

The Challenge of Non-Occupational Radiation Exposures

by the ALARA Committee

For those of us who are Radiation Safety-qualified and even those of us who are not it is important to understand the impact of non-occupational radiation doses. In this case “non-occupational” means dose(s) received from things other than the experiments (and related items) at PPPL. It can sometimes be a challenge for our folks in the Health Physics Division to decipher the source of out-of-the-ordinary doses received by individuals at PPPL. It is important to understand that the dosimetry worn by individuals at PPPL is used to determine our occupational exposure while at work. While the folks in Health Physics usually determine that the cause of an issue is natural background radiation from buildings or other naturally occurring sources (items such as some stoneware, glassware, and other building materials), there are times when an explanation is difficult for these out-of-the-ordinary exposures. This brings us to another major source of non-occupational doses – nuclear medicine.

Radiopharmaceuticals

Many of us are subject to health-related tests that are performed using radiopharmaceuticals. Nuclear stress

tests, positron emission tomography (PET) scans, and whole body bone scans are just some examples of these types of tests. These tests typically are performed using a short-lived radioisotope along with a pharmaceutical or radiopharmaceutical. The radiopharmaceuticals are used because they allow physicians to see things in the body that they cannot otherwise see with available diagnostic equipment.

These types of tests could expose an individual to radiation and could expose others when he or she returns to the Lab. That’s why radiation workers should leave their dosimeters at work prior to undergoing tests that use nuclear medicine. Also, all PPPL employees who undergo tests that use nuclear medicine should report to Health Physics when they return to work for further instructions.

Keep in mind that nuclear medicine can affect not only you but also the people around you. Your doctor can tell you how long it will take for the isotope being used to decay to a level where it does not pose a problem to others, and the Health Physics Division can provide valuable information as well. ■

Supervisors, Hold a Small Group Safety Meeting!

By Neil Gerrish

As a supervisor, are you seeking ways to invigorate your workers when it comes to safety? Consider holding a small group safety meeting led by a Safety Division representative. Your workers will benefit from an informative session relevant to their specific duties and walk away with knowledge they can put to immediate use. We can cover a topic of your choice or suggest subjects that are relevant to your group.

Demonstrate your commitment to your workers’ health and safety by periodically highlighting health and safety issues. Small group safety meetings can accommodate your schedule - the length and frequency are up to you. You can even make a safety talk part of an existing meeting if that’s what’s best for your group.

Such meetings are the perfect platform for your staff to ask questions and bring up concerns. Ensure that your team is on the same page when it comes to procedures

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Group Safety Meeting

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and up-to-date on the latest requirements and best practices. The Safety Division is already holding regular meetings with several groups. Not only have these meetings been well received, they've also resulted in productive conversations and allowed us to be proactive in anticipating future needs.

The ESH&S Department provides general safety information to the Laboratory staff in a variety of ways but if you want an engaging, personalized session tailored to your specific requirements and interests, call Bill Slavin at x2533 or Neil Gerrish at x2531.

If you prefer to conduct your own safety meeting, keep the following in mind:

- Know what you want your attendees to know or do at the end of the meeting.
- Make the subject of the meeting specific and relevant to the type of work that is conducted.

You might want to discuss changes in policy or procedure.

- Set a time limit to help you focus your remarks: 15 minutes is generally long enough. Leave time for questions or discussion.
- Maintain a positive attitude to inspire those around you.
- Use personal stories or experiences that relate to your topic to drive the point home.
- Try not to preach. Ask questions to engage your audience.
- Recognize the good work the group has done and offer specific praise.

Remember: your goal is to pass along relevant information that can help prevent an incident. You can have a tremendous impact and all it takes is a few minutes! ■

STOP Program Refresher

By Dorothy Strauss

Conducting STOP observations reinforces the importance of safe work practices across every activity undertaken here at PPPL. Below is a brief refresher on how to conduct a successful audit.

