medical Waste classes for four employees, and 18 Contractor Right-To-Know classes for 80 employees.

Laboratory Safety Training

Graphic enhancements for the revised Laboratory Standard presentation were developed. Eighty-eight Laboratory Standard Classes were given for 800 employees. Several specialized Laboratory Safety classes for specific target groups included presentations for 100 dental and medical students, 10 high school summer students, and 30 students from SPUR and other programs.

Online re-training for the Laboratory Standard is also now available. The new online Laboratory Standard training, among other features, requires an Affirmation Statement acknowledging that the PI will administer site-specific training pertaining to laboratory hazards and specific safety procedures for their employees.

Chemical Safety Awareness Training

Several general awareness classes for target groups such as the Animal Resource Center (ARC) and Housekeeping were developed and conducted. These groups may enter a specialized laboratory on a daily basis and thus required specifically tailored safety training.

Right-To-Know Training

The Right-To-Know (Hazard Communication) Training was revised. Target groups such as Housekeeping, Maintenance, ARC, Security, and Shipping/Mailroom area were also trained. There were a total of 52 classes held for these employees. These groups may only occasionally enter research areas.

Bloodborne Pathogen Training

Sixty-two classes were held for BBP training of 910 employees. This year more than 300 employees utilized the BBP retraining online. The BBP presentation is currently being revised and new graphics have been developed. Training also includes monitoring of compliance and required vaccination and health monitoring programs.

DOT/IATA Shipping Training

The DOT/IATA Shipping Program was established to provide employees with instruction in the shipping of hazardous materials according to DOT, ICAO, and IATA requirements. The Department of Transportation (DOT), through regulations found in the Code of Federal Regulations (CFR) 49, The International Civil Air Organization Regulations (ICAO), International Air Transportation Association Regulations (IATA), specific carrier restrictions, and regulations particular to countries involved with international shipments, governs the shipment of regulated hazardous materials. The regulations are very precise as to how such materials must be packed, labeled and transported and, therefore required specific reinforcement for involved employees.

Several DOT/IATA training classes for infectious substances, non-flammable gases, and aviation-regulated material were developed, refined and conducted. For the first time, the SSO promoted participation of members of the university community for in-house DOT/IATA/ICAO infectious substance shipping training. Also the University Security Plan for hazardous material shipments under HM 232 was created.

Respirator Protection Training

Special training sessions for Plant Services, Animal Resource Center (ARC), and BL3 Facility employees were conducted. Fit testing sessions were also carried out. Fifteen Plant workers, 30 Students, and 25 Laboratory workers completed the medical evaluation, were respirator trained, and then fitted for respirators.

OSHA LABORATORY PERFORMANCE STANDARD

The impact of the OSHA Laboratory Performance Standard and its implementation by SSO during this fiscal year has resulted in greatly increased awareness of the OSHA regulations, as well as awareness of Material Safety Data Sheets (MSDSs) and use of Personal Protective Equipment (PPE) in addition to certification of equipment that can be potentially hazardous. Compliance continues to increase in these programs with each year.

Material Safety Data Sheet (MSDS) Program

The MSDS program is now on the Internet for all laboratories, and is available as a hard copy printout for the laboratory staff to reference. MSDS information was contracted to Chemwatch in October 2001 and continues to be accessed for chemical information. Currently past archived hard copy MSDS(s) from distributors are being scanned into our database for easy retrieval.

Chemical Hygiene & Exposure Control Plans

The Chemical Hygiene Plan (CHP) has been updated and is currently on-line at the DOES website. The Exposure Control Plan (ECP) is still being revised, however, the current form is also on-line. CHPs were 95% compliant with annual documentation of awareness. A PI packet was created for new faculty members. The packet is a compilation of all safety information that is needed for establishment of safety laboratories at CASE. The new packet includes:

- Checklist
- Training information
- Blank CHP
- Blank ECP
- Blank Z-list
- Personnel log sheet
- Waste disposal table
- Label order form
- Respirator information

Instrument Calibrations

Properly calibrated instruments were necessary for Industrial Hygiene (IH) and hood certifications in laboratories to perform accurate surveys and provide results with proper measurements. Annual factory calibrations of 20 instruments were maintained.

