

October 1992

ASBESTOS IN FEDERAL BUILDINGS

Federal Efforts to Protect Employees From Potential Exposure



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October 6, 1992

The Honorable John Glenn
Chairman, Committee on
Governmental Affairs
United States Senate

Dear Mr. Chairman:

At your request, we have examined the potential problem of asbestos in federal buildings. Specifically, this report discusses (1) the extent and condition of asbestos-containing materials in federally owned buildings and (2) selected federal agencies' efforts to minimize the potential for release of asbestos fibers from these materials.

As arranged with your office, unless you publicly announce its contents earlier, we will make no further distribution of this report until 30 days after the date of this letter. At that time, we will send copies to appropriate congressional committees; the heads of the agencies discussed in this report; and the Director, Office of Management and Budget. We will also make copies available to others upon request.

This work was performed under the direction of Richard L. Hembra, Director, Environmental Protection Issues, who may be reached at (202) 275-6111. Major contributors to this report are listed in appendix III.

Sincerely yours,

A handwritten signature in cursive script, appearing to read 'J. Dexter Peach'.

J. Dexter Peach
Assistant Comptroller General

Executive Summary

Purpose

Before the potential health risks were recognized, thousands of buildings were constructed with materials containing asbestos. Damage to or deterioration of these materials can release asbestos fibers into the air. Concerned about potential risks to federal workers, the Chairman, Senate Committee on Governmental Affairs, asked GAO to review federal agencies' efforts to deal with asbestos in federal buildings. As agreed with the Chairman's office, GAO specifically reviewed (1) the extent and condition of asbestos materials in federal buildings and (2) efforts to minimize the release of asbestos fibers from these materials at five agencies: the Department of Energy, the Environmental Protection Agency (EPA), the General Services Administration (GSA), and, within the Department of Agriculture, the Forest Service and the Soil Conservation Service.

Background

The term "asbestos" refers to several naturally occurring minerals that typically separate into very thin fibers when processed. Lightweight, strong, and highly fire-resistant, asbestos was widely used as insulation and in other building materials until the 1970s, when these uses were banned by EPA because of health concerns.

According to EPA, most cases of severe health problems resulting from inhaling asbestos fibers have been experienced by workers in industries such as shipbuilding and mining, where they were exposed to very high levels of the fibers without benefit of current protections. Although EPA believes that the relationship between the level of exposure and disease indicates that a portion of people exposed to low levels may also develop diseases caused by asbestos, how many fibers a person must breathe to develop these diseases is uncertain. EPA and other cognizant organizations have concluded that lower concentrations of airborne asbestos fibers carry lower risks. According to EPA, asbestos materials in good condition and not disturbed or damaged are unlikely to release fibers.

In 1972, the Department of Labor's Occupational Safety and Health Administration (OSHA) issued regulations to protect construction workers and others in industry from occupational exposure to asbestos. Since 1980, federal agencies have also been required to comply with these regulations.

OSHA's regulations provide for stringent engineering controls and work practices during activities, such as building renovation, that will disturb asbestos materials. OSHA has also established less stringent controls and practices that may be used for small-scale, short-duration renovation and

maintenance activities, including minor repairs and cleaning. In the latter cases, employers are to implement asbestos maintenance programs for buildings that contain asbestos. Under such programs, employers are to develop an inventory of asbestos materials and periodically examine the materials' condition for deterioration. Employers are to also establish written procedures for handling asbestos materials during these projects, for dealing with emergencies when fibers are or could be released, and for disposing of the materials. EPA issued documents in 1985 and 1990 that provide more detailed guidance to building owners on how to manage asbestos materials to minimize the potential for fibers to be released.

Results in Brief

The full extent and condition of asbestos materials in buildings owned or leased by the federal government is unknown. No single agency is responsible for maintaining this information on a governmentwide basis, and the agencies GAO reviewed did not have complete and accurate inventories of the buildings containing asbestos. The most comprehensive data available, from a 1984 survey by EPA, estimated that 39 percent of facilities owned or operated by federal civilian agencies contained friable asbestos materials, that is, materials that can be crumbled, pulverized, or reduced to powder by hand pressure. The survey also found that about 36 percent of those facilities with asbestos had some damaged materials. Asbestos materials were present at all 14 federal worksites GAO visited, and at 11 of these sites some of the materials were damaged or deteriorated.

The worksites GAO visited were not fully implementing OSHA's requirements and EPA's recommendations for managing asbestos. Four had not inspected to determine if asbestos materials were present, and only 6 of the 14 had implemented asbestos maintenance programs. In addition, these programs did not fulfill all of OSHA's basic requirements. For instance, the worksites generally did not regularly monitor the condition of asbestos materials. In the absence of comprehensive programs, GAO identified asbestos materials at most of the worksites that needed to be repaired or replaced.

Of the five agencies reviewed, only GSA and the Forest Service had issued policies informing worksite managers about what actions to take to manage asbestos. In addition, only GSA routinely monitored the effectiveness of the asbestos programs at the worksites. Furthermore, officials responsible for asbestos management at these agencies were either unaware of OSHA's requirements for asbestos maintenance programs

or believed that the requirements applied only under certain limited circumstances, such as during the time asbestos material was to be disturbed by a repair project.

Principal Findings

Many Federal Worksites Have Asbestos

EPA estimated that about 14,000 of 35,000 facilities included in its 1984 survey contained friable asbestos materials. EPA also estimated that about 5,000 of these facilities had damaged materials. EPA focused on friable materials, such as sprayed-on materials, as the greatest and most immediate concern because fibers can be more easily released from such materials. According to EPA, nonfriable materials, such as asbestos-containing floor tile, are also a concern because cutting, drilling, sanding, or breaking the materials can release fibers.

All 14 worksites that GAO visited had asbestos materials, and damage to or deterioration of some of these materials was observed at 11 of the worksites. For example, one worksite had over 275 locations of damage. Moreover, some of the damage or deterioration at seven worksites was severe. In a few cases, GAO found asbestos-containing debris or dust lying on the floor or on machinery.

Federal Agencies' Efforts to Identify and Manage Asbestos Have Not Been Effective

Not all of the worksites GAO visited had identified the location of asbestos materials. Of the 14 worksites, only 7 had completed a comprehensive inspection for asbestos. Four worksites had not performed inspections; two others were performing comprehensive inspections for the first time. The remaining worksite's inventory covered only damaged asbestos materials.

Eight worksites had not established programs to minimize the potential for asbestos fibers to be released. In addition, the programs of the other six worksites did not include all of the elements required by OSHA or recommended by EPA. For example, the worksites were not always monitoring the condition of all asbestos materials and updating their inventories for the changes noted. Furthermore, the worksites had not fully implemented procedures to minimize the potential for damage to asbestos materials. For example, warning labels were not consistently posted on all asbestos materials so that maintenance personnel and other

employees would know not to disturb the materials without taking special precautions.

Managers for 7 of the 14 worksites visited told GAO that they did not know asbestos was present or that they had not received information from their agencies on how to establish asbestos programs. Other managers said that asbestos was not as high a priority as other safety and health concerns, such as radiation exposure, from which employees at the Department of Energy facilities must be protected. Three of the five agencies GAO reviewed had not issued policies on how to perform asbestos inspections and what actions to take if asbestos materials were identified. In addition, only GSA routinely monitored the effectiveness of asbestos programs at its worksites.

Furthermore, agency officials did not understand OSHA's requirement for buildings with asbestos to have asbestos maintenance programs. Some officials were not aware of the requirement and those who were aware of it believed that its provisions applied only to the specific materials to be disturbed during renovation and maintenance projects. OSHA officials informed GAO, however, that agencies are required to implement asbestos maintenance programs whenever buildings contain asbestos—even when officials do not anticipate that the asbestos will be disturbed by renovation and maintenance projects—in order to protect employees against potential exposure that can occur through general building repairs or routine cleaning.

Recommendations

GAO recommends that the Secretary of Labor direct the head of OSHA to clarify the conditions under which agencies are required to implement asbestos maintenance programs at federal worksites. GAO also recommends that the Secretaries of the Departments of Agriculture and Energy and the Administrators of EPA and GSA ensure that worksite managers are informed of OSHA's requirements and fully implement them.

Agency Comments

GAO discussed its findings with officials of OSHA's Office of Federal Agency Programs and officials responsible for asbestos control activities at the agencies it reviewed and has incorporated these officials' comments where appropriate. These officials generally agreed with the factual information in this report. As requested, GAO did not obtain written comments on a draft of this report.

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Abbreviations

EPA	Environmental Protection Agency
DOE	Department of Energy
GAO	General Accounting Office
GSA	General Services Administration
OSHA	Occupational Safety and Health Administration

Introduction

The term "asbestos" refers to a group of naturally occurring minerals that when processed typically separate into strong microscopic fibers that resist corrosion, insulate well, and will not burn. For these attributes, asbestos found widespread use in commercial building materials, especially from 1900 until the 1970s, when several major kinds of asbestos materials were banned by the Environmental Protection Agency (EPA) because of health concerns. Research had shown that inhaling asbestos fibers can cause lung cancer and other serious respiratory diseases. Many of today's federal buildings were built or renovated during the time that the use of asbestos-containing materials was popular.

Asbestos Materials in Buildings Present Potential Dangers

The mere presence of asbestos in a building does not mean that the health of building occupants is endangered. According to EPA, as long as asbestos-containing materials remain in good condition and are not disturbed, the release of asbestos fibers into the air is unlikely. However, asbestos fibers may be released because of deterioration over time; vibrations or air movement; or damage stemming from maintenance, repair, cleaning, or accidental contact by building occupants. In addition, fibers that have already settled on surfaces can reenter the air in a building if disturbed by activities such as custodial work. Once in the air, asbestos fibers can remain suspended for hours. When inhaled, the fibers can stay in the lungs because the fibers are not easily destroyed or degraded. Exposure to these fibers can cause several disabling and fatal diseases, including lung cancer; mesothelioma, a cancer of the mesothelial lining in the chest cavity; and asbestosis, a fibrous scarring of the lungs.

