

**In this issue of the Environmental Health and Safety (EHS) Listserv, December 7, 2016:**

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## **1. Hotplates & Fire**

Many research & teaching laboratories use hotplates. There have been multiple reports over the past ten years from universities that experienced explosions or fire incidents involving hotplates. Many of these instances occurred from overheating when the heat control was in the “off” position and the indicator light indicated the power was off, although electrical power continued to flow to the heating elements. For example, Northwestern University reports 1-3 hotplate-related incidents each year over the past ten years. Investigation of hotplate incidents has revealed the following causal factors:

- Many hotplates manufactured prior to 1984 lack temperature feedback controls, leading to overheating. Older hotplates with relay heater switches can spontaneously heat in the OFF position.
- Newer hotplates with TRIAC or microprocessor-controlled heater switches may spontaneously heat in the OFF position due to liquid exposure to the electronics.
- Hotplates in disrepair are a hazard.

Following are some mitigation strategies to prevent hotplate fires/explosion:

- Turn off and unplug all hotplates when not in use.
- Periodically test the function of the “off switch” to verify it works and the heating device quickly cools. Any unit that fails should be taken out of service immediately.
- Discard old hotplates that lack safety features (e.g., temperature feedback controls) and hotplates in disrepair.
- Avoid unattended use of hot plates when possible. If you must have an unattended heating operation, have a safety plan. The plan should include how to monitor and de-energize the hotplate if overheating occurs.
- Where only stirring is required, acquire and use a stirrer instead of a hotplate/stirrer combination.

- As with all equipment, check the equipment, including the electrical cord and plug, for integrity prior to use. Follow manufacturer instructions for use and maintenance.
- Do not use hotplates in close proximity to oil baths, or other combustible or flammable materials. Check above, below and on all sides for possible hazards.
- Select hotplates with hermetically sealed housing to protect the electronics from liquids and gases.
- Look for hotplates with two independent temperature control circuits which switch off heating in case of an “over temperature” situation.

## Resources

- University of California Santa Cruz: Hot Plate [Failure] Study.  
<http://ehs.ucr.edu/laboratory/hotplatesafetyadvisory20110715.pdf>
- University of Illinois Division of Research Safety: Warning about Malfunctioning Hot Plates. <https://www.drs.illinois.edu/News/Warning-about-malfunctioning-hotplates>
- Lawrence Berkeley National laboratory: Hot Plate Switch Failure.  
<http://www2.lbl.gov/ehs/Lessons/pdf/FinalHotPlateLL.pdf>
- Northwestern University: Safety Issues of Hotplate Heating Controls.  
<http://www.research.northwestern.edu/ors/forms/CSHEMA%20Hotplate%20Poster%202014.pdf>
- University of Pennsylvania Safety Alert: Lab Fire Caused by Hot Plate  
<http://www.ehrs.upenn.edu/programs/labsafety/alerts/hotplatefire.html>
- Massachusetts Institute of Technology Safety Topic: Bunsen Burners and Hotplates  
<http://web.mit.edu/cohengroup/safety/burner%20and%20hotplates%20safety062911.pdf>
- University of California Laboratory Hot Plate Safety  
<http://safety.ucanr.org/files/152250.pdf>
- EHS **Fire Safety – General Prevention and Extinguishers** SOP  
[http://ehs.unl.edu/sop/s-fire\\_safety.pdf](http://ehs.unl.edu/sop/s-fire_safety.pdf)

## 2. Holiday Hazards

Statistics show that workers encounter a considerable number of hazards outside the workplace, some more so during certain seasons and times of the year. Here are some holiday safety considerations.

### Motor vehicles:

- Accidents tend to increase during times of bad weather and increased traffic. When operating a motor vehicle be sure to drive defensively and not engage

in the most dangerous driving behaviors: texting/cell phone use, speeding, aggressive driving, inattention, drowsiness, and when impaired.

- Monitor the weather and do not attempt travel during hazardous conditions. Make sure your vehicle is in good repair and your vehicle contains a cold weather emergency kit in case you become stranded.

### **Hanging lights/decorations:**

- Use a properly designed ladder or stepstool to decorate areas beyond your reach.
- Inspect your ladder to be sure it has non-skid feet, no visible damage, and has the proper rating to hold not only your weight but also the weight of the decorations/tools you will be using.
- Make sure stepladders are fully unfolded. Do not stand on the top rung, climb on the back side of the ladder, or lean out to the side of the ladder.

