

CHAPTER 14 POLYCHLORINATED BIPHENYLS

C14.1 SCOPE

This Chapter contains criteria to control and abate threats to human health and the environment from the handling, use, storage and disposal of polychlorinated biphenyls (PCBs). These criteria include specific requirements for most uses of PCBs, including, but not limited to, transformers, capacitors, heat transfer systems, hydraulic systems, electromagnets, switches and voltage regulators, circuit breakers, reclosers, and cables.

C14.2 DEFINITIONS

Capacitor. A device for accumulating and holding a charge of electricity and consisting of conducting surfaces separated by a dielectric.

In or Near Commercial Buildings. Within the interior of, on the roof of, attached to the exterior wall of, in the parking area serving, or within 30 meters of a non-industrial, non-substation building.

Incinerator. An engineered device using controlled flame combustion to thermally degrade PCBs and PCB items. Examples include rotary kilns, liquid injection incinerators, cement kilns, and high temperature boilers.

Leak or Leaking. Any instance in which a PCB article, PCB container, or PCB equipment has any PCBs on any portion of its external surface.

Mark. The descriptive name, instructions, cautions, or other information applied to PCBs and PCB items, or other objects subject to this Guide.

Marked. PCB items and PCB storage areas and transport vehicles marked by applying a legible mark by painting, fixation of an adhesive label, or by any other method that meets these criteria.

PCB (as used in this Chapter). Any of the following substances, including mixtures of these substances where the concentration of any of the identified substances is greater than 0.005% by weight (50 ppm):

- polychlorinated biphenyls (PCBs, CAS# 1336-36-3);
- polychlorinated terphenyls (PCTs, CAS# 61788-33-8);
- monomethyl-dibromo-diphenyl methane (DBBT, CAS# 99688-47-8)
- monomethyl-dichloro-diphenyl methane (UGILEC 121 or 21, CAS# Unknown); and
- monomethyl-tetrachlorodiphenyl methane (UGILEC 141, CAS# 76253-60-6).

PCB Article. Any manufactured article, other than a PCB container, that contains PCBs and whose surface(s) has been in direct contact with PCB. This includes capacitors, transformers, electric motors, pumps, and pipes.

PCB Article Container. Any package, can, bottle, bag, barrel, drum, tank, or other device used to contain PCB articles or PCB equipment, and whose surface(s) has not been in direct contact with PCBs.

PCB Container. Any package, can, bottle, bag, barrel, drum, tank, or other device that contains PCBs or PCB articles, and whose surface(s) has been in direct contact with PCBs.

PCB-Containing Equipment. Any equipment containing greater than one liter of PCB-containing fluid with a concentration greater than 50 ppm, or any equipment that has contained greater than one liter of PCB-containing fluid (e.g., transformers, capacitors) with a concentration greater than 50 ppm that has not been decontaminated.

PCB-Contaminated Electrical Equipment. Any electrical equipment including, but not limited to, transformers, capacitors, circuit breakers, reclosers, voltage regulators, switches, electromagnets, and cable, that contain 50 ppm or greater PCBs.

PCB Equipment. Any manufactured item, other than a PCB container or a PCB article container, which contains a PCB article or other PCB equipment, and includes microwave ovens, electronic equipment, and fluorescent light ballasts and fixtures.

PCB Item. Any PCB article, PCB article container, PCB container, or PCB equipment that deliberately or unintentionally contains or has as a part of it any PCB, or PCBs at a concentration of 50 ppm or greater.

PCB Large High Voltage Capacitor. A capacitor that contains 1.36 kg (3 lbs.) or more of dielectric fluid and which operates at 2,000 volts (alternating current (ac) or direct current (dc)) or above.

PCB Transformer. Any transformer that contains greater than 50 ppm PCB.

Restricted Access Area. Areas where access by unauthorized personnel is controlled by fences, other man-made structures or naturally-occurring barriers such as mountains, cliffs, or rough terrain.

Small PCB-Containing Equipment. Any equipment such as capacitors, switches, etc., containing one liter or less of PCB-containing fluid with a concentration greater than 50 ppm that has been in operation since 1988.

Substantial Contact Area. An area that is subject to public access on a routine basis or which could result in substantial dermal contact by employees.

