

ENVIRONMENTAL HEALTH AND SAFETY

SIXTH ANNUAL REPORT

2003



DALHOUSIE
University

FEBRUARY 2004

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1 INTRODUCTION

1.1 Environmental Health and Safety Office

The Dalhousie Safety Office operates to:

- Offer advice to the University's Senior Management on ways in which the University can strengthen its efforts to provide a healthy and safe environment in support of the entire range of University activities.
- Support the activities of the Dalhousie Environmental Health and Safety Committee.
- Support the Deans, Directors and Chairs of Departments as they discharge their responsibilities for health and safety within their units.
- Liaise with regulatory agencies and other organizations to keep the University informed of developments which could impact Dalhousie's Environmental Health and Safety Program.
- Ensure that inspections, testing and training are carried out as needed to ensure that the University is operating in accord with legislation.
- In accord with regulations, coordinate the disposal of hazardous waste created by teaching and research programs and by the University's operations.

The Safety Office operates with a staff of three:

Director	-	Dr. William J. Louch
Radiation Safety Officer	-	Ms. Pauline Jones
Administrative Secretary	-	Ms. Jan Taylor McIntyre

2 HIGHLIGHTS 2003

2.1 Laboratory Security

Following the events of September 11, 2001, institutions across the continent reviewed the security of their holdings of dangerous chemicals. Prompted by a request from the deans of Dentistry, Medicine and Science, the Dalhousie Safety and Security Offices carried out a security audit of the University's use and storage of dangerous chemicals. The audit indicated that security could be improved by adopting new procedures and by making changes at both the building and laboratory level. As a response, a number of facility changes were undertaken on all three campuses. During 2003, work was completed on improving perimeter security in each University building where researchers regularly use toxic or reactive chemicals.

2.2 Construction

2003 was another very busy construction year. Major projects included the first phase of the construction of the new residence, an addition to the Sexton Campus N Building, major roof repairs to C Building and the Student Union Building, repairs to the exterior of the Forrest Building, Howe and Shirreff Hall and interior renovations to Fenwick Place, the Student Union Building and Killam Library. These projects, which represent capital expenditures in the millions, and involved hundreds of person years of construction work, were completed without a significant work-related injury.

2.3 SARS

Early in 2003, the Dalhousie Community, along with other Canadians, watched with concern as SARS spread from south east Asia to other parts of the world. To respond to campus concerns, the Safety Office - working with the President's Office and public health specialists in the Faculty of Medicine and the NS Department of Health, prepared several advisories which kept the University Community updated on the crisis and its implication for those travelling to and from the University. Working with the staff of Student Services, a contingency plan was prepared that would have guided the University response, had the illness surfaced in Nova Scotia or among Dalhousie students.

Once the crisis abated, Dalhousie hosted a SARS debriefing meeting attended by public health authorities and Student Services staff of other Nova Scotia universities. The informal communications network created will well serve all area universities should another situation arise. It has also created a forum for common planning as we look more closely at how we might contend with a much more likely influenza outbreak among students.

2.4 Hurricane Juan

On September 29th, expecting that Hurricane Juan would bring wind and rain, Dalhousie began its normal storm preparations. Security Officers made the rounds of buildings, closing windows. Residence managers secured their buildings, moving to safety anything that might be damaged by winds. Facilities Management arranged for extra staff to be on hand to respond to the problems that storms often create. No one, however, expected that a Category 2 hurricane would pass directly over the University.

Directly in the storm's path was Fenwick Place. Winds in excess of 150 km/h, blew in about 150 windows and damaged many others. Swirling winds and driving rain virtually destroyed many of the south facing suites. Recognizing the seriousness of the situation, Fenwick staff, aided by resident volunteers, safely evacuated about 450 people from the 32 storey building to the lower floor. The municipality-wide power failure meant that the evacuation was conducted in the dark with only flashlights offering illumination. Once the upper floors were vacated, staff offered reassurance, blankets, snacks and water to the displaced residents.

Elsewhere on campus, Security officers were pulled off the streets after two vehicles were damaged by the storm.

As dawn broke, it was apparent that residents would not be able to return to their Fenwick Place rooms, so staff began to make arrangements to accommodate displaced students and set in motion the repair work that allowed most residents to return to the building within a week. Other campus residences were largely untouched by the storm.

Following an early morning torrential rainstorm, the campus started to stir as staff began to arrive, prepared to help get the University back in operation. It soon became clear that the University had suffered considerable damage. As was the case throughout the Municipality, many trees were down on the campus and on neighbouring streets. Power lines were down,

again, both on campus and on the streets. In addition to the damage at Fenwick Place, roofs and windows elsewhere on campus, were damaged. University crews were at work by early Monday morning beginning the cleanup.

The difficulties caused by Juan brought out the best in many Dalhousie employees. Despite having to contend with the impact of the storm at home, a number of staff worked long hours to allow the University to recover.

Despite the obvious dangers posed by the storm and the stresses experienced during the recovery week, no member of the University sustained any significant injury.