Instrument	Model	Serial #	Frequency	Next Due
High flow impactor pump	10-709	1298-2617	Annually	11/6/2004
Mini-Buck Calibrator	M-30	M-5648B	Annually	8/24/2004
Mercury Vapor Analyzer (Jerome)	431-X	1835	Annually	11/7/2004
PhD Ultra Atm. Monitor (Combustible Gas Meters)	02-30102N	10406	As Needed	11/30/2004
PhD Ultra Atm. Monitor (CGM)	02-30102N	10389	As Needed	8/13/2004
CMS-Analyzer		ARKH-0164	As Needed	
Accuro (Hand Pump)		ARSE-FO23	As Needed	
Accuro (Automatic Pump)	2000		As Needed	
HCHO 7000 Series	7162	811647	Every 2 years	Out of Service
Airchek Sampler	224-PCXR7	523142	Annually	1/16/2004
Airchek Sampler	224-PCXR7	523121	Annually	1/16/2004
Airchek 2000	210-2002	00529	As Needed	1/16/2004
Airchek 2000	210-2002	00820	As Needed	1/16/2004
Airchek 2000	210-2002	00870	Annually	1/16/2004
Airchek 2000	210-2002	00503	Annually	1/16/2004
Airchek 2000	210-2002	00868	As Needed	1/16/2004
Pocket Pump	210-1002	07413	Annually	1/16/2004
MiranSapphlRe (ASHRAE)	205B	205B-67068-357	Annually	11/15/2004
VelociCalc Plus	8360	40110	Annually	1/24/2004
VelociCalc Plus	8360	603016	Annually	1/23/2004

Clearance Program

The Clearance Program was implemented in order to centralize the process of equipment or maintenance surveys. More than 500 clearances were conducted for PI's that moved to the new Research Tower and for laboratory relocations during reconstruction. For the Wood building move into the RT, 27 decommissionings were organized. There were a total of 537 clearances associated with these moves. For PIs leaving CASE, 13 decommissionings and 403 clearances were organized. In the SSO, 214 general clearances were submitted including room and building clean out, room repair, equipment, and maintenance.

ENVIRONMENTAL RELEASES

State and federal regulations permitted CASE Dental School mercury sampling to reach a regulatory level of 25 parts per trillion. The Northeast Ohio Regional Sewer District (NEORSD) required semi-annual reports on Best Management Practices (BMP) for minimization of mercury discharge for dental offices to the Cleveland sewer system. CASE's sewer releases were in compliance with both federal and state regulations. In the past fiscal year, the report for January through December 2002 was filed on 2/28/2003.

Semi-annual water testing for nitrates and nitrites were performed in the dormitories on the southern half of the campus. The assessment included collection of 72 samples, summarizing of results, and distribution of reports to the facility coordinator for the dormitories. Regulatory levels were not exceeded.

REGULATED CHEMICALS

Base-line reading assessments were performed to determine how and where PIs were using Z-list substances. One thousand one hundred and fifty four (1154) out of 2034 responses were returned (57%). The remaining assessments were left for address during laboratory inspections.

A new sampling plan for the anatomy laboratories was implemented. Eighty formaldehyde vapor samples were taken to obtain sufficient results to lower the amount of monitoring needed in the 2003-2004 year. This sampling procedure helped to reduce the frequency of required monitoring from five samples each week to one to three samples each semester. This formaldehyde-monitoring plan is currently in place for the medical, dental, and biology anatomy laboratories. The results of formaldehyde sampling were summarized in 44 reports that were distributed to the facility coordinators of involved departments. Formaldehyde monitoring was also performed in Pathology SB10 where human anatomy samples are stored for research.