C14.3 REQUIREMENTS

C14.3.1 The introduction or use of materials and/or equipment having a PCB concentration greater than 50 ppm (mg/kg) is prohibited with the following exceptions:

- C14.3.1.1 The use of PCB-containing equipment is allowed until 31 December 2010 if an exception permit is obtained from the appropriate German authority. This use of PCB-containing equipment is only permitted as long as the PCB-containing equipment is in good condition and appropriate measures are taken to avoid hazards to human health and the environment. Procedures for obtaining permits from German authorities are addressed in Chapter 1, Overview.
- C14.3.1.2 The use of small PCB-containing equipment (i.e., PCB equipment such as capacitors, switches, etc. containing less than one liter of PCB-containing fluid) that have been in service since 1988 is permitted in accordance with the following criteria.
- Small PCB-containing equipment with a volume of PCB-containing fluid greater than 100 milliliters (mL) and less than 1 liter: the use and operation is allowed until the end of equipment's operational life or until 31 December 2010 (whichever comes first).

- Small PCB-containing equipment with a volume of PCB-containing fluid less than 100 mL: the use and operation is allowed until the end of the equipment's operational life.

C14.3.2 The following requirements apply to PCB-containing equipment.

- C14.3.2.1 The installation spill contingency plan will address PCB items, including temporary storage items. Chapter 18, Spill Prevention and Response Planning provides criteria on how to prepare these plans.
- C14.3.2.2 Spills of PCB liquids at concentrations of 50 ppm or greater will be responded to immediately upon discovery and cleaned up in accordance with the following:
- C14.3.2.2.1 Surfaces that are located in substantial contact areas will be cleaned to 10 micrograms per 100 square centimeters.
- C14.3.2.2.2 Surfaces in all other contact areas will be cleaned to 100 micrograms per 100 square centimeters.
- C14.3.2.2.3 Contaminated soil located in restricted access areas will be removed until the soil tests no higher than 25 ppm PCBs and will be backfilled with clean soil containing less than 1 ppm PCBs. Restricted access areas in which PCB spills have been cleaned up shall have annotated on installation real property records the level of PCBs remaining in the soil, including the extent, date, and type of sampling and a reference to any reports documenting the site conditions.
- C14.3.2.2.4 Contaminated soil located in unrestricted access areas will be removed to a minimum depth of 10 inches or until the soil tests no higher than 10 ppm PCBs, whichever is deeper, and will be backfilled with clean soil containing less than 1 ppm PCBs.
- C14.3.2.2.5 Cleanup of PCB spills will be conducted in accordance with Chapter 18, Spill Prevention and Response Planning and/or DODI 4715.8, as appropriate.
- C14.3.2.3 All PCB transformers, PCB capacitors with a volume of greater than one liter, PCB containers, and certain PCB items containing PCBs at concentrations of 50 ppm or greater (i.e., electric motors using PCB coolants, hydraulic systems using PCB hydraulic fluid, and heat transfer systems using PCBs), as well as any PCB article containers used to store the preceding items, must be prominently marked in English and the German language. The marking must include the mark "PCB" in black letters on a yellow or white background, identify the item as containing PCBs, warn against improper disposal and handling, and provide a phone number in case of spills or if questions arise about disposal. This marking criterion also applies to rooms, vaults, and storage areas containing PCB Transformers or storing PCBs or PCB items for disposal. In addition, the following PCB items must be marked at the time of the items' removal from use if not already marked: PCB capacitors, and equipment containing a PCB transformer or PCB capacitor.
- C14.3.2.3.1 The mark must have dimensions of 184 millimeters (mm) by 297 mm and the letters a height of at least 80 mm and a width of at least 15 mm.

- C14.3.2.3.2 All decontaminated PCB-containing equipment which has been returned to service or is in storage (either awaiting disposal or reuse) shall be labeled with the following:

<p>Decontaminated PCB Equipment Dekontaminiertes PCB-Gerät</p> <p>PCB-containing fluid has been replaced with (brand name): _____ on date: _____ PCB-haltiges Fluid ist ersetzt worden durch: _____ (Name des Ersatzfluids) am _____ (Datum) by (name of approved company): _____ von (Name des Unternehmens/Fachbetriebs): _____</p> <p>PCB concentration (ppm) of the replaced fluid: _____ PCB-Konzentration des ersetzten Fluids (ppm): _____</p> <p>PCB concentration (ppm) of new fluid: _____ PCB-Konzentration des Ersatzfluids (ppm): _____ ppm</p>

- C14.3.2.4 Each installation having PCB items will maintain a written inventory that includes a current list by type of all marked PCB items in use and PCB items (whether or not marked) placed into storage for disposal or disposed of for that year. Inventory records should be maintained for a period of time at least 3 years after the last item on the list is disposed of.
- C14.3.2.5 Disposal of PCB items will only be through the servicing DRMO in accordance with DoD 4160.21-M, or subsection C14.3.6.
- C14.3.2.6 All periodic inspections as required in this Chapter will be documented at the installation. Records of inspections and maintenance history will be maintained for 3 years after disposal of the transformer.

