

DRAFT

PCB ALERT - THE PROBLEM AND YOU

WHY THE CONCERN?

In recent years there have been a number of incidents where food has been contaminated with polychlorinated biphenyls (PCBs) and other toxic chemicals. We are especially concerned about future contamination with PCBs since they have been used extensively in feed and processing facilities.

This brochure is to help you identify potential PCB problems and prevent future incidents.

WHAT ARE PCBs - WHY, HOW AND WHERE ARE THEY USED?

PCBs range in consistency from heavy oily liquids to waxy solids. Their most important properties are chemical stability, low flammability, high boiling points, and low electrical conductivity.

Since 1929, hundreds of millions of pounds of PCBs have been used as fluids in electrical transformers, capacitors, and electromagnets, and heat transfer and hydraulic systems. Other important uses include as plasticizers in paints, adhesives, and caulking compounds, as fillers for investment casting waxes, and as dye carriers in carbonless copy paper.

Concern over PCBs' toxicity and persistence in the environment led Congress to ban the future manufacture, processing, distribution in commerce and use in 1976. The last U.S. producer ceased manufacture in 1977.

WHY ARE PCBs HAZARDOUS?

Knowledge of PCB toxicity in humans is based primarily on an incident which occurred in Yusho, Japan in 1968 when PCBs leaked from a heat exchanger and contaminated rice oil. Among the many symptoms observed were chloracne (skin rash), discoloration of the gums and nailbeds, swelling of joints, waxy secretions of glands in the eye lids, as well as more general effects such as lethargy and joint pain. There are also well documented tests on laboratory animals which show PCBs cause reproductive failures, gastric disorders, skin lesions, tumors, and other effects of concern.

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WHY SHOULD FOOD, FEED, FERTILIZER, AND AGRICULTURAL FACILITIES BE ESPECIALLY CONCERNED ABOUT PCBs?

The Yusho incident illustrates the serious human health and economic consequences of PCB contamination in food or food-related industries. Several other incidents underline the need for special attention to prevent similar costly contamination in the future. These include: 1) discovery of PCBs in fishmeal used as a feed ingredient in North Carolina as a result of a leaking heat exchanger, 2) contamination of fishmeal in Puerto Rico resulting from a fire involving stored electrical transformers in the same warehouse, 3) the death and severe illness of feedlot cattle in Kansas caused by inadvertent use of PCB-contaminated oil as a carrier for insecticide in a backrubber solution, and 4) more recently, the contamination of animal feed ingredients with PCBs leaking from a transformer in storage at a packing company in Billings, Montana. The last case has already resulted in the destruction of large quantities of food, including over 400,000 chickens and one million eggs.

PCBs IN THE ENVIRONMENT

Unlike most organic chemicals which break down fairly rapidly in the environment, PCBs are extremely stable. Of special concern is the potential for PCB biomagnification in the food chain. Biomagnification refers to the uptake of trace PCBs by plants and tiny organisms which are eaten by small fish or other animals which in turn are eaten by higher forms of animal life leading to increasing PCB content in each step of the sequence. Relatively small amounts are concentrated and stored in the fatty tissues at each stage of the food chain. Thus very low levels of PCBs in the Great Lakes and other waters result in many food fish contaminated at significantly higher levels, frequently above the levels considered safe for human consumption.

WHERE MIGHT PCBs BE FOUND IN FOOD, FEED, FERTILIZER AND AGRICULTURAL FACILITIES?

The following types of equipment may contain PCB fluids or other liquids such as mineral oil that are contaminated with PCBs:

- * Transformers
- * Large capacitors
- * Electromagnets
- * Heat transfer and hydraulic system
- Small capacitors
- Equipment containing small capacitors including: electrical switchgear, fractional HP motors, and fluorescent light ballasts

*The items marked by an asterisk are of primary importance because they contain free flowing liquid. Small capacitors are of less concern because the PCBs are usually in a non-flowing state.

EXISTING FEDERAL REGULATIONS PERTAINING TO PCBs AND FOOD

Concern about highly toxic PCBs contaminating human food has led to a number of actions by the Food and Drug Administration, (FDA), the U.S. Department of Agriculture (USDA), and the Environmental Protection Agency (EPA). Currently, foods and feeds are considered to be contaminated and may not be sold in interstate commerce if they contain PCBs in excess of certain prescribed concentrations (see Appendix A). FDA also prohibits the use of PCBs in food and animal feed processing facilities, except for use in transformers and capacitors.

EPA has also issued rules governing the use of PCBs. In general, PCB mixtures with concentrations less than 50 parts per million (ppm) (0.005%) are not regulated. The use of intact, non-leaking transformers, electromagnets, capacitors, and capacitor-containing equipment with PCB concentrations greater than 50 ppm is allowed.