Because there is insufficient information on the health effects resulting from low-level exposure to asbestos, it is difficult to accurately assess the magnitude of health risks for building occupants and maintenance and custodial workers. According to EPA, most cases of severe health problems resulting from exposure to asbestos have been experienced by workers in industries such as shipbuilding and mining, where they were exposed to very high levels of the fibers in the air without benefit of current protections. Although EPA believes that the relationship between the level of exposure and disease indicates that a portion of the people exposed to low levels may also develop diseases caused by asbestos, how many fibers a person must breathe to develop these diseases is uncertain. In general, though, the more asbestos fibers a person inhales, the greater the risk of developing these diseases. EPA, the Occupational Safety and Health Administration (OSHA) of the Department of Labor, and the National Institute for Occupational Safety and Health, within the National Institutes

of Health, have concluded that lower concentrations of asbestos fibers in the air carry lower risks.

According to EPA, in general, the risk to health from asbestos in a public or commercial building is greater for the building's custodial and maintenance workers than for the general occupants of the building because such workers have a greater chance of being periodically exposed to elevated levels of asbestos fibers. The jobs of these workers are likely to bring them in close proximity to asbestos materials, such as asbestos-containing pipe insulation, boiler covers, pipe lagging, and ceiling and floor tile, and may sometimes require them to disturb these items in cleaning and performing maintenance.

Federal Agencies Share Responsibility for Managing Federal Buildings

The federal government provides about 499,000 buildings as workspace for its approximately 3 million employees. About 451,000 of these buildings are owned, and roughly 48,000 are leased. These buildings contain over 3 billion square feet of floor space.

As the federal government's facilities manager, the General Services Administration (GSA) provides office space for most federal agencies. However, other federal agencies generally own and are responsible for managing the more numerous "specialty buildings," such as EPA's research laboratories and the Department of Veterans Affairs' hospitals. As of March 1992, GSA owned or leased a total of about 7,500 buildings amounting to about 250 million square feet of floor space. The Departments of Defense, the Interior, Agriculture, Transportation, and Energy and the U.S. Postal Service own or lease more buildings than GSA. (See app. I for the number of buildings owned and leased by individual federal agencies.)

Agencies Are Required to Protect Their Employees From Harmful Asbestos Exposure

Although EPA banned several major kinds of building materials containing asbestos, the agency did not require that these materials be removed from buildings. In fact, EPA generally recommends that asbestos materials in good condition be left in place because removing them can actually increase the risk to building occupants unless all safeguards are properly applied by trained individuals to minimize the release of fibers into the air.

OSHA has issued regulations to protect workers, including federal employees, from asbestos exposure in the workplace. The Occupational Safety and Health Act was enacted in 1970 with the goal of ensuring that

“so far as possible every working man and woman in the Nation [has] safe and healthful working conditions.” Section 19 of the act contains special provisions to ensure safe and healthful working conditions for federal employees, requiring agency heads to establish and maintain an occupational safety and health program. Executive Order 12196, dated February 26, 1980, restated this requirement with regard to federal employees and required the Secretary of Labor to define the basic elements that federal agency heads are to include in occupational safety and health programs. OSHA issued a regulation in 1980 setting out the requirements for agencies in carrying out an effective occupational safety and health program.¹ All workplaces are to be inspected at least annually to identify unsafe and unhealthful working conditions, and agencies are to promptly remediate these conditions.

The regulation defining an effective program also requires federal agencies to comply with OSHA’s regulations issued under section 6 of the Occupational Safety and Health Act that are designed to protect workers. Under section 6, OSHA has issued two major regulations concerning asbestos. OSHA’s regulation for the construction industry (29 C.F.R. 1926.58) provides protection to workers carrying out projects involving the repair or demolition of buildings containing asbestos or the removal or encapsulation of asbestos materials. OSHA’s regulation for general industry (29 C.F.R. 1910.1001) is designed to protect other workers or employees.

The regulation for the construction industry requires stringent engineering controls and work practices to be used during construction work that will disturb asbestos. Construction work covered by the regulation includes demolition and asbestos removal or encapsulation projects, as well as repair, maintenance, alteration, or renovation. Recognizing that these controls and practices can be costly, OSHA promulgated appendix G to the regulation to allow employers to use less stringent controls and practices when performing small-scale, short-duration renovation or maintenance activities, including minor repairs or cleaning. However, if an employer chooses to use the less stringent controls and practices for these activities, the employer must implement an asbestos maintenance program. Under such a program, an employer is to (1) develop an inventory of all asbestos-containing materials in the facility; (2) periodically examine all asbestos materials to detect deterioration; (3) establish written procedures for handling asbestos materials during small-scale, short-duration maintenance and renovation activities; (4) establish written procedures for

¹29 C.F.R. Part 1960, Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters.

disposing of asbestos; (5) establish written procedures for dealing with emergencies resulting when asbestos fibers could be or are released; and (6) train maintenance engineering staff who may be required to handle asbestos materials so that the staff know safe procedures. According to an OSHA official, if asbestos material is present at a worksite and any renovation or maintenance is done, the potential exists for the asbestos to be disturbed.

For owners or operators of buildings containing asbestos, EPA has issued detailed guidance that essentially corresponds to these requirements of appendix G. The appendix's principal guidance is the "Purple Book," which was issued in 1985.² The Purple Book sets out the major steps in establishing a comprehensive program for controlling or managing asbestos. First, the building owner should conduct an inspection to determine if asbestos materials are present, establish an inventory of the materials, and assess their condition and the likelihood that they could be disturbed. Second, if asbestos is located, a written program regarding operations and maintenance should be implemented to keep the materials in good condition and minimize the release of asbestos fibers. Third, the building owner should be prepared to repair the materials or take other abatement actions, such as removing or encapsulating the materials (covering them with a sealant to prevent fibers from being released) when warranted by the condition of the materials.

In July 1990, EPA issued the "Green Book"³ to expand and refine the Purple Book's guidance on special operations and maintenance programs for asbestos materials. Major elements of such a program set out in the Green Book include (1) notifying workers and building occupants about where the materials are located and why to avoid disturbing them; (2) regularly conducting visual reinspections of the materials to note, assess, and document any changes in condition; (3) establishing a system to control activities, such as maintenance or repair work, that might disturb the asbestos; and (4) establish work practices for the custodial, maintenance, and construction staff to use to perform routine tasks that may involve asbestos materials and to clean up asbestos containing dust or debris.

²Guidance for Controlling Asbestos-Containing Materials in Buildings (EPA 560/5-85-024, June 1985).

³Managing Asbestos in Place: A Building Owner's Guide to Operations and Maintenance Programs for Asbestos-Containing Materials (EPA 20T-2003, July 1990).

Other Benefits of Asbestos Management Programs

In addition to protecting workers and complying with OSHA's requirements, an effective program that controls asbestos offers several other benefits. The program helps the building owner or operator avoid potential lawsuits resulting from any adverse health effects of exposure. By keeping the materials in good condition, such a program can also help avoid the costs of an immediate large-scale project to remove asbestos materials, which would include the related costs of moving building occupants, arranging alternative workspace for them during the project, and restoring the building after the project is completed.

Objectives, Scope, and Methodology

Citing concerns about the potential health hazards of exposure to asbestos, the Chairman, Senate Committee on Governmental Affairs, requested that we review federal agencies' efforts to deal with asbestos in their buildings. As agreed with the Chairman's office, we reviewed (1) the extent and the condition of asbestos-containing materials in federal buildings and (2) efforts to prevent or minimize the release of asbestos fibers from these materials at five agencies: (1) the Department of Energy (DOE), (2) EPA, (3) GSA, (4) the Forest Service, and (5) the Soil Conservation Service—the latter two agencies being within the Department of Agriculture.

To determine the extent and condition of asbestos in federal buildings, we interviewed headquarters officials of each of the selected agencies and obtained available reports. In addition, we visited 14 worksites of these agencies—4 for DOE, 4 for EPA, 2 for GSA, 2 for the Forest Service, and 2 for the Soil Conservation Service. These worksites, which were judgmentally selected, collectively provide examples of different sizes and types of federal worksites. For example, the worksites vary in size from having 1 building to over 100. (A listing of the worksites visited is provided in app. II.)

At these worksites, we interviewed agency officials and reviewed available asbestos inventory/inspection data.⁴ We also conducted inspections of asbestos materials at all or a substantial portion of the buildings at each worksite. At each worksite, the inspections were conducted by one of the two Asbestos Hazard Emergency Response Act (AHERA) certified inspectors from our Office of Security and Safety, who participated in our review. Together the two inspectors have over 30 years of experience

⁴The DOE worksites that we visited are government-owned, contractor-operated facilities. Thus, we generally conducted our interviews with and obtained records, reports, and other information on the extent and condition of asbestos materials and management of these materials from contractor personnel responsible for these activities at the worksites.

working in safety and health programs for federal employees, including programs for controlling asbestos. The two inspectors have received training and participated in relevant research sponsored by EPA and the National Institute for Occupational Safety and Health.

On these inspections, we were generally accompanied by worksite occupational safety and health personnel and/or officials responsible for managing the buildings being inspected. In some cases, we sampled (for laboratory analysis) materials suspected but not known to contain asbestos.

To evaluate the agencies' efforts to control asbestos, we reviewed federal laws, regulations, and executive orders pertaining to controlling asbestos and establishing federal agencies' responsibilities for the occupational safety and health of employees. We also obtained guidance issued by EPA on controlling asbestos in buildings and discussed with OSHA officials what activities agencies should be carrying out in providing safe and healthful conditions for their employees. From the individual agencies, we obtained internal policies and guidance to worksite managers on controlling asbestos. At the worksites visited, we interviewed officials and reviewed reports, written procedures, and records to determine how the individual worksites have been addressing asbestos.

Our review was performed between February 1991 and June 1992 in accordance with generally accepted government auditing standards. We discussed the information in this report with DOE, EPA, Forest Service, GSA, and Soil Conservation Service officials responsible for administering and/or knowledgeable about these agencies' activities to control asbestos. We also discussed the information with officials of OSHA's Office of Federal Agency Programs. The comments of all of these officials have been incorporated into the report where appropriate. The officials generally agreed with the facts presented in this report. As requested, we did not obtain written agency comments on a draft of this report.