C14.3.3 PCB TRANSFORMERS

The introduction or use of transformers having a PCB concentration greater than 50 ppm (mg/kg) is prohibited unless an exception permit has been obtained from the appropriate German authority in accordance with C14.3.1.1.

- C14.3.3.1 Any out of service transformer with a PCB concentration of greater than 50 ppm shall be disposed of, and not reused or stored for reuse.
- C14.3.3.2 The following requirements apply to PCB transformers that are permitted for use in accordance with C14.3.1.1 and are currently in service.
- C14.3.3.2.1 PCB transformers with a PCB concentration of greater than 50 ppm that are in use will not be used in any application that poses a risk of contamination to food or feed.
- C14.3.3.2.2 All PCB transformers with a PCB concentration of greater than 50 ppm that are in use will be registered with the servicing fire department.

- C14.3.3.2.3 All PCB transformers with a PCB concentration of greater than 50 ppm in use in or near commercial buildings or located in sidewalk vaults will be equipped with electrical protection to minimize transformer failure that would result in the release of PCBs.
- C14.3.3.2.4 PCB transformers will be serviced as follows.
- C14.3.3.2.4.1 Transformers classified as PCB-contaminated electrical equipment will only be serviced with dielectric fluid containing less than 50 ppm PCB.
 - C14.3.3.2.4.2 Any servicing of PCB transformers requiring removal of the transformer coil is prohibited.
 - C14.3.3.2.4.3 PCBs removed during servicing will be captured and either reused as dielectric fluid or disposed of in accordance with subsection C14.3.6.
 - C14.3.3.2.4.4 PCB transformers may be serviced with dielectric fluid having a PCB concentration less than 50 ppm.
- C14.3.3.2.5 All in-service PCB transformers (with dielectric fluid having a PCB concentration of greater than 50 ppm) will be inspected at least every 3 months except that PCB transformers with impervious, undrained secondary containment capacity of 100 percent of dielectric fluid or PCB transformers tested and found to contain less than 60,000 ppm PCBs will be inspected at least every 12 months.
- C14.3.3.2.6 If any PCB transformer is involved in a fire such that it was subjected to heat and/or pressure sufficient to result in violent or nonviolent rupture, the installation will take measures to control water runoff, such as blocking floor drains. Runoff water will be tested and treated if required.
- C14.3.3.2.7 Repair or replace leaking PCB transformers within 48 hours or as soon as possible. Leaking PCB transformers not repaired or replaced will be inspected daily. Leaking PCB fluid will be containerized.
- C14.3.3.2.8 All transformers will be considered and treated as PCB transformers unless information to the contrary exists.

C14.3.4 OTHER PCB ITEMS

The restrictions regarding the use of PCBs and PCB-containing equipment addressed in C14.3.1 apply to PCB items. The following requirements apply to PCB items that are permitted for use by the appropriate German authority in accordance with C14.3.1.1 and C14.3.1.2.

- C14.3.4.1 Electromagnets, switches, and voltage regulators that may contain PCBs at any concentration are serviced as follows:
- C14.3.4.1.1 PCB-contaminated electrical equipment will only be serviced with dielectric fluid containing less than 50 ppm (mg/kg) PCB;
 - C14.3.4.1.2 Servicing any electromagnet, switch, or voltage regulator with a PCB concentration of 50 ppm (mg/kg) or greater which requires the removal and rework of the internal components is prohibited;

- C14.3.4.1.3 PCBs removed during servicing will be captured and disposed of properly;
- C14.3.4.1.4 PCBs from electromagnets, switches, and voltage regulators with a PCB concentration of 50 ppm (mg/kg) or greater will not be mixed with or added to dielectric fluid from PCB-contaminated electrical equipment; and
- C14.3.4.1.5 Dielectric fluids containing 50 ppm (mg/kg) or greater will not be used as dielectric fluid in any electromagnet, switch, or voltage regulator classified as PCB-contaminated electrical equipment.
- C14.3.4.2 Capacitors containing PCBs must be managed in accordance with C14.3.1.
- C14.3.4.3 Any PCB item removed from service will be marked with the date it is removed from service.