OBSERVE

Observe workers while they are working. You can observe anyone on site. Consider:

- Body positioning
- Need for personal protective equipment (PPE) and appropriateness of PPE selected
- Procedures or expected practices governing the work
- Workers' use of tools
- Housekeeping practices employed by the worker(s) you observe (not area conditions independent of work taking place)
- Potential injuries or illnesses that could arise as a result of the task(s) being performed.

COMMUNICATE

Observation by itself has little value. Speak with the worker(s) you observe.

- Offer specific praise for any safe practices in use. "Thank you for keeping wires out of the walkway" or "thank you for wearing your side shields" has a far greater impact than a generic "good job."
- If you find any unsafe practices being used, it is important to get the worker to recognize the

hazard, rather than merely pointing it out to them. "What could happen if . . .?" is a good way to broach the subject.

- Determine the reason why the worker is working unsafely. Address the cause and not the symptom. Is PPE unavailable or uncomfortable? Is time inadequate to perform all steps of a task safely? Are expectations clear and understood?

REPORT

STOP cards provide valuable data that help the Laboratory ascertain safety-related trends and address them proactively.

- Provide a detailed account of your interaction, including any praise given.
- Be sure to include reasons given for unsafe actions.

REMEMBER

- Leave names and any identifying information regarding those you observe off your card.
- Let the ESH&S Department know if you need help, additional training, or if you'd like one of us to accompany you on a STOP observation. We want to make this easy for you!
- Your interactions with others demonstrate that safety is important to you, have a positive effect on our safety culture, and ultimately reduce the risks of worker injuries!

What You Need to Know About Parking Decals

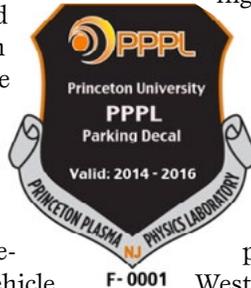
A reminder to staff that all vehicles on site are required to display the CY 2014 - CY 2016 parking decal at this time. The Parking Decal Request Form may be found at <http://ppplparking.pppl.gov/parkreq.aspx>. Once vehicle information is received in the Badge Office, your new decal(s) will be issued and mailed to you via interoffice mail. If you wish to pick up your decal(s) in person at the Badge Office, please contact Dina Christie in the PPPL Badge Office at Ext. 2898 or at Badge@pppl.gov. The decal should be displayed on the vehicle's rear side window (driver's side).

We were reminded of the importance of vehicles having new decals recently when a vehicle in the Lower Lot was parked directly below perilously swinging tree limbs. Without a decal, it was difficult to find the owner of this vehicle. The delay in locating the vehicle owner could have resulted in damage to the ve-

hicle. Thankfully, the owner was found in time and the vehicle was moved to allow professionals to begin tree limb removal work.

Remember that the privilege of operating or parking a motor vehicle or bicycle on the PPPL site is granted by PPPL on the condition that all staff members comply with the PPPL Parking, Traffic and Bicycle Regulations. Please read these regulations found at <http://www-local.pppl.gov/docs/ParkingRegs.pdf>. The regulations are also available on the PPPL Employee Services Home Page. Vehicles with a valid PPPL parking decal may park on main campus in the West Garage and in Lot 21.

If you have any questions concerning the new parking decal or the Parking, Traffic and Bicycle Regulations, please contact the Site Protection Division at Badge@pppl.gov.



Personnel Update

We welcome **DINA CHRISTIE**, right, to the Site Protection Division. Dina will be assisting with program and project support, administering the Personnel Security Program (including badging), and providing administrative support for the Division.

Dina has a BS in accounting and management information systems from Drexel University. She is also a certified fitness personal trainer. You may reach Dina on ext. 2898.



New E-Mail Address for Badge Office

The PPPL SPD Badge Office has a new e-mail! Badge@pppl.gov. This e-mail address should be used by staff for all issues concerning badges, lanyards, keys, card reader access requests, etc. The new e-mail address allows the Badge Office to continue to respond to badging requests in a timely fashion. Please begin to use this new e-mail address today. Remember, the in-person Badge Office hours are Monday thru Friday, 9:30 a.m. - Noon and 1:30 p.m. - 3 p.m. The Badge Office is located in MOD VI.

