SPILLS

Initial Incident

- Time: ~ 4:00 pm a Friday.
- An EHS rep and another lab member were going through an acid storage cabinet under a fume hood as part of a chemical inventory.
- The lab member picked up a plastic bottle, which cracked apart and dropped to the floor.
- Droplets from the bottle splashed onto the lab member's face and leg.
- Both people were wearing gloves but no lab coat or safety glasses.

Immediate Response

- Exposed person:
  - The EHS rep looked at the broken bottle, saw that it said “acetic acid”, and instructed the lab member to use the eyewash for face flushing. The eyewash was used for approximately 10 minutes.
  - Following the face wash the lab member felt some stinging but wasn’t in pain. One cheek was red. The lab member proceeded to the bathroom to remove potentially contaminated pants and wash the leg. The EHS rep brought the lab member a change of clothes.
  - The lab member proceeded to MIT Medical for medical follow-up.

Immediate Response

- Spill response:
  - Others in the lab told to leave based on the presence of fumes in the lab.
  - The lab had absorbent spill pillows that were pulled out and placed on the acid.
  - Between 500 – 1000 ml of liquid were estimated to have been in the bottle. The concentration of the acetic acid was unknown.
  - The EHS rep looked online for information on cleaning up acetic acid spills, then instructed another lab member to call EHS to find out the next steps.
  - Instructions for the cleanup were to place absorbent materials on the spill, then gather the material in hazardous waste bags.

Immediate Response

- Spill response cont.:
  - The EHS rep waited approximately 20 minutes for the spill kit bags to soak up the acid, then placed them into clear waste bags, put red tags on them, and placed them in the fume hood.
  - Extra absorbent material to cover the spill area was obtained from a neighboring lab. The floor was cleaned by the lab with water.
  - The polish on the floor was eaten by the acid.
  - Clean Harbors came the following week, tested the pH level of the spill area, and cleaned with Simple Green.


CAUTION

What Went Right?

- Lab member immediately went to eyewash to flush face.
- Potentially contaminated clothing was removed.
- People not involved in the spill or cleanup were sent out of the lab.
- EHS was called for assistance.
- Lab member went to MIT Medical.

What Went Wrong?

- Plastic bottle containing acetic acid failed.
- PPE – The lab member was wearing gloves but no lab coat or safety glasses at the time of the incident.
- Unclear if acetic acid is compatible with storage container and how long the container was stored prior to the spill.
- Lab members didn't think there was a risk of chemical exposure if they weren't opening the bottles. They did not anticipate a bottle failure.
- Lab members were uncomfortable cleaning up, but didn't know help was available.

Suggested Improvements

- Start dating chemical bottles and discard any whose integrity or compatibility with contents is unclear.
- Include concentration of chemicals on bottles.
- Wear lab coat and safety glasses in addition to appropriate gloves when handling bottles that contain hazardous chemicals.
- Train all lab members to know when to get help.

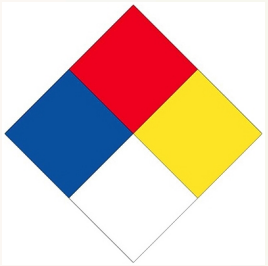
Hazardous Spills

- Reduce the risk
  - Buy only what you need.
  - Remove old chemicals that are no longer needed.
  - Keep your work area clear of unneeded chemicals.
  - Wear appropriate PPE for the material(s) you are handling.
  - Know the hazards of the materials you are handling.
  - Know the location of the nearest eyewashes and safety showers *and* how to use them.
  - Think about what you would do in the event of a spill before you start working.

Hazardous Spills

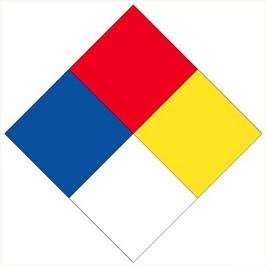
- Once a spill happens. . .
  - Did anyone get exposed? If yes, flush exposed area immediately and seek medical help.
  - Alert others in the area of the spill.
  - Determine what spilled and its hazards.
  - Is there an immediate risk to you or other's in the room/floor/building?
    - If yes, evacuate area and dial x100.

Chemical Spills



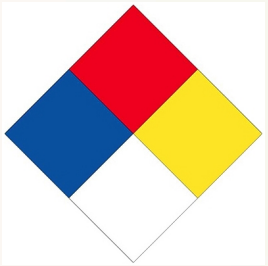
- Is it a major or minor spill? A major spill is any of the following:
  - Difficult or impossible to clean up by yourself
  - Threatens the health and safety or you or others in the area
  - Spill in the hallway or public space
- If it a major spill, dial x100.
- If it is a minor spill, clean it up *if* you have the proper cleanup materials and are comfortable doing the cleanup. Otherwise, contact EHS for assistance.