INSPECTIONS

The inspection program is on going. A standardized form for laboratory audits was prepared that addressed all facets of OSHA, NFPA, RCRA, Medical Waste, and any other special hazard that may exist in the laboratory. The form is in a computer file that enables call-up of designated areas of address through use of standardized words and also helps to address concerns that arise sporadically.

This computer program has aided in correcting many items of non-compliance as well as disposal of many pounds of waste chemicals to achieve compliance. Non-compliance in laboratory settings is dropping significantly. Corrections in most cases were achieved due to the staff perseverance with the investigators to work out reasonable methods to

eliminate deficiencies. The inspection protocol and form were revised to make them more comprehensive and user friendly during inspections and PI follow-ups.

CASE has more than 1000 Principal Investigators (PIs) authorized to use chemical and biological materials in 2000 laboratories. Laboratories are inspected by the SSO annually. Inspections include physical inspections, verification of training records, and follow-up. Audits are more frequent if there are particular concerns in a laboratory.

Inspections were conducted at outlying sites including UH, Metro Health, and Veterans Administration (VA) Hospitals. These outlying sites were inspected because CASE personnel are working in these areas.

Building	**Rooms Inspected**
Bingham	88
BRB	451
DeGrace (Biology)	31
Bolwell	2
Clark	0
Dental	111
Glennan	109
Health	1
KHS	111
Wearn	111
White	0
Wickenden	0
Wood	321
UCRC II	15
MacDonald	27
Mather	0
Med East	511
Metro Heath Hospital	4
Millis	128
Morley	35
Nursing (Bolton)	71
Olin	0
Pathology	169
Rad Waste	0
RBC	110
Research Tower	10
Rockefeller	30
Strosacker	14
Smith	160
Veterans Administration Hospital	0
Total	**2620**

RESPIRATOR PROGRAM

An inventory of respiratory protection equipment was carried out including cartridges, filters, face pieces, wipes, and valves. Approximately six cartridges and four face pieces were used monthly. There are currently four Self-Contained Breathing Apparatus (SCBAs) in inventory, two are new and two will be recycled. A policy and questionnaire were developed for the medical students requesting N95 respirator fit testing for electives at other facilities as part of their program.

An assessment of Respiratory Hazards was utilized for the campus community. The assessment included employment of written methodology, assessment forms and questionnaires, employee interviews and evaluations, and exposure estimate calculations. All elastomeric face pieces and SCBAs were recycled to improve visibility and comfort. This allowed cost savings for the SSO through negotiation of credit for old elastomeric face pieces at approximately $2 X 14 half-face respirator mask and $7 X 12 full-face respirator mask.

HOOD CERTIFICATION PROGRAM

The University met compliance goals for OSHA, NFPA, as well as Ohio Radiation Safety programs by implementation of the SSO's "Hood Certification Program". Hood testing was carried in all laboratories that were occupied or used by CASE personnel. These areas included laboratories in CASE, UCRC II, & I (University West) UH, Metro Health and VA Hospitals. All chemical hoods located in these laboratories were tested in the past year with a velometer. Those flows, with an accompanying letter of pass/fail to the PI, were recorded on a computer program for audit purposes. The response of Plant Services in repairing those hoods failing the fume hood certification has been good. In future years, on an annual basis, our target will be to test one-third of the chemical hoods using ASHRAE 110 testing and two-thirds using face-velocity testing only. During fiscal year of 2002-2003, a total of 760 hoods were tested, among which 95 hoods were tested using the ASHRAE 110 method and more than 665 hoods were tested using face velocity method. This process yielded a failure rate of 7% for all hoods.

Following these procedures, the chemical hoods were calibrated to ensure proper engineering controls using the ASHRAE 110 testing techniques. The method of calibration consisted of three tests:

1. Face Velocity Measurement
2. Flow Visualization Test
3. Tracer Gas Containment Test

Biosafety cabinets and Laminar Flow hoods were certified through a contracted company named Laboratory Certification Services (LCS). Annually PIs were notified through inspection and department notification to re-certify their hoods. An online database was created on the DOES website that allowed the PI, to sign up for re-certification and to

request repairs. Two hundred eight-one Biosafety cabinets and Laminar Flow hoods were re-certified last year.