Many Federal Buildings Contain Asbestos

Though the total number of federal buildings that contain asbestos materials is unknown, prior studies and the data available from the agencies we reviewed suggest that a substantial portion do contain such materials. For example, a 1984 national survey by EPA indicated that 39 percent of the civilian federal facilities owned or operated by the government contained friable asbestos materials.¹ The survey also indicated that in 36 percent of federal facilities with asbestos, some of the materials were damaged. In addition, the 14 agency worksites we visited have a considerable amount of asbestos. Most of the worksites contained some materials in poor condition because of damage or deterioration over time. In some instances, the damage or deterioration of the materials was severe. (Agencies' programs to manage their asbestos materials to prevent or minimize the release of asbestos fibers are discussed in ch. 3.)

Prior Surveys Indicate Number of Federal Buildings With Asbestos Materials Is High

No single federal agency or office is responsible for collecting governmentwide information on the extent or condition of asbestos in federal buildings. The most comprehensive estimate of the number of federal buildings with asbestos materials is based on EPA's 1984 national survey. On the basis of that survey, EPA estimated that about 14,000 of 35,000 facilities (a facility may consist of one or more building) owned or operated by federal civilian (nondefense) agencies nationwide contained friable asbestos materials. According to the survey, about 5,000 of these 14,000 federal facilities with friable asbestos materials had some of these materials damaged. Less than 500, or less than 1 percent, of these facilities contained some significantly damaged materials.

Although EPA focused the survey on friable materials as the greatest and most immediate concern because asbestos fibers may be easily dislodged when materials are friable, it stated that nonfriable material should not be ignored. Asbestos fibers will likely be released if nonfriable material is cut, drilled, sanded, or broken down during building repairs or renovation. EPA's current guidance to building owners recommends a management program covering all asbestos materials. According to EPA's guidance, such a program is to minimize the potential for release of asbestos fibers by keeping all asbestos materials in good condition and not disturbed unless it is intentional and special precautions are taken.

Concerned about the likely presence of asbestos materials in their buildings, two of the five agencies that we reviewed—GSA and

¹Asbestos materials that are friable can be crumbled, pulverized, or reduced to powder by hand pressure. Such destruction of the materials releases asbestos fibers into the air.

EPA—inspected for asbestos and developed agencywide inventories of these materials in the mid-1980s. GSA's survey determined that 70 percent of the 1,639 buildings then owned by the agency contained asbestos materials. EPA's survey showed that approximately 25 percent of its 269 buildings at the time contained friable asbestos. These surveys also determined the condition of the asbestos materials, but that information was not available in summary form.

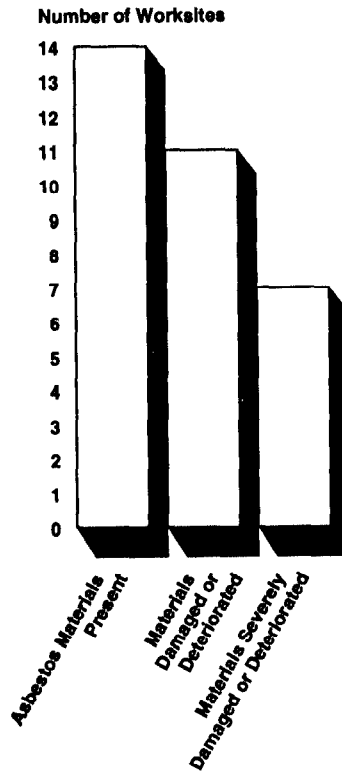
Although GSA and EPA have performed more recent inspections of their asbestos materials, their agencywide inventories have not been updated to reflect the results. GSA and EPA officials told us that worksite managers are responsible for maintaining this information. The remaining three agencies—DOE, the Forest Service, and the Soil Conservation Service—have not collected agencywide data on the presence of asbestos materials in their buildings, although some individual building or facility managers may have conducted inspections. Headquarters officials for these three agencies said that agencywide inventories are not necessary because individual building managers are responsible for addressing problems that might result from asbestos.

Since the time of EPA's 1984 national survey and GSA's and EPA's individual inventories, some of the buildings covered may no longer be occupied by federal agencies or may have had the asbestos materials removed during renovation. However, about 80 percent of the buildings currently owned by the federal government are over 20 years old, and more than half are over 40 years old. According to EPA officials, buildings this old have a good chance of containing some asbestos because they were built when asbestos use was popular.

Worksites We Visited Have a Substantial Amount of Asbestos Materials

All 14 of the federal agency worksites we visited have asbestos materials. In addition, 11 of the 14 worksites had some asbestos materials that were damaged or deteriorated. Moreover, at half of the worksites, some of the damage or deterioration to the material was severe. Asbestos fibers can be released from damaged or deteriorated material or as the material deteriorates further. (See fig. 2.1.)

Figure 2.1: Extent and Condition of Asbestos Materials at 14 Selected Federal Agency Worksites



Inspection or inventory data at the worksites and our own inspections identified a considerable amount of asbestos materials, especially at the DOE worksites. The DOE worksites (consisting of up to 100 or more buildings) are larger than the worksites reviewed for other agencies, and asbestos materials were used extensively in constructing these industrial-type facilities. For example, large steam pipes that run throughout the facilities, outside and inside the buildings, are covered by asbestos insulation except for some areas where asbestos has been replaced with insulation made of other materials. The other worksites we visited also have a substantial amount of asbestos. For example, an EPA building in Cincinnati, Ohio, in addition to other asbestos materials, has 270,000 square feet of asbestos-containing floor tile.

Eleven of the 14 worksites we visited had some asbestos materials in poor condition. However, the amount of damage to or deterioration of the materials varied. The DOE facility at Rocky Flats, Colorado, for example,

had identified about 275 areas of damage and deterioration throughout the facility. During our inspections, we saw numerous areas of damage to the asbestos-containing insulation on steam pipes and some damage to asbestos wall panels. We also saw deterioration of ceiling materials. In contrast, the Soil Conservation Service facility in Beltsville, Maryland, had two locations of damaged asbestos. Figures 2.2 and 2.3 show examples of the asbestos materials and the damage and deterioration that we saw during our inspections at the worksites.

Figure 2.2: Deteriorating Asbestos Insulation Covering a Tank at DOE's Portsmouth Gaseous Diffusion Plant, in Piketon, Ohio

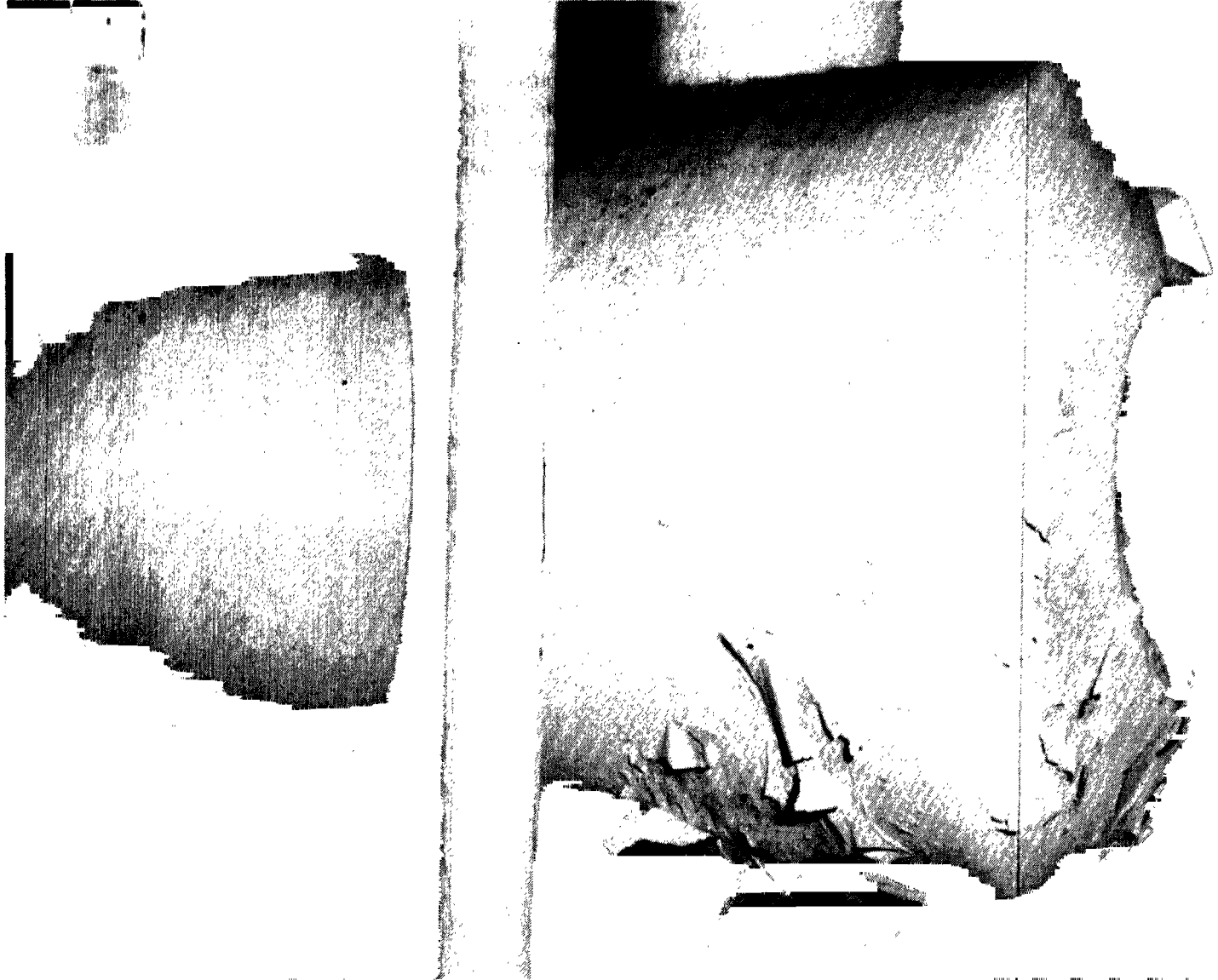
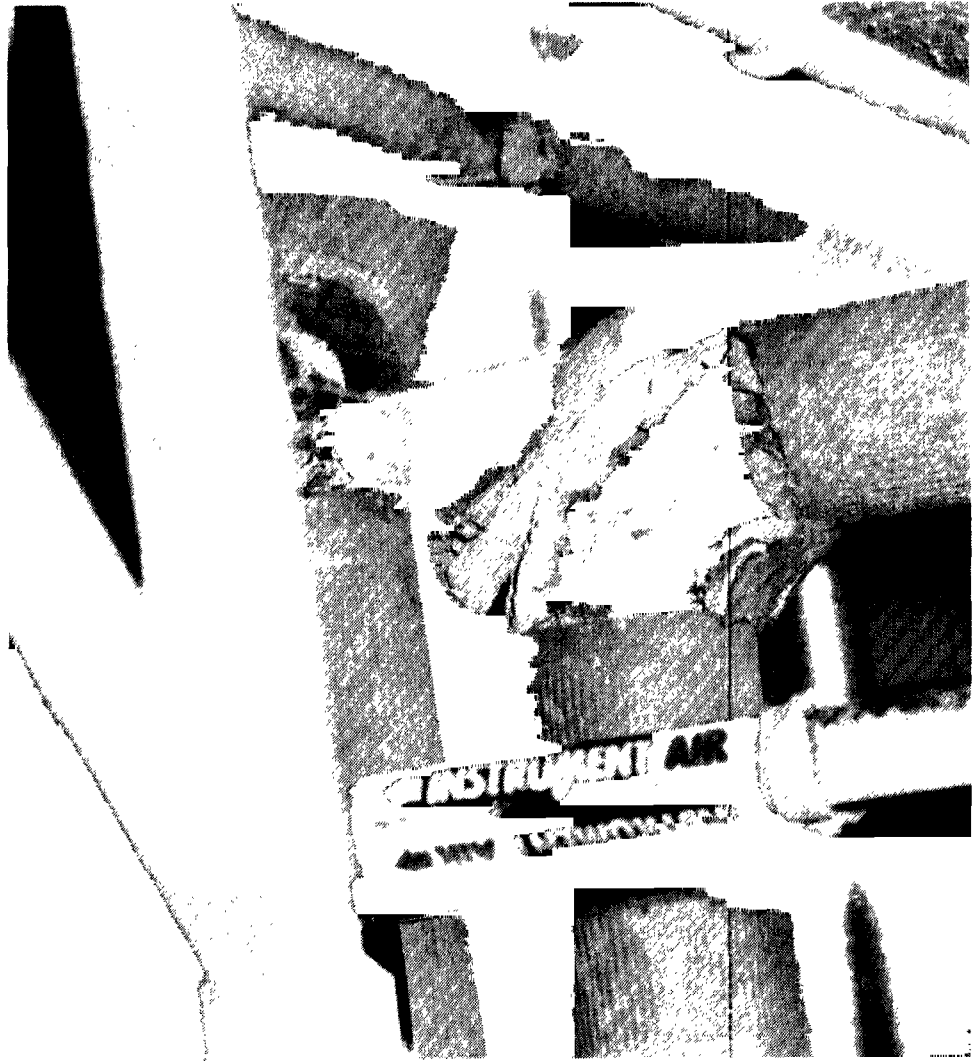


