POLYCHLORINATED BIPHENYLS REGULATION

A PERSPECTIVE

Background

Polychlorinated Biphenyls (PCBs) are a class of chlorinated, aromatic compounds with over 200 structurally different members. PCBs have been used in the United States since 1929 in such applications as transformer and capacitor coolant/dielectric fluids, heat transfer and hydraulic liquids, plasticizers and miscellaneous industrial uses. PCBs may also be incidentally generated in trace concentrations during the manufacture and processing of many chemicals.

Commercial sales for all uses, except as dielectric fluids in closed systems, were voluntarily discontinued in 1972 by Monsanto Company, the primary U.S. manufacturer. All U.S. commercial manufacture was voluntarily discontinued in 1977 (two years prior to the 1979 TSCA ban regulations).

Section 6(e) of the Toxic Substances Control Act (TSCA) established a ban on the manufacture, processing and distribution of PCBs and also banned non-totally enclosed uses. Regulations put in place by EPA in 1979, defined a PCB substance as a substance containing more than 50 ppm PCBs.

As a result of a successful legal challenge in 1980 by Environmental Defense Fund (EDF) in response to the decision by the U.S. District Court of Appeals to remand EPA's 1979 "Ban Regulations," the EPA has been developing a new set of PCB rules in several areas. The Court found that EPA did not present substantial evidence in the rulemaking record to support its determination that:

1) transformers, capacitors, and other electrical equipment are intact, non-leaking and therefore statutorily exempted as "totally enclosed uses"; and

2) materials containing less than 50 ppm of PCBs are excluded from regulation.

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Following the remand, EPA divided its efforts into three separate rulemakings:

1) Use of PCBs in electrical equipment;

2) PCBs generated in manufacturing processes defined as "closed or controlled waste"; and,

3) remaining manufacture with trace quantities of PCBs.

During the past nine months, EPA issued a final rule on the use of PCBs in electrical equipment and a second rule excluding chemical operations if releases of PCBs from those operations are at the lowest practically measurable levels. Both of the new rules have subsequently been challenged in the courts by environmental and industry groups.

EPA recently initiated efforts on its third PCB rulemaking. This will be critical for all manufacturers that generate trace levels of PCBs and for products with trace quantities of PCBs, commonly referred to as "incidental PCBs."

The Incidental PCBs Issue

The U.S. EPA's plan to regulate "incidental PCBs" at levels less than 50 parts per million (ppm) is totally unnecessary for the protection of public health and the environment. Such regulations would be a waste of the Agency's PCB resources and would work a substantial economic hardship on the chemical industry, particularly small producers.

Excessive capital requirements and associated costs to implement trace level contaminant removal may cause smaller companies to simply drop the processes or materials containing incidental PCBs. Product innovation could be curtailed and jobs may be lost. Considering the many PCB issues with which EPA must wrestle, its concern about incidental PCBs is totally misplaced.

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Hundreds Of Pounds Vs. Hundreds Of Millions Of Pounds

"Incidental PCBs" are trace-level impurities unintentionally created during certain chemical processes, principally those involving a chlorine source such as chlorine or a chlorinated solvent, hydrocarbons and heat. Even such simple operations as treating sewage with chlorine at a municipal treatment facility can generate incidental PCBs at the ppm level. Incidental PCBs at levels above 50 ppm already are regulated by EPA.

A recent Chemical Manufacturers Association (CMA) survey demonstrates that incidental PCBs lower than 50 ppm constitute a non-problem, whose control is unnecessary and makes absolutely no sense from a risk/benefit viewpoint. The survey, conducted by an independent consultant and published in November 1981, queried about 200 CMA-member firms, of which 85 responded. The responses represent about a third of all chemical industry sales.

Twenty-six of the 85 firms, believed to account for the bulk of incidental PCBs actually produced or theoretically possible in the U.S., reported 135 processes that could generate about 13,800 pounds per year of PCBs at concentration levels less than 50 ppm. About 90 percent of these incidental PCBs are estimated to be of the non-commercial "monochloro" and "dichloro" biphenyl variety whose half-life for environmental degradation is known and demonstrated to be only a matter of several weeks.

The survey also showed that about 95 percent of the 13,800 pounds is disposed of in an EPA-regulated manner through incineration, landfilling, and underground injection. The remaining five percent (660 pounds) exists either in chemical intermediates and industrial compounds or is encapsulated in commercial goods, such as polymers and paint films. None of these uses or products poses any significant exposure risk to the general public or workers.

Contrast this situation -- this 660 pounds of incidental PCBs -- with the roughly 750 million pounds of old PCBs still present and in service

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in the environment. These PCBs are still authorized by EPA for use in "totally enclosed" electrical equipment. Also approximately 150 million pounds of PCBs are free and mobile in air, water and soil, according to a 1979 National Research Council study ("Polychlorinated Biphenyls," National Academy of Sciences, Washington, D. C.). The balance is in storage or has been disposed of, much of this in landfills.

Again, contrast this 660 pounds of incidental PCBs with annual leakage figures cited in EPA's support documents for the recently promulgated new rules (April 19, 1982 and August 25, 1983 Federal Register) for PCBs in "totally enclosed" electrical equipment. These new rules exempt from regulation PCB use in transformers and utility and industrial capacitors which may leak more than one-half million pounds of PCBs per year, according to the Agency. The potential human exposure to PCBs from leaky capacitors is immense since they are found on utility poles throughout the country. EPA estimates the following annual leakage in its support documents: 25,000 pounds from transformers, 369,000 pounds from utility capacitors, and 170,000 pounds from industrial capacitors.