INCIDENT/INQUIRY PROGRAM

The Incident/Inquiry Program was established to ensure that all incidents and inquiries were handled in a timely manner and appropriately documented. This included all incidents involving Emergency Response, Indoor Air Quality, and other types of non-standard assignments.

Indoor Air Quality (IAQ) Monitoring

An IAQ monitoring protocol has been established to ensure that concerns are addressed using the appropriate techniques in a timely manner. Air monitoring was done when necessary and an assessment was carried out through sampling and analysis. Follow up was carried out when the analyses were complete. A report was written for each complaint. The SSO responded to five major incidents, 141 odor complaints, 10 of which evolved into IAQ assessments involving sampling and analysis reflective of possible safety problems. There were also 59 incidents involving spills and two incidents involving mold in campus buildings excluding the West Quad. All response and follow-up procedures were completed for this program.

Seven IAQ complaints were investigated in the Service, Dively, Sears, Adelbert, Wood, Guildford, and Baker buildings. This involved assessing questionnaires, performing monitoring, contracting a laboratory to do in-depth monitoring, analyzing results, and summarizing reports.

Bio-aerosol Monitoring

This prospective air-monitoring program was coordinated with a contractor to permit semi-annual bio-aerosol monitoring for October 2002 and April 2003. Two hundred and fifty-four samples were taken, analyzed, and evaluated as part of this program. Reports on this program were sent to facility coordinators for the Animal Resource Center (ARC), the Wearn building, and Hayden Hall.

Major Incidents

Fire in Med East Cold Room - 3/6/2003
A fire was reported in a Cold Room on the 6th floor of Med East. The Cleveland Fire Department responded and the fire was contained. During this incident old signage left on the cold room led to inaccurate reporting of the site of the incident. As a result of this problem, a memo was distributed to all PI's regarding cold/warm room signage,

inventory, and the duties of the PI responsible for the area. An "Experiment in Process" sign was also developed for posting in common usage areas during the experiments.

Power Failure in Eastern States - 8/14/2003 at 4:15 pm.
During the blackout, the Service Building Conference Room could not be used as the communication hub because there was no emergency power generator for this area. This problem is currently being remediated. During the power outage, several states were without electric power for more than 12 hours. Therefore, DOES has added to its emergency inventory since the blackout to aid in the department's response if there is a reoccurrence of this problem in the future. The SSO now stores emergency dried food, bottled water, glow sticks, walkie-talkies, and a battery-operated radio on site in the DOES Office suite.

BIOLOGICAL SAFETY

BSL-3 Facilities

In the aftermath of September 11, 2001, the Patriot Act was enacted to protect against bio-terrorism. Two federal agencies are under its auspices, the Center for Disease Control (CDC) and the US Department of Agriculture (USDA). On June 12, 2002 President Bush signed the "Public Health Security and Bio-Terrorism Preparedness and Response Act of 2002" (Public Law 107-188). The Law's purpose is to improve the ability of the United States to prevent, prepare for, and respond to bio-terrorism and other public health emergencies. The Law requires that all persons possessing select biological agents or toxins deemed a threat to public health, animal or plant health, or animal or plant products register with the appropriate federal agency. On December 13, 2002, the Departments of Health and Human Services (HHS) and the USDA published new rules in the Federal Register governing facilities that possess, use, or transfer select biological agents or toxins. These rules became effective on February 7, 2003.

Currently there are two BSL-3 facilities for prion research (one for molecular and biochemical research, and one for animal research); a specifically equipped BSL-2 facility for prion research, as well as one BSL-3 facility for other potentially dangerous agents including HIV and Mycobacterium Tuberculosis.