Figure 2.3: Deteriorating Asbestos Pipe Insulation at DOE's Fernald Feed Materials Production Center, Near Cincinnati, Ohio



In several instances, the damage to and deterioration of the materials were such that we found asbestos-containing debris. For example, at one DOE worksite, a considerable amount of asbestos insulation had deteriorated and fallen off pipes because of vibrations from machinery. (See fig. 2.4.) At another worksite, belonging to GSA, asbestos-containing pipe insulation was found on the floor. (See fig. 2.5.) At a Forest Service worksite, asbestos-containing floor tiles had been razed and were in a pile. (See fig. 2.6.) Figure 2.7 shows asbestos-containing debris at another DOE facility.

Figure 2.4: Section of Pipe for Which Asbestos Insulation Had Disintegrated at DOE's Portsmouth Plant



Figure 2.5: Litter From Damaged Asbestos Pipe Insulation at GSA's Custom House, in Philadelphia, Pennsylvania

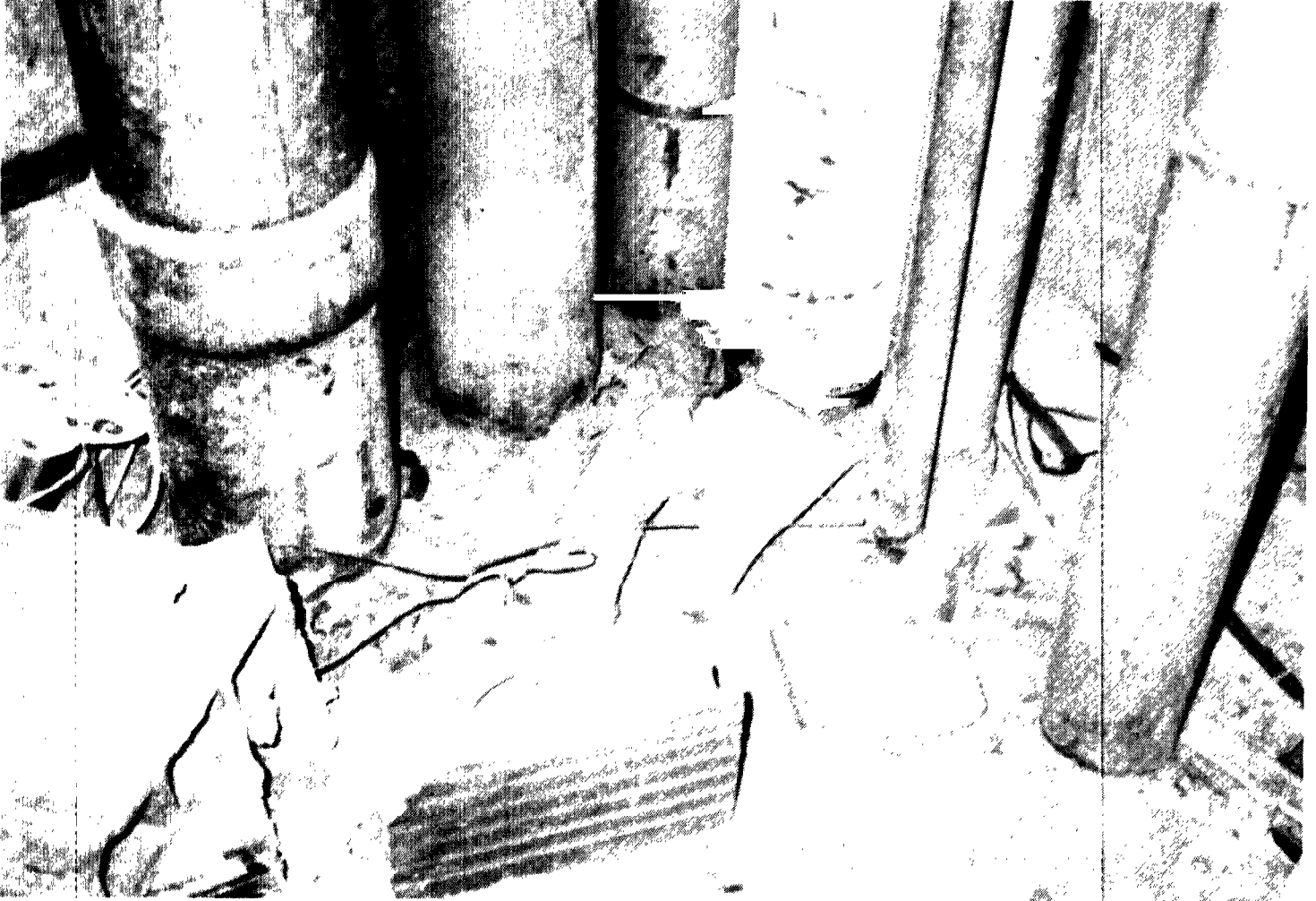
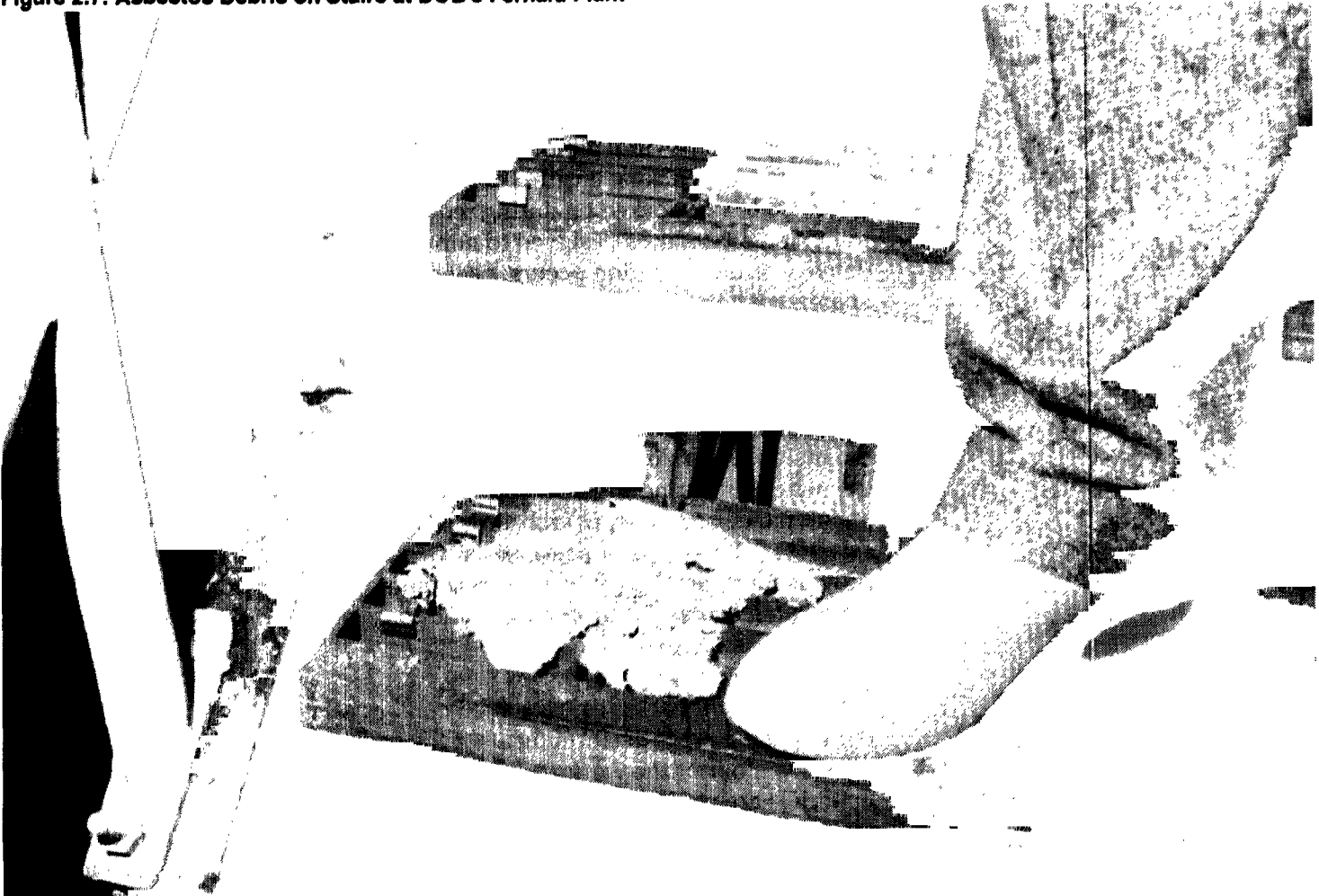