EPA rules also permit the continued use of PCBs in servicing of electromagnets and transformers and in heat transfer and hydraulic systems until July 1, 1984. As of November 1, 1979, PCBs may no longer be used in heat transfer systems in plants manufacturing or processing of food, drugs, and cosmetics.

The EPA rule also includes marking, disposal, storage, and recordkeeping requirements, portions of which are discussed later in this booklet.

Furthermore, EPA, FDA, and USDA are proposing to prohibit the use of PCBs in all transformers and capacitors in other electrical equipment in food, animal feed, fertilizer, and agricultural manufacturing, processing, and packaging plants.

We suggest you use the following checklist to conduct a full safety check of your facility.

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CHECKLIST FOR ACTION

WHAT CAN I DO?

A. Determine If You Have PCB Equipment.

1. Locate Any Potential PCB Source.

You can inventory your plant for transformers, capacitors, heat transfer systems, hydraulic systems, and fluids stored for use in this equipment. After you have located these items, ...

2. Examine the Equipment for Caution Labels.

A caution label specifically identifying the equipment as containing PCBs may be present. If so, skip to Section B of this checklist. If not, ...

3. Transformers and Large Capacitors May Bear Nameplates.

If your transformer or capacitor has a manufacturer's nameplate with a trademark, refer to Appendix B at the end of this booklet. If the trademark does not appear there, the equipment may still contain PCBs. Contact the manufacturer, referencing the serial number to determine if the equipment contains PCBs. If there is no nameplate, or if this approach is unsuccessful, ...

4. Seek Assistance from a Servicing Expert.

Call on your local transformer servicing company or the engineering service department of your utility company. They can assist you to obtain a sample of your transformer fluid for analysis. You may also want to sample your heat transfer systems, hydraulic systems, or other suspect oil. Then ...

5. Have the Samples Analyzed.

This is the only way to be certain whether or not your equipment contains PCBs.

If you determine that you have PCB equipment, ...

B. Consider Replacing PCB-Containing Equipment with Non-PCB Equipment.

EPA, FDA, AND USDA are considering prohibiting the use of PCBs in all electrical equipment in food, animal feed, fertilizer, and agricultural manufacturing, processing, and packing plants. Although the prohibition on PCB-containing equipment is not yet in effect we urge voluntary removal to prevent future food contamination.

EPA disposal regulations require incineration of all PCB liquids with concentrations of 500 ppm (0.005%) or greater. The first approved incinerators will be available sometime in 1980. Until incinerators are available, PCBs removed from service must be stored for later disposal.

If it is not possible for you to replace your PCB-containing equipment, you will want to ...

C. Take Special Precautions for Continued Use.

The risk of PCB contamination can be minimized by analyzing the risk of spillage associated with each individual PCB unit and by taking steps to contain the potential uncontrolled loss of PCBs from the unit. You should consider the following questions:

1. Is there any evidence of an active leak from the PCB unit? If so, take whatever steps are necessary to protect your product. Of course, leaking equipment should be repaired immediately.
2. Is the PCB unit located in an area where there is a way that leaking fluid from the unit could find its way into your process? If so, these units should be given priority in the development of spill prevention measures. Special consideration should be given to potential leaks result in accidents as discussed below.
3. Is any liquid ever pumped from the vicinity of the PCB unit to the process area? If so, can the PCB unit be isolated from the pump?
4. If the PCB unit is pad mounted, are there curbs or diking to serve as a barricade against loss of fluid?
5. If the PCB unit is located in an area surrounded by porous cinderblock walls, have they been sealed with material which will not dissolve in solvents such as PCB and trichlorobenzene? Is the wall/floor interface tight?
6. Is the floor in the vicinity of a PCB unit free from cracks? Cracks that look like they would not prevent the loss of fluid should be grouted and painted with solvent resistant materials.
7. Is the PCB unit in a location where vehicular traffic might be a hazard? If so, a vehicle barrier might be useful.
8. Is the PCB unit located near machinery which might throw projectiles with sufficient energy to damage the unit? If so, a fence may provide the necessary protection.

9. Is the PCB unit mounted on a surface which might be difficult to seal, such as unwelded steel plates or in a mobile machine? If so, a catchbasin might be installed under the unit.
10. Are there floor drains in the vicinity of a PCB unit? If so, can they be sealed or otherwise isolated from the unit?
11. If you have PCB equipment or drums of PCB fluid in storage for future use, can they be removed from the process area? Are they marked or labeled to warn of PCB presence because if you have PCB equipment, you may be subject to...

D. Mandatory Labeling and Storage Requirements

1. Labeling Requirements

The EPA label for PCBs looks like this:

You must label the following items: transformers containing more than 500 ppm of PCBs, PCB capacitors with three or more pounds of fluid operating at 2500 volts or more, containers such as bags, barrels, or drums used to hold PCBs, electric motors using coolant with 50 ppm or more of PCBs, hydraulic systems or heat transfer systems containing 50 ppm or more of PCBs and the storage areas described below.

