CITY OF PHILADELPHIA RISK MANAGEMENT DIVISION

Safety Directive # P-8 Revision #1 September 27, 2001

Mercury Spill Response And Cleanup

I. Purpose

Mercury (Hg) is defined as a hazardous material by the U.S. Environmental Protection Agency and the Pennsylvania Department of Environmental Protection. Moreover, mercury is a toxic substance that can result in severe health effects. Therefore, all mercury "spills," including droplets of mercury from a broken laboratory thermometer need to be cleaned up by following safe and environmentally sound procedures. Anyone who has questions regarding mercury or spill procedures should contact their supervisor, Safety officer and Risk Management.

II. Hazard Information

Mercury is a heavy, silvery white, shining metal that is liquid at ordinary room temperature and is toxic by inhalation, absorption through the skin, and ingestion. Mercury may cause sensitization by inhalation and skin contact. It is irritating to the eyes, respiratory system, and skin. Mercury vapors are odorless, colorless, and tasteless. The effects of mercury are cumulative and may result in kidney damage, emotional disturbances, unsteadiness, inflammation of the mouth and gums, general fatigue, memory loss, headaches, and irritation or corrosion of the skin. In most cases, symptoms of mercury spill poisoning disappear gradually when the source of exposures is removed.

III. Mercury Spill Cleanup Procedures

A. Small Mercury Spills (5 mls or less from small devices such as thermometers)

In the event of a small mercury spill, the following procedures should me followed to minimize exposure to inhalation, skin contact, or ingestion of mercury.

- Prevent the spread of mercury. Mercury beads can splash and roll around. Immediately, secure the area around the spill so the mercury does not get "tracked" or "kicked" around. Cease ALL activities and keep the area restricted until the entire spill is cleaned up.
- Contact RISK MANAGEMENT for assistance if the mercury has spread to an inaccessible area (such as floor cracks or crevices, drains, etc.).
- Before attempting to clean spill, don/properly wear the appropriate personal protective equipment:
    a. Protective gloves
    b. Plastic shoe covers (booties)
    c. Lab coat

d. Safety glasses/goggles

If kneeling on the floor is required for cleaning up the spill, a Tyvek suit or similar impervious clothing is required preventing the absorption or mercury beads into clothing and into the skin.

- If the spill occurs on or within a heated surface, turn off the heat-producing device and immediately contact, Risk Management for further instruction. If possible turn on fume hoods or open windows to ventilate the area, have all personnel leave the room, and shut the door. Placard the door(s) to the room with the following words, "Mercury Spill-Do Not Enter."
- If using a commercially available spill kit, follow instructions given in the kit.
- If using the sodium thiosulfate/EDTA powder implement the following step-wise procedure:
    a. Wear protective latex or nitrile gloves. Using two small pieces of stiff cardboard (one in each hand), consolidate the droplets of mercury.

    b. Collect the large droplets using either a hand pump or mercury sponge. Place the recovered mercury or contaminated sponge in a heavy-walled polyethylene bottle with a screw-cap lid and label the bottle as "mercury spill residue.
    c. Sprinkle the sodium thiosulfate/EDTA powder over the spill area, wet with a water mist from a pump operated spray bottle.

    d. Let stand overnight.
    e. Wipe the powder with a damp household sponge and place in the mercury spill residue bottle.

    f. Properly remove gloves to ensure skin and hands do not come into contact with the contaminated glove surface and place them in the mercury spill residue bottle.

    g. Tag the spill residue bottle for hazardous waste collection.

    h. Any other Personal Protective Clothing that is suspected of being contaminated with mercury during the clean up must be placed in a plastic trash bag, then double bagged, labeled “Mercury Contaminated Materials”, and properly disposed/or removed by an qualified mercury waste removal contractor.

    i. Wash hands, arms and face thoroughly with soap and water to prevent skin absorption or irritation.

B. Special Consideration: Large spills, spills in confined areas with poor ventilation, or spills in areas heated above room temperature must be addressed by trained personnel with protective equipment. A risk of high exposure to mercury vapors can occur in these situations.

C. Large Mercury Spills

If more than 5 mls of mercury is involved in the spill contact RISK MANAGEMENT for assistance.

D. Commercial Kits and Devices for Responding to Small Mercury Spills

- **Mercury vacuums**: This device is essential only for responding to large mercury spills and is not an economical choice when dealing with minor mercury spills resulting from broken thermometers. These devices are specially designed to purify exhaust air and capture the elemental mercury for recycling.
- **Amalgamating kits**: These are sold by numerous safety supply and lab supply vendors. The amalgamating powder is sprinkled over the droplets of mercury and the mixture is scooped up and placed in a polyurethane bottle for disposal. Some kits are equipped with a small hand pump for difficult to reach areas and collecting large mercury droplets.
- **Sponges**: These kits are simply composed of specially designed sponges that pick up mercury droplets when firmly pressed against the surface of the spill. Use of a sponge alone is not recommended. If a sponge is used the area should be treated with an amalgamating powder as well to reduce any mercury vapors emitting from residual mercury. The sponges work best on non-porous, smooth surfaces.
- **Home Remedy**: A mercury spill powder can be prepared in-house by mixing 85 grams of finely powdered sodium thiosulfate with 15 grams of finely powdered EDTA. Instructions for cleaning spills with this powder are given in the "Small Mercury Spills" section. This powder should be used in conjunction with a hand pump or mercury sponge.

IV. Safe, Legal Disposal

Mercury waste and all waste materials contaminated with mercury must be handled as chemical hazardous waste. No mercury, including broken thermometers, may be disposed of in the normal trash or into the sewer system.

V. Prevention

Mercury spills are disruptive, extremely difficult, and time consuming to properly clean up. Therefore, preventative measures are of the utmost importance to avoid accidents. Mercury containing equipment and supplies should always be stored in unbreakable containers and stored in a well-ventilated area. Trays, buckets or other containers placed under apparatus containing mercury help confine spills and make clean up less troublesome. Replacing mercury thermometers with red liquid thermometers can avoid mercury spills altogether. Red liquid thermometers are available for temperatures up to 200 C (300 F).
Employees should be trained about how to prevent Mg spills and what to do I the event of a spill.