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BY THE U.S. GENERAL ACCOUNTING OFFICE

Report To The Administrator Environmental Protection Agency

EPA Slow In Controlling PCBs

In 1976 the Congress required that the Environmental Protection Agency control the widely used chemicals, polychlorinated biphenyls (PCBs). Slow in implementing the mandate, however, EPA can offer only limited assurance that its control measures are being followed. Its enforcement program lacks overall direction and does not encourage quick compliance. Additionally, disposal facilities have developed slowly, meeting with considerable public opposition.

GAO makes several recommendations to EPA aimed at strengthening controls for the safe use and proper disposal of this chemical.

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UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D C 20548

COMMUNITY AND ECONOMIC
DEVELOPMENT DIVISION

B-203051

The Honorable Anne M. Gorsuch
Administrator, Environmental
Protection Agency

Dear Ms. Gorsuch:

This report summarizes our review of the Environmental Protection Agency's program to control the use and disposal of polychlorinated biphenyls (PCBs). Our report recommends a number of actions to help improve program direction and encourage wider compliance with PCB control regulations.

As you know, section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on actions taken on our recommendations to the Senate Committee on Governmental Affairs and the House Committee on Government Operations not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

We are sending copies of this report to the Director, Office of Management and Budget; appropriate congressional committees and subcommittees; and other interested parties.

Sincerely yours,

Henry Eschwege

Henry Eschwege
Director

GENERAL ACCOUNTING OFFICE
REPORT TO THE ADMINISTRATOR,
ENVIRONMENTAL PROTECTION AGENCY

EPA SLOW IN CONTROLLING PCBs

D I G E S T

Various studies have associated the widely used polychlorinated biphenyls (PCBs) with a number of health problems, including liver damage, reproductive disorders, and cancer. U.S. industry has purchased over 1 billion pounds of PCBs for use primarily in electric transformers and capacitors. (See pp. 1 and 2.)

Because of PCBs' potential for environmental harm, in 1976 the Congress passed a special provision under the Toxic Substances Control Act to control PCBs. Among other things, the act prohibits with certain exceptions the manufacture of PCBs, limits their use, and requires the Environmental Protection Agency (EPA) to develop regulations to assure proper marking of PCB materials and prescribe acceptable methods for disposal.

EPA has made slow and limited progress in implementing the mandate and has little assurance that industry is complying with its regulations.

Since PCBs were the only chemicals the Congress specifically identified for immediate EPA action, GAO initiated this assignment to determine how well the PCB control mandate has been implemented.

DELAYS HINDER CONTROL EFFORTS

EPA missed by more than 7 months its congressionally mandated deadline for issuing rules on marking and disposing of PCBs. In addition, regulations for implementing the statutory ban on PCBs were late by as much as 18 months. Tight rulemaking time frames and complicated regulatory issues are factors that contributed to the delays.

Once the regulations were issued, EPA was not adequately prepared to enforce them through a coordinated inspection program. Although EPA has made progress in developing an inspection program, additional improvements are needed to make better use of its limited inspection resources.

Although PCB control regulations have been in effect for 3 years, EPA's inspection strategy is still not complete. It is intended to guide EPA regional offices responsible for enforcing the regulations and to allocate inspection resources on a percentage basis among industry groups EPA believes use PCBs. However, some industry groups using PCBs, such as transformer repair shops and waste oil dealers, are not included in the strategy. Also, the inspection priorities have not been refined to reflect regional differences. (See p. 9.)

The inspection strategy also does not include a complete list of the individual PCB facilities making up the targeted industry groups. This insulates some facilities from even being considered for PCB inspection. For example, EPA region II identified 400 possible PCB facilities but estimates that about 2,000 exist. Thus, 80 percent of the PCB users are not even considered for possible inspection. (See p. 11.)

As a result of the strategy's weaknesses, there is little assurance that EPA is inspecting those facilities whose use of PCBs pose the greatest potential threat of environmental contamination. Decisions on which facilities to inspect are important because at the present rate of inspection it would take EPA over 60 years to inspect the limited number of potential PCB facilities contained in the current strategy. (See p. 11.)

Limited EPA oversight and an inadequate information system have also inhibited EPA's ability to target the most appropriate facilities for inspections. EPA headquarters, responsible for providing overall program guidance, does not routinely obtain information in such areas as (1) the number of inspections resulting from complaints, (2) the compliance rate of a given industry, and (3) the types of facilities being inspected. (See p. 12.)

Compliance with EPA's PCB control regulations continues to be a problem. Although the seriousness of violations varied, the economic and potential health consequences of even small PCB contamination incidents could be severe. For example, in 1979 the PCB contents of a single electric transformer leaked and contaminated feed and feed products which were

distributed to 19 States and 2 foreign countries before being discovered. It was estimated to cost private industry $2 million to clean up the problem. (See pp. 13 to 15.)

ENFORCEMENT ACTIONS NOT ADEQUATELY ENCOURAGING COMPLIANCE

EPA's enforcement actions, which are issued in response to violations, are processed slowly and do not encourage rapid or widespread compliance with PCB regulations. Final notices of violation are delayed, which may also delay corrective action. In the five regions GAO reviewed, the average time to issue a notice of noncompliance was about 3-1/2 months, and the time for a civil action was 7 months. (See p. 18.)

Additionally, because EPA does not have the resources to inspect all potential PCB facilities, it must rely on the deterrent value of its penalties and voluntary industry efforts to help achieve widespread compliance. However, penalties which are assessed in accordance with an agencywide penalty policy are substantially reduced during settlement--averaging 65 percent. Such reductions may weaken the penalties' deterrent value and could be a strong indication that either the policy is not being applied properly or that the policy itself is incorrect. (See p. 20.)

Although one of EPA's enforcement strategy objectives is to maximize voluntary compliance, its user awareness program is of limited scope. This program has concentrated on only about 10,000 of the potentially 500,000 PCB facilities. As a result, PCB facilities are not always aware of the regulations. (See p. 22.)

DISPOSAL FACILITIES DEVELOP SLOWLY

Another problem hindering EPA's initial PCB control efforts was the lack of incinerators capable of destroying the large quantities of PCBs taken out of commerce. For over 2-1/2 years, no such disposal facilities were commercially available to burn PCB wastes which by law required incineration. As a result, large quantities of PCB wastes had to be stored, which created a potentially significant health and environmental danger. (See p 28.)

In January 1981, EPA approved two commercial incinerators, the only two available. Although these are fewer than EPA originally anticipated, EPA believes that they can adequately handle PCB waste disposal demands (See p. 29.)

RECOMMENDATIONS

Because of the extensive responsibilities associated with PCB control, GAO recommends that the Administrator, EPA, give more specific direction for the inspection program which should achieve better use of the Agency's limited resources. This can be accomplished by refining the PCB enforcement strategy, reviewing regional implementation of inspection strategies, and developing and using an information system capable of assisting program oversight. (See p. 16.)

To encourage greater compliance with the PCB regulations, the Administrator should require written interim violation notification, review the penalty policy and its application to assure that penalty reductions are limited, and require that the industry awareness component of the strategy be expanded. (See p. 24)

Office of Toxic Substances officials generally agreed with GAO's recommendations. They are considering changes which are in line with GAO recommendations to decrease violation notification time frames and encourage wider compliance with PCB regulations. (See pp. 17 and 25.)

Contents

ABBREVIATIONS

EPA	Environmental Protection Agency
GAO	General Accounting Office
PCBs	polychlorinated biphenyls
ppm	parts per million
TSCA	Toxic Substances Control Act

CHAPTER 1

INTRODUCTION

Polychlorinated biphenyls (PCBs) are toxic synthetic chemicals which are literally everywhere. Since their development in 1929, over 1 billion pounds of PCBs have been sold for a variety of uses, including electrical capacitors, transformers, gas turbines, and adhesives. Several adverse health effects have been associated with PCBs, including liver damage, reproductive problems, and cancer. Compounding problems created by their wide distribution and toxic effects, PCBs are also very persistent. Thus, they can remain in the environment for decades.

In 1976, the Congress expressed particular concern over the PCB hazard, drafting a special provision to control the chemicals under the Toxic Substances Control Act (TSCA). Section 6e of the act required the Environmental Protection Agency (EPA) to control the manufacture, processing, distribution, and use of PCBs. They were the only chemicals that the Congress specifically identified for action under TSCA.

WHAT ARE PCBs?

