



# n o t e s

ENVIRONMENTAL HEALTH and SAFETY

## Personal Protective Equipment (PPE): Its Maintenance, Storage & Use

A comprehensive personal protective equipment (PPE) program not only can be one of the easiest safety and health programs your department can implement and maintain, but it also can be one of the most beneficial.

Before we even consider PPE we must follow the hierarchy of controls (Engineering, Administrative and then PPE). First take the hazard out of the work areas by instituting engineering controls, e.g., ventilation hoods, gas cabinets, guarding, etc. Then, consider administrative controls, e.g., limit the amount of time an individual is allowed to work with or is exposed to a given hazard. Last is personal protective equipment. Since PPE can fail, and relies on the worker to use it properly, and leaves the hazard in the workplace, PPE is always our last line of defense against workplace contaminants and physical hazards.

We use PPE when engineering controls are not adequate to control exposures, during emergency and clean-up procedures, to supplement engineering and administrative controls, and sometimes simply for comfort.

Why do we use PPE? Experience tells us that we can prevent most workplace injuries with

the help of properly selected, worn and maintained PPE. In some cases it's also the law!

According to state law all employees are required to wear at least safety glasses in our laboratories. Most laboratories also require gloves and lab coats, plus other unique PPE. In the United States, thousands of people are blinded each year from work-related eye injuries that could have been prevented with eye protection. According to OSHA, eye injuries alone cost more than \$300 million per year in lost production time, medical expenses, and worker compensation.

Common types of PPE include the following:

- Eye and face protection, e.g., safety glasses, safety goggles, safety side shields, face shields, laser and welding shields;

**(Continued on page 3)**

### In This Issue

Personal Protective Equipment	1
Lessons from Emergency Planning	2
Got Mercury?	4
Good News for rDNA Research	5
New Dosimetry Contract	6

**EHS****Director's Desk****Safety Lessons from  
Emergency Planning**

The February blizzard gave us a lot to talk about, but most would just as soon not go through the experience again. Our campus has put a lot of energy into emergency preparedness and that energy paid off in a big way when the blizzard hit. Because of previous planning activities, decision makers were well-equipped to make good, timely decisions about campus operations. Many thanks go out to those employees who put so much effort into clearing streets, walks and parking lots, as well as those that provided other essential services for campus. Our personal and work lives were greatly disrupted, but I think all of us can see that things could easily have been much worse.

Now that the blizzard is behind us, what safety lessons can we apply going forward? First, significant and potentially hazardous disruptions to our work can occur due to factors that are not controllable. However, many of these hazards can be anticipated and steps can be taken to reduce or eliminate undesirable consequences. For example, if you have an emergency eyewash and safety shower in your laboratory, it should be readily accessible at all times. Don't pile up stuff that blocks access. Likewise with fire extinguishers—keep them readily accessible and make sure you know how to use one without having to spend a lot of time on refresher training if a fire occurs.

Second, good planning and written procedures help lead to better and more efficient work, facilitate analysis of potential hazards, and help restore normal operations in the event of unexpected disruptions.

Third, provisions should be made to back up essential written and electronic records. What would you do if your work area records were damaged by fire or you lost your computer records? It ought to go without saying that backups should be kept in an alternate location.

Fourth, make sure you know how to contact emergency responders in the event of an emergency. The quicker the response, the less the consequences of the emergency. Also, communicate with important contacts in the event that your normal communication resources (office phone, office computer, etc) are not available.

Last, having an emergency plan can prevent hazards and enable a more efficient response in the event of an emergency. Fortunately, emergencies don't happen very often. Spending some time preparing for emergencies is time well spent not just for you, but for those around you. For emergency resources a good start would be to visit our EHS web page: <http://ehs.missouri.edu/other/er/>

**Peter Ashbrook****Guidance to Faculty for  
Emergencies**

EHS periodically receives requests from faculty about procedures in the event of an emergency. In response we have prepared a handout that summarizes procedures in the event of different types of emergency situations. This handout can be found at: [http://ehs.missouri.edu/other/pdf/faculty\\_er\\_guide.pdf](http://ehs.missouri.edu/other/pdf/faculty_er_guide.pdf)

Teaching assistants and other non-faculty instructors may also find this of interest.

