

CWA Occupational Safety & Health Fact Sheet #7

Polychlorinated Biphenyls - PCBs - and the Workplace

Polychlorinated Biphenyls (PCBs) are toxic and persistent chemicals primarily used as insulating fluids in electrical equipment like transformers in power plants, industrial plants, telecommunications and utility lines, and in large buildings across the country. PCBs have a heavy liquid, oil-like consistency. The properties that make them commercially attractive are:

- A high degree of chemical stability
- Low solubility in water
- Low vapor pressure
- Low flammability
- High heat capacity
- Low electrical conductivity and
- Favorable dielectric consistency.

PCBs are widely dispersed in the environment and are at low concentrations throughout the world. This dispersion has occurred because there have been inadequate control procedures in place to prevent hundreds of millions of pounds of PCBs from being improperly used and disposed. This is of particular concern because upon exposure into the environment, PCBs are not biodegradable, i.e., they do not break up or separate into chemical arrangements, and may result in cancer and other serious health problems among exposed humans and animals, as well as causing significant environmental contamination/pollution.

As noted, within CWA-represented industries and sectors, PCBs have been widely used in transformers. Most electrical transformers have been designed to operate with the current carrying cells immersed in a dielectric fluid. PCB dielectric fluid is known by the generic name, Askarel.

Servicing of transformers may result in exposure to PCBs. For example:

- Routine servicing includes testing and filtering the fluid, replacing gaskets, and possibly, the removal and replacement of some dielectric fluid. Routine servicing often results in low-level exposure to workers and the environment.
- Rebuilding of PCB transformers involves draining the transformer, removing and disassembling the core, reworking the coil or rewinding a new coil, reassembling the core, and refilling the transformer with new fluid. Rebuilding is necessary after a transformer has failed or after an inspection indicates that it will soon fail.

Cleaning the inner surfaces of the transformers with solvents during the rebuilding process, cleanup of spillage and drippings, and scrapings of unserviceable components increases the production of PCB wastes and potential contamination. Further, when the old coil must be

disposed of separately from the casing, the potential for workplace and environmental exposure to PCBs is increased.

During the performance of this work, i.e., servicing transformers, it is not uncommon for workers to be exposed to PCBs. Therefore, employers must provide involved workers with the appropriate control procedures and personal protective equipment to ensure that PCB exposures are eliminated/minimized.

An additional concern involves ensuring that uncontrolled PCB leaks and spills do not occur. Such leaks/spillage could seriously contaminate both the workplace, as well as the environment.

Health Effects

Exposure to PCBs may result in very serious health effects. Workplace exposure occurs primarily as a result of inhalation or breathing airborne PCBs as well as skin contact or absorption of PCBs. Short-term or acute health effects include skin, eye, and throat irritation; breathing difficulties; nausea and vomiting; loss of weight; and stomach pain. Long-term or chronic health effects include cancer (PCBs are classified as a human carcinogen), liver damage, and reproductive effects.

Controlling the Hazard

Ideally, the employer should replace PCBs with less toxic substances. However, where this is not possible, the employer should provide all of the necessary equipment and procedures to control worker exposures to PCBs. This would include the development and implementation of engineering and administrative controls, personal protective equipment and clothing, medical surveillance, personal hygiene and sanitation procedures, and training and education programs for all workers who work with and/or might suffer possible exposure to PCBs. Since PCBs may cause cancer among humans, CWA members should make sure that the employer is providing the above control equipment and procedures.

Where engineering controls do not reduce PCB exposure to levels below the OSHA standard, respiratory protection must be provided. During this process, employers must adhere to the OSHA Respiratory Standard, 1910.134. This rule calls for the provision of physical examinations, fit testing, and the appropriate cleaning and storage of respiratory equipment.

Personal protective equipment should be provided to prevent skin and eye contact as well as to control respiratory exposure. Skin protection can usually be achieved by wearing non-porous gloves, gauntlets, boots or shoe protection, and aprons or heavy overalls. For major spill clean-up operations, a full suit of non-porous clothing may be necessary. Unless the garment is heavily contaminated, non-porous protective clothing can usually be laundered and re-used. Work clothes should be laundered separately from other garments. Also, eye protection such as goggles and/or face shields should be provided and worn when there is a possibility that PCBs might be splashed into the eyes.

If PCBs are splashed or spilled on a worker, contaminated clothing should be removed immediately and the skin washed thoroughly with soap and water for at least 15 minutes. If PCBs should come into contact with a worker's eye(s), the eye(s) should be cleansed for at least 15 minutes. In addition, a drop of vegetable oil may be put into the eye(s) to relieve the irritating effect of PCBs. Also, involved workers should notify their doctor of their exposures.

Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) Rules

Presently, there are no comprehensive OSHA regulations concerning PCB exposure. However, OSHA has set permissible exposure limits (PELs) for PCBs of 42% (concentration) at 1 milligram per cubic meter (mg/m³) and PCBs of 54% (concentration) at 0.5 mg/m³. (Given that PCBs are probable human carcinogens, CWA members should consider any exposure to be excessive. Therefore, members should ensure that employers are providing the necessary protections as described above).

The Environmental Protection Agency (EPA) adopted a PCB Ban Rule effective July 2, 1979 that set stringent environmental exposure standards. Although EPA Rules do not directly regulate worker exposure, the Rules do restrict or prohibit employer PCB use activities that, in turn, reduce the number of workers that would be exposed.

The EPA Rule prohibits the manufacture, processing, distribution in commerce, and "non-enclosed" uses of PCBs unless specifically authorized or exempted by EPA. Totally enclosed uses will be allowed to continue for the life of the equipment. Also, EPA will allow use and servicing of most existing large electrical equipment containing PCBs under controlled conditions for the life of the equipment. However, the manufacture of new PCB electrical equipment (such as transformers and capacitors) is prohibited.

The EPA Rule also forbids the use of waste oil containing any detectable concentration of PCBs from being used as a sealant, coating, or dust control agent (e.g., road oiling, pipe coating, or vegetation spraying). Further, disposal of PCBs must only take place at U.S. Government-approved disposal sites. Any other method of disposal is illegal.

What Can You Do?

The key to making the workplace safe for all CWA workers is strong, active local safety and health committees. The committee can identify dangerous conditions at the workplace and discuss them with management. If the employer refuses to resolve the safety and/or health hazard(s), the committee can request an OSHA inspection. The committee should always coordinate its activities through the local officers, the CWA Representatives, and negotiated safety and health committees.

In addition, CWA members may obtain information and assistance by contacting the:
CWA Occupational Safety and Health Department
501 Third Street, N.W.

Washington, D.C. 20001-2797

Webpage: www.cwasafetyandhealth.org

Phone: (202) 434-1160.

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