PCBs are in a class of chemicals called chlorinated hydrocarbons and range in consistency from heavy, oily liquids to waxy solids. PCBs have been widely used in industry as fluids for heat transfer systems, hydraulic systems, gas turbines, and vacuum pumps. Other uses include plasticizers (softeners) in paints, adhesives, and caulking compounds; fillers for casting waxes; dye carriers in carbonless copy paper; and dust control agents in road construction. Most of the PCBs produced in the United States have been used in manufacturing electrical capacitors and transformers.

In a 1977 report, 1/ Versar, Inc., a contractor for EPA, estimated that there were over 900 million PCB containing capacitors in service in the United States. Small capacitors containing less than 3 pounds of PCBs are in such equipment as television sets, home air conditioners, and light fixtures and have service lives of at least 10 years. Large capacitors may contain up to 25 pounds of PCBs and have service lives of 15 to 20 years.

Ironically, PCBs were used for safety reasons in transformers at locations where their proximity to people or property demands a fire resistant dielectric. Approximately 5 percent of the transformers are PCB filled, containing an average of 235 gallons of PCBs. The life expectancy for transformers containing PCBs is more than 30 years, with over 135,000 put into service since 1932.

1/"Microeconomic Impacts of the Proposed Marking and Disposal Regulations for PCBs," April 1977.

WHY ARE PCBs DANGEROUS?

Research indicates that PCBs may cause several adverse effects in people, mammals, birds, and aquatic organisms at extremely low concentrations. In addition, PCBs are widely distributed and degrade very slowly. As a result, once released into the environment through spills, incineration, or discarded end-use products, they can remain a problem for a considerable time. Human exposure to small amounts of PCBs is already widespread as a result of environmental contamination.

PCBs are toxic to animals and humans

Laboratory animal studies have shown PCBs to cause reproductive failure, cancer, gastric disorders, skin lesions, and other problems. For example, in 1978 the International Agency for Research on Cancer concluded that some PCBs are carcinogenic in rats and mice and induce benign and malignant liver cell tumors. Additionally, PCBs have been found to cause loss of facial hair and facial acne in infants of female monkeys fed PCBs before, during, and after pregnancy.

One source of information for PCB effects on people resulted from an accidential contamination incident which took place in Yusho, Japan, in 1968. During this incident, over 1,000 people ingested PCBs which had leaked from a heat transfer system and contaminated rice oil. Among the observed symptoms were nervous system disorders, chloracne (skin rash), gum discoloration, swollen joints, and lethargy. In addition, EPA in 1980 stated that, although precise figures are not yet available, evidence indicates an increased rate of cancer among Yusho victims who have died since 1968.

Toxic effects of PCBs in workers exposed in their occupations were noted as early as the 1930's. Of 24 men working with PCBs in the early 1930's, 23 developed chloracne. Other effects on workers were burning eyes, digestive disturbances, and impotence in men. At least one worker fatality in 1936 was related to synthetic waxes containing PCBs. The worker developed chloracne, followed by jaundice and abdominal pain and distention.

As a result of these incidents, other studies were done. Studies of workers exposed to PCBs have shown a number of symptoms and adverse effects including, but not limited to, chloracne, throat and respiratory irritation, severe headaches, digestive disturbances, impotence, and jaundice. The National Institute for Occupational Safety and Health has noted liver injury in occupational studies with even the lowest PCB concentrations. It concluded that PCBs in the workplace are potential carcinogens.

PCBs are widely distributed

A 1976 EPA contract report estimated that only about 4 percent of the 1.25 billion pounds of PCBs purchased by U.S. industry had been destroyed by incineration or degradation. This means that large quantities of PCBs are believed to be in existence either in service, in landfills, or uncontrolled within the environment.

In the United States, PCBs are present in the air, soil, and water. Sources of airborne PCBs include incomplete incineration of PCB-containing materials and evaporation from paints, PCB contaminated water, and spills. PCBs enter the soil through discarded end-use products and spills during use or transport. One of the principal PCB inputs to a body of water is a contaminated inflowing stream. These problems are compounded because PCBs are among the most stable compounds known. As a result, once released into the environment, they degrade very slowly over several decades.

Release of PCBs into any part of the environment can result in widespread distribution, eventually exposing larger populations of wildlife and people to PCBs. For example, a 197-mile section of the Hudson River was extensively contaminated with PCBs discharged over a 25-year period from two General Electric Company facilities. Because PCBs in the sediments were taken up and concentrated in the aquatic food web, the Hudson River fish became contaminated. Measurements in 1975-76 showed that PCB levels in fish in the Upper Hudson ranged between 12 and 300 parts per million (ppm), averaging 73 ppm. Current EPA regulations require disposal of PCB-contaminated materials with 50 to 500 ppm in an approved, secured landfill or in an EPA-approved incinerator. Because almost all fish in the Hudson River exceed the Food and Drug Administration's PCB tolerance level of 5 ppm, commercial and sport fishing in the upper river has been closed, and commercial fishing in the lower river has been restricted to a few species.

As a result of wide distribution, PCBs are often found in environmental monitoring programs. For example, in a 1974 study of PCBs in human tissue, EPA found that over 90 percent of the samples collected nationally contained traces of the chemical. This was an increase over the 1973 level, which was about 75 percent. In addition, detectable concentrations have been found in up to 62 percent of blood serum samples with concentrations ranging up to 30 parts per billion. PCBs have been found in human embryonic and fetal tissues. And in an analysis of human milk from 40 States, only 5 of 384 samples contained no PCBs.

THE PCB MANDATE

On October 11, 1976, the Congress enacted the Toxic Substances Control Act which gave EPA broad authority to prevent harmful new chemicals from entering commerce and to take control actions against hazardous chemicals already in the environment.

In regard to controlling existing chemicals, the Congress required EPA to take actions against PCBs. They were the only chemicals specifically singled out by the Congress for EPA action.

Provisions for PCB control are found in section 6e of the act which requires EPA to develop a series of regulations within a certain time frame. These include regulations for marking materials containing PCBs and prescribing acceptable techniques for disposing of such materials. Additionally, the act prohibits with certain exceptions the manufacture, processing, distribution, and use of PCBs in other than a totally enclosed manner. PCBs are totally enclosed if they are contained in such a manner as to preclude detectable exposure.

OBJECTIVE, SCOPE, AND METHODOLOGY

We initiated this assignment because PCBs are among the first chemicals EPA has attempted to control under TSCA and are the only chemicals specifically designated for action by the Congress. Our objective was to determine how well EPA implemented the section 6e mandate for PCB control. Our approach to this objective was to (1) determine the nature and scope of PCB contamination, (2) evaluate the effectiveness of EPA's PCB enforcement program, (3) identify obstacles to effective PCB control, and (4) evaluate how well EPA has addressed these obstacles.

We conducted our review primarily at EPA headquarters and EPA regions II (New York), IV (Atlanta), VI (Dallas), VII (Kansas City), and X (Seattle). These regions were not selected on a statistical or scientific basis but were selected principally to obtain a cross section of EPA regions in terms of PCB violations resulting in administrative civil actions as of December 15, 1980. In this respect, EPA's New York and Dallas regional offices had the highest number of civil actions, 21 and 25, respectively; Atlanta and Seattle regional offices had the lowest number, 2 and 0, respectively; and Kansas City regional office was between these extremes, having initiated 6 actions. In addition to being part of this cross section, region VI is the only region having approved commercial PCB incinerators. We conducted our review between February and August 1981.

To determine the nature and scope of PCB contamination, we examined pertinent health effects literature--an October 1978 monograph on PCBs by the International Agency for Research on Cancer, the 1979 report by the National Academy of Sciences entitled "Polychlorinated Biphenyls," and the September 1977 criteria document for PCBs by the National Institute for Occupational Safety and Health. To obtain information on the scope of PCB contamination, we talked with officials overseeing PCB environmental monitoring at EPA, the Food and Drug Administration, the Occupational Safety and Health Administration, and the Department of Agriculture and reviewed data on levels of PCB contamination in a variety of foods, wildlife, and people.

To evaluate the effectiveness of EPA's enforcement strategy, we examined documents and interviewed enforcement officials at EPA headquarters and each of the five selected regional offices. At each location, we obtained information on inspection strategies, penalty policies, and resources allocated for inspection and enforcement actions. Finally, we examined how EPA's enforcement activities are coordinated with other Federal agencies and States through discussions with appropriate State and Federal officials.

