PRESS CLIPPINGS REPORT

THE SOAP AND DETERGENT ASSOCIATION · 475 PARK AVENUE SOUTH · NEW YORK, N.Y. 10016 · (212) 725-1262

The New York Post
Sept. 11, 1979

file PCB Animal Studies #59-7

We're going sterile

Pollution is ruining the American male

Special to The Post

WASHINGTON — American men appear to be going sterile.

A new study released today shows sperm density declined by one-third since 1929.

If the decline continues at this rate, most American men would be sterile in another 50 to 100 years.

The study suggests that chemical pollutants may be to blame.

Dr. Ralph Dougherty of Florida State University, who conducted the study using 132 volunteer college students, said, "It is possible that toxic substances in the environment may be partially responsible."

Dougherty said a 1929 study showed the sperm density of an average American man was 100 million per milliliter of semen.

By 1974, the figure had dropped to 65 million.

And the new study put it at 60 million a milliliter.

A man with a sperm density of 20 million a milliliter is considered by many medical authorities to be sterile, Dougherty told a meeting of the American Chemical Society.

Using this standard, he said, 23 per cent of the students who participated in the test were sterile.

Dougherty cautioned, however, that college students may not be typical of the general population, and that some sterility may be temporary.

Some studies indicate that stress, cigaret and marijuana smoking and very high sexual activity can lower sperm count.

These conditions often are more common with college students.

All of the semen samples studied were contaminated with toxic substances at low levels.

Among the chemicals that may be to blame, he said, are PCBs, which have been used in various industrial processes for 50 years.

Federal environmental officials restricted their use in 1976.

The problem is not confined to the United States.

The sperm count is also decreasing among men living in Western Europe, Japan and other industrialized areas.

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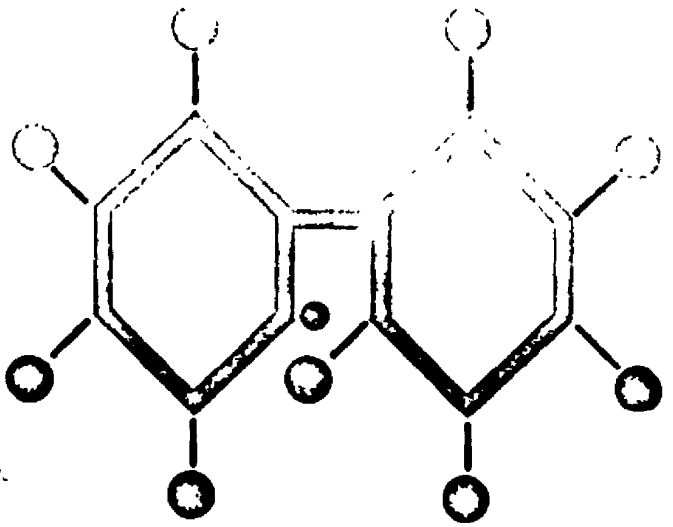
PCB
Article



MONS 007135

PCB—power transmission's invisible menace

Eliminating a potentially carcenogenic chemical is Government's headache. But when the illegal substance has been used in plants for decades, it becomes an industry nightmare.

ALEX KRISLOV
Assistant Editor

EARLIER this year, the transformer, the most innocuous of static devices, officially became the source of a new industry scourge: PCBs. Odds are that you have some in your plant right now.

PCB is shorthand for polychlorinated biphenyls, a dielectric fluid developed for capacitors in 1929. With fifty years of use, this chemical has spread to virtually every industry using transformers or recycled oil. This summer, it was pronounced hazardous, toxic, and illegal.

While perception of PCB's fatal qualities took more than forty years to congeal, the dangers are not in dispute. This once-"beneficial" substance produces birth defects, tumors, and skin lesions in animals. Workers exposed to PCBs display symptoms ranging from jaundice and impotence to skin disorders and throat and respiratory irritations. Most damning of all, studies show that exposed workers develop statistically unlikely numbers of cancers.

Acting under the authority of the Toxic Substances Control Act, the Environmental Protection Agency

(EPA) put sweeping PCB control measures into effect on July 2nd of this year. This rule applies to any party who manufactures, processes, distributes in commerce, or uses or disposes of any item with substantial PCB contamination. The key word is "substantial."

