SAFE HANDLING & DISPOSAL OF MERCURY-CONTAINING THERMOSTATS

Additional Regulations Affect Demolition Industry: Pre-Demolition Removal of Mercury-containing devices from Residential and Commercial Facilities

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Mercury can be found in various devices in residential and commercial structures. If not managed properly at the end-of-life, these devices can break, releasing mercury into the environment. Prior to demolition, facilities should be inspected and these devices should be removed to ensure proper disposal.

Mercury releases can present a serious environmental and health problem. Inhaling mercury vapors – which are colorless and odorless – can cause irreversible damage to the brain and kidneys. Even very small amounts of mercury (less than a gram) may cause adverse health effects.

The central nervous system, eyes and respiratory system can also be affected by mercury. Developing fetuses and children are the most sensitive to mercury exposure. Inhalation of mercury vapor is the most harmful means of exposure. Mercury can also enter the body through contact with the skin or by swallowing.

If released, mercury can pose a danger to people if not properly cleaned up and removed. It can easily spread by walking (tracking), sweeping or vacuuming, thereby presenting a potential health threat to others. Tracking throughout a building or into automobiles has spread mercury contamination to many other locations in many instances.

Health impacts will increase over time if the mercury is not properly removed. Mercury vapors are heavier than air and tend to remain near the floor or mercury source, but can get into the ventilation system and be spread throughout a house or business. Indoors, mercury vapors will accumulate in the air. Children five years of age and younger are considered to be particularly sensitive to the effects of mercury on the nervous system.
system since their central nervous system is still developing. When pregnant women are exposed to mercury, the mercury can pass from the mother’s body to the developing fetus; it can also be passed to a nursing infant through breast milk.

CLEANING UP MERCURY SPILLS

If released, clean-up costs are significant. It is not unusual for costs to range from $5,000 up to $300,000 for a single incident. Typical response to mercury releases in homes has consisted of relocating the residents and providing temporary housing, gathering visible mercury with a special vacuum, and heating and ventilating the house to drive off the harmful mercury vapors. In some instances, walls, carpeting and floors of houses have had to be removed because they were grossly contaminated. Personal possessions have also been discarded if they became contaminated and the mercury could not be removed. Contaminated materials are likely to be treated as hazardous waste and sent to a special landfill or a mercury retort facility. In a worst case scenario mercury is spread from the original release location into vehicles and other homes via shoes or clothing; spreading contamination and the scope of clean-up.

DEVICES THAT CONTAIN MERCURY

The three most common devices with significant amounts of mercury in them are mercury-switch thermostats, gas pressure regulators, and mercury pressure switches.

Facilities that were built prior to 1968 may have a mercury-containing gas pressure regulator adjacent to the gas meter. Most of these devices were manufactured and installed in the 1940s and 1950s. These devices contain approximately two teaspoons of mercury. Mercury spills have sometimes occurred during improper removal of these devices, causing a potentially significant health risk and resulting in costly cleanups.

Some older boiler heating systems have a mercury seal generator or mercury pressure switch(s). These devices may be found near the boiler or near a radiator on an upper floor. They can contain up to several fluid ounces of mercury. Mercury spills can occur as a result of improper removal of these devices. A spill can require a significant cleanup effort. In April 2011, EPA responded to a mercury spill at a home where an old 1920s boiler had been improperly removed, resulting in a spill of about four fluid ounces of mercury.

The most commonly found mercury-containing devices are mercury-switch thermostats. While it is more likely to find them in residential structures (single and multi-family), mercury-switch thermostats may also be
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found in commercial and light-industrial facilities. Each thermostat contains up to 12 grams of elemental mercury and is one of the largest remaining reservoirs of mercury in residential buildings today.

LEGAL ISSUES GOVERNING MANAGEMENT

The management of mercury-containing devices is regulated by both state and federal authorities.

The Superfund Law (Section 104 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 as amended, 42 U.S.C. Sec. 9604) provides the US Environmental Protection Agency (EPA) the legal authority to respond to mercury releases. The Superfund law also gives EPA the authority to identify the party responsible for the release, order those who improperly handle mercury to take appropriate response, and/or compel them to pay for a cleanup.

CERCLA also requires that any release amount above the quantity of one pound – one pound of mercury is approximately two tablespoons – must be reported to the National Response Center.

The Emergency Planning and Community Right-to-Know Act requires that any release of mercury greater than one pound be reported to the local emergency planning committee, state emergency response commission, or local response personnel by the owner/operator.

Disposal of these devices may also be regulated by federal law.

Additionally, many states also regulate the disposal of mercury-containing products. Twelve states specifically ban the disposal of mercury-containing products in solid waste. Additionally, some states, most notably California and Illinois, require demolition contractors to remove and properly manage all mercury-containing thermostats prior to a building’s demolition.

PROPER MANAGEMENT

Facilities need to be inspected, and if mercury is present, these devices need to be removed and disposed of properly prior to a building’s demolition. In the instance of mercury-containing gas pressure regulators, the removal needs to be coordinated with the gas utility.

In the case of mercury-switch thermostats, they can be managed as a universal waste, reducing costs associated with transport and disposal. In fact, the manufacturers of mercury-switch thermostats established a national program in which assumes all costs associated with the transport and disposal of whole mercury-switch thermostats. For more information on the management of waste mercury thermostats visit www.thermostat-recycle.org.

Mercury Gas Regulator
(Courtesy of American Gas Association)