Welcome to the 2005 winter edition of the REHS Newsletter. This edition contains safety articles pertaining to accident investigation, laboratory fume hoods, respiratory protection and select agents. Additionally, you will find environmental articles on universal waste management and water conservation. If you have a suggestion for a future Environmental, Health or Safety article, please feel free to contact us through the Safety Suggestion Link on our website at http://rehs.rutgers.edu or by contacting us at (732) 445-2550.

Water Conservation Project in Wright-Rieman Chemistry Department

The University is continually considering ways to conserve water. Water conservation saves money, saves natural resources and protects the environment. Under the leadership of Dr. Roger Jones, the Wright-Rieman Chemistry Department on Busch Campus is currently implementing a project to conserve water. Organic chemistry labs utilize rotary evaporators (also called "rotavaps") to remove solvents from reaction mixtures. Rotovaps require a vacuum system to properly remove solvents. There are currently two predominant methods in which a vacuum is achieved:

- Water aspirators
- Mechanical vacuum pumps

The use of water aspirators is discouraged for the following reasons:

- A large volume of water must be used to create a good vacuum. Water aspirators may consume approximately 22 liters/minute when in use. This is not uncommon for these to be used continuously up to 8 hours.
- While in use, volatile solvents are carried from the flask, through the aspirator to the water that is running down the sink, potentially contaminating the wastewater with organic solvents.

The use of the mechanical vacuum pumps eliminates the use of water aspirators, reducing drastically the amount of water used and preventing any contamination of wastewater. Unfortunately, mechanical vacuum pumps are not always used because of their cost, (approximately $4,500/pump).

Other universities, such as the University of Colorado, recently replaced all of their water aspirators with vacuum pumps and reported an estimated water savings of 10 million gallons and $40,000 annually. The University of California – Berkeley has replaced water aspirators with electronic vacuum systems in their College of Chemistry. The following universities prohibit the use of water aspirators in their laboratories:

- Stanford University
- University of Arizona
- Iowa State University
- Harvard University

The Wright-Rieman Chemistry Department will be replacing 30 water aspirators with mechanical vacuum pumps over the next few months. All new faculty in this department will be required to utilize mechanical vacuum pumps. If you have suggestions for a water or energy conservation project at Rutgers, please submit your ideas on the REHS website at http://www.rci.rutgers.edu/%7Erehs/suggestion.php.

For additional information regarding this project please contact Mark McLane at (732) 445-2550 or mmclane@rehs.rutgers.edu.
Universal Waste

Generally, employees/students who generate hazardous waste are required to be trained in the management of these wastes and the proper disposal is coordinated through REHS. Another waste stream at the University is universal waste. The disposal of certain universal waste varies depending on your job function at the University. Universal waste is a classification for “universal” items, which could be more appropriately referred to as “common” waste items. These are common wastes that can have an impact to the environment, if not managed properly. The following are universal wastes managed by the University:

**Light bulbs** - fluorescent, high intensity discharge, neon, mercury vapor, metal halide, and high-pressure sodium

**Batteries (rechargeable)** - Lead Acid, NiCad, NiMH and Lithium batteries

**Consumer Electronics** – Computers, laptops, printers, copiers, tele-facsimiles, VCRs, stereos, televisions, and telecommunication devices

**Mercury Containing Equipment** – Thermometers, barometers, thermostats, mercury switches, and blood pressure devices

Last year, Rutgers University managed more than 300,000 pounds of universal waste. Facilities Maintenance Services, Materiel Services, Housing, Dining and Athletics have done an excellent job managing the majority of these wastes. Universal wastes are also generated (typically in smaller quantities) in research laboratories, administrative offices, and health clinics throughout the University.

If you generate light bulbs or rechargeable batteries please check the REHS waste management section related to your job function at the University. If you generate consumer electronics please contact Materiel Services for pick-up and disposal, and if you generate mercury containing equipment please contact REHS for pick-up and disposal. For more information about the management of universal waste, please contact REHS at (732) 445-2550 or visit our website [http://rehs.rutgers.edu/](http://rehs.rutgers.edu/) and check the waste management section related to your job function at the University.

