

Purdue University Preventative Injury Program

by Elena Cool

Four months ago, Radiological Environmental and Management in collaboration with Purdue Staff Benefits initiated a new project called the Purdue University Preventative Injury Program. The principal goal of the program is to eliminate occupational hazards in order to reduce the number of injuries and illnesses at Purdue University.

The Preventative Injury Program now has its own logo and slogan: "I make a difference!" This message to increase personal responsibility and inspire upstream actions is being promoted across campus and in critical target areas, such as Physical Facilities and University Residences. Using this slogan, a proactive injury reduction workgroup is developing strategic plans to reduce slip, trip, and fall injuries among Purdue University employees. Sharing in the enthusiasm of this slogan, University Residences and Physical Facilities safety committees have begun a new academic year.

The major role in the Preventative Injury Program is given to safety committees. Safety



committee members are asked to be actively involved in incident analysis (i.e. brainstorming solutions to prevent similar accidents and injuries), hazard assessment and job safety analysis (i.e. comprehensively identifying and assessing occupational hazards, then systematically eliminating or reducing the risk of these hazards). Management's involvement and support is another essential key to the success of the program.

A new online injury reduction portal will be available to REM customers in October. This portal

will evolve over time and will be a resource for University employees to report the occurrence of injuries, to provide injury analysis tools, to request injury data, and to gather injury prevention ideas. In addition to the portal, new safety workshops will be proposed, such as a Supervisor's Safety Workshop and a Multi-Cultural Safety Workshop.

The Preventative Injury Program logically unites departmental safety champions and all REM sections. One project recently initiated is increasing the awareness of physical haz-

ards in the school of Veterinary Medicine. This collaboration involves many groups both within the School of Veterinary Medicine and REM. A PowerPoint presentation, "Vet Schools' Occupational Hazards," will be developed as an online resource to REM customers.

"I make a difference!" The slogan that drives the Purdue University Preventative Injury Program is simple, but powerful. Make a difference! It starts with a letter "I!"

Computer and Electronic Equipment Recycling

by Brian McDonald



Hard drives are placed on a conveyer belt that will dump them into the shredder.

Rest assured that when you no longer need your computer and other electronic equipment, they are being properly managed by an expert team of University employees. This team from Purdue University Warehousing and Surplus Disposal (Purdue

Warehouse) will first try to repurpose and resale the equipment or salvage useful parts. Sometimes the equipment is obsolete and therefore has little value, but it may contain lead and other heavy metals that are hazardous to humans and the environment if not properly managed.

Please do your part and never dispose of computers or electronic equipment in a solid waste dumpster or abandon the equipment on a dock, an old storage room, or anywhere else on campus.

To ensure all computers and electronic equipment are properly managed, please follow these guidelines:

- Remember electronic media may contain sensitive data. When ready for disposal, electronic media (e.g. flash drives, hard drives, compact discs, magnetic tape, etc.) should be properly destroyed and disposed of.

- For data security requirements, follow ITaP's Media Disposal Guidelines (<http://www.purdue.edu/securepurdue/files/MediaDisposalGuidelines.pdf>).
- Purdue Warehouse offers physical destruction of electronic media accumulated by departments on campus. These data storage devices are shredded onsite and then recycled.
- Call Purdue Warehouse to make arrangements for electronic media destruction and for infor-

mation on the best procedures for you to follow.

- To make arrangements to dispose of computers or electronic equipment:

- First, complete a Property Accounting Equipment Change in Status Form (http://www.purdue.edu/surplus/text/pm_fm9.xls).
- Then, contact Purdue Warehouse at 742-4414 or 742-7386 to request equipment pick up. For large equipment or multiple computers, it may be necessary to make arrangements with the General Labor Crew through the work order process to pick up and transport the equipment to Purdue Warehouse.
- Departments may also deliver the equipment directly to Purdue Warehouse at 3601 Sagamore Parkway North, Suite K, Lafayette, IN 47904. The facility is best accessed from North 9th Street.



Metal debris after a hard drive is shredded.

For questions about repurposing, reselling, or recycling computers or electronic equipment on the West Lafayette campus, please contact the Purdue University Warehousing and Surplus Disposal at 742-4414 or 742-7386.

For questions about the hazards of electronic equipment, off site recycling procedures, and determining if your material is regulated electronic waste, contact Brian McDonald of REM at 49-63712 or bnmcdonald@purdue.edu.