### **Electrical hazards:**

- Carefully inspect holiday lights and discard any with frayed or nicked cords or loose connections. Always turn off holiday lights, both indoors and out, when you leave the house unattended or retire for the night.
- Do not use power strips in series for indoor holiday electrical needs, rather arrange items so power strips can be plugged directly into a permanently installed outlet.
- When purchasing/using light strings, extension cords, spotlights, or electrical decorations, look for the certification mark of an accredited organization such as UL (Underwriter's Laboratories). Before using lights outdoors make sure they have been certified for outdoor use.
- Do not use extension cords in series, rather use a cord long enough to reach the outlet without stretching, but not so long as to get easily tangled. Plug all outdoor electric decorations into circuits with ground fault circuit interrupters to avoid potential shocks.
- When hanging outdoor lights keep electrical connectors off the ground and away from metal rain gutters. Use insulated tape or plastic clips to hold them in place, not metal nails or tacks. Ensure your lights and cords are designed and rated for outdoor use.

### **Fire safety:**

- Test your smoke alarms and carbon monoxide detectors if you have not recently done so, and make sure that they are UL-listed.
- If purchasing a live Christmas tree, try to get one as fresh as possible. Fresh trees should have needles hard to pull from branches and branches that do not break off. Keep the tree watered and do not use candles in the vicinity or set up a tree near fireplaces, radiators, portable heaters, or other heat sources. When purchasing an artificial tree look for the label "Fire Resistant."
- Use noncombustible or flame-resistant materials to trim a tree.
- Make sure trees and other decorations do not block exits.
- Do not burn wrapping papers in a fireplace.

These are just a few tips to help keep you safe during the holidays. Look around your home for other hazards that may be present.

## Resources

- EHS **Ladder Safety** SOP <http://ehs.unl.edu/sop/s-ladder.pdf>
- EHS **General Electrical Safety** SOP <http://ehs.unl.edu/sop/s-electricalsafety.pdf>
- National Fire Protection Association (NFPA) “Use Care When Decking the Halls” <http://www.nfpa.org/press-room/news-releases/2014/use-care-when-decking-the-halls-this-holiday-season>
- NFPA “Winter Holiday Safety (including a video clip of a Christmas tree fire)” <http://www.nfpa.org/winterholidaysafety>
- Consumer Products Safety Commission “Holiday Decoration Safety Tips” <http://www.cpsc.gov/PageFiles/121347/611.pdf>
- Parents.com “12 Tips for Holiday Home Safety” <http://www.parents.com/holiday/christmas/safety/12-tips-for-holiday-home-safety/>
- Reader’s Digest “Holiday Hazards Checklist” <http://www.rd.com/home/christmas-safety-checklist/>

## 3. Extension Cords & Power Strips w/Surge Suppressor

These electrical items are so common that we often overlook the inherent hazards associated with electricity, and specifically the use of extension cords and power strips/surge suppressors. Holidays are a time when use of powered decorations and lights increases. To better manage increased electrical demand we will review safety tips related to the use of extension cords and power strips with surge protection.

**Electrical extension cords** are designed to provide TEMPORARY power, such as over the holidays, when a conventional outlet is not nearby. Extension cords must not be used as substitutes for permanent wiring.

When selecting extension cords:

- Select UL-rated extension cords constructed with #12 gauge or larger wire. Do not overload extension cords by plugging in equipment that draws more wattage than the rating of the cord.
- Always use 3-wire extension cords for devices with 3-prong plugs. Never remove the ground prong.

When using extension cords:

- Inspect extension cords for damage prior to each use.
- Remove damaged extension cords from service. Examples of damage include detachment of the plug from the sheath, cracked or worn insulation or plug, etc.

- When using extension cords outdoors, use only extension cords labeled for outdoor use and in combination with protection provided by a Ground Fault Interrupter (GFI), either built into the cord, the outlet, or the circuit.
- Do not use multiple extension cords in series (plugged end-to-end). Use one cord of the proper cord length.
- Do not run extension cords through open doorways or windows, holes in walls, underneath carpet, up on overhead piping or other structures, or suspended over counter tops. If absolutely necessary to run a cord temporarily along the floor, use a runner or tape the cord down so that it does not become a trip hazard.
- NEVER use nails or staples to attach or hang an extension cord.
- After use, inspect the cord for damage. If there is no damage, neatly coil the cord and store in a designated area.

Power strips and surge suppressors are not the same. Simple power strips are devices used to convert a two-receptacle wall outlet to a multiple-receptacle outlet. Use of a simple power strip is not recommended because it is easy to exceed the capacity of the circuit when energizing multiple appliances or devices.

A better alternative is use of a power strip equipped with a surge suppressor, which protects sensitive and expensive electrical equipment such as televisions, computers, stereos, etc., from power spikes. Following are some safety suggestions:

- Do not use surge suppressors in wet locations.
- Do not use multiple surge suppressors in series or in combination with an extension cord.
- Use only surge suppressors that are Underwriters Laboratories (UL) approved.
- Ensure that plugs placed into the surge suppressor receptacles are firmly and fully seated to avoid exposure of the metal prongs.
- Do not use damaged surge suppressors.
- Do not use for devices that draw more than 12 amps of power, for example heating devices such as microwaves, hotpots, etc.