With the impending introduction of the variant prion (Bovine Spongeform Encephalpopathy agent, BSE) to campus, a specific Biosafety Committee was formed as an oversight committee. The one select agent to be used on campus, BSE, has been registered with the CDC and USDA. Those individuals who will be involved in this program (20-30) are undergoing background checks and fingerprinting carried out by the Federal government. The BSL-3 laboratories in which BSE will be used are in the 4th floor Institute of Pathology and the ARC (BL-3) facilities. There will be three levels of security:

1. Card swipe entry security at the entrance of the laboratory

2. A second card swipe system for the isolation laboratory
3. A third locked location for storage of BSE materials within the laboratory.

BSE material will be stored only in the 4th floor laboratory and only amounts of BSE required for injection of the animals will be transported to the ARC Facility when required.

Laboratory Inspections Program

The Inspection Program for Chemical Safety compliance also investigated and resolved biological safety compliance and hazards.

Emergency Response

Emergency Response to all incidents leading to possible biological agent exposures was investigated. This year there were several responses to bio-terrorism-related mailings but investigation proved that the materials involved were not hazardous.

Waste Disposal

Safety compliance and equipment inspections were carried out and resolved for bio-hazardous waste autoclaves.

PHYSICAL SAFETY

Training

Three sessions of Plant Safety Awareness training was given on Personal Protective Equipment (PPE) use and care for a total of 40 employees. Fifteen sessions of Driver Safety training were given for 110 employees and one session of Fire Safety training was given for 60 employees.

Physical Safety Manual

A new Physical Safety Manual was completed and made available online. This manual has also been promoted through direct contact with investigators during inspections and in the DOES Newsletter. Laboratories that do not have an emphasis on chemical use can find many applicable safety recommendations in the Physical Safety Manual.

Fire Inspection Program

Fire drills are conducted twice per year. This year fire drills were conducted in 32 buildings. Evacuation Plans have been revised for 16 areas. There are three plans remaining that must be revised.

Building Walkthroughs

Walkthroughs of two buildings each week were carried out to determine areas that were in violation of any safety codes, including fire and means of egress. Ninety buildings were inspected this year.

Ergonomics Evaluations

Ergonomic issues were addressed on an individual basis to eliminate work-related muscular-skeletal disorders among employees. Twelve issues were evaluated this year affecting 30 employees in their workstations. Ergonomic evaluations were performed to minimize the amount of stress and strain placed on the body while working. The underlying premise of these recommendations was that the task should fit the worker rather than the worker be forced to make potentially harmful physical demands to perform the task. Most evaluations performed at CASE pertain to office workstations, laboratory work (pipetting/microscope usage), or material handling operations (lifting hazards). Some factors for evaluation included:

- The arrangement and adjustability of equipment, tools, or furniture
- Anthropometric data (for clearance, reach, worker dimensions, etc.)
- Tasks performed
- Reported health problems

Facility Inspections

Regular inspections of all facilities were carried out by the Physical Safety Specialist in collaboration with the Plant Services personnel involved in campus walkthroughs.

Remedial Services

The Physical Safety Specialist incorporated on-site problem solving in all areas of physical safety. Three noise complaints that were also resolved, and it was recommended that a more refined sound meter be purchased.

PLANT SAFETY

Training

Training overlapped with all safety areas of the department and was tailored specifically for Plant, Protective Services, and Custodial personnel.

Facility Inspections

Inspections were carried out on an on-call basis before execution of any maintenance procedures that could result in hazardous exposures.

Contractor Safety

The Plant Safety Specialist carried out on-site inspections and monitoring of contractor safety practices and programs. Contractors completed more than 350 projects with oversight by a DOES representative.

Exhaust Fan Survey with Plant

All exhaust fans were monitored to ensure safe air quality for Plant personnel before maintenance and filter replacements. This operation occurred on a quarterly basis.

Programs

Programs for safe and compliant operation of the Sanipak Waste Sterilizer were written in 2001. The Sanipak is surveyed on a monthly basis and quality assurance checks are done on a quarterly basis.

The Lead Abatement and Asbestos Abatement Programs were addressed on a per case basis.