How much is too much?—Substantial contamination is defined differently for different conditions. A transformer with over 500 parts-per-million (ppm) PCB in the dielectric fluid is considered a "PCB Transformer." The same transformer is considered merely contaminated if it has less than that amount. However, in a spill, there's no safety cut-off; *any detectable level* of PCBs in spilled fluid is absolutely forbidden. Any item falling into these classifications demands special treatment. That treatment, regardless of cost, is industry's responsibility.

Searching it out—PCBs were produced in this country exclusively by the Monsanto Corp., which voluntarily stopped making them in 1977. However, while Monsanto used the name "Askeral" on all its PCB fluids, other companies, buying wholesale quantities for resale, marketed it under different tradenames. Aroclor, Pydraul, Abestol and Inerteen are common examples; there are many others. Even with a list of them all, there is no guarantee that the outlaw chemical will be found. All too often, likely prospects for contamination simply have no label.

Here lies the net which ensnarls all industry: while some PCBs lurk in solids, the majority are mixed into mineral oils. From 35 to 40% of mineral-oil transformers, says the EPA, are either contaminated with PCBs or filled to over the 500-ppm mark. Thus, all transformers are assumed to be contaminated, unless they are tested and their safety is proven.

Another problem lies in the recycling of oil drained from the transformers. Naturally, this is now out of the question—but for almost fifty years it was business-as-usual. The reusable oil could end up anywhere, including transmissions. The EPA calls this "waste oil" and notes that it may be found as a remnant of fuel oil, transmission oil, or various lubricants.

Of course, if old transformer oil ended up as a lubricant on exposed gears, it is probably already in the environment. Oil that found its way into a transmission is another matter. If your transmission has been sealed for more than a few years, the oil that went into it might have a dangerous level of contaminant. The best bet, in such a case, is to assume suspicion is warrented.

To bury or to burn—By 1975, over 300 million pounds of PCBs had entered the general environment according to the EPA. The ban rule naturally forbids any disposal methods that might add to this load. In setting up rules for junking PCB items, though, the EPA created another load for the already burdened shoulders of industry.

If discovering all the PCBs in a factory is difficult, disposing of them is so complicated as to be monstrous. The EPA mandates specific methods for cleaning up—and levies stiff penalties for error. The punishment for breaking the rules includes civil fines of up to $25,000 per day, plus criminal fines of another $25,000 per day, plus up to one year in jail.

There are only two ways to be rid of PCB-contaminated articles. The first is incineration. This sounds simple enough—but stringent regulations make it an expensive and complex proposition. PCBs cannot be destroyed in just any furnace. An EPA-approved furnace must be capable of a PCB destruction efficiency of no less than 99.9%; and even then the PCB content of the feed is limited to 10%. Nor can the chemical be added to the combustion chamber during start-up or shut-down. Finally, emissions from the furnaces have strict limits as well.

If incineration is too large a problem, burying the stuff is a possibility—but, once again, strict, limiting regulations must be followed. PCBs can only be dumped in a special EPA-approved chemical landfill. If an industry is near or in New York, Oregon, California, Iowa or Kentucky, it's in luck. Those states house the eight approved landfills—there are no more in existence.

Keeping it around

With all these limitations and regulations, it is inevitable that some people are going to have problems getting rid of their PCBs. The final alternative left open to them is storage. The attraction of this choice is the low initial cost; the drawback comes with the continuing expense of time and money.

The EPA will allow the storage of nonleaking PCB articles for up to thirty days, as long as no damage can occur in the storage area. Storage for longer periods requires a special EPA-approved storage area. These must be walled, roofed, and diked, and the floor must be constructed of some impermeable substance such as concrete or steel. Even then, the items being stored must be inspected every thirty days. Additionally, the storage room must be above the 100-year flood level.

But there's still more: while PCB-contaminated equipment need be inspected only once a month, PCB transformers come up for check-

outs once a week. And the following items may not be stored for more than thirty days: leaking PCB articles and equipment (which, during their 30-day grace period, must reside in containers approved by both the EPA and the Department of Transportation); non-liquid PCBs in containers; and PCB-contaminated liquids in 50 to 449-ppm concentrations.