2.5 "Routine" Maintenance

In recent years, the University has allocated special funding to begin to respond to the growing problem of deferred maintenance. These funds have made it possible to address a number of safety issues. Among the 2003 projects with clear safety implications were sidewalk reconstruction on the Sexton Campus, around the Dunn Building and on the Killam upper Plaza, removal of a deteriorated temporary building adjacent to Chemical Engineering, and upgrading of emergency phones and door safety devices in LSC elevators. A snow guard system was installed on the east side of Memorial Rink to protect pedestrians and parked vehicles from avalanches. A covered walkway was installed along the west side of the building several years ago. Finally, a new system for screening sunshine was installed on the LSC Green House roof. This new system makes unnecessary the very dangerous work that was involved in maintaining the old, exterior shades.

3 PROGRAM ADMINISTRATION

3.1 Environmental Health and Safety Committee

Throughout 2003, the Dalhousie Environmental Health and Safety Committee continued to operate as a forum for discussion of health and safety policy and procedural matters. Although the Committee responds to the requirements of Nova Scotia's Occupational Health and Safety Act, it was actually created in 1980 some years before Nova Scotia law required organizations to establish such committees.

Committee membership for the year is shown below:

<u>Chair Person</u>	2002 - 2003 K. Wheadon-Hore	University Appointee
	2003 - 2004 F. Fyfe	Employee Group Appointee

**2003-2004 ENVIRONMENTAL HEALTH & SAFETY
COMMITTEE MEMBERSHIP**

Employee and Student Group Appointees

Anne Weeden	DUAG	Medicine	Anne.Weeden@dal.ca
Curtis McGrath	DSU	VP Education	DSUVPED@dal.ca
David Clarke	IUOE	Facilities Management	
Bill Freedman	DFA	Biology	Bill.Freedman@dal.ca
Forest Fyfe	DFA	Physics	Forest.Fyfe@dal.ca
Joe Dorey	IUOE	Facilities Management	
Marvin Silver	CUPE	Biology	Marvin.Silver@dal.ca
Dawn Korn	NSGEU	External Relations	Dawn.Korn@dal.ca

University Appointees

Cathy MacLean	Dentistry	Cathy.MacLean@dal.ca
Christine Delodder	Financial Services	Christine.Delodder@dal.ca
Colin Stuttard	Microbiology & Immunology	Colin.Stuttard@dal.ca
Darrell Boutilier	Facilities Management	Darrell.Boutilier@dal.ca
Jan Hines	Housing & Conference Svs.	Janice.Hines@dal.ca
Patrick McGrath	Athletics & Recreational Svs.	Pat.McGrath@dal.ca
Paul Amyotte	Chemical Engineering	Paul.Amyotte@dal.ca
Ruth Murray	Can. Institute Fisheries Tech.	Ruth.Murray@dal.ca

Ex-officio Members

William J. Louch	Director
Jan Taylor McIntyre	Recording Secretary

In addition to some of the more routine matters listed below, the Committee responded to the President's request for advice on extending the University smoking policy. Early in 2003, the Committee surveyed campus opinion and found overwhelming support for the suggestion that smoking no longer be permitted on University property. In its recommendation that the University move forward with this change, the Committee identified a number of issues which Committee members felt should be addressed to ensure the smooth implementation of the policy change. The Committee also provided helpful input on matters including smoking signage and communications.

The Committee considered a proposal put forward by the Physics Department to install and operate a LIDAR facility on the roof of the Dunn Building. Lidar systems are powerful lasers which direct a light beam vertically. Analysis of the reflected light allows researchers to gain information about atmospheric chemical phenomena. To ensure that the beam poses no threat to aircraft overflying the site, a co-axial radar beam is integrated into the laser power supply. The radar beam detects an aircraft entering the conical space surrounding the laser beam and instantly shuts the light beam down.

The Committee reviewed the literature on such sites and the consultations that had taken place with agencies including Transport Canada, Health Canada, NatCan, Industry Canada, National Defence (both in Ottawa and Shearwater), and operators of the heliport on the IWK Children's Hospital. The Committee concluded that the facility met all relevant licencing

requirements and posed no danger to members of the University or those living in surrounding neighbourhoods.

The Committee also co-operated with the Senate Environmental Committee by increasing awareness of the problems created by car engine idling. The Senate Committee's interest in promoting energy conservation and avoiding unnecessary green house gas emissions, complimented the Environmental Health and Safety Committee's interest in protecting indoor air quality.

Among the more routine matters handled by the Committee during the year, were reviews of:

- Environmental Health and Safety Committee Terms of Reference
- Environmental Health and Safety Policy
(as required by Section 27 of the NS Occupational Health and Safety Act)
- Environmental Health and Safety Program
(as required by Section 28 of the NS Occupational Health and Safety Act)
- Compliance Orders issued by Department of Environment and Labour Inspectors
- Monthly and Annual Accident Experience
- Results of Environmental Monitoring
- Health and Safety Promotional Efforts

Through the Safety Office, the Committee communicated regularly with the University Administration and with many local safety committees which operate across campus.

3.2 Local Safety Committees

In response to the University Policy which encourages Deans, Directors and Departmental Chairs to engage staff and faculty in safety matters, 17 local safety committees operate on a faculty, departmental, building or functional level.

To the extent possible, the Director attends meetings of these committees.

3.3 Communications

During 2003, the Safety Office continued to expand its website: www.dal.ca/safety. The site has become the Environmental Health and Safety Committee's and the Safety Office's most important means of communicating with the University and the broader community. The users response to the new design has been very positive and the traffic visiting the site continues to grow.