EPA Hazardous Waste Inspection

by Adam Krajicek

Last summer, the U.S. Environmental Protection Agency (EPA) conducted a surprise inspection of Purdue's hazardous waste operations. This inspection consisted of site visits to several research laboratories selected at random in four campus buildings, as well as a detailed inspection of

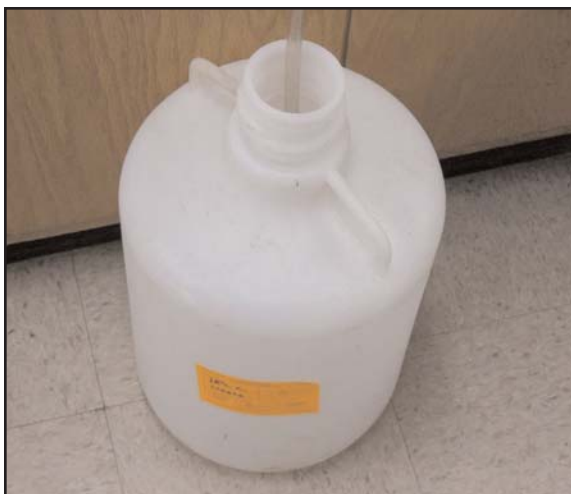


Photo 1: Open HPLC Waste Container

REM's chemical storage and processing facility. Overall, compliance with hazardous waste regulations was very good at the time of the inspection; containers were closed and properly labeled. However, several open HPLC waste containers were witnessed in four separate laboratories. Purdue received official notice of violations for these open containers and was given 30 days to submit a corrective action plan as a result of these open containers. Fortunately, EPA approved the corrective action plan and proposed no fines to be

associated with these violations. The EPA has the ability, however, to fine the University up to \$32,500 per violation, per day and will return at least annually for more surprise inspections. Therefore, it is important to prevent these types of violations from reoccurring.

Keeping hazardous waste containers closed is a very easy problem to solve: simply put the lid back on once waste has been added to a container. But with HPLC waste, it's not always that simple. HPLC machines require continuous waste collection since they often run for long periods of time and automatically discharge small volumes of waste at variable time intervals. Another complication with HPLC waste collection systems is that the waste container cannot be sealed with a tight fitting lid; otherwise pressure will build up and affect the operation of the HPLC equipment and cause a spill. The volume of air in the container must be allowed to vent as liquid enters the container. Because of these issues, a common practice is to place the plastic tube running from the HPLC machine into a waste container without any positive closure of the container; the tube simply lies in the container with no lid. This is exactly what was seen during the EPA inspec-



Photo 2 - Example of a HPLC waste container that can be purchased from Justrite.

tion (see Photo 1).

To respond to these open container violations and EPA's request for a corrective action plan, REM worked with two campus HPLC laboratories to develop a workable solution that is both compliant and practical for researchers. The first, and most ideal, solution is to purchase a waste container specially made for HPLC waste collection systems. These containers are fitted with an opening for the plastic waste tube running from the HPLC machine and a carbon filter that captures any potentially harmful vapor venting from the container (see Photo 2).

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Eyewashes and Safety Showers

by Don Campbell

The 2009 REM eyewash and safety shower crew consisted of Purdue students Christopher Baker and Chad Dillon. For 63 days this summer, they inspected and repaired nearly 2000 eyewashes or safety showers on the Purdue West Lafayette campus. They began their work on May 12, 2009 and finished August 14, giving them some time off before the start of fall semester. Their work took them to more than 100 buildings, including buildings at the airport and on nearby Purdue research farms.

Two large three ring binders prepared by REM Secretary, Phyllis Hill, containing the list of buildings' rooms with eyewashes and showers guided the crew. The crew started in Civil Engineering and finished on the farms. They developed their own order and schedule for completing the buildings.

Each emergency eyewash and safety shower was flushed until the water ran clear. If the eyewash or shower water flow was not correct, the units were adjusted or repaired. Shower water was collected in a 55 gallon drum mounted on a four-wheeled cart and emptied by a sump pump into sinks or floor drains along the way or through a spigot at the base of the drum.

When the crew members started, they were asked to come up with a project to improve the job for next year's crew. Baker and Dillon decided to create a training DVD to pass on insights they discovered to make the job easier. What resulted was an extremely informative and well laid out DVD in which the two took turns providing very



helpful information that will be used for training future eyewash crews.

Eyewash Questions and Answers

Q. I know that REM checks my eyewash annually during the summer, but how do I know that my eyewash is working any other time that I might need it?