We contacted a variety of individuals and reviewed various documents in order to obtain information on the obstacles to effective PCB control and how well EPA is addressing them. For example, in addition to contacting officials from the Federal agencies mentioned previously, we talked to industry representatives, such as the Edison Electric Institute and State officials in New Mexico, Texas, Oklahoma, Arkansas, Louisiana, Washington, Alaska, Oregon, Idaho, New York, Alabama, Florida, and North Carolina, which are within the EPA regions we visited. We also reviewed the Environmental Defense Fund's litigation documents which outlined that organization's concern over EPA's PCB regulatory actions. Also, because of preliminary concern over the adequacy of PCB disposal capabilities and technology, we examined data on the only two EPA-approved commercial incinerators located at Deer Park, Texas, and El Dorado, Arkansas, and visited two of nine approved landfill sites located in Niagara Falls and Model City, New York.

We discussed the matters contained in this report with Office of Toxic Substances officials, including the Director. Where appropriate, their comments have been incorporated into the final report.

CHAPTER 2

QUESTIONABLE PROGRESS IN CONTROLLING PCBs

EPA has made slow and limited progress in regulating PCBs. It was slow in issuing PCB control regulations, due in part to tight time frames and complicated rulemaking issues. Once the regulations were issued, EPA was not prepared to enforce them through a coordinated inspection program. For example, EPA regional offices, responsible for conducting inspections, lacked sufficient guidance on how to inspect PCB facilities or which facilities should be inspected until as many as 3 years after the regulations were enforceable. Even now, regional offices may not be inspecting the most appropriate facilities because EPA has not completed modifying a national enforcement strategy for regional use or developed comprehensive lists of potential PCB facilities within targeted industries. The significance of properly targeting inspections is extremely important in view of EPA's limited resources and the 500,000 facilities that may have PCBs. Limited headquarters oversight has contributed to problems in developing inspection programs and may continue to limit program success.

In addition to the slow start in rulemaking and inspections, EPA has only limited assurance that industry is complying with its regulations for PCB control. Fiscal year 1980 inspections in the five regions we reviewed revealed a 45-percent rate of noncompliance among facilities having PCBs. Although the seriousness of the violations varied, the economic and potential health consequences of incidents involving even relatively small amounts of PCBs could be severe.

RULEMAKING IS SLOW

The Toxic Substances Control Act required EPA, within certain time frames, to develop disposal and labeling requirements. It also prohibited with certain exceptions the manufacture, distribution, and use of PCBs in other than an enclosed manner. As we reported in our 1980 report entitled "EPA Is Slow To Carry Out Its Responsibility To Control Harmful Chemicals" (CED-81-1), EPA missed its legislative deadline for issuing PCB regulations. Disposal and labeling rules were issued on February 17, 1978, or more than 7 months late. In addition, most EPA regulations for implementing the statutory ban on PCBs were late. For example,

--the processing, distribution in commerce, and use of PCBs except in an enclosed manner were banned on July 2, 1979, or 18 months late;

--the manufacture of non-exempted PCB was banned on July 2, 1979, or 6 months late; and

--the processing and distribution of non-exempted PCBs were banned on July 1, 1979, as required by TSCA.

EPA officials indicated that complicated regulatory issues and tight time frames contributed to the rulemaking delays.

PCB regulations are lengthy and complex. However, they are basically designed to control all aspects of the chemicals' manufacture, use, and disposal. First, to avoid substantially increasing the amount of PCBs already in the environment, the regulations prohibit additional manufacture of PCBs unless exempted by EPA. Also, the regulations restrict PCBs' uses to those that are totally enclosed. EPA has defined this to include nonleaking PCB filled transformers and capacitors which contain about 750 million of the estimated 758 million pounds of PCBs in commercial use. Additionally, the regulations require that (1) industry mark most items containing 50 ppm or more PCBs with appropriate warning labels and (2) records be maintained by facilities using or storing PCBs.

Aside from controlling PCBs' manufacture, distribution in commerce, and use, EPA regulations prescribe acceptable methods for disposal to help assure that those PCBs taken out of commerce do not further contaminate the environment. These rules will affect over 500 million pounds of PCBs currently contained in transformers and capacitors that will eventually require disposal. Basically, the rules require that highly contaminated liquids, including those drained from transformers and capacitors, be destroyed at EPA-approved, high-temperature incinerators. Other materials, such as drained transformers, municipal sewage sludge, and materials contaminated by spills can either be incinerated or placed in approved chemical landfills.

The Environmental Defense Fund challenged EPA's definition that nonleaking, intact transformers, capacitors, and electromagnets constituted totally enclosed uses of PCBs. It also questioned why EPA had attempted to regulate only those PCBs whose concentration exceeded 50 ppm. As a result of this challenge, the U.S. Court of Appeals ruled that EPA's definition of totally enclosed uses and its decision not to regulate PCB concentrations under 50 ppm were not supported by substantial evidence. Thus, the court required EPA to conduct further rulemaking consistent with the court's decision. However, on February 12, 1981, the court filed an order staying its earlier decision for a period of 18 months, except for EPA regulations which permitted the manufacture, processing, distribution in commerce, and use of PCBs in concentrations of less than 50 ppm. The court's decision with respect to that regulation was stayed for a period of only 30 days. EPA is expected to finish obtaining additional data supporting its rulemaking by August 1982. If EPA is required to control PCBs in concentrations less than 50 ppm, its enforcement responsibilities would increase significantly.

LIMITED GUIDANCE AND OVERSIGHT HINDER INSPECTION PROGRAM DEVELOPMENT

Even though slow rulemaking occurred, the full impact of the congressional mandate was further delayed because EPA was not prepared to conduct a coordinated inspection program to determine industry compliance. EPA regional offices, which are responsible for conducting such inspections, lacked sufficient guidance on what types of industries should be inspected, how to conduct inspections, and how to apply penalties in cases where violations were discovered. Although progress has been made, EPA has not yet fully completed developing enforcement priorities among potential PCB users, nor has it developed a complete list of individual facilities within targeted industries. As a result, unresolved questions remain concerning whether the most appropriate facilities are being inspected.

Enforcement strategy and other guidance late

Development of regional office PCB inspection programs was hampered by late program guidance documents. For example, regional offices were operating under insufficient interim guidance because EPA did not complete a final inspection strategy until 3 years after the PCB rules were enforceable. The development of inspection manuals was also late. As a result, EPA was not adequately prepared to conduct a coordinated inspection program to enforce the regulations and assure public health and safety.

According to EPA's Pesticides and Toxic Substances Enforcement Division's biannual reviews, much of the program guidance was late. These reviews, which are designed to evaluate regional offices' pesticide and toxic substances enforcement programs, were conducted from April 1980 to February 1981 by a team of headquarters and regional officials who visited each regional office. According to the reviews, regional offices did not have enforcement strategies, inspection manuals, penalty policies, and other guidance documents until well after the program was actually enforceable. The Division reviews added that program implementation documents should have been ready as close as possible to the effective date of the regulations. Other guidance that was not issued before 1981 included a manual on how to handle spills, a booklet on PCB rules in understandable language, and an inspector training manual.

EPA issued its final enforcement strategy in May 1981, about 3 years after PCB marking and disposal regulations were in effect. The strategy was based on the results of a contracted study which had been completed 1-1/2 years earlier. EPA officials gave several reasons for the delay. According to the Chief of the Policy and Strategy Branch, a program was in operation in the regions and they were not clamoring for a final strategy. Finally, he stated that there was no need to get an inspection

strategy out to the regions because they were in a response mode--that is, responding to spills, tips, and calls.

Basically, the EPA strategy provides for awareness and inspection components throughout targeted industry groups which use the vast majority of PCB equipment, as did the contracted strategy In the awareness component, the strategy suggests communicating to company headquarters and plants such information as the health hazards associated with PCBs and the PCB regulations for several industry groups. In the inspection component, the strategy identifies the industry groups and the percentage of inspection resources to allocate to each, as shown below.

Sector/industry	Percentage of inspections (note a)
Railroads	20
Complaints, crises, and special situations	16
Metals	14
Chemicals	13
Utilities	12
Food and feed	10
Paper and lumber	10
Commercial buildings	8
Stone, clay, and glass	5
Textiles	5
Mining	3
Automobile	1

a/Sum of percentages exceeds 100 percent. EPA plans to correct the error.

