Laboratory Electrical Hazards

Safety Talk

What's at Stake?

Consider the following story…

A scientist was conducting an experiment using a portable fluorescent lighting rack. The lighting rack was plugged into an electric timer, which was plugged into the wall.

However, since the timer only accepted a two-prong plug, an adapter was used to allow the three-prong plug of the lighting rack to be used with the two-prong outlet of the timer.

When the scientist went to adjust the timer a lab worker noticed the doctor was grasping the lighting rack and became rigid. The scientist was pushed away from the lighting rack, and CPR was performed, but she was later pronounced dead at the hospital.

What likely happened is the lighting rack was drawing more current than approved for the fixture and the ballast overheated. This melted the insulation around the wire causing an energized wire to touch the ballast's metal cover, energizing the entire fixture. When the scientist grasped the fixture, some part of her probably brushed against the nearby metal sink. This completed a circuit to ground through the scientist, electrocuting her.

What's the Danger?

An electrical hazard can be defined as a serious workplace hazard that exposes workers to the following:

Burns **E**lectrocution **S**hock **A**rc Flash/Arc Blast **F**ire **E**xplosions

Therefore, you can remember to **BE SAFE** by recognizing, avoiding and protecting against all of these electrical hazards.

In the laboratory, workers may be exposed to electrical hazards in one of the following ways:

1. Faulty Equipment, Instrumentation, and Wiring
2. Damaged Receptacles and Connectors

3. Unsafe Work Practices

How to Protect Yourself

The typical laboratory contains a wide variety of electrically-powered equipment including stirrers, shakers, pumps, hot plates, vent hoods, ovens, etc. To avoid potential dangers from equipment:

1. Always follow manufacturer’s recommendations for operating equipment.
2. Inspect wiring and equipment before each use.
3. Only equipment with three prongs (grounding) should be used.
4. Only use extension cords temporarily. In all other cases, request installation of a new electrical outlet.
5. Ensure that GFCI outlets are installed and used when water/chemicals are present within 6 feet.
6. Replace all frayed or damaged electrical cords immediately.
7. Remove equipment from service if in poor condition and replace or have it repaired by a qualified repair person.

Use safe work practices:

1. Always report hazards to supervisors and safety officers.
2. Regularly test GFCI outlets and ensure all safety features on equipment are intact and in working order.
3. No more than two high current draw devices should be plugged into the same outlet to prevent an overloaded circuit.
4. Carefully place power cords so they don’t come in contact with water or chemicals. Contact with water is a shock hazard. Corrosives and solvents can degrade the cord insulation.
5. Do not lift a piece of electrical equipment by the cord or pull the cord to disconnect from the outlet to prevent damage.
6. Know the location operation of shut-off switches and circuit breakers.
7. If you see a person being shocked, DO NOT TOUCH THEM! The electricity can go through you, too. If possible, turn off the power, or use an item made of non-conductive material (e.g., wooden broom handle) to pry him or her away from the contact. Call 911 immediately.

Final Word

Recognizing electrical hazards and then taking appropriate measures to prevent and protect lab workers will help to avoid electrocution and electricity related injuries.