Cleanout and decommissioning of the former Mount Sinai Hospital Complex were successfully executed by the Plant Safety Manager and DOES Specialists. Many assessments were completed to prepare for the demolition of several of the Complex. These assessments included:

- Environmental Assessment
- Water Quality Assessment

- Indoor Air Quality Assessment
- Cessation of Regulated Operations as required by EPA Inspection.
- Mold Abatement

EMERGENCY RESPONSE PROGRAM

The SSO was involved in writing the campus-wide Emergency Response Plan by completing a section of the Campus Incident/Emergency Management Plan. The DOES Emergency Response Plan was developed and designed to integrate with this plan. This DOES plan was reviewed with Protective Services and Cleveland Fire Department representatives.

Following the 911 tragedy in 2001, the Federal government put into place a National Security Alert System that codes the level of security required on a daily basis. When the level is raised from red to orange, the DOES staff increases its on-call schedule to 24-hour status. Security checks are carried out on the weekends during the level increase and all buildings, BSL3 facilities, and irradiators are inspected to ensure that they are secured. The DOES Conference Room has been designated as the emergency headquarters should the need arise. If the DOES site is compromised, a reciprocal arrangement for housing emergency services has been established with General Electric in Nela Park.

Response equipment was inventoried and re-supplied. The annual usage for each type of response equipment is as follows:

- 400-500 pairs of thin Nitrile gloves
- 10-12 pairs of other glove types over 12 mils
- 4-5 Tyvek suits
- 8-10 Tyvek QC suits
- 12 pairs Tyvek polycoated booties
- 30 lbs. Mercury absorbent
- 10-12 lbs. of various other absorbent for solvents, formaldehyde, acids, etc.
- 20-25 spill filter strips

Other forms of response equipment have been incorporated into the inventory such as tack cloth for powder clean up and mercury thermometer containment tubes. Personal Protective Equipment (PPE) has also been evaluated for adequacy and the types materials kept on hand were augmented to increase response capabilities including:

- North Silvershield glove liners
- Butyl, Viton, and Polyvinyl Acetate (PVA) gloves
- Saranex suits
- Hazmat boots
- Drum leak kit
- Mercury Vacuum

The DOES staff was involved in an in-house HAZWOPER training session that included training, response activities and exercises. All staff members were certified for 24-hour HAZWOPER emergency response.

WASTE DISPOSAL PROGRAM

Waste Collection at CASE has essentially doubled during the 2002-2003 fiscal year. The ability of the Chemical Analytics contractor to perform de-activation of Peroxides, Picric acid, and Perchloric acid has reduced the intrinsic cost of disposing of this material and represents a significant cost savings. Most importantly, reduction in hazard was accomplished through on-site performed waste handling to comply with OSHA requirements.

A database used to assign tracking numbers facilitated accurate tracking of expenditure reporting and facilitated evaluation of cost effectiveness of waste disposal. In addition, an audit of all manifests has been used so that detection of overdue manifests can be tracked before the 42-day time limit.

Recycling Program

Fluorescent Bulbs and computers were recycled on the campus. The disposal task over this past year was greatly amplified with materials from the West Quad (Mount Sinai) Complex. The Recycling Program for chemical solvents was terminated in October 2001.

Waste Facilities

The CASE Waste Facilities are used to segregate and prepare waste for disposal. The different waste streams include aqueous waste and dry solid waste. Reducing the volume of waste to be disposed remains a continuing aim of the waste program promoted by the SSO. As part of the Waste Minimization Program, researchers are encouraged to reduce the volume of waste generated in the laboratory.

Waste Disposal

For unit disposal costs, due to the volume of disposals, only select areas have been detailed in the table below.