Safety Contest

CAPTION THIS PHOTO FOR A CHANCE TO WIN A \$20 GIFT CERTIFICATE TO THE PPPL PLASMA HUTCH!

The Safety Division will judge the entries and the winner will be announced via email and in the next ESH&S Newsletter. Submit your entries to dstrauss@pppl.gov by Friday, March 21. Safety Division members are not eligible.

Congratulations to Leanna Meyer, who won the November 2013 ESH&S Newsletter Safety Contest!



Tips for a Healthy Back

By Bill Slavin

The PPPL Occupational Medicine Office hosted Chris Blessing, a registered physical therapist from Princeton Healthcare, who gave a presentation titled “Maintaining a Healthy Back and Body” on Jan. 28. *For those of you who may have missed it or would like to know more, here is some critical information on preventing back injuries:*

You place stress on your back every time you bend over, lift something heavy, or lean forward in your chair. Too much stress, or even repetitive moderate stress can cause the discs in your spine to bulge or rupture, putting pressure on your spinal nerves, resulting in severe pain in your back and legs (sciatica). Other types of back problems occur from damage to the muscles, ligaments, or tendons in your back. All of these types of injuries frequently require medical attention, including surgery. *Here are some ways to prevent the problem:*

Sitting

A long time spent sitting in your chair or car can cause muscle spasms and poor blood flow to your back. The worst posture is sitting and leaning forward in your chair because that places additional strain on the discs in your spine. Prevent damage by getting up and moving as often as possible. PPPL generally recommends getting out of your office chair at least once per hour. If driving, stop as often as you can to get out and stretch or walk around for a few minutes. Use good posture when seated. Your feet should be flat on the floor and your chair set up so that it supports your back. If necessary, a small pillow or rolled up towel can be placed behind your lower back to provide additional support. Don't keep anything in your back pockets when sitting, especially things like a wallet, because that can throw your spine out of alignment.

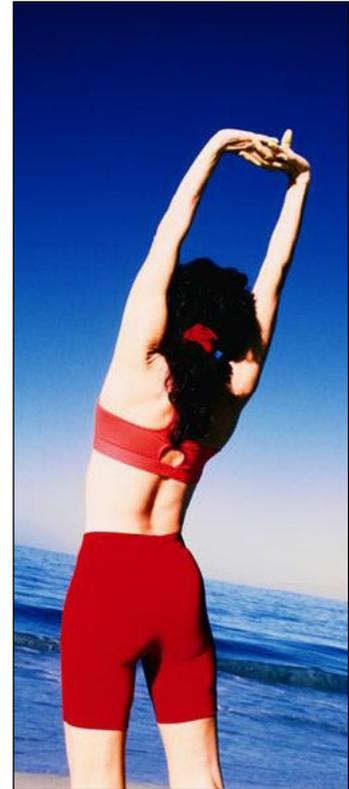
Lifting

Poor lifting technique can easily cause damage to your back. Here are some basic methods for proper lifting:

- Bend your knees and keep your back straight. Don't bend at the waist.
- Tighten your stomach muscles (abs). This provides support for your back.
- Keep the object as close to you as possible. The farther away it is, the more stress it places on your back.
- Keep objects between your knees and your shoulders whenever possible. Lifting or holding objects higher or lower creates greater strain. Avoid placing objects on the floor when you will have to lift them again.
- Know the weight of the object and don't lift anything heavy. The maximum allowed lift at PPPL is 50

pounds per person, but this should be reduced based on your physical condition.

- Don't twist while lifting. This puts immense stress on your spine. If you have to turn, move your feet, not your waist.
- Lifting even light objects improperly can cause back damage just from the movements and posture you use. Forgetting to use good technique when picking a pen or paperclip off the floor can still cause injury.