#### **Resources:**

- EHS **General Electrical Safety** SOP <http://ehs.unl.edu/sop/s-electricalsafety.pdf>
- EHS **General Electrical Safety Awareness** web-based training <http://ehs.unl.edu/web-based-training#ElectricalSafety>

## **4. Safety Shorts – Holiday Electrical Safety**

This series features links to short safety resource(s) each month. Regardless of format - video, PDF, other - these short features cover various topics and are

intended as resources for safety committees, faculty/staff/students, as well as individuals, laboratories and work areas.

- **Extension Cord Safety Virtual Demonstration** (Electrical Safety Foundation International-ESFI, Duration 2:13 minutes)  
<https://www.youtube.com/watch?v=VmWlka-SG1o>
- **8 Tips for a Sparkling AND Safe Holiday** (Electrical Safety ESA, Duration 1:47 minutes) <https://www.youtube.com/watch?v=jZqylqjFq84>

NOTE: Resources are provided for informational purposes only. Publication does not in any way endorse a particular company or product or affect current UNL policies and procedures.

## 5. Poster and Business Cards

EHS provides a number of safety posters of relevance to the campus community. Featured this month is the **Near Miss... Near Hit?** poster which points out where on the EHS web site workers can report near misses/close calls, occurrences where one thinks, "Wow, that could have been really bad!" The poster also shows where student injuries may be reported electronically. Do you have a location in your area to display this?



Also available are two-sided business cards with the URL for reporting Near Misses on one side and the URL for reporting Student Injuries on the other. These are handy to have in your work area or department office to share widely.

**Near-Miss/Close Call  
Incident Reporting System!**  
[https://scsapps.unl.edu/EHSNearMissReporter/  
?newpreview](https://scsapps.unl.edu/EHSNearMissReporter/?newpreview)

**UNIVERSITY OF  
Nebraska  
Lincoln** | Environmental  
Health & Safety  
(402) 472-4925  
ehs@unl.edu

**Student Injury/Illness  
Reporter!**  
[https://scsapps.unl.edu/studentinjuryillnessRe  
porter/?newpreview](https://scsapps.unl.edu/studentinjuryillnessReporter/?newpreview)

**UNIVERSITY OF  
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Request your FREE poster(s) and/or reporting information business cards today.

Contact [ehs@unl.edu](mailto:ehs@unl.edu) or 402-472-4925 with your name, campus mailing address, and quantity desired. Review other FREE posters at: <http://ehs.unl.edu/safety-posters>. If you have an idea for a safety poster you would like to become available, contact Elizabeth (Betsy) Howe, [ehowe2@unl.edu](mailto:ehowe2@unl.edu), 402-472-5488.

## 6. Situational Preparedness – Heads Up!

Situational preparedness is so important that we will be looking at various aspects over time, as well as providing resources to assist you to “be prepared” for whatever situations you may encounter at UNL. The Chancellor’s University Safety Committee (CUSC) has been reviewing situational preparedness concerns/near misses. The most recent focus has been hazards associated with lack of situational awareness while walking, biking, driving, in particular on and around campus. The CUSC is rolling out a “Heads Up” campaign designed to remind everyone to be prepared and stay aware while walking, biking, and driving.



### Resources

- Chancellor’s University Safety Committee <http://ehs.unl.edu/chancellors-university-safety-committee-cusc#cusc>

## 7. A Short Survey

Environmental Health and Safety is committed to excellent customer service and offers a *Customer Satisfaction Survey* as an easy method for the campus community to provide feedback on our services and staff. By taking a few moments to complete the survey (<http://ehs.unl.edu/survey>), you will be helping us to identify areas where we might need to focus our attention. Your participation is greatly appreciated.

Please feel free to contact Brenda Osthus, EHS Director, at 402-472-4927 or [bosthus1@unl.edu](mailto:bosthus1@unl.edu), if you would rather communicate outside the parameters of this survey.

## 8. Revised Safe Operating Procedures

- **Dewatering** SOP <http://ehs.unl.edu/sop/s-dewatering.pdf>  
Updated to reflect current regulatory interpretations and requirements of the City of Lincoln and NDEQ.
  
- **Harvest Safety** SOP  
[http://ehs.unl.edu/sop/s-harvest\\_safety.pdf](http://ehs.unl.edu/sop/s-harvest_safety.pdf)  
Added advice for workers to have access to emergency communication devices and first aid kits. Expanded on information regarding making equipment harvest-ready and observation of state laws while operating on roadways.

**Remember...SAFETY IS AN ATTITUDE!**

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