LABORATORY WASTE BREAKDOWN PER MANAGEMENT CENTER

Waste Type	Arts/ Science	Engineering	Dental	Medical School	Kodak	Plant
Asbestos						2
Ballasts (PCB) (#)						12705
Ballasts (Non-PCB) (#)						3652
Bottles <1gal	7082	4475	322	6326		18
Bottles>1 gal						3.47
Unknowns	22	99		121		0.04
Incinerators	81		3	112		0.02
Cleanout	Chemistry	Smith				
Cylinders (small)	4			19		0.001
Cylinders (large)	1	32.34				
Formulin				6		
Mercury		1		1		
Photo Drum			2		1	
Batteries				33		1011
Flam Liquid				30		2
Non-Flam Liquid				6		2.17
Transformers (#)						2530
Vials				488		0.001
Pails				1193		9
Total Cost	$112,064	$71,723	$5,475	$138,999	$150	$30,175

ACCOMPLISHMENTS FOR 2002-2003

Notable new accomplishments included:

- Completion and publication on the Departmental website of a new Physical Safety Manual for the University.
- Establishment of a new Emergency Response Coordinating Facility.
- Development of a detailed response plan for all DOES emergencies. The Emergency Response Plan was also tested as part of an 8-hour retraining exercise.
- Facility Clearance for Select Agents by the USDA in collaboration with Plant Services.
- RCRA compliance program clearance verified through inspection by the Ohio Department of Health. With the exception of West Quad, which is currently being cleared, no deficiencies were noted in CASE's programs by State inspectors who audited our facilities over the past year. The inspectors praised our program.
- In 2002-2003, SSO also enjoyed exceptionally successful collaboration with its partners in both Plant and Protective Services.
- Advances in the Indoor Air Pollution Program, Ergonomic Awareness Program, Regulated Chemicals Program, and Recycling Program.

GOALS FOR 2003-2004

The overall goal of the coming year will be to continue to align the SSO with the educational and research goals of the University through training and training development. A secondary goal is to increase the impact of SSO programs on the surrounding community through educational and programmatic interaction with local emergency responders. Specific efforts will address:

- Completion of security and safety plans for Select Agent use.
- Establishment of new safety programs for the Wolstein building.
- Revision of the Chemical Safety Manual.
- Complete update of chemical hygiene plans and exposure control plans.
- Increased emphasis on waste disposal procedures.
- Increased emphasis on satellite waste accumulation and posting of waste leakage logs in laboratories
- Enhancement of safety programs concerning Plant Services.
- Reduction of dependence on paper records through on-line archiving.
- Enhancement of interaction with Cleveland Fire and Emergency Response Agencies through both training and response.
- Review and augmentation of all Emergency Response Programs pertaining to campus-wide emergencies.
- Increased involvement of all Safety Services team members in emergency response to keep skills and knowledge current and to provide back up of outside agency responses.
- Development of a revised Bloodborne Pathogen presentation.

- Inclusion of the Right-To-Know Hazard Communication training on line.
- Revision of Infectious Substance Training materials to reflect regulatory changes.
- Creation of new Diagnostic Specimen training materials.
- New security plan training for Select Agent and DOT programs.
- Development of test questions for documentation of security plan awareness and general awareness after each DOT/IATA training.
- Completion of risk assessment for all job categories.
- Creation of materials and documentation for DOES personnel who are involved in hazardous waste operations to meet EPA requirements.
- Installation of secondary containment in waste sheds to contain leaks of material and prevent co-mingling of incompatibles per EPA requirements.
- Examination of applicable waste log requirements for laboratories.
- Examination of applicability of satellite accumulation options in the laboratories.
- Completion of initial and online revisions to Laboratory Standard training.
- Obtaining the remaining 880 responses that have not been returned from the Z-list questionnaire.
- Implementation of a new monitoring program where required for the PIs using Z-list substances.
- Development of similar sampling plans for Nursing Anatomy laboratories and the Mortuary.
- Continuation of semi-annual Bio-Aerosol Sampling in 2003-2004.
- Distribution of Emergency Response Plan to Cleveland Fire Department, Cleveland Police Department, Hospitals, Protective Services, Plant Services, and the appropriate DOES representatives.
- Development of an IAQ Manual for CASE.
- Encouragement of the staff toward completion of national certification to facilitate participation in community safety training initiatives.

Prepared by Felice Thornton-Porter on 10/21/2003.