A. The American National Standard for Emergency Eyewash and Shower Equipment, ANSI Z358.1-2004, states, "Plumbed equipment shall be activated weekly for a period long enough to verify operation and ensure that flushing fluid is available." A note further states, "The intent is to ensure that there is a flushing fluid supply at the head of the device and to clear the supply line of any sediment build-up that could prevent fluid from being delivered to the head of the device and minimize

microbial contamination due to sitting water."

Q. How do I check my eyewash if the eyewash drains directly onto the floor without a floor drain?

A. Those eyewashes can be modified by your zone plumber to allow a five-gallon bucket to be placed under the eyewash drain pipe. The department will need to initiate a work order for this service. You should consult your building deputy for proper procedures.

Q. What if I find that the eyewash is not operating properly?

A. Submit a work order request for service to your zone plumber to make the needed repairs. Again, your building deputy can assist with this process.

Q. Can REM check my eyewash for me weekly?

A. Sorry, REM does not have the resources to perform weekly checks of the hundreds of eyewashes on campus.

Q. Are there situations where I would want to check my eyewash more frequently than once a week?

A. A daily check would be advisable when working with corrosives and other chemicals that present hazards to the eyes.

More information on eyewashes and safety showers can be found on the Radiological and Environmental Management (REM) website here at <http://www.purdue.edu/rem/safety/shower.htm>.

Cellular Phones and Radiofrequency Concerns

by Mary J. Handy

The concerns over the health effects from radiofrequency (RF) radiation emitted from cellular telephones have increased proportionally with the tremendous expansion of the population which uses these devices. According to Cellular News, in 2003, cell phones outnumbered landlines in the United States, and the average time of use per caller was 490 minutes a month. A February 2009 study reported in The Telegraph (United Kingdom) indicated their nation's average age for first time ownership of a cell phone was, amazingly, eight years of age.

Direct health effects

RF radiation is a form of non-ionizing radiation. In other words, RF radiation does not emit enough energy to cause ionization of molecules, but can cause excitation of the orbital electrons. This excitation can produce a heating effect. Just as microwave radiation (a form of non-ionizing radiation) can be used to heat food, over-exposure to RF radiation can cause heating of body tissue.

The areas of the body that over-exposure could encumber the most damage are the eyes and the testes. These areas do not have much blood flow, so the body's ability to carry away excess heat from these areas is greatly diminished. The Federal Communication

Commission (FCC) requires cell phone manufacturers to ensure that their phones comply with these objective limits for safe exposure.

Many people are concerned that cell phone radiation will cause cancer or other serious health hazards.



The Food and Drug Administration (FDA) states that the weight of scientific evidence has not linked cell phones with any health problems.

Interference with pacemakers and other medical devices

As these cell phones emit RF, there is a potential for interference with other devices that are run by electro-magnetic current; this includes pacemakers, electro-cardiographs, and many other medical devices. The FDA has issued a

draft guidance document intended to assist device manufacturers and other groups on the safety parameters that should be followed in the development and use of these devices.

According to the FDA, cell phones do not seem to pose a significant health problem for most pacemaker wearers. However, for pacemaker wearers that would like to take additional precautions, these steps are recommended:

1. Hold the phone to the ear opposite the side of the body where the pacemaker is implanted. This increased distance reduces the amount of RF exposure to the pacemaker.
2. Do not place the cell phone in a pocket directly over the pacemaker, unless the cell phone is turned off.

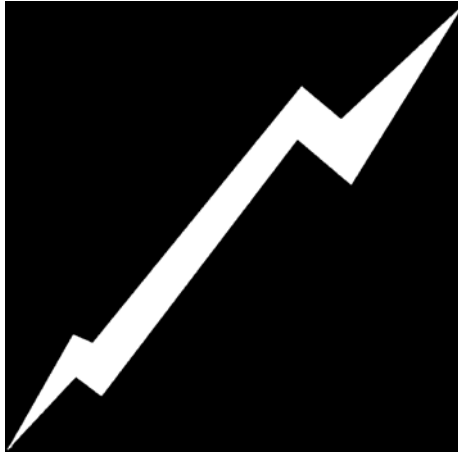
Hearing aids can also receive interference from cell phones, potentially reducing the clarity of hearing (e.g. static, high-pitched tones, buzzing). The FCC now requires cell phone manufacturers to test and rate their wireless handsets' hearing aid compatibility using the American National Standards Institute (ANSI) C63.19 standard. These ratings indicate the likelihood of hearing aid interference from cell phones. Hearing aid users should read and understand these ratings when choosing a cell phone.