In addition, labels must be placed on the following items when they are removed from service: PCB capacitors containing more than 3 pounds of fluid operating at less than 2000 volts and equipment containing a PCB transformer or large high voltage capacitor.

2. Storage Requirements

PCBs and PCB items which you remove from service for disposal must be stored in a location meeting EPA criteria to insure that they are properly contained. This location should not be near your process area. It should be isolated so that it is not vulnerable to damage and puncture from vehicular, forklift, and other moving equipment. For assistance with the storage design criteria, contact the EPA regional office for your state. A list of EPA regional offices appears at the back of this Bulletin.

E. This Brochure is Not Complete:

It is assumed that you have a copy of the EPA regulations on PCBs. If not, get a free copy from EPA by calling toll free (800) 424-9063 (in Washington, D.C., 334-1404) and asking for a reprint of the PCB Ban Regulation, May 31, 1979 Federal Register and for a list of the approved PCB Disposal Facilities. If you want more background information on the regulation, ask for a free copy of the EPA Support Document to the PCB Ban Regulation at the same phone number. (The mailing address is: Office of Industry Assistance, Office of Toxic Substances TS-799, U.S. Environmental Protection Agency, 401 M Street, S.W., Washington, D.C. 20460.)

Other useful background information on PCBs is listed in Appendix F.

Appendix A

FDA Limits on PCB Concentrations in Food

1.5 parts per million (ppm) in milk and manufactured dairy products (fat basis);

1 ppm in poultry (fat basis);

0.3 ppm in eggs;

5 ppm in fish (edible portion) [a new level of 2 ppm has been proposed];

0.2 ppm in finished animal feed for food-producing animals (except concentrates, supplements, and premixes);

0.2 ppm in infant and junior foods;

10 ppm in paper food-packaging in direct contact with food.

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Appendix B

Some Manufacturers and Trade Names of PCBs

<u>Manufacturer**</u>	<u>Country</u>	<u>Trade Name</u>
Bayer	Germany	Clophen
Caffaro	Italy	Venclor
Caffaro	Italy	DK
Caffaro	Italy	Inclor
Chemko	Czechoslovakia	
Geneva Industries	US	
Kanegafuchi	Japan	Kennechlor
Monsanto	UK and US	Aroclor
Monsanto	UK and Japan	Santotherm FR
Monsanto	UK and Europe	Pyroclor
Prodelec	France	Phenoclor
Prodelec	France	Pyralene
Sovol	USSR	
Allis-Chalmers	US	Chlorextol
American Corp.	US	Abestol
Electro Engineering Works	US	
Envirotech Buell	US	
ESCO Mfg. Co.	US	Askarel*
Ferranti-Packard Ltd.	US	Askarel*
General Electric	US	Pyranol
H. K. Porter	US	
Helena Corp.	US	
Heavy-Duty Electric	US	Askarel*
ITE Circuit Breaker Co.	US	Non-Flammable Liqs
Kuhlman Electric	US	Saf-T-Kuhl
Maloney Electric	US	
Niagara Transformer Corp	US	Askarel*, EEC-18
Power Zone Transformer US	US	EEC-18
R. C. Uptegraff	US	
Research-Cottrell	US	Askarel*
Standard Transformer Corp.	US	
Van Tran Electric	US	
Wagner Electric	US	No-Flamol
Westinghouse	US	Inerleen
?	US	Nepolin
?	US	Dykanol

*Generic name used for non-flammable insulating liquids in transformers and capacitors.

**This list is not necessarily complete. PCBs have been used since 1929, and many companies have gone out of business.

Appendix C

Other Available Information

This booklet does not go into much detail about the health and environmental effects of PCBs or the chemicals now being used as substitutes for PCBs. The following reports cover these technical areas; the NIOSH Criteria Document is particularly recommended for its discussion of health issues if you are going to service PCB equipment or clean up PCB spills.

"Criteria for a Recommended Standard... Occupational Exposure to Polychlorinated Biphenyls (PCBs)." DHEW (NIOSH) Publication No. 77-229, September 1977. Order from: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Price \$4.00 plus postage.

"Assessment of the Use of Selected Replacement Fluids for PCBs in Electrical Equipment." Report No. EPA 560/5-77-008, March 1979. Order from National Technical Information Service, Springfield, Virginia 22161. Report No. NTIS-PA-295-377.

"Polychlorinated Biphenyls and the Environment." 1972. Order from National Technical Information Service, Springfield, Virginia 22161. Report No. NTIS CON-72-10419. This is a thorough discussion of the properties and uses of PCBs.

"PCBs in the United States: Industrial Use and Environmental Distribution." 1975. Order from National Technical Information Service, Springfield, Virginia 22161. Report No. NTIS PA-252-012.