4 SAFETY AND ACCIDENT PREVENTION

4.1 Accident Reporting

For well over a decade, Dalhousie has required staff and faculty to report work-related accidents and injuries. Such reporting is an important component of the University's safety program in that these reports provide a means to:

- document the incident,
- ensure that the accident victim receives appropriate care, and
- initiate a review which aims to prevent similar accidents.

When accidents occur, those involved are required to report the accident to their supervisors. In turn, the supervisor directs the individual to complete the section on the Accident/Incident form which describes the sequence of events that led to the accident and the nature of the injuries. The supervisor then completes the section of the form describing the steps which the supervisor believes are necessary to prevent similar accidents. Copies of the report are provided to:

- the individual involved in the accident,
- the local safety committee (acting on behalf of the Dean, Director or Chair),
- the supervisor, and
- the Director of Environmental Health and Safety.

Where the accident is serious, the Director of Environmental Health and Safety, in cooperation with the Dalhousie Environmental Health and Safety Committee, carries out a formal accident investigation. The fire (see below) which injured a Chemistry Department graduate student is an example of one such serious accident to which the Director and the Environmental Health and Safety Committee responded.

In addition to investigating serious accidents, the Director, again in cooperation with the Committee, prepares an annual review of the University's accident experience. This overview aims to identify trends or clusters of accidents which present an opportunity for future accident prevention efforts.

4.2 2003 Accident Experience

As **Figure I** shows, employees suffered 166 accidental injuries during 2003. This total was well below the 208 injuries sustained by employees during 2002, and is quite near the ten year average. Although there is considerable year-to-year variation in the number of employee injuries, it is encouraging to note that the accidental injury trend line has remained reasonably flat despite the rapid growth in enrolment and research activity that the University has seen, particularly over the past 5 or 6 years.

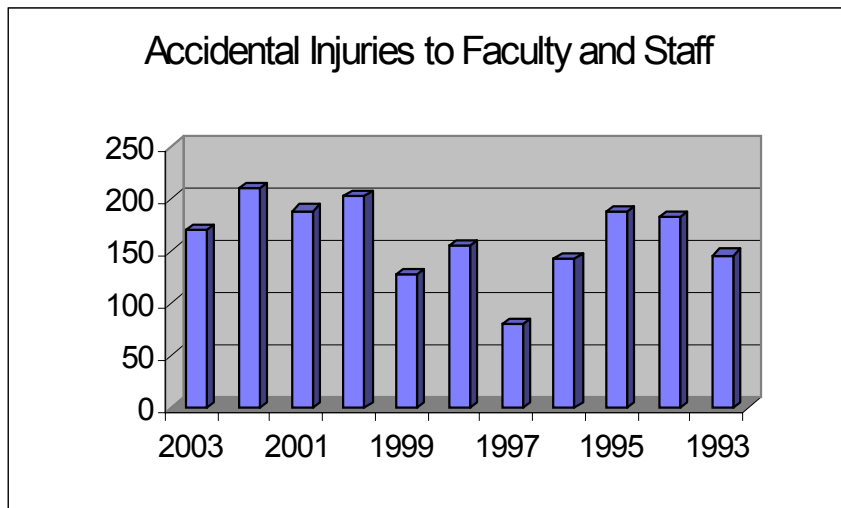


Figure I

Table I breaks down the proportions of staff and faculty reporting injuries.

Table I

2003 ACCIDENTAL INJURIES BY EMPLOYEE GROUP	
Employee Group	Number of Accidental Injuries
Faculty	5
Engineering Services	44
Environmental Services	90
Security Services	3
Other Staff	24
Total Employees	166

As is always the case, the highest proportion of injuries are reported by employees of Facilities Management. Included are carpenters, plumbers, electricians and mechanics employed in Engineering Services; custodians, truck drivers and grounds keepers employed in Environmental Services, and the officers employed in Security Services. Other universities across the country report similar accidental injury patterns.

Although all accidents are of concern, clearly some are more serious than others. One measure of accident severity is time lost from work. Dalhousie counts as a lost time accident, one which prevents the injured person from returning to work on the next scheduled work day. During 2003, 36 accidents caused injuries serious enough to keep staff from reporting to work on their next scheduled work day. Again, the 2003 experience was an improvement over 2002 when 47 University employees lost time as a result of injuries at work.

In total, these 2003 time loss accidents resulted in 355 lost work days. An additional 59 days were lost as a result of accidents which occurred late in 2002. The net result then is that Dalhousie lost the services of staff for 414 days during 2003. **Figure II** shows that, while still significant, the 2003 loss time experience was again in line with the long term trends.