In addition, the strategy includes background information, a summary of PCB regulations, violation categories, and the penalty policy that provides guidance in assessing civil penalties. It also includes several segments of the contract study strategy as appendixes.

Little assurance that facilities inspected are most appropriate

Although EPA has issued its enforcement strategy, it has still not completed setting priorities or identifying industries to be inspected. Additionally, EPA has not developed complete lists of potential PCB facilities within the targeted industry groups. As a result, unresolved questions remain concerning how well EPA's limited inspection resources are distributed among the extensive number of potential PCB facilities.

EPA's inspection strategy is still not complete. The strategy identifies and allocates inspections on a percentage basis among 11 industry sectors which control the vast majority of PCBs. However, several types of facilities, including transformer repair shops, waste oil dealers, disposal sites, and

Federal facilities, were not included in the strategy. Policy and Strategy Branch officials agreed that additional groups should be added. Additionally, the percentage of inspection resources allocated to each industry was based on how the industries were distributed nationally. The strategy states that these percentages should be further refined to allocate the percentage of inspections in each category, by region, based on how the number of industry facilities are distributed within that region. However, EPA has not yet completed this modification because of limited resources and other priorities.

The inspection strategy is an important aspect of helping to assure that limited EPA resources are being used to inspect the most appropriate facilities. In the five regions we reviewed, about 50 percent of the facilities selected for inspection during fiscal year 1980 did not have PCBs. While it is difficult to know in advance whether a facility selected for inspection actually has PCBs, such a high percentage of non-PCB facilities indicates that inspections may not be targeted correctly, as discussed below.

Regional selection of facilities for inspection within the regions we visited may not have resulted in the best industry selections and sometimes resulted in geographic inequities. For example, region VI selected its inspection sites based on its inspection of facilities having national permits for discharging wastewater. The region selected these facilities and made a PCB inspection at the same time. It selected some other sites for PCB inspection if they were in the same general location as the permit sites. Although this method saves time and travel, PCB inspections were not the priority, but rather an add-on to wastewater treatment inspections. As a result, several shortcomings occurred. For example, 15 percent of the region's fiscal year 1980 inspections were of wastewater treatment plants, which have not been identified as heavy PCB users. In addition, the region's 119 inspections included only 16 utilities out of 317 that had been identified. Electric utilities are one of the heaviest PCB users.

Region IV selected potential PCB sites in an area to which inspectors were sent in response to a pesticide misuse case. It will also do some inspections at the region and suboffice locations. Again, several shortcomings exist. Areas that have few pesticide misuse cases are also less likely to be inspected. Also, because of limited travel funds, firms that are closer to inspector locations, such as the regional office and suboffices, are more likely to be inspected. As a result, there are geographic inequities in inspection coverage.

Other geographic inequities occurred in other site selections. In the fiscal year 1980 inspections in five regions, several States were overlooked. Also, some other States and locations, particularly those near the regional offices, had concentrated inspection efforts. For example, three of region X's four States were relatively equally inspected, but the fourth,

Alaska, had no inspections. In region VII, Nebraska was omitted, and most of the inspections made in Missouri were within a 60-mile radius of the regional office. In region VI, Texas, the State in which the regional office is located, received about one-half of the total PCB inspections. In region IV, seven of eight States were relatively equally inspected, but Kentucky had no inspections. EPA officials cited limited travel funds and staffing shortages as the principal reasons for geographic coverage problems.

The lack of comprehensive lists of PCB facilities within targeted industries creates further questions about whether the most appropriate facilities are being inspected. Except for early limited guidance from headquarters, EPA regions had to develop lists of potential PCB facilities themselves. Several of these lists concentrated largely on utilities. None, however, was very complete in terms of identifying large numbers of PCB facilities. As a result, some potential PCB facilities may not even be considered for possible EPA inspection. For example, region II identified 400 possible users, but anticipated about 2,000 users for its region. If this estimate is accurate, 80 percent of the PCB users in this region may be insulated from inspections. In region X, one section responsible for inspections compiled a list of only 248 users. However, it was unaware that another section in the same branch had compiled a list of an estimated 2,000 possible PCB users in the region.

PCB facilities dwarf EPA inspections

Inspections are sparse when compared to the many possible PCB locations. It is therefore important that EPA's inspection resources be targeted at the most appropriate facilities. According to an EPA strategy document, PCBs are potentially in over 45,000 facilities, but the estimate did not include such likely facilities as railroads, waste oil dealers, disposal sites, and transformer repair shops, to name a few. In addition, the estimates were made before PCBs were found in some natural gas lines, for which there are about 1,600 distribution companies. In addition, EPA officials estimate that about 300,000 commercial buildings contain large quantities of PCBs. According to the Chief of the Compliance Monitoring Branch, at least 500,000 PCB facilities exist.

In contrast, EPA has done only about 2,000 PCB inspections from the program's inception in fiscal year 1979 to March 1981. In addition, not all of the inspections were of a different facility, nor did EPA always select the facility. In the five regions we reviewed, about 5 percent of the inspections were followups to assure correction of previously identified violations, and about 25 percent were inspections for cause, such as spills and tips. The regions also inspected many facilities that did not have PCBs.

EPA averages about 750 inspections a year. At the current rate of inspection, it would take over 60 years to inspect just

the approximately 45,000 facilities listed in EPA's strategy and over 450 years if public buildings were included. As a result, a PCB user's likelihood of inspection in the next 5 years is small.

EPA does not and should not inspect every facility The Chief of the Compliance Monitoring Branch could not estimate just how many inspections EPA should do to establish compliance. However, he anticipated that the number of inspections per year will decrease to 300 to 400 for such reasons as having less contract money available and distributing enforcement resources to other TSCA requirements.

State enforcement grants may alleviate some of the burden of PCB enforcement. As of September 15, 1981, EPA had $1 million available for State enforcement of PCBs. Ten States have been considered for grants, and EPA has offered grants to Connecticut, Ohio, Michigan, and California and is in the process of recommending a grant to Maryland. These five grants will total $1 million and, at least in those States, provide added PCB enforcement. In addition, according to EPA's Grants, Analysis, and Information Section, EPA anticipated that grant money will be available in fiscal year 1982.

Headquarters has inadequate information for proper oversight

EPA headquarters has limited management information on the PCB enforcement program. It compiles almost no regular data and receives few regional information reports on a regular basis. As a result, EPA sometimes makes inaccurate assumptions about the PCB program and consequently cannot make informed decisions about the direction of the program. Lack of information and oversight problems have contributed to the inspection program's slow start and may continue to limit its chance of success.

EPA's few sources of information on the PCB program include 1-week biannual reviews of the regions' TSCA and pesticide enforcement programs, quarterly regional program accountability reports, a periodically updated list of civil actions, and occasional requests to the regions for information. In the 1-week regional reviews, the Pesticides and Toxic Substances Enforcement Division does a general overview of the regions' pesticides and toxics area in terms of management and organization, compliance monitoring, case development, and enforcement. However, this is not a source of routine data on program inspection results. The quarterly regional program accountability report is an agencywide computerized reporting system. However, it lists only general information on the number of inspections for different regulated substances that the regions have projected to do, the number completed, and the number of enforcement actions.

Because EPA headquarters routinely collects only limited program data, the following types of information were not readily available and would have to be requested from the

regions, according to officials in the Compliance Monitoring Branch: (1) number of inspections resulting from complaints, (2) number of PCB spills, (3) compliance rate of a given industry and whether it is improving, and (4) types of facilities being inspected. This information is important because it permits various analyses of past inspection activities from which decisions on program direction can be made. For example, if the compliance rate of a particular industry throughout the United States is very high, inspection resources may be better utilized in other industries.

In some cases, it appears that a lack of program information has detracted from headquarters' decisions. For example, headquarters officials were not overly concerned about completing the final strategy or complete user lists because they believed that the regions were responding to complaints and spills rather than selecting their inspections. However, in the five regions we visited, the data did not substantiate this. In fiscal year 1980, for example, the five regions we reviewed were responding to complaints or requests only about 25 percent of the time.

According to the head of EPA's Grants, Analysis, and Information Section, however, a computerized information management system will be able to provide more information. The system was expected to be in place by December 1981. It will contain TSCA and pesticide enforcement histories and records of contracts and enforcement grants.

