

**SAFETY & HEALTH BULLETIN**

Assistant Secretary for Environment, Safety &amp; Health • U.S. Department of Energy • Washington, DC 20585

**Safe Management of Mercury (Hg)**

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**Special Operations Reports** are issued to initiate management actions in response to events whose subject matter represents significant departmental safety concerns.

**Environment, Safety and Health Alerts** are issued to initiate immediate action on potentially significant safety issues.

**Environment, Safety and Health Bulletins** are issued to share information and recommend actions on potential safety issues.

**Operating Experience Summaries** are issued to share lessons learned information, operating experience information, and best practices from significant events or important individual DOE activities.

**PURPOSE**

This Bulletin provides information on a safety concern that may impact operations at Department of Energy (DOE) facilities. Specifically, the concern is the safe handling of mercury and mercury compounds.

**BACKGROUND**

Mercury is found in small amounts in thermometers, manometers, and barometers and in larger quantities at DOE facilities – ranging from amounts found in scientific equipment to tons in remediation waste at burial sites and hundreds of tons at the DOE stockpile storage facility in Oak Ridge.

DOE records show that there have been about 30 safety incidents involving mercury over the past 5 years. Half of those occurrences were leaks, discharges, and spills in quantities ranging from milliliters to over 100 pounds. Improper cleanup of one spill led to the contamination of four workers. Another 30 percent of those incidents involved the unexpected discovery of mercury with quantities exceeding 200 pounds in one situation or mercury and dimethyl mercury levels above permissible levels.

**WHAT ARE THE HAZARDS?**

Mercury (Hg) is a heavy, silver-white odorless metal which is a liquid at room temperature. Due to its vapor pressure, liquid mercury can volatilize at room temperature. Inhalation of mercury vapors is the main cause of toxicity because mercury is well-absorbed by the lungs. Short-term exposure to high levels of mercury vapors may cause lung damage, nausea, vomiting, diarrhea, increased blood pressure or heart rate, skin rashes, and eye irritation. Symptoms of chronic poisoning include inflammation of the mouth and gums, weakness, increased saliva production, loss of appetite and weight, and impaired digestive and kidney functions. Effects of mercury on the central nervous system often show up as tremors, particularly in the hands. Irritability, temper outbursts, excitability, shyness, and indecision are other symptoms of mercury poisoning.

Mercury can combine with other elements to form toxic inorganic and organic mercury compounds that can seriously affect the nervous system, lungs, kidneys, and developing fetus. One of the most dangerous mercury compounds is dimethyl mercury. A single drop on the skin can cause serious injury or death.

**CONTROLLING THE HAZARDS**

Ensure that all users and bystanders are properly trained in the hazards of mercury and observe the following good practices:

- Use enclosed systems that isolate mercury processes.
- Post appropriate warning signs and limit access to mercury operations.
- Floors and work surfaces should be nonporous and free of joints and cracks.
- Ventilate areas where mercury or mercury compounds are handled.
- Maintain equipment containing mercury to prevent release of mercury liquid.
- Immediately clean all mercury spills using a vacuum cleaner especially designed for cleaning mercury.
- Avoid sweeping; it breaks the mercury into smaller particles that volatilize quickly.
- DO NOT use compressed air to clean clothing or equipment.
- Place mercury wastes in vapor-tight containers.
- Wear a respirator designed for use with mercury vapors when necessary.


**ADDITIONAL SOURCES OF INFORMATION**

- Your Safety and Health Office
- Information on the web:
  - <http://www.atsdr.cdc.gov/MHMI/mmg46.html>
  - [http://en.wikipedia.org/wiki/Mercury\\_\(element\)](http://en.wikipedia.org/wiki/Mercury_(element))
  - <http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDDB>

**SUMMARY**

- Mercury is found at all DOE sites.
- Exposure to mercury and mercury compounds can lead to serious health problems.
- Take proper precautions when handling mercury and cleaning up spills.

If you have any questions, please call Dr. Bill McArthur at 301-903-9674 or e-mail [bill.mcarthur@eh.doe.gov](mailto:bill.mcarthur@eh.doe.gov).

  
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