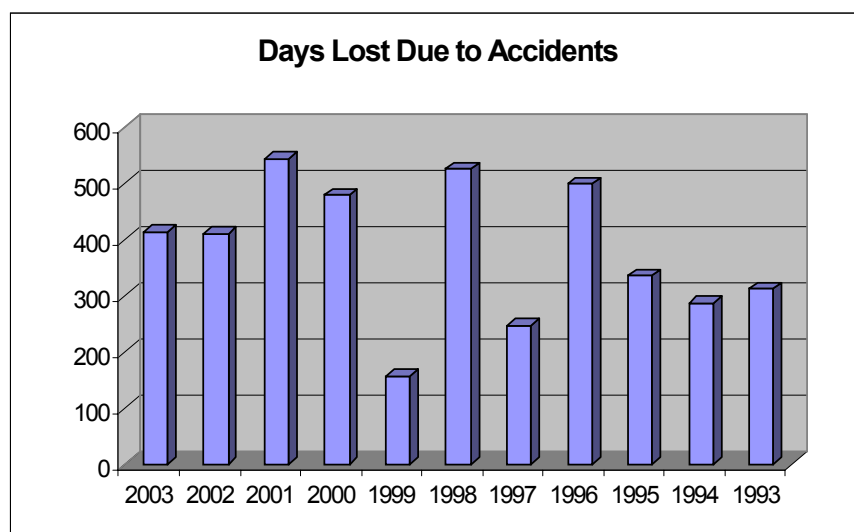


Figure II

A breakdown on the number of 2003 time loss accidents and days lost for each employee group is shown in **Table II**.

Table II

	NUMBER OF TIME LOSS ACCIDENTS	DAYS LOST
Engineering Services	9	90
Environmental Services	22	212
Security Services	1	6
Other Staff	4	47
Total	36	355

In line with the usual experience, a small number of accidental injuries accounts for the bulk of the loss time. In 2003, only 3 accidents together accounted for almost half of the time lost due to 2003 accidents.

Table III shows that over-exertion, falls, including falls from a height (for example from a ladder or on a set of stairs) as well as falls on the level, and striking something or being struck by something, were the most important causes of loss time accidents.

Table III

	Over-Exertion	Falls	Striking/Being Struck	Other
Number of Accidents	130	10	9	4
Total days Lost	105	168	62	20

In roughly half of the falls, water or ice on the walking surface played a role in the accident. And the time loss in these accidents tended to be much higher than when a mis-step on a dry surface caused the accidental injury.

Accidents and injuries involve not only staff. Faculty, students, contractors and visitors are also occasionally injured. Further, the Safety Office receives reports on other campus events, some of which relate to injuries.

Figure III shows that the Safety Office received a total of 251 such reports during 2003, generally in line with the experience of recent years. Included among these reports were:

- Accidents causing injuries to staff and faculty 166
- Other work or study accidents (1) 24
- Sport accidents involving:
 - students 14
 - visitors 13
 - staff 1

- Medical emergencies 14
- Incidents (2) 19

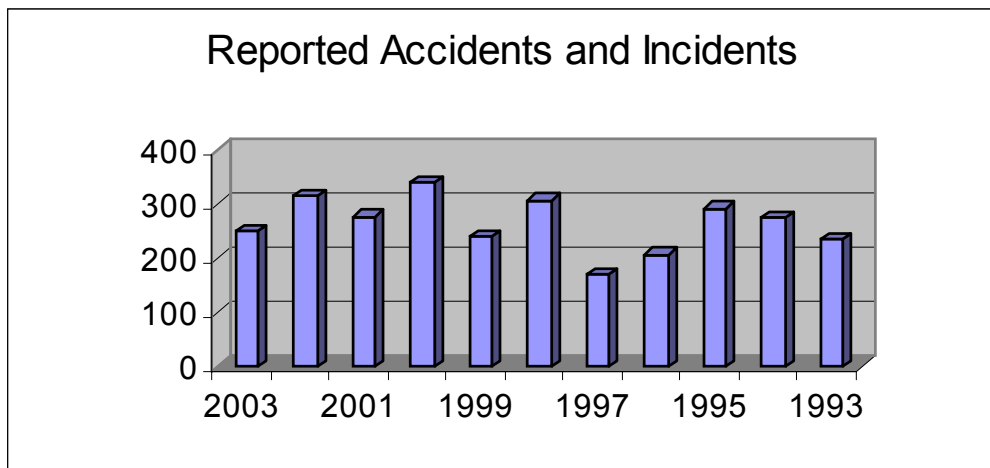


Figure III

- (1) *Other work or study accidents include:*
 - cuts and punctures suffered by students in laboratory or clinic programs, and
 - other miscellaneous injuries suffered by students in the course of attending classes or working on campus.
- (2) *Incidents included 11 fires, 4 chemical spills, several indoor air quality episodes and similar events. In one fire, a graduate student suffered burns to his face and arms. None of the other incidents resulted in serious injuries or property damage.*

5 FIRE SAFETY

5.1 The Fire Safety Program

During 2003, Dalhousie continued to operate the aggressive fire safety program which has been developed over the years. The University makes ongoing efforts to install and maintain detection, suppression and alarm systems, and to upgrade equipment and facilities to keep pace with changes in the National Building and Fire Codes of Canada.

5.1.1 Fire Warden Teams and Evacuation Drills

During the year, the Safety Office continued to work with fire warden teams which serve each of the University's major buildings. To ensure that both wardens and building occupants are familiar with the building's emergency evacuation plan, evacuation drills are conducted annually. In most cases, the drill is conducted during the first few weeks of the Fall term. The evacuation systems are now so well established that we are able to evacuate most Dalhousie buildings in under 5 minutes.