Exercise

Exercise can hurt or strengthen your back. Know your limits. Weekend warriors and athletes often suffer back injuries because they exceed their physical abilities. One of the best ways to prevent a back injury is to perform back strengthening and stretching exercises. Talk to your doctor or with the PPPL Occupational Medicine Office to learn what you can do to improve your back health without increasing your risk of being injured.

Resources

PPPL offers many resources to help you stay healthy and safe. The Occupational Medicine Office is available for consultation and the PPPL Safety Division can help with ergonomic evaluations of computer workstations or physical tasks. The Industrial Hygiene website has an office ergonomics help tool at <http://www-local.pppl.gov/ihs/Ergo/Main.html> and you can request an evaluation at <http://www-local.pppl.gov/ihs/Ergo/EvalRequest.html>. Remember that this request form is not just for computer stations but also for any job done at the Lab. We're also happy to answer any questions about back safety outside the Lab, since injuries that occur outside the Lab will affect your performance here. For questions or further information, contact Bill Slavin at x2533 or bslavin@pppl.gov. ■

Lessons Learned – Vague Scope of Work Hinders Adequate Hazards Review and Control, Results in Personnel Acid Exposure at Another DOE National Laboratory

By Jerry Levine (Based on DOE Lessons Learned Database)

Lessons Learned Statement:

The objective of Integrated Safety Management (ISM) Core Function 1 is to define the work activities necessary to accomplish the work in a safe and environmentally sound manner. Defining these activities clearly and completely is critical to successfully identifying and analyzing hazards (ISM Core Function 2), and, subsequently developing and implementing the hazard controls necessary to accomplish the work in a safe and environmentally sound manner (ISM Core Function 3). In this case, a vague scope of work that hindered the hazards review and control process resulted in two personnel at another DOE Laboratory experiencing acid burns that required hospitalization.

Discussion:

Three personnel working to a documented work plan titled “Synthesis of Energetic Materials” were exposed to strong acids ejected from a reactor vessel (see photo). Two experienced acid burns on their faces, extremities, and torsos that resulted in their being hospitalized. Ejection of the acids was a result of an unanticipated exothermic reaction initiated by the rapid addition of fuming sulfuric acid to the reactor vessel’s contents.

Analysis:

A post-event review of the work plan directing this work revealed that it did not adequately describe the processes to be used. A key example of this is that the work

instructions authorized use of the fuming sulfuric acid, but did not provide information on how or when it was to be used. This lack of specificity prevented Environment, Safety & Health personnel and other relevant subject matter experts from understanding the full scope of the operation and, therefore prevented them from fully evaluating the associated hazards and identifying effective process and hazard controls.

Actions:

1. In the work plan, define work at the task level in a step-by-step manner with sufficient detail and clarity to allow the work planning process to:
 - identify hazards associated with the work,
 - select and implement appropriate controls,
 - develop necessary schedules and priorities, and
 - produce work instructions that ensure the personnel performing the work understand the tasks, hazards, and controls implemented to ensure safe completion of the work scope.
2. Make sure personnel understand what constitutes a process or scope change and that work must stop until the change control process produces work instructions that address all the components listed in item 1 (above).



SYNTHESIS EQUIPMENT AND WORK LOCATION

Per PPPL Procedure ESH-004 (<http://bp.pppl.gov/procedures/esh004.pdf>), a job hazard analysis (JHA) is to be performed at the task level when the activity has matured to the point where detailed steps and procedures have been identified. The JHA must be corrected if the scope of work should change, if new hazards are identified or are introduced, or if new control measures are to be utilized. The JHA must also be reviewed and modified if necessary to address new hazards or control if changes are made to an associated procedures. All affected workers must be briefed on the changes to the JHA.