How can the EPA logically contend that PCB leakage of this magnitude is acceptable but that quantities of the order of 660 pounds of incidental PCBs pose serious environmental hazards in need of urgent control?

To further put the issue in perspective, it should be noted that the amount of incidental PCBs likely to be generated between now and the year 2000 would be less than 0.5 percent of the old, environmentally free PCBs expected to degrade during the same period.

How to control and dispose of the 750 million pounds of PCBs now in use and available to the environment is a question worthy of EPA's attention. It is an issue with which the agency has been grappling for the last several years. By comparison, the issue of 660 pounds of incidental PCBs at less than 50 ppm ranks as a genuine molehill, and rightfully so: the health or environmental risk posed by poten-

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tial exposure to these incidental PCBs is next to non-existent. In fact, many of us are exposed every day to considerably more vaporized PCBs from fluorescent light fixtures (a use excluded from EPA regulations) than we would ever experience from incidental PCBs.

Weight Of Scientific Evidence

Many additional scientific studies on the health effects and toxicity of PCBs have been published since these compounds were singled out for regulation in the 1976 Toxic Substances Control Act. Included among these are about two dozen epidemiological studies of exposed workers which indicate that the health hazards of PCBs have been greatly exaggerated. Most of these epidemiology studies dealing primarily with occupational exposures have been published within the past three years.

These studies include a recent report by the National Institute for Occupational Safety and Health on more than 2,500 electrical equipment manufacturing workers exposed to PCBs as long as 20 to 40 years. As a group, these occupational studies show that while exposure to PCBs can cause temporary skin problems, there are no clinically observable long-term health effects, including cancer.

Other studies of non-occupationally exposed populations have found neither dermatitis nor other clinical evidence of exposure-related effects.

The same 1979 National Research Council report cited earlier states that: "Although PCBs have been detected in the U.S. population, there have been no documented cases of PCB intoxication of humans other than those related to industrial exposure. Effects, when detectable, have been subtle rather than overt."

Reviews by several independent scientific panels of PCB health effects tests involving animals demonstrate that PCBs are not "deadly toxins" as occasionally misrepresented in the news media.

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In short, the scientific facts do not support the belief that any exposure of humans to PCBs is significant and may present an unreasonable risk.

Suppose CMA Survey Estimates Are Incorrect

Suppose CMA's partial survey of incidental PCBs seriously underestimates their quantity, that in fact 100 times 13,800 pounds per year are being produced and that 66,000 -- not 660 -- pounds exist in intermediate chemicals or commercial goods. (More recently EPA contracted with another consultant to perform their own survey of incidental PCBs. This survey estimated the maximum level of incidental PCBs at about 100,000 pounds/year.)

Assuming the fate of this larger quantity is in essentially the same ratio found in the survey, even this amount of incidental PCBs still would not merit EPA's regulatory attention. The vast majority of it still would be subject to controlled disposal, and the remainder would pose no significant exposure risk to the general public or workers.

Shaky Measurements

Despite convincing evidence to the contrary, EPA decided to proceed with regulating less-than-50 ppm incidental PCBs, and found itself confronted with some tough technical problems. Another CMA study, requested by the Agency in the EDF court action and submitted in August 1981, found that the ability of current analytical technology to accurately measure PCBs at levels less than 50 ppm varies considerably, depending upon the type of PCB involved and the chemical stream being analyzed. Measurement limits can range from less than one ppm to no better than several hundred ppm. In addition, the precision and reproducibility of measurements on the same sample vary widely. Such a shaky analytical situation does not make for trouble-free industry compliance or Agency enforcement action. It is, however, fertile ground for lawsuits and countersuits.

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Compliance Problems And Costs

The chemical industry would find it difficult and very costly to attempt to comply with an EPA low-level incidental PCB control program. To date, the industry has had little success in reducing low concentrations of incidental PCBs above 50 ppm. This is attested to by the more than 400 industry requests now pending at EPA for exemptions from the current rules regulating incidental PCBs above 50 ppm.

Control of incidentally generated PCBs at trace levels, if technically possible, won't come cheaply. The industry estimates that developing a low-level PCB measurement protocol for an entire chemical process costs about $120,000. The necessary test equipment (gas chromatography/ mass spectrometry) costs about $250,000 and another $12,000 per year to maintain.

Actual control of incidental PCB generation would be more expensive. Two case histories illustrate the point: One firm spent $800,000 to reduce PCBs in its process for manufacturing a specialty chemical intermediate; another firm spent $5.6 million to design and construct a new system for removing PCBs after their incidental generation.

Many small chemical companies cannot afford expenditures of this magnitude. They probably will respond to a new low-level regulatory program by simply dropping the process or material that contains the incidental PCBs. As a consequence workers may be displaced.

A Non-Problem

Former Administrator Gorsuch had said on many occasions that her aim was to concentrate the Agency's resources on real problems whose solutions will result in genuine environmental improvement. The low-level incidental PCB issue represents one excellent chance to put this philosophy into practice. Incidental PCBs at less than 50 ppm are a non-problem; the total amount in the environment from this source is insignificant; the health and environmental impact is nil. They are a PCB footnote and should not be allowed to divert the Agency's efforts and attention from the important PCB tasks it now faces.

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However, other "non-problem" PCB issues still remain that won't be addressed in the third rule dealing with incidental PCBs. Since there is no blanket regulatory cutoff, each of these issues will require other rules to be developed by the Agency with a concurrent drain on Agency resources. The time is appropriate to put the PCB issue into perspective and resolve the issue once and for all by changing the law if need be to assure reasonable protection of health and the environment by adequate control and disposal rules without a significant drain on the nation's resources.

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