Arc Flash Hazard Identification

By Alan Gerth

Radiological and Environmental Management recognizes and sends sincere appreciation to Mike Jones, Senior Electrical Engineer in the Office of the University Architect, for his initiative in pursuing and helping in the development of a comprehensive plan to perform an arc flash analysis for all new and existing buildings, as well as, electrical renovation projects.

Arc flash is an electrical explosion that can rapidly vaporize metal conductors, blast molten metal and expanding plasma outward with extreme force. The arc flash analysis



will help quantify the hazards university electricians will face when testing and troubleshooting energized circuits, thus allowing them to determine the correct PPE to wear. It will also identify equipment that is particularly hazardous and help develop strategies to lessen the hazard, such as replacing a slow-opening circuit breaker with a faster model.

Thank you, Mike Jones, for taking an initiative and making a difference!

Updated Electrical Standard

by Alan Gerth

NFPA 70E, the Standard for Electrical Safety in the Workplace, has been updated. The 2009 edition updates the 2004 standard. NFPA 70E is a consensus standard that provides guidance on how to follow the requirements of OSHA 1910 Subpart S Electrical Standard, as well as, other OSHA electrical regulations. This will affect all employees who perform electrical work, from operating a circuit breaker or fused switch on a 208/120 volt electrical panel to those performing testing and troubleshooting on electrical equipment above 50 volts.

Some changes include:

- Stricter PPE standards
- Specifying requirements for using voltage

detectors

- Documentation of training of qualified persons
- Field marking incident energy levels and required PPE determined from arc flash analysis
- Periodic review and exceptions of arc flash analysis
- Redefining "working near" as "working within the Limited Approach Boundary" with the corresponding distance tables

Much more is to come. Feel free to contact REM Occupational Safety Professional Alan Gerth with any questions (62089 or amgerth@purdue.edu).

EPA Hazardous Waste Inspection

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REM strongly recommends purchasing these types of containers if waste solutions contain high concentrations of organic solvents. These containers can be purchased from laboratory equipment companies such as Lab Safety, Fisher Scientific, Justrite, and Analytical Sales and Products. Contact REM for more details.

The second option is to modify an existing cap or container. An opening for the plastic waste tube and a small vent hole can be drilled into an existing cap (*see Photo 3*). This system should only be utilized with waste solutions containing high water content (>70 percent).



Photo 3 - Examples of modified containers

Remember, the EPA conducts hazardous waste inspections at Purdue annually. Operating laboratories in full compliance with hazardous waste regulations ensures no worries when the EPA

decides to conduct one of these surprise inspections. If you have any questions, please feel free to contact Adam Krajicek (49-63072; arkrajicek@purdue.edu).

New face in REM: Amy Theivagt



Amy Theivagt has joined REM as a Hazardous Waste Chemist. She earned a bachelor's degree in Chemistry and Biochemistry/ Molecular Biology from Illinois State University before coming to Purdue. She then worked as a graduate research assistant for three years and earned her Professional Master's degree in Animal Science.

Amy first worked as a student hazardous materials technician before becoming a professional chemist for REM. Some of her primary responsibilities as a Hazardous Waste Chemist include managing the unknown chemical characterization and chemical treatment programs.

Welcome aboard, Amy!

Safety Tip: Mower Mirages

by Don Campbell

Some things aren't really there, but only appear to be. An example is a highway water mirage. As the "lake" is approached, it vanishes and a highway takes its normal place.

On the other hand, some things are there, but don't appear to be. Spinning fan blades, airplane propellers, and mower blades are examples. While stationary, they're visible, but move them quickly enough and they vanish leaving behind only a blur.

Now, no one has ever drowned driving into a highway lake mirage, but many have painfully discovered invisible mower blades where none seemed to exist. Get chummy or drop your guard around a rotating pound-and-a-half chunk of flattened, sharpened steel and you might as well be a nearsighted dentist without their glasses working on

an alligator. Someone is going to get hurt, and for sure it will not be the mower blade or the alligator.

A 3 HP mower engine spins a blade as much as 3200 RPM. The tip of a 20-inch blade travels a distance of 62.8 inches with each revolution or 190 MPH, about the speed of an Indy Race Car! By waiting for a break in traffic, it is possible to walk across the track at Indy's 2.5 mile oval on race day without getting a scratch, but a mower blade tip passes by every 0.009 seconds. That doesn't leave enough time for you to get out of the way!

So remember, two blade tips are in hot pursuit under the deck the next time you or a member of your family mow, and even Helio Castroneves would have a tough time keeping up in the turns.



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Purdue University
Radiological and Environmental Management
Civil Engineering Building, Room B173
550 Stadium Mall Drive
West Lafayette, IN 47907-2051