Figure 2.6: Razed Asbestos-Containing Floor Tile at a Forest Service Worksite in Laconia, New Hampshire



Figure 2.7: Asbestos Debris on Stairs at DOE's Fernald Plant



Conclusions

Although the exact number is unknown, many federal buildings contain asbestos. Governmentwide information on the extent and condition of the asbestos materials in these buildings is also not available. However, during visits to the 14 worksites across 5 agencies, we found a considerable amount of asbestos materials and many instances of damaged or deteriorated material. The selected agencies' programs for managing asbestos materials are discussed in chapter 3.

Federal Agencies' Efforts to Manage Asbestos in Buildings Need to Be Improved

Federal agencies are responsible for providing their employees with a safe and healthful work environment. To meet this responsibility with regard to asbestos, agencies must minimize the potential for fibers to be released into the air because of deterioration of or damage to asbestos-containing materials. The first step for agencies is to develop inventories of all asbestos materials and periodically examine them for deterioration. Second, agencies must ensure that the materials are not (1) inadvertently damaged or (2) worked on during renovation or maintenance without following procedures designed to minimize asbestos exposure. Third, if damage or deterioration occurs, agencies must promptly take appropriate abatement action, and if fibers are released, emergency procedures must be implemented to prevent or minimize exposure.

OSHA's requirements for asbestos maintenance programs provide specific requirements for employers to develop inventories; periodically examine the materials for deterioration; and establish procedures for (1) handling the materials during small-scale, short-duration renovation and maintenance activities; (2) asbestos disposal; and (3) dealing with asbestos-related emergencies. EPA's "Green Book" and "Purple Book" provide more detailed guidance on actions needed to protect the materials from being inadvertently damaged and to respond quickly to otherwise abate the risk of exposure.

Although all 14 worksites we visited contain asbestos materials, none of the worksites were performing all of the basic requirements for managing asbestos. Four of the worksites had not inspected to determine if asbestos materials are present, and only six worksites had programs in place to maintain the materials in good condition. In addition, those worksites with programs did not fully carry out all of OSHA's requirements, such as its requirement to monitor asbestos materials to detect deterioration. As a result, we found damaged or deteriorated asbestos materials at most of the worksites.

Worksite managers cited various reasons for not implementing comprehensive asbestos management programs. Managers for 7 of the 14 worksites we visited said that they did not know their buildings contained asbestos materials or that agency management has not instructed them to establish programs. Other managers said that they did not consider addressing asbestos to be as high a priority at their worksites as addressing some other occupational safety and health concerns. None of the officials responsible for asbestos control activities that we contacted at the five agencies were aware that OSHA's regulations require them to

have asbestos programs, and only the Forest Service and GSA had established specific agencywide policies for worksites to follow in managing asbestos. In addition, none of the agencies we reviewed could provide an overall assessment of the effectiveness of worksites' actions to manage and control asbestos.

Worksites' Performance in Inspecting for Asbestos Has Varied Considerably

Initial inspections determine if asbestos materials are present in worksite buildings. The inspections involve both identifying the location and assessing any damage to or deterioration of the materials. The results serve as the basis for the worksite's or building's inventory of asbestos materials and for establishing an effective overall plan for dealing with these materials to prevent asbestos fibers from being released. According to OSHA's requirements and EPA's guidance, conducting these inspections is the first and a critical step in a worksite's efforts to protect employees or other occupants of the building from asbestos exposure.

Four of the worksites we visited had not performed initial inspections. Two of these worksites—the National Plant Materials Center in Beltsville, Maryland, and the Cape May Plant Materials Center in New Jersey—are owned by the Soil Conservation Service, and the other two—the Saco Ranger District Office of the White Mountain National Forest in Laconia, New Hampshire, and the Middlebury Ranger District Office of the Green Mountain National Forest in Rutland, Vermont—are owned by the Forest Service. Soil Conservation Service building managers told us, and headquarters officials confirmed, that they are not required by their agency to survey their buildings for asbestos. Forest Service building managers told us that inspections were planned by the end of 1992 to comply with the agency's requirement to inspect buildings, which was established in 1990. We found that all four of these worksites contain asbestos materials. When we informed the worksite managers of the locations of these materials, they generally told us they were unaware that the materials were asbestos.

Another two worksites we visited—DOE's Rocky Flats and Portsmouth Gaseous Diffusion Plants—had not conducted complete inspections. At the Rocky Flats Plant, the inspections only identified damaged asbestos materials. The plant's inventory did not include asbestos materials that were in good condition. According to Rocky Flats personnel, funding was not available to do a complete inventory (in 1985, a complete inventory was estimated by facility personnel to cost \$2.2 million) so they focused their efforts on damaged materials, which pose the greatest risk of

exposure. The personnel also said that the inventory may include some materials that do not actually contain asbestos because the inventory was based on a visual inspection rather than a laboratory analysis of the materials. In addition, the personnel told us that in addressing safety and health concerns in the past, they considered asbestos a lower priority than others such as radiation.

In our inspections, we identified damaged asbestos materials at Rocky Flats that were not in the facility's inventory of damaged materials. At the Portsmouth plant, the asbestos program managers told us that all buildings on site had been inspected for asbestos materials in 1990.

The remaining eight worksites had performed or were in the process of performing comprehensive inspections. Six worksites—GSA's U.S. Customs House and Veterans Affairs Center Building (Philadelphia, Pennsylvania) and EPA's Andrew J. Briedenbach Environmental Research Center, Center Hill Test and Evaluation Facility, Test and Evaluation Facility (all in Cincinnati, Ohio), and the Newtown Fish Toxicology Station (in Newtown, Ohio)—completed comprehensive inspections in 1984 as part of GSA's and EPA's agencywide inspections of buildings. Two worksites—DOE's Mound and Fernald plants (in Ohio)—were in the process of performing an inspection of their buildings at the time of our visits. Past efforts to identify the location and quantity of asbestos materials at Fernald and Mound were performed as needed before construction or maintenance projects began, and a complete inventory of asbestos in the worksite's buildings had never been developed. For example, an inspection performed at Mound in 1989 did not identify all asbestos at the site. In June 1992, Mound representatives told us that 60 buildings had been surveyed for asbestos in the last few months and that the remaining buildings were to be surveyed in the next few months, while Fernald representatives told us that the inspection that was being performed at the time of our visit had been completed.

Worksites Are Not Fully Implementing Asbestos Maintenance Programs

When asbestos materials are identified in a building, an asbestos maintenance program is required to keep them in good condition and prevent or minimize the chance for fibers to be released. According to OSHA's requirements and EPA's guidance, such a program primarily involves monitoring the materials' condition through periodic inspections, ensuring that the materials are not inadvertently disturbed and that personnel are informed of necessary special precautions, and establishing emergency

procedures for responding to incidents when fibers could be or are being released.

Eight Worksites Had Not Established Programs

Eight of the worksites we visited—four EPA, two Forest Service, and two Soil Conservation Service—had not established asbestos management programs. The EPA worksites had developed written procedures a week before our visits in September 1991 and had not yet implemented them. According to an EPA facilities director who was unaware of the requirement to establish asbestos maintenance programs, EPA safety and health officers at agency headquarters told them of the need for such programs in July 1991. At one of the worksites, managers had known about the presence of asbestos materials since 1989, when maintenance personnel alerted them about some damaged asbestos materials. In July 1992, an EPA headquarters official told us that the new procedures for managing asbestos, including training of the worksite managers responsible for implementing and overseeing them, will be fully implemented by late 1992. Soil Conservation Service building managers said that they had not established asbestos maintenance programs because their agency has no requirement for these programs. Forest Service building managers told us that such programs will be developed in 1993 after inspections are completed to locate asbestos materials. However, at the time of our visits to the Forest Service worksites, the manager of the Saco Ranger District Office had received asbestos training. In June 1992, Forest Service officials told us that asbestos training had been provided to all Forest Service worksites.