QUESTIONABLE COMPLIANCE WITH PCB CONTROL REGULATIONS

In addition to the early rulemaking and inspection program problems, EPA has only limited assurance that its PCB control regulations are being followed. For example, EPA's fiscal year 1980 inspections within the five regions we visited resulted in a 45-percent noncompliance rate among PCB facilities. These violations included improper labeling, storage, disposal, or recordkeeping. While the severity of violations varied, the economic and potential health consequences of even relatively small amounts of PCBs contaminating the environment could be significant.

Significant violation rate

The fiscal year 1980 noncompliance rate of about 45 percent in the five regions we visited indicated that many facilities with PCBs on the premises were not following congressionally mandated EPA regulations. The types of violations found included improper marking, storage, disposal, or recordkeeping. The severity of the violations varied from those resulting in a notice of noncompliance to a civil complaint, which carries a civil penalty with it. Regional offices have considerable flexibility in determining what type of enforcement action to take. However,

notices of noncompliance can be used in lieu of civil penalties if the violation does not constitute a significant threat, if it is the violator's first violation, if it does not involve illegal disposal, and if it does not appear to be a willful act. The notice must also be considered sufficient to induce the violators to correct the problems. The following table summarizes the results of fiscal year 1980 inspections in the five regions we reviewed.

Region	Total FY 1980 inspections (note a)	PCB users (note b)	Notices of noncompliance	Civil complaints	Percent of facilities with violations
II	84	61	4	37	67
IV	72	48	(c)	7	15
VI	119	51	18	7	49
VII	48	26	9	11	77
X	60	32	6	0	19
Total	383	218	37	62	45

a/Includes randomly selected inspections, those resulting from complaints and those that were followups.

b/Excludes 21 PCB users with violations whose cases were incomplete.

c/Eleven other violations were noted, including two Federal facilities, two verbal warnings for minor violations, etc., but the region issues no notices of noncompliance.

Potential consequences of PCB contamination can be severe

The economic and potential health consequences of PCB contamination incidents involving even relatively small quantities of the chemical can be severe. For example, in a December 31, 1980, report, "Further Federal Action Needed To Detect and Control Environmental Contamination of Food" (CED-81-19), we examined the Pierce Packing Company contamination incident which occurred in June 1979 in Billings, Montana. About 200 gallons of transformer fluid containing PCBs leaked into a packing plant's drainage system and were eventually processed into animal feed and grease. These products were marketed to customers who further processed them and fed them to animals. These products, animals, and animal products were eventually distributed to 19 States, Canada, and Japan before the contamination was identified by Department of Agriculture and Food and Drug Administration inspectors.

· By the end of October 1979, the Federal investigation had resulted in the destruction of about 800,000 chickens, 3,840,000 eggs, 4,000 hogs, 74,000 bakery items, 800,000 pounds of assorted animal feeds, and 1.2 million pounds of grease. In addition, 11 firms initiated recalls of about 130 batches of feed and feed ingredients. The Department of Agriculture estimated that the animals, food, and feed products destroyed cost private enterprises more than $2 million.

Perhaps of even greater impact on affected companies will be the loss of public confidence and possible law suits stemming from the incident. For example, during congressional testimony, the Chairman, Pierce Packing Company, said that:

> "The accident, which was not reported to management, and caused the toxic contamination of our animal meal department, has caused irreparable damage to our Company. The integrity, credibility and reputation of our Company has been dramatically impaired * * *."
>
> * * * * *
>
> "The effect of PCB contamination in the State of Montana and the Northwest has resulted in panic in the poultry, egg, feed and livestock industries."
>
> * * * * *
>
> "The effect on the consuming public may never be known. The liabilities may go on ad infinitum. Liability claims no doubt will result in astronomical sums of money far in excess of our ability to pay. It is impossible for any company of our size to be financially responsible for potential claims which may result from this accidental disaster."

CONCLUSIONS

EPA has made limited progress in implementing the congressional mandate to control PCBs. It did not have a coordinated inspection program in place at the time PCB regulations were issued and consequently was not prepared to enforce the regulations. Key pieces of guidance, such as inspection manuals and inspection strategies, were not completed until as many as 3 years after PCB disposal and marking regulations were in effect. Much of the early inspection program relied on inadequate interim guidance.

Although progress has been made in developing an inspection program, questions remain concerning whether EPA is inspecting those facilities whose use of PCBs poses the greatest potential threat of environmental contamination. The current inspection strategy allocates inspections among 11 industrial sectors but

does not include some likely PCB facilities, such as transformer repair shops, waste oil dealers, and disposal sites. In addition, the proposed inspection allocation is based on how the 11 industries are distributed nationally, not regionally. EPA has acknowledged that such modifications are needed but has not yet refined the allocations. Finally, EPA has not developed a complete list of potential PCB facilities within the targeted industry groups and, as a result, insulates many facilities from the possibility of PCB inspections. The disparity between the small number of EPA inspection resources and the vast number of possible PCB facilities further emphasizes the need to inspect the most appropriate facilities in order to maximize the use of EPA's resources.

Limited management information and oversight have contributed to the inspection program's slow development and could continue to hinder EPA's ability to evaluate the program's success or provide overall program direction. For example, EPA headquarters officials thought, incorrectly, that their regional offices were primarily responding to PCB complaints rather than selecting and initiating their own inspections. As a result, headquarters officials did not emphasize establishing inspection priorities. This contributed to delays in developing an inspection strategy which was needed by the regional offices. EPA headquarters continues to lack basic program results information, such as industry compliance rates and types of facilities being inspected, and consequently lacks needed information for program direction. EPA is developing a pesticides and toxic substances management information system which was not in place at the time we made our review.

In addition to EPA's slow rulemaking and inspection program development, there is little assurance that industry is complying with the congressionally mandated regulations for PCB control. As a result, the congressional intent of controlling the PCB hazards may not be fully implemented. In the five regions we reviewed, there was a 45-percent violation rate among the facilities inspected in which PCBs were found. While the seriousness of the violations varied, contamination incidents involving even relatively small amounts of PCBs can have severe economic and potential health consequences.

RECOMMENDATIONS TO THE ADMINISTRATOR, EPA

Because of extensive responsibilities associated with PCB control, we recommend that the Administrator give more specific direction for the PCB inspection program which should result in better use of the Agency's limited resources by:

--Developing a PCB enforcement strategy that encompasses such areas as (1) inspection priorities on a regional basis, (2) complete lists of potential PCB facilities within the targeted industries, and (3) target groups, such as transformer repair shops and waste oil dealers, which are not included among the strategy's currently targeted industries.

--Periodically reviewing the regional implementation of inspection strategies to help assure that the most appropriate facilities are being inspected.

--Developing and using an information system capable of assisting in program evaluation and oversight. This information system should contain such information as types of facilities inspected, the compliance rate of a given industry, and number of inspections resulting from complaints.

OFFICE OF TOXIC SUBSTANCES COMMENTS

Office of Toxic Substances officials generally agreed with our conclusions and recommendations.

CHAPTER 3

ENFORCEMENT ACTIONS: SLOW WITH LIMITED IMPACT

Enforcement actions in response to violations are generally slow, and as a result, many inspected facilities are not notified of their violations in a timely manner. Such delays may allow PCB violations to go uncorrected after they are detected. Additionally, because EPA cannot inspect all PCB facilities, it must rely on the deterrent value of penalties and voluntary compliance. However, penalties are substantially reduced during settlement, and user awareness programs are of limited scope. These problems further weaken EPA's efforts to assure wide compliance with its PCB control regulations and reduce the chance of environmental contamination.

SLOW PROCESSING DELAYS NOTIFYING VIOLATORS

After an inspection, it often takes EPA a considerable amount of time to process and issue final notification of enforcement action. These time frames are important because processing delays slow violator notification, which may delay corrective action. In the five regions we reviewed, the average time to issue a notice of noncompliance was about 3-1/2 months and the time for a civil action was about 7 months. The delays are attributed to headquarters concurrence time, delays in obtaining test results of samples sent for PCB analysis, and limited resources. Plans to eventually eliminate headquarters concurrence with regional enforcement actions will reduce processing times. Additionally, one region we reviewed has attempted to reduce notification time by sending an interim letter to certain inspected facilities before issuing its final enforcement action.

Violator notification is slow

Our review of time frames in four regions showed that the average time from inspection to issuance of a civil complaint was about 140 workdays, or about 7 months. The shortest average time for any region was about 3-1/2 months; the longest average was 11 months. One fiscal year 1979 civil complaint took 21 months, or nearly 2 years, to issue.