C14.3.5 STORAGE

PCBs, PCB items, PCB-containing equipment, and PCB-contaminated waste oil at concentrations of greater than 50 ppm that are collected prior to disposal shall be stored in accordance with the requirements of Chapter 6, Hazardous Waste.

- C14.3.5.1 PCBs and PCB items at concentrations of 50 ppm or greater that are to be stored before disposal will be stored in a facility that will assure the containment of PCBs, including the following:
 - C14.3.5.1.1 Roofs and walls of storage buildings that exclude rainfall.
 - C14.3.5.1.2 A containment berm, at least 6 inches high, sufficient to contain twice the internal volume of the largest PCB article or 25 percent of the total internal volume of all PCB articles or containers stored, whichever is greater.
 - C14.3.5.1.3 Drains, valves, floor drains, expansion joints, sewer lines or other openings constructed to prevent any release from the bermed area.
 - C14.3.5.1.4 Continuous, smooth and impervious flooring material.
 - C14.3.5.1.5 To the maximum extent possible, a new PCB storage area will be located to minimize the risk of release due to seismic activity, floods, or other natural events. For facilities located where they may face such risks, the installation spill prevention and control plan will address the risk.
- C14.3.5.2 The following items may be stored temporarily in an area, subject to weekly inspection, that does not comply with the requirements of C14.3.5.1 for up to 30 days from the date of removal from service (however, the temporary storage of such items, must still be in accordance with the requirements of Chapter 6, Hazardous Waste).
 - C14.3.5.2.1 Non-leaking PCB items, marked to indicate whether it is a PCB article or PCB equipment.
 - C14.3.5.2.2 Leaking PCB articles and PCB equipment placed in a non-leaking PCB container that contains sufficient absorbent material to absorb fluid contained in the PCB article or equipment.

- C14.3.5.2.3 PCB containers in which non-liquid PCBs have been placed.
- C14.3.5.2.4 PCB containers in which PCBs at a concentration between 50 - 499 ppm have been placed, and whose containers are marked to indicate there is less than 500 ppm PCB.
- C14.3.5.3 All other PCB storage areas will be inspected at least monthly.
- C14.3.5.4 Containers used for the storage of PCBs will be at least as secure as those required for their transport for disposal by the servicing DRMO.

C14.3.6 DISPOSAL

- C14.3.6.1 PCB-containing waste, including PCB-containing mineral oil and PCB-containing synthetic oil, is categorized as waste requiring special supervision (*besonders überwachungsbedürftiger Abfall*, see Chapter 7, Solid Waste). The off-site transport of this waste must be conducted in accordance with Chapter 6, Hazardous Waste.
- C14.3.6.2 The disposal of PCB waste must be conducted by an approved disposal company (*Entsorgungsfachbetrieb*, see Chapter 6, Hazardous waste).
- C14.3.6.3 PCB-containing waste oil with PCB concentrations of 20 ppm or greater is prohibited from being recycled.
- C14.3.6.4 Retrogrades of PCB Items. DoD-generated PCB items manufactured in the U.S. will be returned to CONUS for delivery to a permitted disposal facility if host country or third country disposal is not possible, is prohibited, or will not be managed in an environmentally sound manner. Ensure that all PCB items and equipment are marked in accordance with criteria in subsection C14.3.2.3.

C14.3.7 ELIMINATION OF PCB PRODUCTS

- C14.3.7.1 Installations shall minimize the use of PCBs and PCB items without degrading mission performance.
- C14.3.7.2 Installations shall not purchase or otherwise take control of PCBs or PCB items for use. It is specifically prohibited to produce, import, export, or sell PCB items.
- C14.3.7.3 All procurement of transformers or any other equipment containing dielectric or hydraulic fluid shall be accompanied by a manufacturer's certification that the equipment contains no detectable PCBs (less than 2 ppm) at the time of shipment.
- C14.3.7.4 Such newly procured transformers and equipment shall have permanent labels affixed stating they are PCB-free (no detectable PCBs).