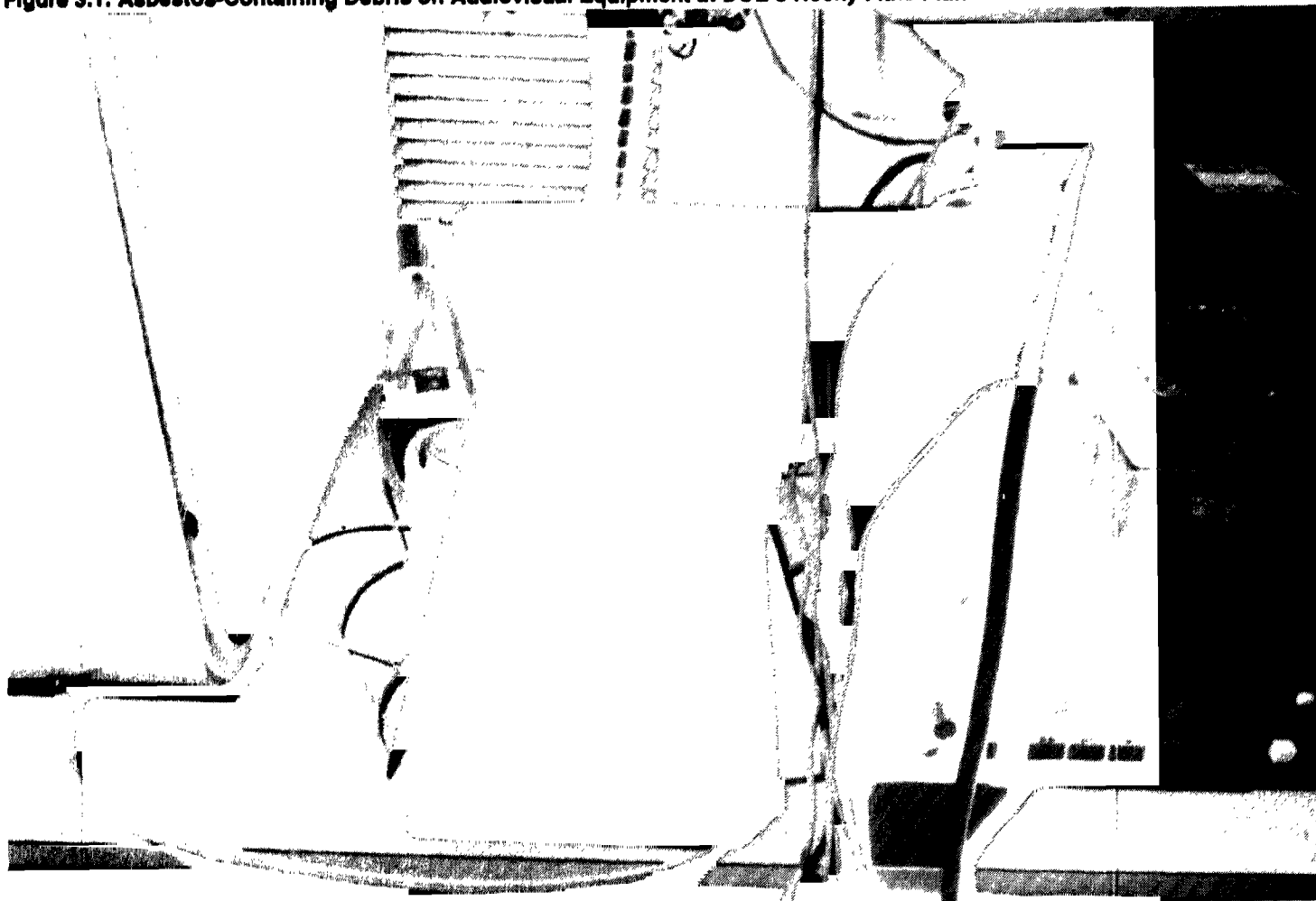
Six Worksites Had Incomplete Programs

The remaining six worksites—two belonging to GSA and four to DOE—had asbestos maintenance programs, but they were not complete. For example, these worksites had not monitored the condition of all asbestos materials in a complete and timely manner. OSHA requires the “periodic examination” of asbestos materials to identify any damage or deterioration but does not specify what periodic or examination means. EPA’s “Purple Book” recommends that building owners inspect asbestos materials at least twice a year for evidence of damage or deterioration. EPA’s “Green Book” states that building owners should conduct a visual inspection of all asbestos materials at regular intervals. The “Green Book” does not recommend a specific interval but cites as a guide its regulations for schools, which require a routine physical surveillance check of asbestos materials every 6 months (the regulations permit this surveillance to be

conducted by a trained school custodian or maintenance worker) and a reinspection by an accredited inspector at least every 3 years.

The two GSA worksites, for example, reinspected their buildings, but one of them was reinspected in 1989, 4 years after the initial inspection. Another example is the Rocky Flats plant. Facility personnel told us that they perform periodic inspections. However, the plant-wide survey of damaged asbestos materials performed in 1991 identified about 38 locations of damage that were not on the last survey in 1988. Periodic inspections taking place between the two surveys should have found and noted this damage. During our inspections at the plant, we found damage or deterioration that plant personnel responsible for the surveillance were not aware of. For example, in an unrestricted, administrative building, we found debris or dust that laboratory tests later showed to contain asbestos. Asbestos ceiling material in the auditorium and in adjoining audiovisual and mechanical rooms was deteriorating. Debris, for example, was on the equipment in the audiovisual room, including near a fan that if used could have blown asbestos fibers back into the air. Asbestos debris was also in the mechanical room and auditorium. The facility personnel responsible for surveillance of asbestos materials were unaware that the debris contained asbestos and had not noted the severe extent of deterioration or the debris. An audiovisual operator told us that he had been finding similar dust in the room for several years. (See fig. 3.1.)

Figure 3.1: Asbestos-Containing Debris on Audiovisual Equipment at DOE's Rocky Flats Plant



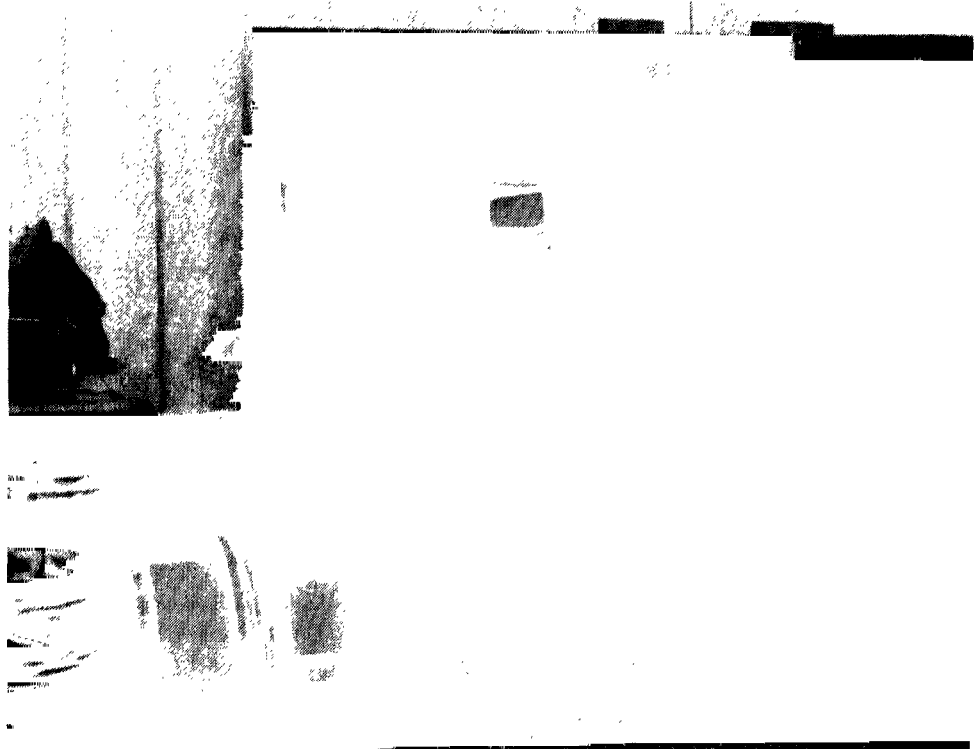
The other DOE worksites also were not routinely monitoring the condition of asbestos materials. However, in June 1992, Fernald representatives told us that with completion of their asbestos site survey, they are now monitoring asbestos materials and updating their inventory on a continuing basis. We did not verify or evaluate these efforts.

In addition, at the DOE and other worksites, we identified improper posting of labels that warn building occupants and maintenance workers of the potential hazards if the asbestos materials are disturbed. In some buildings, asbestos materials were labeled, and in others, they were not. In

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the steam plant at Rocky Flats, for example, we saw an area of asbestos material that appeared to have been dug out by a wrench used by someone on the maintenance staff who worked on a pipe near the material. A warning label was not attached. In some cases when labels were present, they were ineffective. Some had been damaged or had faded over time. (See fig. 3.2.) In other cases, the labeling was confusing because it did not make plain which materials contained asbestos. In June 1992, representatives of the Fernald plant told us that since the time of our visit, all asbestos materials are now properly labeled on the basis of the recently completed survey of the site.