In the four regions that issued notices of noncompliance, the average time to process them from inspection to issuance averaged 75 workdays, or about 3-1/2 months. Time frames ranged from 21 workdays (about 1 month) to 198 workdays (almost 10 months).

The following chart shows the average time each region took to officially notify the violator for those actions we reviewed.

Region	Notice	Complaint
	-----(workdays)-----	
II	122	181
IV	(a)	220
VI	60	77
VII	78	112
X	54	(b)

a/Region IV issues no notices.

b/Region X had issued no complaints as of April 23, 1981.

A facility may not know about a violation until it receives notification from EPA. Thus, the violation can go uncorrected for weeks. For example, according to the vice president of a chemical company, EPA inspected his facility but did not notify him of violations until a civil complaint was issued about 7 months later.

According to regional officials and a review of regional case files, several factors contributed to processing delays. They included delays in test sample analysis, headquarters concurrence times, lack of a regional tracking system, and limited resources, to name a few.

The time required to obtain test sample results caused delays in several regions. These tests determine the presence of PCBs and their concentrations which are factors in determining whether a violation exists and its severity. In region VI, a sample took 98 workdays, or almost 5 months. In region IV, one sample took about 3-1/2 months. However, delays before and after the analysis amounted to almost 12 months from the inspection to notifying the facility of the results.

Obtaining EPA headquarters concurrence sometimes adds months to the processing time for civil complaints. Concurrence, which is a mutual agreement on penalty amounts between regional offices and headquarters, is required on all initially assessed penalties resulting from civil complaints and on settlement agreements above or below 40 percent of the originally assessed penalty. For example, if a regional office assessed a $10,000 civil penalty and through the settlement process reduced it to $4,000, the initially assessed penalty would require headquarters concurrence along with the final settlement because the final settlement had been reduced more than 40 percent. One reason for the concurrence time frames was inexperience in applying the relatively new penalty policy. This inexperience required that central oversight be performed to help assure uniform penalty assessments. In the five regions, including those civil complaints in process, the time between submission of a case and receipt of headquarters concurrence averaged 25 workdays, or over 1 month.

In region IV, the lack of a tracking system for enforcement actions contributed to processing delays. For example, one case had been misplaced for nearly 1 year. Region IV's Chief of the Pesticides and Toxic Substances Branch said that he had been remiss in standardizing his PCB recordkeeping. He intends to institute a tracking system to help spot future delays.

Actions to reduce processing time frames

EPA headquarters plans to take action which will reduce notification time frames, and one regional office has already adopted a system to do so The headquarters action involves the concurrence step of the enforcement action process. Some regional officials believe that the original intent of concurrence, which was to assure proficiency in applying the penalty policy, has been realized and that concurrence only contributes to excessive time frames. Headquarters Chief of the Case Development and Legal Branch expected concurrence to be relaxed sometime in 1981. This may reduce time frames by about 1 month.

In addition to headquarters' planned action, region II has already implemented actions to reduce notification times through issuing early notification letters to violators. Although regions are instructed to disclose apparent violations to a facility's management at the time of inspection, they cannot provide information on violations which are dependent upon the results of sample analysis because such analysis cannot be done on site. As a result, there is little assurance that an inspected facility is aware of the complete results of an inspection until it receives official notification. Region II, however, provides a facility with interim written violation notification between the receipt of sample analysis and the final notification. The region adopted this policy in June 1980 to minimize the time period of PCB exposure which could occur if a company was not notified of violations until a formal civil complaint was issued.

EPA SETTLEMENTS REDUCE PENALTIES

Although EPA's penalty policy provides for sizable penalties, they are substantially reduced during settlement negotiations, averaging 65-percent reductions. Various reasons are given for the reductions, but often the penalties are reduced to some extent just for correcting the violations. As a result, the penalties may not be much of a deterrent.

Penalty policy

On March 10, 1980, EPA transmitted to its regional administrators a TSCA civil penalty policy which set up the framework for future development of a PCB penalty policy for individual violations of rules promulgated under TSCA. Subsequently, on April 24, 1980, a PCB penalty policy was issued to regional administrators to guide them in determining penalties for violating PCB regulations. According to the TSCA penalty policy, two of its

purposes are to assure that TSCA civil penalties are assessed in a fair, uniform, and consistent manner and that persons will be deterred from committing violations.

Penalties range from $25,000 for a major violation to $200 for a minor violation. For example, improperly disposing of 300 or more large capacitors would result in a major violation requiring the steepest penalty. Failing to maintain records on less than 220 gallons of PCBs would result in a minor violation and lowest penalty. However, adjustments may be made for culpability, history of violations, ability to pay, ability to continue in business, and such other matters as justice may require. Although one of the adjustments justice may require includes money spent by the violator in cleaning up, the penalty policy states that normally the penalty should not be reduced since cleanup costs are part of the cost of violation.

Penalties are often substantially reduced

In our review of adjusted penalties for all civil complaints settled through March 1981, we found that initially assessed penalties were reduced an average of 65 percent. In addition, although the average initial assessment was about $21,000, the average penalty after settlement was only about $6,000.

At the time of our review, few cases within the five regions visited were issued and settled after the April 1980 penalty policy went into effect. In region II we reviewed 10 such cases and 2 cases in each of regions IV and VI. Region VII had settled only one, which was issued prior to the penalty policy, and region X had no cases. As a result, only 15 cases were reviewed.

The following chart gives the region's number of cases and the average percent of their reductions.

Region	No. of cases	Average initial assessment	Average final assessment	Percent reduction
II	10	$31,920	$19,335	39
IV	2	8,875	7,375	17
VI	2	15,600	3,960	75
VII	1	38,500	2,750	93
X	0	-	-	-
Total	15	$94,895	$33,420	65

The regions had various reasons for reducing the penalties. Most penalties were reduced to some extent, however, just for correcting the violation. This justification was cited in nine cases. The attitude of the violator was also cited frequently, appearing as a reason for reduction in seven cases.

For example, one company was assessed a penalty of $10,000 for disposal, marking, and storage violations. The disposal violation was a result of leaking PCB-contaminated oil. During settlement negotiations, the amount was reduced to $6,600 (a 34-percent reduction) because the company exhibited a positive attitude and provided evidence of corrective action. The corrective action, which involved minimum cost to the company, included labeling PCB materials, placing a plastic sheet over a drum containing PCBs stored for disposal, and tightening up the system to prevent further leakage. Where measures taken by a violator to mitigate a violation do not involve excessive costs, EPA guidelines provide that corrective action may justify a penalty adjustment of up to 15 percent of the assessed penalty.

Other reasons included borderline violations; weak, conflicting, or erroneous information; and ability to pay. Cases where reductions were based on weak or conflicting information included a company's challenge of EPA laboratory results and an inspector not acquiring adequate evidence to support the violation.

Despite the official reasons for reducing penalties, however, one case attorney in a region said arriving at a final settlement without having to go to court is a major consideration in determining the final penalty. In addition to court costs, the time required to prepare testimony would reduce the resources available to handle other PCB cases. Therefore, penalty reductions are viewed as a favorable alternative.

Another reason for reducing penalties and avoiding court proceedings may involve recognition that EPA penalty assessments and policies are only guidelines and not binding. A recent administrative law judge's decision concerning the PCB penalty policy stated that EPA's basic policy for assessing civil penalties is useful only as a guide and ruled in favor of a substantial penalty reduction.

Because of the substantial reductions to the initial penalties, the final assessments may not be an adequate deterrent. According to a former region IV TSCA attorney, civil penalties can be a deterrent if all regions stick to a tough original assessment. However, when other regional attorneys negotiate settlements significantly lower than the initial assessments, corporate lawyers expect the same treatment from EPA in all parts of the country and, as such, consider large penalty reductions to be the norm, not the exception.

INDUSTRY AWARENESS PROGRAM NEEDS STRENGTHENING

Because of the large numbers of facilities and the few inspections, voluntary compliance is crucial to a successful PCB enforcement program. However, efforts to inform industries about PCBs have been limited, and prospects for further awareness are not good.

According to the final enforcement strategy, a key objective of the strategy is to maximize voluntary compliance; that is, to encourage compliance at a facility in the absence of any active enforcement effort there. To accomplish this goal, it is necessary for the regulated community to be aware of both the PCB requirements and the possible enforcement consequences of noncompliance.