5.2 Juan Response

Hurricane Juan presented some significant fire safety issues. The extended power failure that brought the City to a halt also impacted the University. Most academic buildings were

closed when the hurricane struck. Open buildings were closed and remained so until the power was restored. Fire protection systems, like other building systems, are of course, at least partially, on electrical power. Power from the grid is backed-up by either battery packs or standby, diesel-powered emergency generators. Battery systems generally only operate for a few hours. Many buildings were completely without power for several days. Since only essential staff were allowed in closed academic buildings, the fact that fire systems were compromised did not create a serious life safety risk.

The situation in University residences was, however, quite different. As the power failure dragged on, some students began to take advantage of the unscheduled break to go home. But others remained and the residences continued to operate during the week. As part of the construction of Fountain House, an emergency generator capable of meeting the emergency power demands of the entire Howe Hall complex was installed. So residents of the complex - unlike their fellow students in some other residences and in most off-campus housing - were able to live through the crisis in relative comfort and safety.

Because of extensive wind and rain damage, the upper floors of Fenwick Place were evacuated in the very early hours of September 30th. By mid-morning, all residents of the high-rise had been re-located to other accommodations. Students did not return to Fenwick until after preliminary repairs had been completed and the power had been restored.

In other residences, battery systems soon failed. For many years, candles and open flames have been banned in residences because of the fire safety risks that they present. Residence staff responded promptly to the power failure to provide flash lights and to remind students of the prohibition on the use of candles. As the power failure dragged on, Housing mounted all night fire watches in residences.

5.3 The 2003 Fire Experience

The 2003 fire experience was in-line with experiences over the past decade. In total, 11 fires occurred in Dalhousie buildings or on University property.

5.3.1 Chemistry Building

The most serious fire of the year occurred on Monday, September 9 when a fire broke out in a ground floor Chemistry research lab. A student in the second year of his graduate program was working with organic solvents and suffered burns to his hands and face. Although the student was alone at the time of the accident, other students were working nearby. The research group studies some very reactive chemicals and the preparation of solvents for use in these experiments also involves the use of very reactive chemicals. The fire seems to have occurred when a solvent escaped from a still in which it was being purified.

The injured student was escorted to a nearby building until an ambulance arrived to take him to the hospital. Fortunately, the student's injuries were not too severe and he made a complete recovery, returning to his studies within a couple of weeks. The sprinkler system contained the fire until the Fire Department arrived. The Fire Department was able to extinguish the fire and began the clean-up.

The Chemistry Building was closed for the day to allow the remaining fire and water damage to be cleaned up and the building systems to be restored. The Building re-opened the following morning.

As required by the NS Occupational Health and Safety Act, the fire was reported to the

Department of Environment and Labour.

The Chemistry Safety Committee conducted a review of the causes and response to the fire and forwarded their findings to the University Environmental Health and Safety Committee. In turn, the University Committee considered the incident from the perspective of the entire University, making several suggestions about changes in policy and procedures. The University Administration has accepted these recommendations and has asked the Safety Office to work with the deans and chairs of affected departments to put these changes in place.

5.3.2 Dental Building

Two other laboratory/clinic fires also occurred during 2003. In one, a student using alcohol and a Bunsen burner to sterilize an instrument accidentally ignited a beaker of alcohol. The teaching assistant was easily able to extinguish the fire. A burner malfunction in the Dental Clinic also caused a small fire. Again, staff responded quickly and the fire was extinguished. Neither of these fires caused injuries or significant damage.

5.3.3 N Building, Sexton Campus

During the construction of the addition to N Building, a fire was deliberately set in a clear effort to damage University property. Along side a yet-to-be unpacked large refrigeration unit, an unknown intruder placed equipment that had been stored to accommodate the construction work. The intruder then started a fire before fleeing the scene. The building fire detection system automatically registered the alarm. The building suffered very little damage and only a fraction of the equipment in the immediate vicinity was damaged. But the equipment losses were still in the tens of thousands of dollars. Fire and police responded to the incident which is still being investigated. It is not clear how the intruder gained access to the site.

5.3.4 Oceanography, LSC

Overheating in an electrical motor, which powered a portion of the building's ventilation system, ignited the wire insulation creating a good deal of smoke in the Oceanography section of the Life Sciences Centre. Facilities Management staff responded promptly to the report of smoke, de-energized the motor and quickly extinguished the small fire. Other than destroying the motor, the fire did little other damage.

5.3.5 Grounds

On February 12, a fire broke out under the hood of a car parked in the Gerard Hall lot. Neither the student owner nor the responding fire crew were able to identify the cause. A second parking lot fire occurred in the very early hours of March 8th. A passer-by reported that several young men had set a small fire in the then-under-construction CSB parkade. Security and Halifax Regional Fire and Emergency Services responded. The fire was quickly extinguished. Those responsible for the fire had fled the scene.

5.3.6 Student Residences

During the early months of 2003, 4 fires broke out in student residences. Although all were fairly minor and no-one was injured in any of these fires, any fire in a building occupied by hundreds of people is cause for concern.

In one fire, a Howe Hall student attempted to burn papers in a metal garbage container.

The smoke triggered the alarm and residence staff responded promptly and extinguished the fire.