Chemical Spills



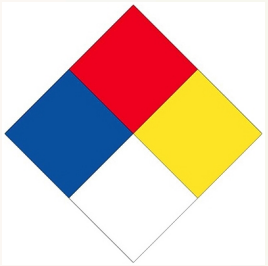
- What is in your spill kit?
  - Absorbent materials:
    - DriZorb absorbent and/or Lite-Dri - Compatible with all materials but HF.
    - Spill X-A - to neutralizing acids; HF tolerant.
    - Spill X-C – to neutralizing bases.
    - HazMat sock, pillows, and pads.

Chemical Spills



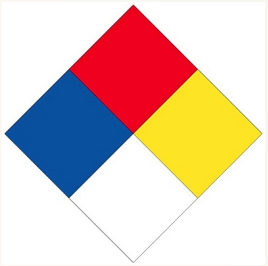
- What is in your spill kit?
  - PPE:
    - Goggles. The basic goggles can go over eyewear as additional protection.
    - Silver Shield Gloves.
    - Nitrile gloves. Nitriles should go over Silver Shields to improve dexterity.

Chemical Spills



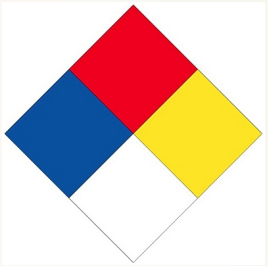
- What is in your spill kit?
  - Hazardous Materials marked yellow bag to put compliant used absorbent into for waste disposal
  - Red Tag for waste disposal.
  - 5 Gallon Pail that all the material is packaged inside. The pail itself can be used to contain the used absorbent for waste disposal.
  - Dust Pan and Brush
  - Doff-It Personal Privacy Kit
  - Simple Green

Chemical Spills



- Cleaning a minor spill:
  - Put on PPE – lab coat, compatible gloves, eyewear.
  - Carefully remove any broken glass.
  - Use absorbent materials to limit the extent of the spill.
  - Add appropriate spill cleanup reagent carefully and slowly – don't be in a hurry.
  - Transfer absorbent to a waste container along with any contaminated materials.
  - Wipe up the area with paper towels or other absorbent material to ensure all material is cleaned up. Put this cleanup material into waste bucket.
  - Close the bucket, put a red tag on it, and notify EHS for pickup.

Chemical Spills



- Follow-up
  - Determine what caused the spill.
  - Educate lab members about the spill, what happened, and proper preventative measures to prevent future spills.
  - Reach out to EHS coordinator and/or EHS Office for help or guidance.

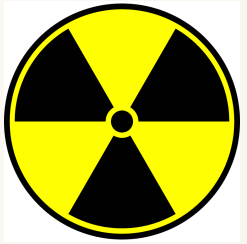
Gas Leaks

- Incident:
  - Vendor tried to deliver a tank that was leaking.
  - EHS rep smelled the gas and heard a hissing noise.
  - Rep had vendor driver take the tank away.
- What worked:
  - EHS rep was in room during delivery and noticed a problem.
- What didn't work well:
  - A hissing, leaking cylinder shouldn't be delivered.
  - When a leak was detected vendor didn't initiate the appropriate gas leak response – a leaking propane tank shouldn't be transported through the MIT halls without appropriate safeguards in place.

Gas Leaks

- What should happen:
  - Vendor notices leaking cylinder and doesn't deliver it.
  - Labs follow the same procedure for reporting other emergencies and evacuate.
  - If there is a hood in the lab and you can do so safely as you evacuate, push the red button.
  - Depending on the hazard of the gas, the IC will decide if other bldgs. need to be evacuated.
  - EHS will call Clean Harbors and vendor, which both have at least 2 hours response time (traffic jams during the day and gathering the crew when its off hours).
  - The Clean Harbors on site crew doesn't have the tools or the expertise.

Radioactive Spills



- Survey yourself and your work area before starting work, routinely during the experiment, during cleanup, and before leaving the area.
- Call RPP immediately if a radiation spill is suspected.

Biological Spills

For spills of biological material or rDNA. . .




1. Assess the situation, alert others in the area, put on appropriate PPE, gather spill kit and appropriate equipment
2. Remove any broken glass or sharps with tongs or dust pan/broom into sharps container
    - Large sharp material goes into a rigid container, e.g. cardboard box, sealed then into bio box
3. Cover the spill with paper towels
4. Disinfect the spill: Saturate paper towels with disinfectant, let sit for 20 minutes
5. Clean up the spill and dispose of spill materials in bio box
6. Repeat steps 2-5

When in doubt, seek help!