The early awareness program had a limited scope. According to the Chief of the Policy and Strategy Branch, about 10,000 letters were sent out to electric utilities when the program first started in 1978 telling them about the PCB regulations and requirements. Despite the estimated 500,000 possible users of PCB, he said it was the only mass mailing EPA has done.

Several regions have terminated their awareness programs. Region II has deemphasized its program to the extent that it is not being funded in fiscal year 1982. Region IV does not plan to conduct any kind of future program for PCB user groups beyond providing information upon request to small electric utilities. Region X, which mailed out some PCB information after the mass mailing, did not plan to do any more because of the cost involved.

Nonetheless, industries continue to be unaware of the PCB regulations. In several enforcement actions, industries said they did not know about the regulations before they were inspected. For example, one food processing firm had to request the necessary PCB information from EPA before it could properly correct a minor marking violation. Another case involved a small town municipal utility that had numerous violations. The superintendent of utilities said that he was not aware of the PCB rules, and region VII reduced the penalty because of it.

According to several State officials we contacted, the users do not understand the PCB regulations. One official said large companies had the expertise to understand the regulations, but small businesses do not and therefore do not understand what is required. According to the chief engineer of a company fined for violating the PCB regulations, his firm was "* * * guilty only of not being large enough to afford a staff of people to read, sort and disseminate the avalanche of laws * * * [put out] * * * by Federal agencies." EPA's Administrator responded that the regulations have had widespread publicity and that EPA attempts to disseminate information to the regulated community.

According to a region X official responsible for educating possible PCB users, however, more needs to be done now to get the word out about PCBs, especially for the smaller utilities and industrial users. The one absolute requirement, he said, would be to publicize the rules in easily understood language. Although EPA headquarters is currently drafting the PCB regulations in easy-to-understand language, it still needs to get the word out to the users.

CONCLUSIONS

EPA's PCB enforcement program may not encourage quick or widespread compliance because violator notification is slow, the deterrent value of its civil penalties is questionable, and the user awareness program is limited. EPA is faced with a difficult task--there are large numbers of potential PCB users and only limited EPA resources to assure compliance with PCB regulations. This disparity puts added pressure on EPA to adopt policies and procedures that promote compliance with the regulations while using its resources as effectively as possible.

One of the primary purposes of any enforcement program is to correct violations quickly. However, we found that the process of notifying a PCB violator is slow, which may delay corrections. For example, it took an average of about 3-1/2 months to issue a notice of noncompliance--which is the minimal enforcement action EPA can take. It took twice as long to issue a civil penalty. Only one region that we visited adopted an early notification system that would provide a violator with written interim notification of problems before it received the official notification.

In addition to slow violator notification, it is questionable whether EPA's application of civil penalties is much of a deterrent against PCB misuse. Such penalties are often reduced substantially from the initial assessment to the final settlement, averaging a 65-percent reduction. There are too few completed civil penalty cases to make broad generalizations as to why final settlements are reduced. Normal negotiations, for example, would certainly account for some of the reductions. However, the amount of these reductions could also be a strong indication that either the penalty policy is not being applied properly or that the policy itself is incorrect. If the penalty policy is incorrect, EPA would be misusing its time and resources in pursuing cases that result in small settlements.

Because of the large potential universe of PCB users and EPA's limited enforcement resources, education that would result in voluntary compliance is needed to supplement civil penalty actions. However, efforts to inform industries have been limited and several regions intend to reduce emphasis in this area. This deemphasis has occurred despite the fact that several State and industry officials see the need for continued awareness efforts. We believe EPA should reconsider the intended action since education seems to be a cost-effective approach to ensuring public health and safety.

RECOMMENDATIONS TO THE ADMINISTRATOR, EPA

To encourage greater compliance with the PCB regulations, we recommend that the Administrator:

- --Require written interim notification of possible violations to inspected facilities to speed the correction of the violation.

- --Review the penalty policy and its application and, if necessary, revise it so that EPA's limited resources are used to penalize the most serious violations and that penalty reductions are limited.

- --Require that the industry awareness component of the strategy be expanded.

OFFICE OF TOXIC SUBSTANCES COMMENTS

Office of Toxic Substances officials generally agreed with our conclusions and recommendations. They are currently considering a proposal designed to shorten violation notification time frames by (1) using an interim inspection report to provide an inspected facility with quick notification of obvious violations prior to receiving laboratory sample analysis and (2) using a laboratory results report to alert a facility of PCB violations which could result in substantial human or environmental exposure and encouraging regional offices to use such reports in all other cases when resources are available.

CHAPTER 4

SLOW PROGRESS IN DEVELOPING DISPOSAL FACILITIES

Proper disposal is the ultimate aim of EPA's PCB control efforts and, consequently, is a key control consideration. Despite this, approved incinerators capable of burning PCBs were not commercially available until over 2-1/2 years after they were needed. This delay created large backlogs of PCB wastes and extended the time during which certain PCB items could be disposed of in landfills rather than by incineration. Incineration is generally preferable to disposal by landfill because the PCBs are destroyed rather than merely contained.

The approval of two commercial incinerators and the development of chemical destruction techniques are significant advances in PCB disposal. However, additional expansion of existing disposal facilities is likely to meet with public opposition, which has also hindered the development of disposal facilities in the past.

DISPOSAL IS AN IMPORTANT CONTROL CONSIDERATION

Disposal is a key aspect of PCB control because improper disposal does not reduce PCBs' potential to contaminate the environment. According to one study, improper disposal could increase levels of environmental contamination by six or more times. Incidents involving unsafe disposal can threaten the environment and public health.

Disposal regulations and their significance

The importance of PCB disposal is discussed in a 1977 EPA contract report entitled "Microeconomic Impacts of the Proposed Marking and Disposal Regulations for PCBs" by Versar, Inc. The contractor pointed out that an estimated 758 million pounds of PCBs are in commercial use. Capacitors comprise about 450 million pounds of this quantity, transformers about 300 million pounds, and nonelectrical uses make up the remaining 8 million pounds. The contractor estimated that the combined 750 million pounds of PCBs in capacitors and transformers are about five times the amount currently contaminating the environment. The study concluded that uncontrolled disposal of these items could increase environmental contamination levels by six or more times.

The potential disposal requirements discussed above are in terms of pure PCBs. However, PCBs are not always in a pure form but rather are mixed with other substances. Therefore, quantities of contaminated material are significantly larger. For example, New York State expects to remove about 1.8 billion cubic yards

of PCB-contaminated sludge from the Hudson River. In addition, it is estimated that there may be over 300 million gallons of PCB-contaminated oil

To help assure appropriate PCB disposal, EPA issued regulations in February 1978 which described what PCB materials were subject to disposal controls and what disposal methods were acceptable. Basically, the regulations required that all highly contaminated liquids, including those drained from transformers and capacitors, be destroyed by high-temperature incineration which assures that 99.9 percent of the PCBs are destroyed. Other materials, such as drained transformers, municipal sewage sludge, and materials contaminated by spills, could be either incinerated or placed in secure landfills. Because no incinerators were approved at the time these regulations were published, EPA also allowed until March 1981, large high- and low-voltage capacitors to be placed in chemical landfills.

The disposal regulations gave EPA regional administrators authority to approve disposal facilities or to waive any condition required by the regulation. As of December 1981, regional administrators have approved nine landfills, four noncommercial incinerators, and two commercial incinerators. The noncommercial incinerators may be used only to burn PCB wastes generated by their owners; the commercial incinerators can offer incineration service to anyone. In addition to the landfills and incinerators, there are also nine high-efficiency boilers which can be used to burn less contaminated PCB material, such as PCB-contaminated mineral oil. Since boilers may not burn highly contaminated PCB material, they do not require EPA approval for burning PCB-contaminated oil--only EPA notification. Finally, as of September 1981, several regional administrators had approved a chemical destruction process which was also intended for use on materials with low PCB concentrations.

Improper disposal can harm environment

Several incidents of improper PCB disposal have threatened public health and the environment. For example, in College Point, New York, a lagoon containing about 500,000 gallons of PCB-contaminated waste oil was found in an abandoned field belonging to the New York City Department of Real Property. According to EPA, the oil was probably dumped illegally and poses a hazard to children or anyone wandering in the area. As of January 1980, an acceptable site for incineration or disposal had not yet been found.