Two fires broke out in the Fenwick garbage system. The first occurred, it seems, when someone discarded burning material down the building's garbage chute. The material ignited waste in the dumpster at the bottom of the chute. Although the sprinkler system activated, the waste prevented the sprinkler from being fully effective. The fire did some damage to the base of the chute. Two months later a similar fire occurred. In this second fire, the updraft carried burning materials up the garbage chute and allowed the fire to spread to refuse that had accumulated in the concrete shaft that enclosed the chute. Following this fire, Fenwick staff renovated the bottom section of the chute to ensure that refuse does not accumulate and re-designed the sprinkler assembly that protects the dumpster. The Fenwick building manager extinguished a third fire which occurred in a garbage room on one of the building's upper floors.

Given this experience, Housing and Conference Services placed much more emphasis on fire safety when residences opened for the 2003 - 2004 academic year. During the fall term, there were no fires in any of the Dalhousie residences.

Year	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994
# of Fires	11	5	7	8	10	7	12	6	4	13

5.4 2003 Fire Safety Upgrades

5.4.1 Residence Fire Safety

During 2003, fire safety upgrades in University residences focussed on replacing furniture with newer, more fire retardant materials. In 2004, Housing and Conference Services expects to retrofit Cameron Hall with sprinklers, renew electrical wiring in Cameron Hall and Glengarry Hall as well as install an emergency generator to provide service to Gerard Hall during power failures.

5.4.2 Other Fire Safety Upgrades

Each issue of the National Building and Fire Codes of Canada introduces new fire safety requirements. Although some of these changes cannot easily be accommodated within existing structures, Dalhousie tries, whenever practical, to meet these new standards. Continuing a project started in 2002, the University improved exit route safety by systematically installing latched stairwell doors in two 8 storey stair towers in the Biology section of the Life Sciences Centre - a cost of about \$10,000. Over the coming years, we plan to make similar changes in each of the older University buildings.

During the year, Facilities Management staff completed the second of a three-phase project that will provide the Life Sciences complex with a fully-modernized fire detection and alarm system.

6 MANAGEMENT OF HAZARDOUS MATERIALS

6.1 Highly Regulated Materials

Dalhousie has had years of experience dealing with materials such as asbestos, freons and PCBs, all of which are subject to many federal and provincial regulations. Asbestos is present in many of the University's older buildings and staff are now well versed in the special procedures that need to be followed when renovations or other work could generate asbestos fibre exposures. Freons are present in some of the older fire suppression, cooling and air conditioning equipment on campus. Again, special procedures are involved when this equipment is serviced and these gases will eventually be removed when these units are taken out of service. Although large volumes of PCBs have been removed and destroyed, the University continues to operate 5 large transformers which contain PCBs. Again, facilities have been put in place to contain these fluids in the event of a leak, fire systems protect these locations, and equipment servicing practices are designed with the PCB content in mind.

Because asbestos is so prevalent in Dalhousie buildings, the University has, for many years, set aside funds to remove asbestos in priority locations. During 2003, roughly \$75,000 was spent in small asbestos removals associated with maintenance jobs on all three campuses and a major project was undertaken in the Arts Centre. In the Arts Centre, we are completing the second of a three year project that will see all asbestos-containing decorative cement finishes removed from public areas. Earlier projects replaced asbestos cement tiles used as acoustical insulation in the Centre.

Given the extent of the University's use of these highly regulated chemicals, their management will challenge Facilities Management for many years to come.

6.2 Hazardous Waste

Since 1988, the Safety Office has coordinated the University's chemical waste disposal effort. The effort is carried out in two phases. During the academic year, the Safety Office collects waste solvents and related wastes each month. Using a small room in the Life Sciences Building, these wastes are bulked into 45 gallon drums with other compatible wastes and shipped for disposal to a fully licensed waste site by a licenced hazardous waste disposal firm. The second phase, during which we accept the full range of waste chemicals, is carried-out during the summer. This phase depends upon the availability of a vacant undergraduate Chemistry laboratory and the assistance of a senior student, recruited to help with this work.

This system has proven to be very effective. The supervisors of laboratories take full advantage of the regular collection to dispose of wastes. As a consequence, the volume of chemical waste in storage in University laboratories at any time is far less than it was in the early 1990's. As time has passed, research and teaching programs have grown and researchers have become more demanding. Many are no longer satisfied to dispose only of their waste solvents each month. Instead, many researchers insist that they need to be able to discard any type of chemical waste at any time during the year. So for example, it is now common for the Safety Office to be asked to look after the disposal of acids or reactive chemicals during the school year. Without access to the laboratory facilities which we use during the summer, dealing with these wastes presents a growing challenge. During the coming year, we look forward to engaging an external design specialist who can assist with laying the groundwork for the building of a new facility that will both address deficiencies in the Chemistry Department's bulk chemical storage facility and provide a waste handling facility.

6.3 The 2003 Experience

During the year, the disposal program handled over 5400 individual wastes, ranging in size from a few milligrams to a few kilograms. In total, the program handled almost 8600 kg. - up 10% over the quantity handled in 2002. Of this total, about 2700 kg. was made up of oils, laboratory solvents and other associated dissolved solids. A breakdown of the type of wastes handled is shown below.