Using a PCB transformer—The rule has built-in exemptions for certain uses of transformers. With almost half the transformers in the U.S. falling under the ban rule, wholesale elimination of these units is simply implausible. Here's a list of "do's and don'ts" for the transformer that's kept in service:

✗ You may NOT add PCB-contaminated dielectric fluid with a greater concentration of the chemical than already exists in the transformer.

✓ You MAY drain the coolant in the transformer, add noncontaminated fluid in its place, and test it three months later for possible reclassification.

✗ You may NOT dilute the PCB fluid in the transformer by adding noncontaminated fluid.

✓ You MAY rebuild PCB-contaminated transformers (but NOT PCB transformers).

Spills and consequences

Maintaining a transformer can result in trouble (*see sidebar*). A spill involving PCBs is automatically over any legal limit. The single exception to this rule is a leak in a small capacitor—and that ceases to be an exception if it threatens a watercourse, such as a river or an open sewer. Any spill requires immediate EPA notification, even if it is brought under control. Additionally, the regulations for bringing it under control are rigorous. The proper absorbent materials must be used to soak the liquid up; leaking containers must be transferred to nonleaking ones; and the absorbents used are then considered PCB materials, and slated for proper disposal. The power transmission engineer should keep these rules in mind:

- No level of PCB contamination is allowable in oil used as a sealant, dust control agent, or coating. Such waste-oil use on surfaces introduces PCB contaminants directly into the environment. Almost any electric motor may be a PCB article. Motors using PCBs for cooling processes, such as certain mining equipment are certainly contaminated. But if your motor uses PCB transformers or capacitors, plan on checking it, too. Under the law, determining possible contamination is *your* responsibility.
- Some hydraulic systems are contaminated. PCB may be used in hydraulic systems until July 1, 1984, if the system was already in use before July 1 of this year. Even so, users of these systems will have a number of regulations to deal with. Among them: draining the systems, testing the fluid, lowering the PCBs to an acceptable level, retesting the systems every year, and disposing of excess PCBs.
- Fifty years of waste-oil from dielectric fluid has spread the outlawed chemical far and wide. What kind of oil is in that transmission? Are those gears contaminated? Should they be checked?

The cardinal rule, then, is to remember that PCBs have been around for a long time—but they have only been recognized as a danger in recent years. They could be all around you, or entirely absent from your environment. But it is *your* responsibility to know.

Are you a PCB container?

The 50 to 500 ppm classifications designated by the Environmental Protection Agency are essentially a stopgap measure. These rules will remove tons of PCB from the environment without forcing industry to pay an "unacceptable" cost. At least one proposal suggested that 10 ppm be the cut-off, and a figure of 1 ppm was tossed about as well. Left unsaid: If the cut-off point is too low, a number of human beings would legally be PCB containers.

If PCBs are already so widespread, then, what's all the fuss about? Briefly, the danger of the chemical is its tendancy to bioaccumulate. PCBs thrown into the wrong landfill may sink into the water table. From there, they may find their way into cattle feed, or some other part of the food chain. From the cattle, they may eventually reach your body. If they do, you risk any number of toxic effects, including digestive disturbances, impotence, jaundice, respiratory irritations, severe headaches, and possibly cancer.

The PCB Ban Rule is an effort to stop the chemical from reaching you. To some extent, it's already too late for that. Detectable concentrations have shown up in milk, grain, and meat. A great deal of the genie, it is clear, can no longer be forced back into the bottle.

Sometimes, however, the danger is caught in time—but at great cost. In June, a transformer at Pierce Packing Co., Billings, Mont., ruptured, spilling as much as 200 gallons of its dielectric fluid. Among the costs: 300,000 hens have been gassed, and another 53,000 slaughtered. Millions of eggs have been destroyed. 139,000 pounds of chicken meat are being held in Iowa and Minnesota, possibly to be destroyed. In all, 1.9 million pounds of possibly contaminated meat meal was shipped to six states over a 3-1/2-month period. How much contaminated food has escaped the FDA net? FDA commissioner Sherwin Gardner is "reasonably certain" that none has—but he could not be sure, he recently said, for at least thirty more days.