Figure 3.2: an Ineffective Warning Label at DOE's Rocky Flats Plant



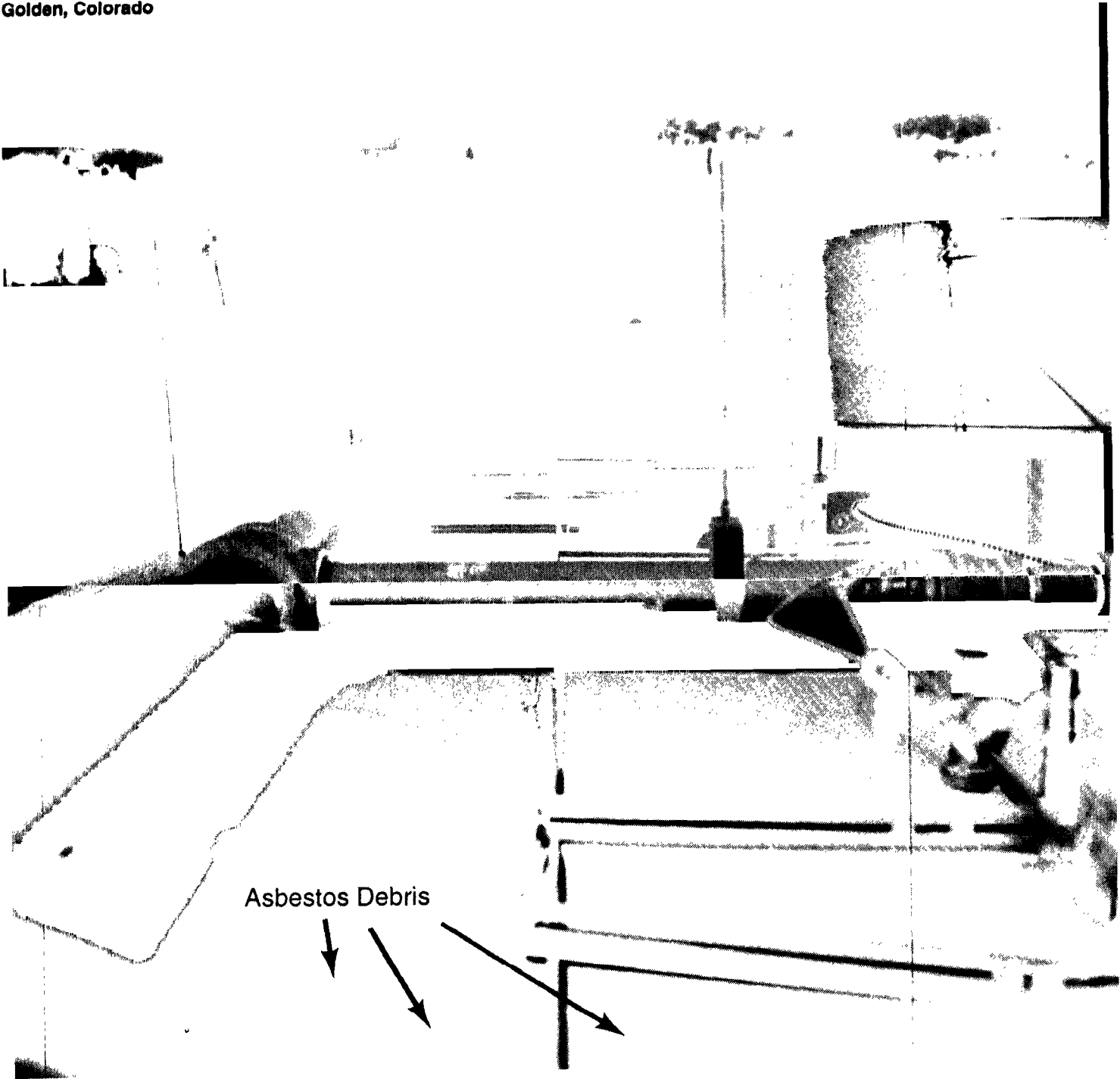
Note: The indicated label had faded so that it was not legible.

The instance of asbestos debris in the administrative building at Rocky Flats illustrates the need to make building occupants and others, such as maintenance personnel, aware of asbestos materials and to also have

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procedures to control access to the materials. For example, personnel in office space that had been part of the auditorium told us that they had also found the debris on occasion, usually after security guards had crawled above the suspended ceiling installed below the asbestos material. Security guard personnel explained that they occasionally check above the suspended ceiling in that office space and in the auditorium. The guard personnel did not know that the materials above the suspended ceiling contained asbestos. (See fig. 3.3.) In addition, the operator of the audiovisual equipment told us that he was not aware of the asbestos and had not taken special precautions in cleaning up the dust.

Figure 3.3: Deteriorated Asbestos-Containing Ceiling Material Above a Suspended Ceiling at DOE's Rocky Flats Plant, Near Golden, Colorado



The DOE worksites had not always implemented procedures for dealing with emergencies involving the potential release of asbestos fibers. Without effective implementation of asbestos procedures, which would include having personnel report damage to or deterioration of asbestos materials, asbestos fibers could continue to be released into the air. For example, at DOE's Mound facility, which lacked such procedures, a pipefitter identified severely deteriorated asbestos materials but did not know the procedures for reporting such conditions.

Some Damaged Asbestos Materials Were Not Addressed

All of the worksites we visited—except EPA's Center Hill Research Test and Evaluation Facility, the Forest Service's Middlebury Ranger District Office, and the Soil Conservation Service's Cape May Plant Materials Center—had some asbestos materials that had been damaged or that had deteriorated. Some of the damaged or deteriorated materials needed minor repairs, while others were more damaged and needed more extensive work and possibly removal and replacement.

Some of the areas of damaged or deteriorating asbestos materials have been allowed to exist for at least 4 years. A DOE facility manager told us that the damage to asbestos materials had not been as great a concern as some other safety and health concerns, such as radiation, and thus had been a lower priority for limited funding, as the following illustrates: In 1989, the DOE contractor estimated that it would cost about \$3.8 million to remove damaged asbestos at Rocky Flats Plant. According to contractor officials, funds were allocated to abate the worst asbestos hazards but instead were used for other plant operations, and the damaged materials were not remediated. According to Rocky Flats representatives, about \$2.5 million was spent on asbestos abatement projects from 1986 through 1989. Mound personnel told us that some asbestos materials had been scheduled for remediation, but remediation of the materials had not taken place at the time of our visit. Worksite managers for the Soil Conservation Service and Forest Service told us that they did not have the expertise to address the asbestos materials we identified at their worksites.

In June 1992, Fernald representatives told us that work orders were being developed to remediate damaged pipe insulation and wallboard identified during the survey of the facility that was completed since our visit. During our visit to Fernald, we found areas of damaged asbestos insulation on pipes that needed to be wrapped or encapsulated and areas of asbestos debris that needed disposal. (Similar damage was found at the other DOE sites.) Also, nitric acid evaporating from systems operating at the plant

had caused asbestos-containing wallboard to deteriorate. Those panels were damaged enough to need removal.

Headquarters' Direction and Oversight of Asbestos Management Has Been Limited

Of the five agencies included in our review, only GSA and the Forest Service had developed agencywide policies specifically for managing asbestos. However, EPA is in the process of issuing such a policy. In July 1991, EPA headquarters sent a memorandum to regional and laboratory health and safety managers stating that asbestos materials should be managed in accordance with documents providing technical guidance that have been issued by the agency, such as the "Green Book." (The EPA worksites included in our review had not yet received these documents at the time of our visits.) In addition, EPA has developed a draft policy statement and standard operating procedures for locally managing asbestos in buildings occupied by agency employees. According to EPA headquarters officials, the new policy and operating procedures, dated March 1992, will be pilot tested, revised on the basis of this experience in implementing them, and disseminated nationwide in early 1993.

DOE has issued an order on industrial hygiene programs at government-owned, contractor-operated facilities such as those that we visited. The order requires identification and evaluation of existing and potential occupational health hazards and control measures to deal with them but does not provide specific guidance on asbestos management. DOE has not published agencywide asbestos management policies. DOE facility managers told us that asbestos management is left to the worksites because conditions can vary by individual building and cannot all be addressed by an agency policy. The Soil Conservation Service has provided only broad policy guidance on implementing occupational safety and health programs. A Soil Conservation Service official explained that the agency has not issued an asbestos management policy primarily because, as an agency within the Department of Agriculture, it follows the Department's policies, and the Department has not required the agency to develop a program.

Officials from each of the five agencies reviewed told us that local worksites have primary responsibility for dealing with asbestos materials. However, the agencies, except for GSA, provided limited monitoring of the effectiveness of their worksites' management of asbestos. OSHA requires that federal agencies develop and implement a program of self-evaluation to determine the effectiveness of their activities to address occupational safety and health hazards at worksites. All the agencies, except the Soil

Conservation Service, conducted periodic internal audits of worksites' occupational safety and health and environmental management activities. For example, according to agency officials, EPA conducts these reviews at its worksites on the average of every 2 to 3 years.

Our review of the reports on the audits of the worksites that we visited showed that asbestos management at these facilities was usually not discussed, or the reports indicated that limited evaluations of asbestos management were carried out. For example, EPA's reports on its most recent audits noted only that each of the worksites should have written asbestos management plans. Although each of the EPA worksites contained asbestos, an earlier audit of one of these worksites reported that asbestos materials were not present at one of them. DOE officials evaluate asbestos management during its audits only if the worksite managers indicate that asbestos is a problem at the facility. DOE and Soil Conservation headquarters officials said that they generally rely on reports about occupational illnesses and injuries to inform them of asbestos problems at worksites. Asbestos-related diseases, however, generally do not develop until 20 years or longer after exposure. In June 1992, Forest Service officials told us that the agency is planning to implement a formal requirement for worksites to report on asbestos management.

Some Agency Officials Question Applicability of OSHA's Regulations

Officials from the agencies included in our review were either unaware that appendix G of OSHA's regulation 29 CFR 1926.58 required them to have asbestos maintenance programs or believed that the appendix applied only in a limited way. For example, some DOE officials told us that appendix G is not mandatory and that they are not required by the regulation to have an asbestos maintenance program. Some GSA and EPA officials said that appendix G applies only when a small-scale, short-duration project is to begin and only to the asbestos material that is affected by that particular project. These GSA and EPA officials also said that the term "small-scale, short-duration renovation and maintenance activities" referred to in the appendix does not include activities such as minor repairs and cleaning. Officials that we talked with from the other agencies were not familiar with the requirements of appendix G.

According to OSHA officials, agencies are required to implement asbestos maintenance programs whenever buildings contain asbestos, even when it is not anticipated that the asbestos will be disturbed by renovation and maintenance projects, in order to protect employees against potential

exposure that can occur through general building repairs or routine cleaning.

Conclusions

The federal agencies that we reviewed have not taken action to ensure that their worksites have asbestos management programs that meet the requirements of OSHA's regulations and the principal recommendations set out in EPA's guidance. Some worksites did not have programs, while the programs of others were not comprehensive or did not demonstrate the attention to detail needed to minimize the potential for asbestos fibers to be released. The lack of these programs and the weaknesses in the programs that exist stem from several factors, including competing priorities, the agencies' failure to provide direction and oversight, and the lack of knowledge about the requirements for such programs. A clarification that specific requirements exist, coupled with agencies' direction and oversight to ensure that the requirements are implemented, would provide better assurance that actions are taken to minimize the potential for federal employees to be exposed to asbestos fibers.

Recommendations

To help ensure that federal employees are not exposed to unhealthful amounts of asbestos fibers, we recommend that the Secretary of Labor direct the Assistant Secretary for Occupational Safety and Health to clarify the conditions under which agencies are required to implement asbestos maintenance programs at federal worksites. We also recommend that the Secretaries of Agriculture and Energy and the Administrators of EPA and GSA (1) inform those responsible for their worksites of the need to implement OSHA's requirements and (2) ensure that the requirements are effectively carried out.