Waste Disposal

Toxic and reactive metallic compounds	130 kg.
Scintillation waste	1050 kg.
Various reactive organic chemicals	50 kg.
Contaminated acids	75 kg.
Laboratory solvents and oil	2700 kg
Non-hazardous chemical wastes	240 kg.
Spent batteries (for recycling)	0
Metals (for reprocessing)	0
Sharps and other potentially infectious waste *	2280 kg.

*This quantity represents only a fraction of roughly 24,000 kg. in sharps and potentially infectious waste created by research and teaching laboratories and Clinics in Medicine, Dentistry and Science. Disposal of this material was handled by Facilities Management's Environmental Services.

In addition to this disposal activity, we are increasingly able to reuse or recycle some of these surplus and waste materials. The 2003 totals for materials diverted from disposal are shown below.

Precious metals	30 kg.
Batteries	1101.4 kg.
Paint	120 kg.
Compressed gas cylinders	1510 kg.
Glass	918 kg
ChemEx	75 kg.

Chemical disposal costs can be significant. Since 1992, when much of the chemical waste handling was taken over by the Safety Office, annual disposal costs have run between \$10,000 - \$15,000. As the table shows, 2003 chemical disposal costs were, again, in this range.

* Expenditures do not include contributions to student support provided by Human Resource Development Canada's various student employment programs. In a typical year, HRDC's support is in the range of \$1000 to \$1500.

Year	Annual * Chemical Disposal Cost
1989	\$3,000
1990	\$8,000
1991	\$68,000
1992	\$27,000
1993	\$12,500
1994	\$11,200
1995	\$10,800
1996	\$13,700
1997	\$10,800
1998	\$13,500
1999	\$16,000
2000	\$14,250
2001	\$16,200
2002	\$14,600
2003	\$14,800

6.4 ChemEx

The Safety Office continued to operate ChemEx, the University's Surplus Chemical Exchange Program. Established in 1992, ChemEx diverts surplus chemicals from disposal to use in teaching and research. Although ChemEx primarily serves Dalhousie researchers and teachers, others representing schools, universities and research institutions across the Maritimes, also donate or receive chemicals. ChemEx neither pays for nor charges for chemicals. The Safety Office supervises shipments of chemicals between Dalhousie locations. External participants make their own shipping arrangements. To our knowledge, when ChemEx was launched, there were no similar exchanges operating at any other University. In the ensuing years, safety offices at a number of major universities across the continent have introduced similar programs.

Users continue to make heavy use of the web-based inventory/order system. Researchers across the University, and in neighbouring institutions, are able to search the inventory on the world wide web and electronically place "orders" for items that they are able to use. During the year, ChemEx placed 346 items with a catalogue value of \$17,220. As the table shows, 2003 activity brings the value of chemicals placed since 1992 to well over \$300,000. The value of the exchanged chemicals under-estimates the avoided costs as it does not include shipping or brokerage costs associated with new purchases nor the disposal costs which otherwise would have been incurred.

Year	2003	1992 - 2003
Number of chemicals exchanged	346	6114
Value of chemicals exchanged	\$17,220	\$320,000

7 LEGAL MATTERS

7.1 Regulatory Changes

During the year, there were no major changes in the Federal or Provincial acts or regulations

which would impact Dalhousie's Health and Safety Program. The Halifax Regional Municipality adopted two new by-laws of note. The first, built upon the Province's Smoke-Free Places Act and placed added restrictions on smoking in bars, restaurants and other public areas. With the changed Dalhousie smoking policy, this by-law has little impact on the University. The second by-law established limits on contaminants which may be discharged into the sewer system. During the upcoming year, testing of effluent quality will be required to demonstrate compliance with this new by-law.

7.2 Department of Environment and Labour Inspections and Orders

7.2.1 C Building Air Quality

Concerned that the discomfort he was experiencing was being caused by poor air quality, a faculty member contacted the Department of Environment and Labour, requesting an inspection. An inspector visited the area on several occasions, reviewing the testing that had been done and inspecting the air handling system. Generally satisfied that the appropriate steps had been taken, the inspector did not issue any orders, instead making a few suggestions about additional steps which might be taken to address the employee's concerns. Cleaning, some minor painting and changing furnishings seem to have resolved the matter.

7.2.2 Over-head Work at Fenwick Place

The repair of Hurricane Juan's damage to Fenwick Place, prompted two visits by Department of Environment and Labour inspectors. While passing the building, an inspector was concerned that window replacement work might expose contractors to the risk of a fall. The resulting inspection satisfied the inspector that the appropriate steps had been taken to protect the employees of the window contractor. The inspector, however, did issue orders requiring the contracting firm supervising the repairs to post names of members of the Project Safety Committee and locate an additional first aid kit on-site.

A few days later, a window contractor dropped a piece of window trim. A passer-by reported the incident and the inspector returned. On this occasion, the inspector ordered that the contractor install a covered walkway to protect pedestrians entering or leaving the buildings.

Dalhousie and the contracting companies involved in the work were easily able to comply with the orders within the time frame set by the inspector.

8 TRAINING

Although a number of units and departments across campus provide safety training, the Safety Office is one of the focal points for safety training. During 2003, the Safety Office delivered, or participated in, sessions which provided instruction and information to approximately 500 staff and students.