## PPE Continued

- Hand protection, e.g., gloves and barrier creams;
- Head protection, e.g., hard hats;
- Hearing protection, e.g., earplugs and ear muffs;
- Foot protection, e.g., boots with metatarsal guards and/or steel toes, slip and puncture-resistant soles;
- Body protection, e.g., high-visibility vests, coveralls, welding leathers, life jackets or buoyant work vests, chemical suits and skin protection (sun block)
- Respiratory protection, e.g., half-face, full-face and supplied-air respirators and two-strap irritant dust masks; and
- Fall protection, e.g., personal fall arrest systems, harnesses and lanyards.

Employees can provide their own PPE. The employer (MU in our case), however, must ensure the PPE is adequate for the job and is maintained properly.

## Maintaining PPE

An effective system of maintenance of PPE is essential to make sure the equipment continues to provide the degree of protection for which it is designed. Therefore, the manufacturer's maintenance schedule (including recommended replacement periods and shelf lives) must always be followed. Inspect PPE before each use. With most PPE, it only takes a few minutes to inspect the equipment for any breaks, tears and visible signs of stress or damage. Maintenance may include: cleaning, examination, replacement, repair and testing. You may be able carry out simple maintenance (e.g. cleaning), but more intricate repairs must only be carried out by

competent personnel. Immediately remove any damaged equipment from service until a competent person or a manufacturer's representative can certify the equipment for use. If not authorized by a manufacturer to repair PPE, do not attempt to fix it.

The costs associated with the maintenance of PPE are the responsibility of the employer.

## Storage for PPE

Where PPE is provided, adequate storage facilities for PPE must be made available for when it is not in use, unless the employee may take PPE away from the workplace, e.g., footwear or clothing. All PPE must be stored in a clean and sanitary condition ready for use. Accommodation may be simple, e.g., pegs for waterproof clothing or safety helmets, and it need not be fixed, e.g., a case for safety glasses, a container in a vehicle, or zip-lock bags on a designated shelf. Storage should be adequate to protect the PPE from contamination, loss, damage, water or sunlight. Proper storage often requires a dry and clean place that is not subject to temperature extremes. A hard hat hanging in the back window of a truck, for example, may suffer sun and heat damage that prematurely ages the shell, reducing worker protection. Where PPE may become contaminated during use, storage should be separate from any storage provided for ordinary clothing.

## Provision and Replacement of PPE

Some departments maintain a supply of PPE. Individual units may arrange for the supply of required PPE to staff. Regardless of the arrangements for supply, it is a

## PPE Continued

management responsibility to ensure that correct PPE is available and a program is in place. When considering arrangements for providing replacement PPE it must be remembered that unless a task requiring PPE can be stopped, avoided or delayed until new PPE is obtained, replacement PPE must always be readily available.

### Duties of employees regarding PPE

Employees must take reasonable steps to ensure that PPE provided is properly used. For example:

- PPE must be worn and used in accordance with the instructions provided;
- Employees must take all reasonable steps to ensure that PPE is returned to proper storage after it has been used (unless the employee may take PPE away from the workplace e.g. footwear or clothing);
- PPE must be examined before use;
- Any loss or obvious defect must be immediately reported to their supervisor; and
- Employees must take reasonable care of any PPE provided to them and not carry out any maintenance unless trained and authorized.

If you have any questions about proper selection, use and/or storage of PPE, visit our web site (<http://ehs.missouri.edu/ppe/>) or contact EHS at 882-7018.

**David Dorth**  
Safety Representative

## Got Mercury?

Mercury is a potent neurotoxin. If released into the environment it may bioaccumulate in some of the fish that we eat – the number one source for mercury exposure and poisoning in humans in the 21st century. Other exposures may also result from breaking mercury-containing devices (e.g., thermometers) or using mercury-containing compounds. For a number of years, EHS has actively worked with the campus community to eliminate as much elemental mercury from the campus as possible. However, we've had to make one notable exception through the years: when ASTM International (originally known as the American Society for Testing and Materials) standards or other rules and regulations required the use of a calibrated mercury thermometer. Recent information received indicates that the rationale for this exception will soon be invalid.

In 2006, ASTM was first petitioned to reevaluate standards that required the use of mercury, culminating in a 2008 strategy for phasing out these mercury standards. A timeline was developed in conjunction with US Environmental Protection Agency (EPA), the National Institute of Standards and Technology (NIST) and a host of other agencies. NIST estimates that approximately 300 of the 700 standards that required the use of mercury thermometers have been amended to also allow the use of non-mercury and digital technologies, and that the remaining standards should be addressed within three years. To help accelerate the overall process, NIST announced in February 2011 the institute

would no longer provide calibration services for mercury thermometers effective March 1, 2011.