Select Agent Program

In the wake of September 11, 2001, Congress passed several new laws designed to increase national security and minimize the risk of another terrorist attack on U.S. soil. One of the areas of concern was the potential to use certain biological agents as weapons. Congress identified several of these agents (bacteria, viruses, fungi and toxins) as likely candidates for this type of use. These agents are now referred to as, “select agents.”

The Centers for Disease Control and Prevention (CDC) regulates the possession, use, and transfer of select agents and toxins that have the potential to pose a severe threat to public health and safety. The CDC Select Agent Program oversees these activities and registers all laboratories and other entities in the US that possess, use, or transfer a select agent or toxin.

The U.S. Departments of Health and Human Services (HHS) and Agriculture (USDA) published final rules for the possession, use, and transfer of select agents and toxins (42 C.F.R. Part 73, 7 C. F.R. Part 331, and 9 C.F.R. Part 121) in the Federal Register on March 18, 2005.

Currently, about a dozen University investigators use select agents in their work. They must adhere to additional security measures including, storing the agent under lock and key, maintaining an inventory record of the agent and restricting access to the agent. Most select agents at the University fall under the category of toxin and are used in very small quantities, decreasing their interest to potential terrorists.

If you have questions about the University’s select agent program, please contact Greg Lupinski at (732) 445-2550 or visit the REHS website at [http://rehs.rutgers.edu/lsbio_sa.htm](http://rehs.rutgers.edu/lsbio_sa.htm)
**Respiratory Protection**

Respirators are devices that protect workers from inhaling harmful substances. These may be in the form of gases, vapors, mists, dusts, smokes, fumes, or sprays. Typically, engineering controls such as ventilation and/or substitution of less toxic substances should be the first strategy to reduce worker exposure to harmful substances. However, when engineering/administrative controls are not always feasible, the use of respiratory protection may become necessary.

Respirators can be classified into two types:

- **Air Purifying** – Remove contaminants from the air
- **Air Supplying** – Provide clean air from an outside source

New Jersey Public Employee Occupational Safety and Health (NJPEOSH) regulations require a written Respiratory Protection Program which includes the following:

- Identification and Evaluation of Respiratory Hazards
- Selection of NIOSH approved respirators appropriate for the intended use
- Medical Evaluation of personnel who will be using respirators
- Training of Personnel and Fit Testing of the Respirator

For a respirator to function properly and provide adequate protection from harmful substances, it is critical that the respirator fit properly and be the proper respirator for the hazard. Employees who are required to wear a respirator to perform their job duties, must be included in the University Respiratory Protection Program.

If you are currently using a respirator or think that you require a respirator to perform your job duties, and are not included in the University Respiratory Protection Program, please contact David Fernandez at REHS (732) 445-2550. For additional information regarding the University Respiratory Protection Program please visit the REHS website at [http://rehs.rutgers.edu/](http://rehs.rutgers.edu/).

**Accident Investigations**

Accident investigations are conducted to identify the causes of an accident and to prevent similar, or more serious accidents. It is important to conduct accident investigations with prevention in mind (fact finding not fault finding). All accidents should be investigated so that the hazards are identified and corrected, regardless of the extent of the injury or property damage.

Employees are required to report every accident or incident immediately to their supervisor. Once the supervisor is notified, he/she is required to perform the following:

- Investigate the accident or incident to determine basic causes of the accident and establish corrective measures to prevent reoccurrence.
- Complete and submit the remaining pages of the Accident Report Form within 5 working days of the occurrence of the accident.