8.1 Workplace Hazardous Materials Information System (WHMIS)

WHMIS is a set of interlocking Provincial and Federal regulations, created to give employers and employees information upon which they can develop procedures to work safely with chemicals. WHMIS regulation requires employees to be trained in WHMIS, and in how the employee is to apply this information to daily work with chemicals. The Safety Office provides much of the WHMIS training for those whose exposure to chemicals arises in

laboratories or clinics. Although the WHMIS regulation technically only applies to employees, many of those participating in these training sessions are students. During 2003, the Safety Office conducted 10 training sessions for staff and students in Biology, Chemistry, Dental Hygiene, Dentistry, Communication Services, Facilities Management, and Medicine. For the first time, WHMIS training was provided to third year students in the Science Co-op Program.

8.2 Student Security

As has been the practice for 8 years, the Safety Office provided two half-day safety orientation sessions for members of Tiger Patrol, the Student Building Security Service.

8.3 Radiation Safety Training

The Radiation Safety Office also conducts training for all staff and students working with radioactivity. The training meets the terms set in the consolidated licence issued to the University by the Canadian Nuclear Safety Commission. During 2003, the Radiation Safety Officer conducted 4 training courses to about 90 faculty, staff and graduate students. The Radiation Safety Officer also provides in-lab sessions to acquaint research laboratory staff with the provisions of the Transportation of Dangerous Goods Act that impact the receipt of radioisotope shipments.

8.4 Custodial Safety Awareness Training

The Safety Office conducted training sessions to acquaint custodians with the basics of radiation safety and a second session which dealt with biosafety. The sessions were attended by custodians who work on the Carleton Campus where radiation safety and biosafety are of particular concern.

9 OUTLOOK 2004

The Safety Office, like other Dalhousie units, strives to deliver current programs while also addressing emerging issues. Among the issues which we expect to require attention during 2004 are:

9.1 Emergency Preparedness

Hurricane Juan presented Dalhousie, and all of Nova Scotia, with some once-in-a-century challenges. Although Dalhousie weathered the storm fairly well, the University Administration felt the experience highlighted areas in which the University could be better prepared for such large scale emergencies. Accordingly, Dr. Traves has asked a group of campus units, including the Safety Office, to compare Dalhousie procedures with those of other universities to assemble the nucleus of a comprehensive emergency preparedness plan. The first stage of this work is expected to be completed by late spring.

9.2 Smoking

The September 2003 implementation of the new Smoking Policy went quite smoothly and compliance during the fall terms was generally good. We expect, however, that it will take several years of persistent reminding before the new policy becomes fully ingrained as the Dalhousie way of doing things. The Safety Office will likely be among the campus units which will play a significant role in institutionalizing the new policy.

9.3 New Construction

We look forward to the completion of construction of the new residence and breaking ground for the new Management Building. These major construction projects, along with a number of smaller ones, will continue the high level of construction safety work that has been a feature of campus life over the last few years.

9.4 Biosafety

For some years, it has been clear that Dalhousie needs to more fully address biosafety. The level of research involving potentially infectious material continues to grow at Dalhousie. But perhaps even more pressing is the degree of public concern about the release of infectious agents. As a first step, the Safety Office, in co-operation with specialists both within the University and in government, plans to prepare a biosafety manual that will guide students and researchers in their use of these potentially dangerous materials.

MILESTONES IN HEALTH AND SAFETY AT DALHOUSIE

- 1977** Appointment of A. Chisholm as Director of Safety (in addition to duties as an engineer within Physical Plant and Planning).
- 1980** Establishment of the Dalhousie Environmental Health and Safety Committee - a committee composed of both University and Employee Group representatives charged with providing policy advice and presenting an opportunity for the resolution of health and safety concerns.
- 1983** Appointment of Dr. J. Johnson as Director of Safety (at first part-time, later full-time). Dr. Johnson, a physician with many years of service at Dalhousie Health Services, brought to the Program a professional stature and an important skill set.
- 1985** Enactment of the Nova Scotia Occupational Health and Safety Act. This Act mandated the creation of committees and introduced important new workplace rights and responsibilities.
- 1990** Appointment of Dr. Wm. Louch, Director of Environmental Health and Safety.
- 1995** Adoption of the Scent Reduction Program. Supported by the Senior Administration and each of the employee and student groups on campus, the Safety Office launched a program to encourage members of the University to avoid using scented personal care products. The Program also encouraged Facilities Management to re-evaluate its practices to avoid unnecessary chemical exposure which may arise from maintenance and operations of Dalhousie buildings.
- 1996** Enactment of an amended Occupational Health and Safety Act.
- 1997** Amalgamation of Dalhousie University and Technical University of Nova Scotia. The Dalhousie Safety Office assumed responsibilities for environmental health and safety at the Sexton Campus.
- 2000** Amalgamation of Environmental Health and Safety and Radiation Safety Offices. Although the two units had worked closely together for a number of years, it was not until 2000, that the units were formally amalgamated. As part of the merger, changes were also made to the structure and composition of the Radiation Safety Committee and the range of radiation issues addressed by Radiation Safety.
- 2003** Adoption of a campus-wide Smoke-Free policy. Effective September 2003, smoking was no longer permitted in any Dalhousie building, on Dalhousie property, or in any University-owned vehicle.