Successful EMS Audit

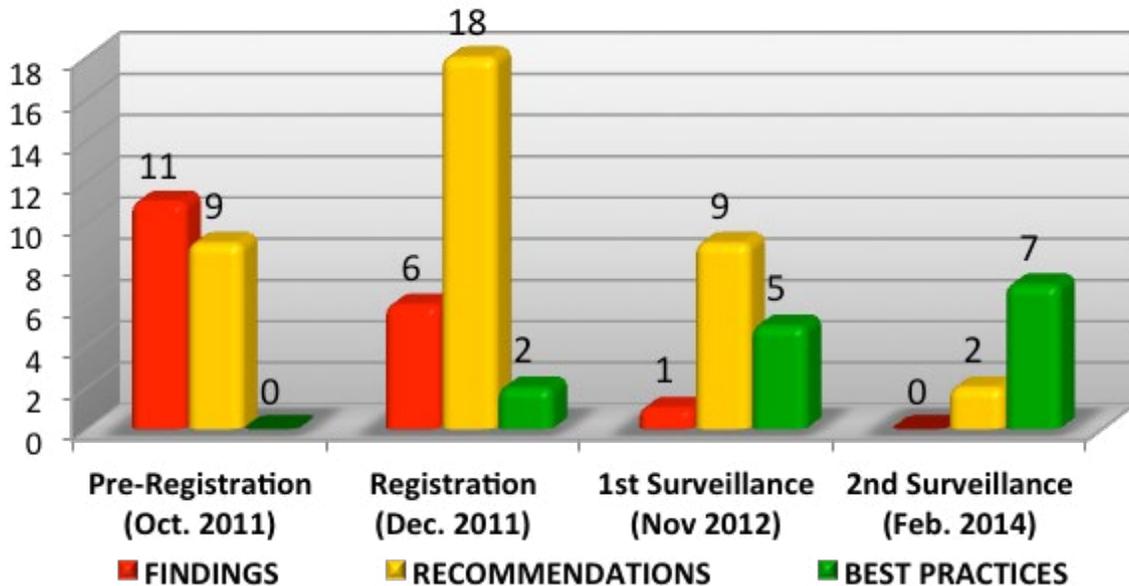
Despite several snow-related closures during the week of Feb. 3 to 7, PPPL successfully completed the annual maintenance audit of its ISO14001-certified Environmental Management System (EMS). The global ISO14001 Standard outlines requirements that organizations commit to as part of the certification process. Among these requirements is to have an independent auditor review the system and its implementation against the Standard. A comprehensive certification audit is conducted every three years and is accompanied by smaller annual “maintenance” audits.

David Powell, a certified lead auditor from the global auditing firm UL-DQS, completed the annual maintenance audit and recommended continuation of PPPL’s certification. Powell spent the two snow days that week reviewing various plans, procedures, and other documents. This off-site review enabled him to focus the remaining time on interviews and site visits throughout the Laboratory. This was Powell’s third visit to PPPL, having been part of the initial certification audit team and having conducted last year’s maintenance audit. Having continuity in the audit team is important because of the complexity of PPPL’s operations.

This year’s audit was very successful in that no findings or “non-conformities” were identified. Powell found two “opportunities for improvement” or recommendations, and identified seven best practices. A review of our EMS audit results over the past four years shows substantial improvement, as shown in the accompanying graph. For example, the pre-registration audit in October 2011 had 11 findings (shown in red) and 9 recommendations (in yellow). Additional recommendations were made as part of the registration audit in December 2011. Since that time, the EMS has matured and improved as evidenced by the decrease in findings and recommendations and the increase in best practices (shown in green).

Such outstanding audit results are a tribute to the ESH&S Department staff as well as everyone at the Laboratory. Our sustainable practices and commitment to environmental protection have earned the Laboratory numerous awards in recent years and have also resulted in improved audit results. Additional information about PPPL’s Environmental Management System is available via a link (<http://www-local.pppl.gov/erwm/EnvirMgmtSys.htm>) on the [Employee Services Home Page](#).

PPPL's EMS AUDIT RESULTS



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