Accidents, typically, have more than one cause. Therefore, it is necessary to examine some underlying factors in a chain of events that resulted in the accident. For example, if an employee slipped and fell, the initial investigation may conclude that it was due to poor housekeeping, but we may be missing other causes or corrective measures. You want to ask enough questions to identify all contributing factors. Examples include:

- What caused the slippery floor? Were mats placed at the entrances?
- Was the floor recently mopped? Were there any wet floor warning signs?
- What type of shoes was the employee wearing?
- What was the floor constructed of (wood, vinyl tiles, ceramic tiles, etc)
- What were the weather conditions? What was the time of day? What were the lighting levels?
- Can you think of other questions?

After answering all the questions, you can establish the corrective measure(s) necessary to prevent recurrence. The corrective measures should be practical, effective, immediately communicated and promptly implemented. A follow-up inspection should be performed after the corrective measures are implemented to ensure that they are adequate and effective.

If you have questions or require assistance in conducting an accident investigation, please contact REHS.
Laboratory Fume Hoods

Many laboratories at the University are equipped with chemical fume hoods. Fume hoods are designed to be the primary source of protection from airborne contaminants in a laboratory. Lab personnel must understand how to properly use a fume hood to minimize potential exposure(s) while working in the hood. The following is a list of important guidelines for lab personnel to follow to ensure proper operation of the fume hood:

• When the hood is in operation, the hood sash must be maintained at the proper operating height (typically 12 to 18 inches). This position provides protection by containing contaminants and shielding the worker from items inside of the hood. The operating height is clearly marked by orange and white stickers on either side of the hood opening. While preparing for an experiment, the sash may be raised to the full open position.

• Minimize the amount of objects stored inside of the hood. Large pieces of laboratory equipment may act as obstructions and compromise the pattern of airflow inside of the hood.

• Limit excessive movement while working inside of the fume hood. Rapid arm movements may cause turbulent airflow.

• Make certain that the rear panels, or baffles, are correctly positioned for the intended use. For instance, vapors that are released from solvents are typically heavier than air. The hood baffles should be adjusted at the bottom to effectively capture the vapors. *Note: not all fume hood designs offer adjustable baffle controls.

• All hoods should have a flow indicating device. Make sure the hood is working adequately, by checking the flow indicating device before each use. Please contact REHS if your hood doesn’t have a device.

To ensure the hoods are working properly, REHS performs annual surveys of each fume hood at the University. The survey includes a general check of hood operation, and a quantitative measure of the face velocity. University standards require an average face velocity of 80 to 100 linear feet per minute at full open sash. You can find a record of your hoods most recent survey on the front or side exterior hood panel.

FOS is responsible for the maintenance of all fume hoods. If your fume hood is not functioning properly, please contact FOS. If you have any questions regarding the performance of your fume hood, please contact the REHS office at (732) 445-2550. For additional information regarding the University Fume Hood Program, please visit the REHS website at http://rehs.rutgers.edu/lslab_fh.htm.

Preventing Wintertime Slips

Wintertime brings snow and ice and an increased risk of slips and falls. While the Facilities Department works diligently to remove snow and ice from slippery sidewalks, parking lots and work areas, you still may encounter slippery surfaces while walking around campus. Use the following important tips for winter safety:

• Limit walking to designated walkways as much as possible. Discourage taking shortcuts over snow piles and in areas where snow and ice removal is not feasible.

• Test the travel path for slickness by sliding your shoe/boot on it before proceeding and then take short steps to maintain your center of balance over your feet; never run on snow or ice covered surfaces.

• When entering and/or exiting vehicles, use the vehicle for support. Never jump from vehicles or equipment.

• When entering a building, remove snow and water from footwear so you don’t create wet, slippery conditions indoors.

Report slippery conditions to the Facilities Maintenance Services at the following phone numbers:

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<tr>
<th>New Brunswick Service Desk</th>
<th>Newark Service Desk</th>
<th>Camden Service Desk</th>
</tr>
</thead>
<tbody>
<tr>
<td>732-932-5555</td>
<td>973-353-5441</td>
<td>856-225-6300</td>
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