If you have retained a mercury thermometer because a standard applicable to one of your processes required it, you should determine if that standard has been updated. EHS continues to fund a program to replace mercury-containing devices with non-mercury alternatives and this may be an ideal time to finally remove the remaining mercury devices in your possession. For more information on EHS' mercury replacement program go to <http://ehs.missouri.edu/chem/mercury.html>.

For more information about this collaborative effort between EPA and NIST, including specific details on migrating from a mercury thermometer to an alternative see: <http://www.epa.gov/hg/thermometer.htm>

**Todd Houts**  
Assistant Director

## Good News for Recombinant DNA (rDNA) Research

In the Recombinant DNA (rDNA) research world, it seems we see more and stricter regulatory requirements all the time. Some of these requirements are close to crossing the line of good and practical science. Well, on January 19, 2011, the NIH Guidelines were revised to exempt most experiments involving breeding of transgenic rodents housed under BL1 (Biosafety Level 1) conditions.

This is very welcome news for rDNA Researchers. There are still two types of these experiments that need to be registered and eventually approved by the Institutional Biosafety Committee (IBC):

- Breeding experiments involving transgenic rodents that contain more than 50 percent of the genome of an exogenous eukaryotic virus from a single family, in order to prevent inadvertent reconstitution of an exogenous virus in the resultant transgenic rodent; and
- Breeding experiments in which the transgenic rodent's transgene is under the control of a gamma retroviral long terminal repeat (LTR), in order to address the small risk of recombination with endogenous retroviruses which could potentially result in mobilization of the transgene via a replication-competent mouse retrovirus.

Please contact EHS Biosafety (882-7018) if you have any questions on this "new" rDNA exemption using transgenic rodents under BL1 conditions. Refer to the NIH website for additional information: [http://oba.od.nih.gov/rdna/news\\_events\\_oba.html#RAC](http://oba.od.nih.gov/rdna/news_events_oba.html#RAC).

Also, your EHS Biosafety Team thanks all MU Researchers, with current IBC applications, for completing their "Annual Online Biosafety Protocol Survey". This annual survey keeps MU Researchers in compliance with CDC, NIH and MU policy requirements.

**Roger P. Riddlemoser**  
Assistant Director



## ENVIRONMENTAL HEALTH AND SAFETY

8 Research Park Development Building  
University of Missouri  
Columbia, MO 65211

(573) 882-7018  
<http://ehs.missouri.edu>

### New Dosimetry Contract

Last fall MU, along with our other sister campuses and MURR, started working on the review of our Dosimetry contract with Landauer, which expired at the end of December. As is protocol for contract renewals, we put the contract out for competitive bids. As a result of this process, we have awarded a three year contract to a company named Mirion to supply dosimetry to the University of Missouri System.

What this means for you is that Radiation Workers will receive new looking whole body as well as ring dosimeters (commonly referred to as badges) from Mirion. The new dosimetry badges from Mirion have already been delivered to EHS and have been sent out to campus and the hospitals. However, below is a checklist to make the remainder of this a transition smooth for everyone:

- When the new Mirion dosimeters are received please check that your staff has the correct type

and number of dosimeters (whole body, collar, finger rings, etc).

- If replacement Mirion dosimeters are not available or missing in your tubs from EHS, please call Crystal Childers at EHS 882-7018 as soon as possible so we can rectify this deviation.
- Please return all Landauer dosimeters and their holders to EHS as soon as possible. We will need to return everything to Landauer as soon as possible as our contract with them ended on December 31st.

**IMPORTANT NOTE:** The fees charged for lost dosimetry will increase with Mirion. Lost badge fees will be charged at \$12.00 and any late dosimeters will also be charged, but at the same rate as before, \$4.00. Thanks in advance for your cooperation as we make the transition to Mirion.

**Jack Crawford**  
**Radiation Safety Officer**

*EHS appreciates campus support of environmental and safety issues. If you have any special needs regarding the format of this publication, or have any comments regarding newsletters, training programs or services, please direct your communications to Rebecca Bergfield, Editor at the above address.*