Buildings Owned and Leased by the Federal Government

Department or Agency	Number of Buildings		Total
	Owned	Leased	
Agriculture	18,188	3,064	21,252
Commerce	749	454	1,203
Defense	334,699	5,093	339,792
Education	152	0	152
Energy	10,211	170	10,381
Environmental Protection Agency	116	19	135
Federal Communications Commission	65	1	66
Federal Emergency Management Agency	26	0	26
General Services Administration	2,714	4,412	7,126
Government Printing Office	5	0	5
Health and Human Services	2,616	278	2,894
Housing and Urban Development	0	0	0
Interior	52,098	308	52,406
International Communications Agency	38	0	38
Justice	1,796	135	1,931
Labor	1,294	505	1,799
National Aeronautics and Space Administration	3,009	8	3,017
National Science Foundation	214	14	228
State	102	0	102
Tennessee Valley Authority	524	87	611
Treasury	373	136	509
Transportation	11,540	5,161	16,701
U.S. Postal Service	5,355	27,700	33,055
Veterans Affairs	4,887	316	5,203
Total	450,771	47,861	498,632

Source: Summary Report of Real Property Owned and Leased by the United States Throughout the World, as of September 30, 1989, General Services Administration.

Federal Worksites Visited by GAO

Department of Energy

Fernald Feed Materials Production Center
Cincinnati, Ohio

Mound Applied Technologies Facility
Mound, Ohio

Portsmouth Gaseous Diffusion Plant
Piketon, Ohio

Rocky Flats Plant
Golden, Colorado

Environmental Protection Agency

Andrew J. Briedenbach Environmental Research Center
Cincinnati, Ohio

Center Hill Test and Evaluation Center
Cincinnati, Ohio

Gest Street Test and Evaluation Facility
Cincinnati, Ohio

Newtown Fish Toxicology Station
Newtown, Ohio

Forest Service

Middlebury Ranger District Office
Green Mountain National Forest
Rutland, Vermont

Saco Ranger District Office
White Mountain National Forest
Conway, New Hampshire

General Services Administration

U.S. Customs House
Philadelphia, Pennsylvania

Veterans Affairs Building 01
Philadelphia, Pennsylvania

**Soil Conservation
Service**

Cape May Plant Materials Center
Cape May Courthouse, New Jersey

National Plant Materials Center
Beltsville, Maryland

Major Contributors to This Report

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Community, and
Economic
Development Division,
Washington, D.C.**

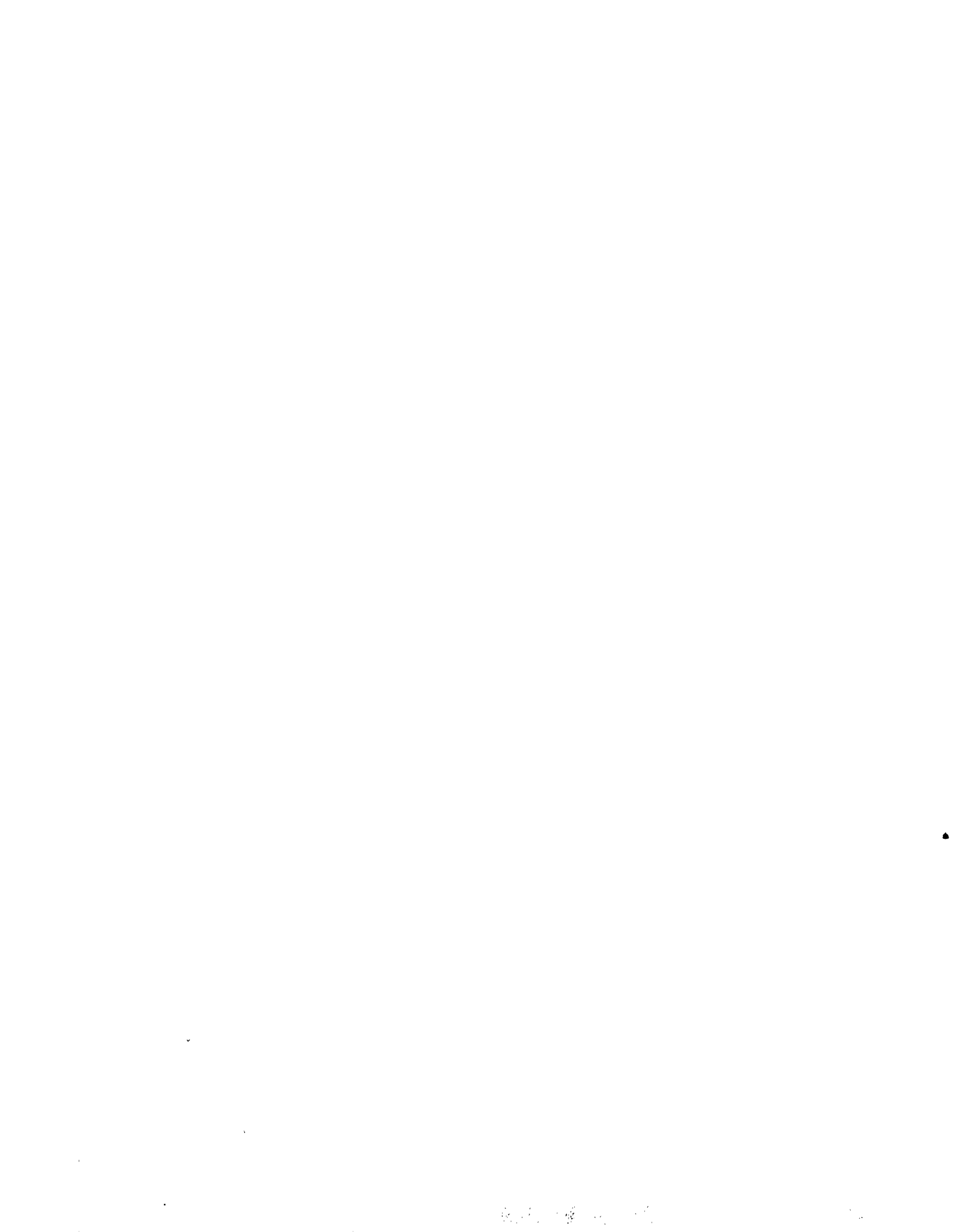
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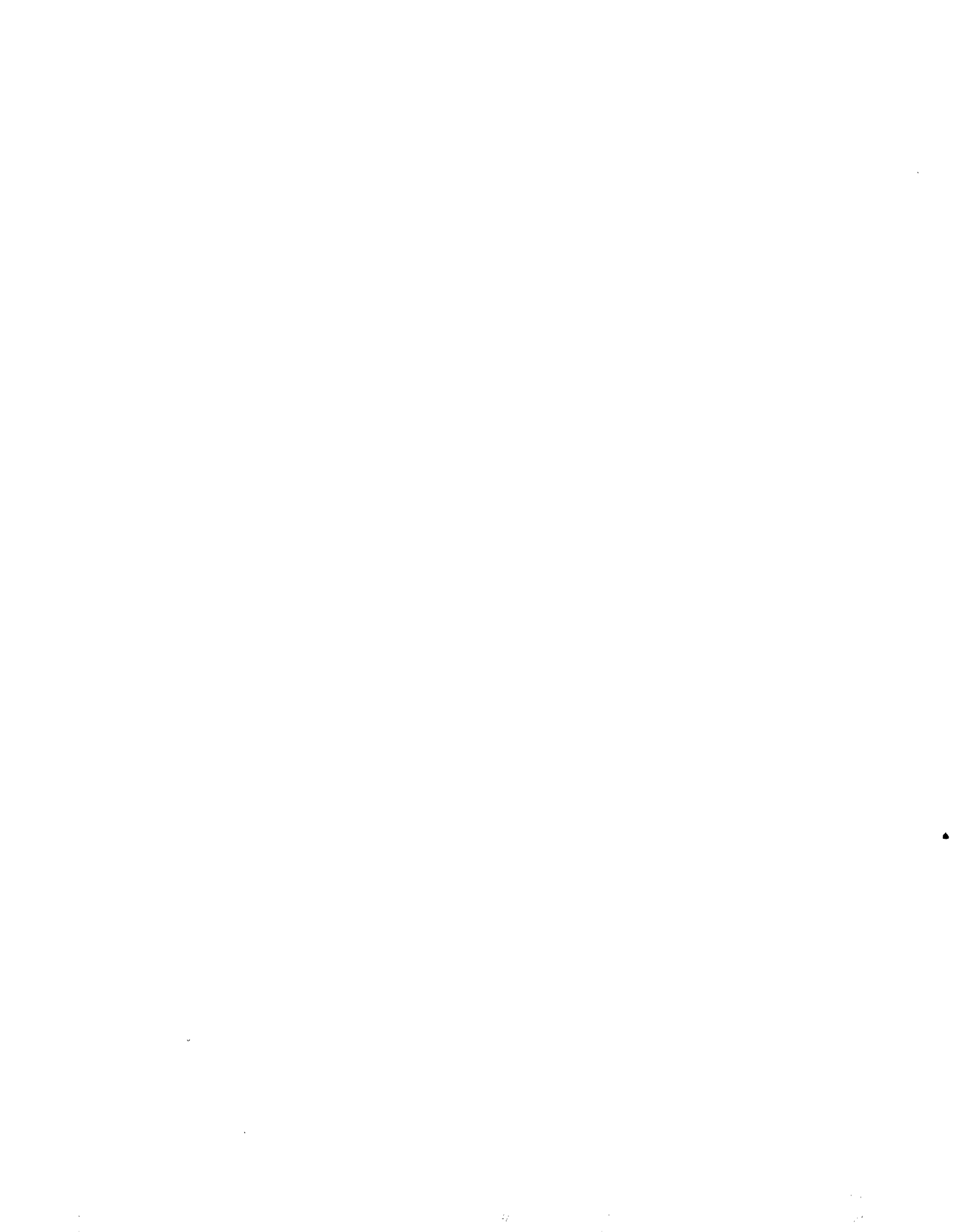
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