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U.S. DEPARTMENT OF ENERGY
Office of Science

NSD Safety Day
Electrical Safety

Scott Small, NSD Electrical Safety Officer

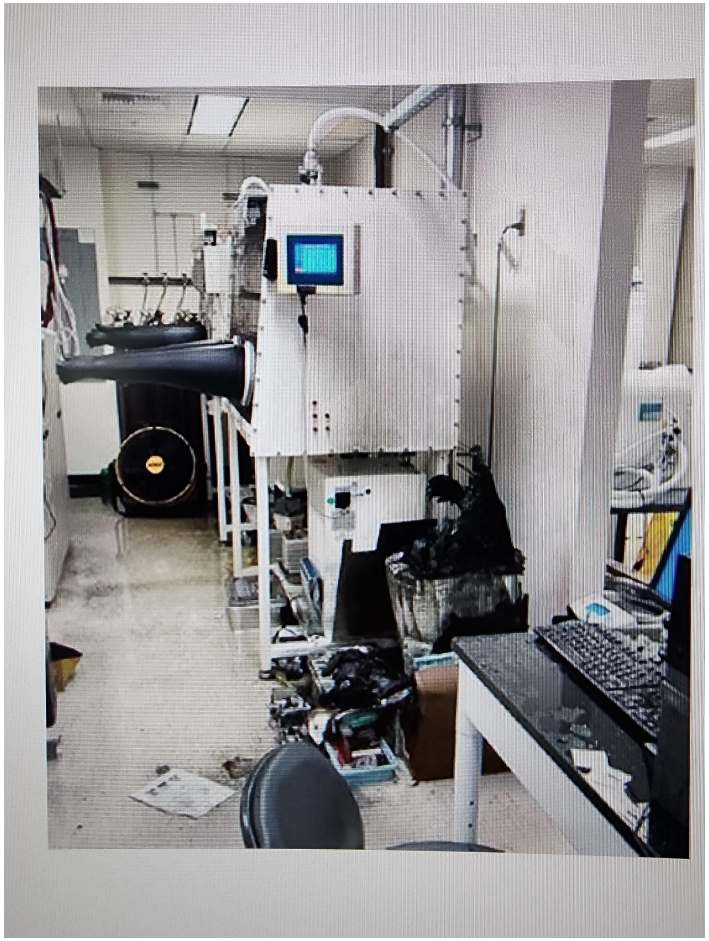
September 13, 2024

Recent Incidents

January 2024 Physical Sciences Fire at PNNL

In January 2024, the Pacific Northwest National Laboratory's (PNNL's) Security Operations Center received an alarm indicating the water suppression system in the basement of the Physical Sciences Laboratory (PSL) had activated. The Richland Fire Department was promptly dispatched and later confirmed the PSL fire suppression system had extinguished a fire in the PSL basement.

After reviewing the evidence and deconstructing the fire scene, PNNL's Fire Investigation Team determined the source of the fire was a battery box storing six Lithium (Li) metal waste pouch cells. The battery box was located on the floor, immediately adjacent to a glove box and a stack of combustible materials, and the box was missing the liner/insulation designed to suppress ignition and extinguish flames. The Fire Investigation Team further determined the fire was caused by thermal runaway as evidenced by burn marks on the floor indicative of smoke and flames flowing from beneath the lid of the battery box, damage to the battery box itself, and the ignition of nearby combustible materials.



Recent Incidents

May 2023 Electrical Shock from Laptop Charger Plug at NREL

In May 2023 an NREL employee experienced a shock while unplugging a laptop charger from a recessed receptacle within a table in a shared space. The contact was a point shock on the worker's thumb as they braced their hand against the metal surrounding the receptacle to help remove the plug. It was determined that the shock likely occurred because the outlets in these type of tables are angled in a tight space and require awkward hand positioning to unplug cords (see Figure 1).

NREL was concerned because, while the shock was minor, it wasn't the first of these to occur. A few months prior, in October 2022, there was a shock that occurred in a similar fashion.

Figure 1: Original Outlet Access

What electrical hazards do you encounter in your work?

In the laboratory area

- Electrical hazards from the use or maintenance of lab equipment.

These are typically controlled by the use of Qualified Electrical Workers (QEWs) and the application of the Lockout/Tagout (LOTO) program.

In the office setting

- Electrical hazards from the use of powered devices; such as computers, extension cords, power strips, electric appliances, and space heaters or fans.

These are typically controlled by using these devices in accordance with the Electrical Safety Manual, as promulgated by the Field Guides.

What resources are available to you to mitigate these hazards?