Another incident took place in North Carolina where individuals illegally dumped about 8,500 gallons of PCB on the shoulder of over 250 miles of highway. The contaminated area included 15 counties. The PCB material was discovered when residents in the affected area noticed an unpleasant odor and dying grass along the roadside. Investigation by State and

Federal authorities led to the convictions of four individuals, some of whom received fines and prison sentences.

DISPOSAL CAPABILITIES DEVELOP SLOWLY

The two existing commercial incinerators took over 2-1/2 years to gain EPA approval. These are fewer and provide less geographic distribution than EPA originally anticipated. Although concerns about disposal capacity vary, EPA believes that sufficient disposal capability exists. The approval of incineration facilities has been accompanied by a new chemical destruction process which potentially could be used on large quantities of PCB-contaminated liquids.

Delays in approving few incinerators

Although disposal regulations required that large quantities of highly concentrated PCB materials be incinerated, incineration facilities were not commercially available until over 2-1/2 years after the regulations went into effect. Thus, for this period, PCB users were forced to store materials requiring incineration. At one point, the Electric Power Research Institute estimated that over 1 million gallons of PCBs awaited incineration. In announcing the January 1981 approval of the first incinerator, EPA's region VI administrator underscored the risks associated with PCB storage, stating that

> "* * * the continued storage of millions of pounds of these dangerous chemicals poses an eminent threat to the American people and our environment. It is vital that we remove this material from our midst and destroy it promptly * * *."

In addition to forcing PCBs to be stored, the delay also caused EPA to extend the time period during which capacitors could be landfilled rather than incinerated. Landfilling, unlike incineration, does not destroy PCBs but is intended to contain them. As we reported earlier ("Hazardous Waste Disposal Methods: Major Problems With Their Use" (CED-81-21, Nov. 19, 1980)), landfills can eventually leach and contaminate the environment.

In addition to delays in approving existing incinerators, EPA has approved fewer facilities than anticipated, and both of them are located within EPA region VI. EPA's support document for its proposed disposal regulations presented an analysis of three disposal alternatives. The disposal alternative chosen for the proposed rule assumed the minimum total number of incinerators which were to be located in Deer Park, Texas; Baton Rouge, Louisiana; San Francisco, California; and Bridgeport, New Jersey. This alternative offered a somewhat balanced geographic distribution. However, as of December 1981, only one of these locations, Deer Park, has an approved incinerator. The other approved incinerator is located within the same EPA region at El Dorado, Arkansas. It

is the only facility approved to burn both solid and liquid PCBs, whereas the Deer Park facility is approved only for liquids.

In 1979 and 1980 hearings before a subcommittee of the House Committee on Interstate and Foreign Commerce, which were held before the approval of commercial incinerators, EPA's Assistant Administrator for Pesticides and Toxic Substances acknowledged that the lack of incinerators was a drawback to controlling PCBs. He summarized the problems associated with establishing facilities as (1) minimum response from the private sector to create facilities, (2) strong public resistance to test burns and/or the location of facilities, and (3) technical problems associated with equipping an incinerator facility.

Incineration capability

The small number and limited locations of approved incinerators have created various levels of concern among industry and some EPA officials. However, EPA headquarters believes that adequate capability exists, emphasizing that neither incinerator is operating at full capacity.

Of the regional offices we visited, officials in regions II and IV expressed concern about current incineration capability. Officials in region II's Toxic Substance Inspection Section and Surveillance and Analysis Division, for example, said that more facilities were needed nationwide and at least one was needed in their region. An official in region IV's Toxic Substances Section identified the lack of incinerators as a major obstacle to PCB control and was concerned about the long distances that some wastes had to be transported.

The Utility Solid Waste Activity Group, an organization sponsored by the utility industry, was also among those concerned about current incineration capacity. In a May 12, 1981, letter to EPA, the group suggested that the single capacitor disposal facility was not capable of handling an estimated 20,000 capacitors each month. It also suggested that the cost to incinerate capacitors was excessive. As a result, it requested that EPA allow capacitors to be landfilled rather than incinerated.

On July 23, 1981, EPA denied the group's request, stating that current information indicated that adequate incineration capacity exists. Among EPA's chief points was that the existing facility was operating considerably below its capabilities. Additionally, EPA stated that incineration was not significantly more expensive than landfilling. EPA acknowledged, however, that it would closely monitor the success in satisfying demand for capacitor disposal and take whatever action is necessary if serious cost or capacity problems develop.

Alternative disposal options

Chemical destruction processes are relatively recent additions to PCB disposal techniques. One process, called PCBX,

was developed by Sunohio and designed to strip chlorine atoms from contaminated oil, leaving it free of PCBs. Its advantages are that it is relatively inexpensive and mobile However, it is approved only for PCB-contaminated mineral oil, which generally contains less than 500 ppm. The process has the potential to be used on about 1 billion gallons of contaminated oil.

As of September 1981, only regions I, IV, and VII had approved the process and only region IV had a unit in actual operation. EPA is attempting to develop a more comprehensive approval of the process.

PUBLIC OPPOSITION HINDERS DISPOSAL EXPANSION

As we and others have reported earlier, siting decisions for hazardous waste facilities are often complicated by strong negative public reaction. It is not unexpected, then, that EPA officials in the Chemical Control Division attributed much of the PCB incinerator development delays to public opposition.

In a 1979 contract study, EPA examined the role public opposition played in siting hazardous waste facilities through a series of case studies. One of the cases they examined was the Ensco PCB incinerator in El Dorado, Arkansas. The study concluded that, although the facility appeared to be technically adequate, representing the current state of the art in high-temperature incineration, the local public was overwhelmingly against its operation. Contributing to public opposition were (1) poor image of the owners, (2) importing out-of-state wastes, (3) visually unattractive facility, (4) site location too close to city limits and populated areas, and (5) national news on cancer and birth defects attributable to PCBs.

Although the incinerator was eventually approved, local opposition did delay the process. For example, even before EPA could respond to Ensco's request to burn PCBs, the county passed an ordinance prohibiting the transportation, storage, or disposal of PCBs. Later, public opposition contributed to postponing the facility's PCB test burn by over 6 months.

Based on its review of the Ensco case and others, EPA's contract study concluded that if public opposition continues to frustrate siting attempts, the national effort to regulate hazardous waste may collapse. It concluded that the State rather than the Federal Government should play the lead role in hazardous waste siting. It recommended that EPA's role include public education and information, research and development, and State program funding. Regarding public education, the study pointed out that, while the public is generally aware of the dangers regarding improper disposal, it does not generally understand or believe that reliable solutions to the problem exist.

Industry officials are also concerned with the problems posed by public opposition. One waste disposal official, for example, said that his firm intends to build a waste incinerator at one of its sites but will not apply for a permit to burn PCBs because of public opposition and the time and effort involved in obtaining an EPA permit. An official of the same firm stated that the public sees only the problems of the past and needs to be informed that properly operated landfills and incinerators are environmentally sound disposal techniques.

As illustrated in the Ensco example, public opposition has been and will continue to be an obstacle to increasing the number of PCB disposal sites. In addition to these problems, however, EPA did little to actively encourage such expansion. A Hazardous Site Control Division official, for example, said that EPA should have more aggressively initiated actions with potential disposal facilities to try to assure adequate disposal capability. Another EPA official agreed that EPA has done little to encourage disposal expansion but was unsure whether such a direct approach would be properly within EPA's scope of activities.

CONCLUSIONS

Disposal is a key aspect of PCB control because, without proper disposal, large quantities of PCBs that are now in use in commerce could be released into the environment with potentially harmful consequences. One study estimates that such uncontrolled release could increase contamination levels by as much as six times.

Despite its importance, incineration capabilities developed slowly. No commercial incinerators were approved until over 2-1/2 years after EPA's disposal regulations required large quantities of highly concentrated PCBs to be incinerated. This created large backlogs of PCB waste and increased risks associated with storage. Additionally, the delay forced EPA to extend the time period during which capacitors could be landfilled rather than incinerated. Landfilling is generally less desirable than incineration because PCBs are merely contained rather than destroyed.

Significant progress was made when the first two incinerators were approved in January 1981. While some industry and EPA regional officials question the capabilities of these incinerators to handle PCB wastes, EPA headquarters believes that adequate capability exists. However, it is monitoring the facilities' operations to determine if cost or capacity problems develop in the future.

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