Division Electrical Safety Officer

- Scott Small - smsmall@lbl.gov, 510.486.4088

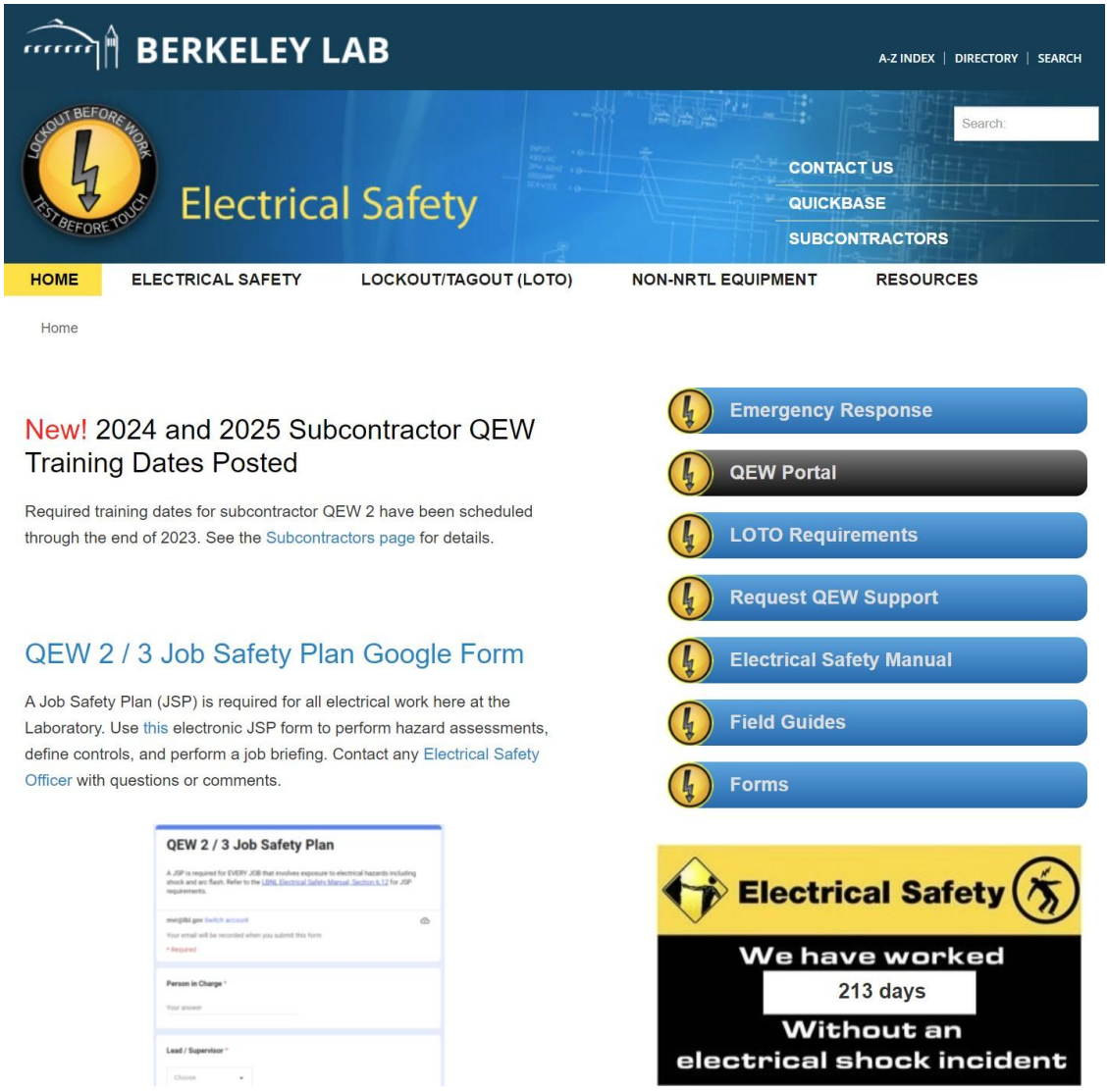
Division Safety Coordinator

- Jeff Bramble - jrbramble@lbl.gov, 510.486.6242

Lab Electrical Safety Website

- electricalsafety.lbl.gov

electricalsafety.lbl.gov



Request QEW Support

Home » Request Help

Request Repair Assistance
Request Inspections
Request Labels (Surveyors)

Electrical Equipment Procurement Guide for Researchers
ES&H Manual Electrical Equipment Safety Program (Chapter 14)
Flowchart of Processes
Reputable Manufacturers
Contact Third-Party Field Evaluation Programs
Metrics for High-risk Equipment Inspections (Quickbase)
Engineering Electrical Equipment Fabrication Specification

Request Help

To request the support of a Qualified Electrical Worker for electrical equipment:

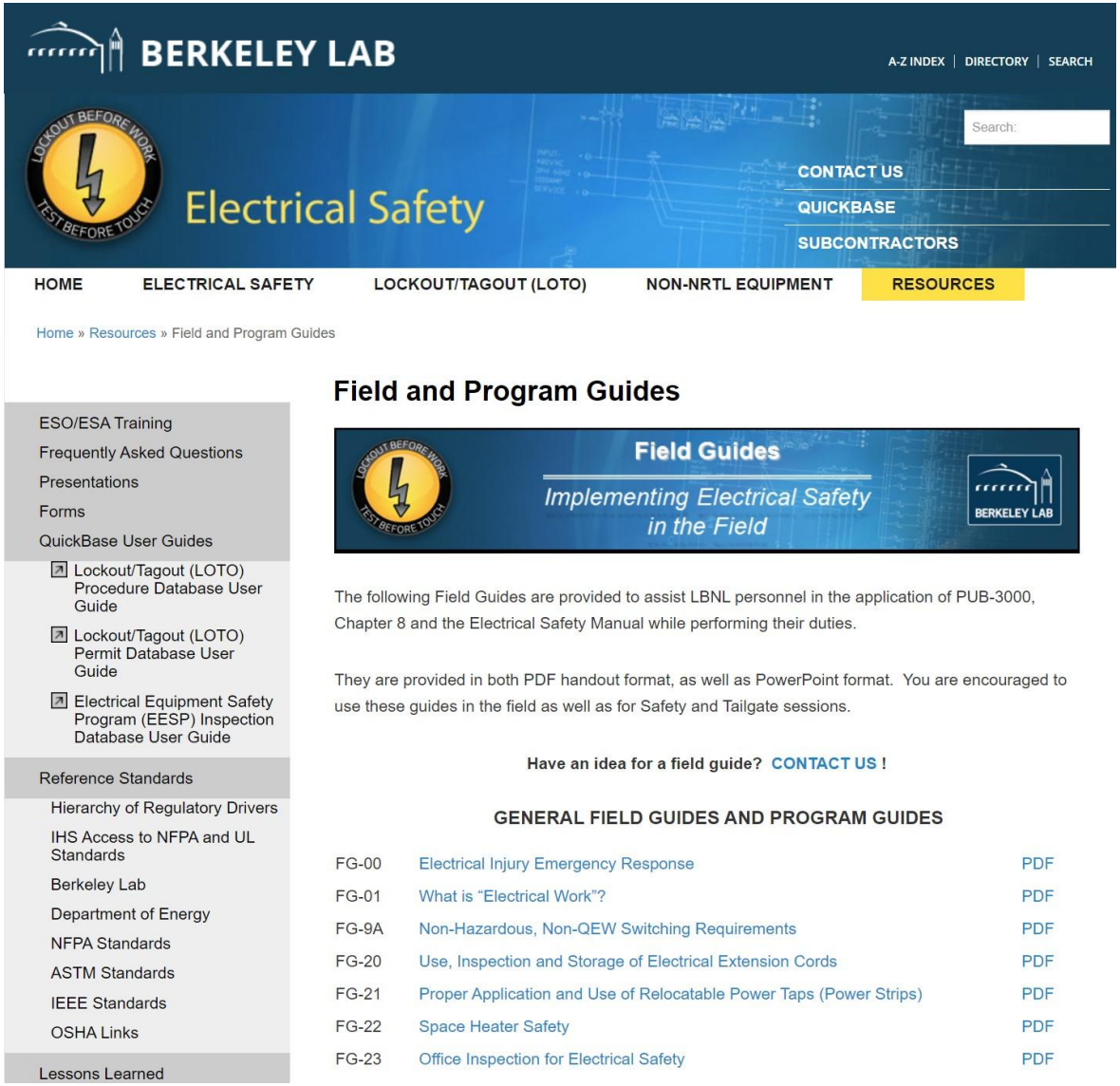
Repair, Modification, and Fabrication of Laboratory Electrical Equipment

- Visit the Engineering Qualified Electrical Worker (QEW) Support web site and submit a Request Form.
- Or, send email to qewhelp@lbl.gov.
- Or call x6222.

Facilities

- If the electrical work involves a building or infrastructure, submit a work request through the Facilities Work Request Center. **Click on the "General Work Request" link** after logging in with your LDAP.
- Or call x6274.

Field Guides



Field Guides, continued

What is “Electrical Work”?

Use, Inspection, and Storage of Electrical Extension Cords

Proper Application and Use of Relocatable Power Taps (Power Strips)

Space Heater Safety

Office Inspection for Electrical Safety

Lithium Ion Batteries

A relatively newer hazard, not especially mentioned in the Field Guides

- There can be a surprising amount of stored energy in these, and they are common in the office setting.
- If used improperly or damaged, they can rapidly release all that energy in the form of a fire.

Dog Chews Battery and Causes Home Fire

Summary

Only Qualified Electrical Workers may perform Electrical Work

- Contact the Division Electrical Safety Officer if there is a question about Electrical Work
- Utilize the Field Guide to determine if it is Electrical Work
- Use the “Request QEW Support” link at electricalsafety.lbl.gov

Use of Electrical Devices in the office setting poses risks as well

- Use the Field Guide to inspect your work area
- Use the Field Guides to effectively and correctly utilize extension cords, power strips, and space heaters.

Questions?

Thank You

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