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HEALTH AND SAFETY

DOE's Implementation of a Comprehensive Health Surveillance Program Is Slow

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Resources, Community, and
Economic Development Division

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December 16, 1993

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

Dear Mr. Chairman:

Activities within the Department of Energy's (DOE) industrial complex expose workers to ionizing radiation, potentially toxic chemicals, and other health hazards. In this environment, thousands of safety and health incidents are reported at DOE facilities each year. DOE and its contractors manage occupational health programs throughout the complex and conduct studies that evaluate the health effects of its industrial activities. Beginning in 1983, several external reviews have questioned DOE's ability to credibly evaluate the effects of its activities on workers' health.

In response to these concerns, in 1989, the Secretary of Energy established the Secretarial Panel for the Evaluation of Epidemiologic Research Activities (SPEERA) to independently evaluate the overall quality of DOE's occupational health activities. SPEERA concluded that, although DOE had operated health-related programs at its facilities, it lacked a comprehensive occupational and environmental health program designed to prevent occupationally related diseases, injuries, and premature deaths. SPEERA recommended, among other things, that DOE implement a health surveillance program to systematically collect and analyze data about workers' health and workplace conditions in order to detect illnesses or health trends that indicated possible adverse effects of workplace exposures. In March 1990, the Secretary directed that DOE establish a comprehensive health surveillance program. In February 1991, at your request, we reported on the status of DOE's implementation of the SPEERA recommendations.[1] Because of your continuing concern about the effects of DOE's activities on workers' health, your office asked us (1) to determine the status of DOE's efforts to implement a comprehensive health surveillance program and (2) to assess the effectiveness of DOE's current program.

[1]Nuclear Health and Safety: Efforts to Strengthen DOE's Health and Epidemiology Programs (GAO/RCED-91-57, Feb. 5, 1991).

Results in Brief

Although almost 4 years have passed since the Secretary directed the establishment of a comprehensive health surveillance program, DOE has not fully implemented such a program. For example, DOE is still unable to determine if exposures to hazardous substances at DOE sites cause workers' illnesses or injuries because DOE does not routinely analyze workplace exposure data. DOE now projects full program implementation, including analyses of workers' occupational exposures, by 1998. According to Office of Health officials, technical difficulties and a continuing staffing shortage within the Office of Health have contributed to delays in implementing a comprehensive program. However, a lack of program planning has also contributed to delays in implementation. Recently, to facilitate program implementation, the Deputy Assistant Secretary reorganized management responsibility for the program within the Office of Health.

Until a comprehensive program is developed and implemented, DOE will continue to operate a program that began as a pilot at the University of Washington in 1983 and is limited to analyzing patterns of illnesses and injuries based on workers' information provided by the sites. However, the current program covers only about 40 percent of DOE's workforce, and the reports provided back to the sites by the program are not always timely and useful. Because workers' injuries and illnesses are not always reported, the current program may not provide the early warning of potential workplace hazards needed to protect workers from occupationally related diseases, injuries, and premature deaths. The Office of Health is in the process of improving the timing and organization of the current program's reports and plans to expand the current program to additional sites in 1994.

Background

Beginning in the 1980s, several external reviews identified problems with DOE's management of its health-related programs.[2] Among other things,

[2]DOE's Safety and Health Oversight Program at Nuclear Facilities Could Be Strengthened (GAO/RCED-84-50, Nov. 30, 1983).

Safety Issues at the Defense Production Reactors, National Research Council, National Academy Press (1987).

The Nuclear Weapons Complex: Management for Health, Safety, and the Environment, National Research Council, National Academy Press (1989).

Complex Cleanup: The Environmental Legacy of Nuclear Weapons Production, Office of Technology Assessment, OTA-O-484 (Feb. 1991).

Hazards Ahead: Managing Cleanup Worker Health and Safety at the Nuclear Weapons Complex, Office of Technology Assessment, OTA-BP-O-85 (Feb. 1993).

these reviews pointed out that DOE was not effectively overseeing its health programs and lacked credibility in its research activities on the health effects of workers' exposures to radiation and hazardous materials.

Acknowledging that problems existed within DOE's health-related programs, in August 1989, the Secretary of Energy established SPEERA to make recommendations on the management, organization, and reporting structure of the various DOE programs involved in epidemiologic research activities. In March 1990, SPEERA concluded that the majority of DOE's epidemiologic research had focused on long-term studies related to workers' deaths and was not being optimally used to monitor the day-to-day health of workers or to understand the incidence of disease associated with DOE's activities. SPEERA made 55 specific recommendations to improve the credibility and management of DOE's epidemiology and health surveillance programs.[3] In addition to recommending that DOE turn over the management of long-term epidemiologic research to the Department of Health and Human Services, SPEERA recommended that DOE establish a comprehensive health surveillance program to identify health risks within the weapons complex as early as possible.

On March 27, 1990, in response to SPEERA's recommendations, the Secretary created the Office of Health under the Assistant Secretary for Environment, Safety and Health to consolidate DOE's health activities. In addition, the Secretary directed the establishment of a comprehensive health surveillance program to meet the health and safety needs of workers throughout DOE's industrial complex. On May 18, 1990, the Acting Assistant Secretary of Environment, Safety and Health submitted an implementation plan for the Office of Health to the Secretary. Included in the plan was an implementation schedule for DOE's epidemiology program. The plan projected full implementation of the health surveillance program by March 31, 1992.

[3]Epidemiology deals with the incidence, distribution, and control of disease in a population. Analyzing information about exposures and illnesses among groups of people allows inferences to be made about the causes of disease, and programs can be developed for disease prevention and control. Health surveillance, one of the activities within DOE's epidemiology program, is the continual evaluation of workers' exposures and illnesses.

Implementation of a Comprehensive Health Surveillance Program Is Still 5 Years Away

Although almost 4 years have passed since the Secretary directed the establishment of a comprehensive health surveillance program, DOE is still at least 5 years away from such a program. Without a comprehensive program, DOE is unable to determine if workers' illnesses and injuries are related to hazardous workplace exposures at DOE sites. Until July 1993, the Office of Epidemiology and Health Surveillance (OEHS), one of three suboffices of the Office of Health, had been responsible for developing and managing DOE's health surveillance program. According to DOE health officials, technical problems and understaffing within the Office of Health have contributed to delays in implementing a comprehensive health surveillance program as planned. However, a lack of program planning has also contributed to delays in implementation.

DOE Is Still Developing Program Functions

According to the OEHS Director, DOE is testing and implementing functions for the comprehensive health surveillance program on a modular basis. The program consists of four modules, each of which collects specific data from DOE sites. The four modules are the Health Events Module, the Demographic Module, the Exposure Module, and the Clinical Module. At the time of our review, the Health Events and Demographic Modules were functioning, while DOE was still developing the Exposure and Clinical Modules. The Health Events Module contains data on workers' illnesses and injuries, while the Demographic Module contains descriptive and occupational information about each worker, such as a coded identification number, birth date, sex, race, job title, and work location.[4] Currently, these modules analyze the workers' health and descriptive data to determine the observed and expected rates of adverse health events that occur in the workforce.

To determine potential causes of observed illnesses and injuries and to identify emerging health problems before disease is evident, DOE plans to analyze information on workers submitted by DOE sites in the Exposure and Clinical Modules. The Exposure Module will contain health physics and industrial hygiene exposure data for each worker. At DOE sites, health physics programs collect and maintain information on workers' radiation exposures, and industrial hygiene programs collect information on workers' exposures to other industrial hazards—for example, exposures to chemicals, gases, metals, and noise. The Clinical Module will contain information from workers' physical examinations and laboratory tests. By eventually combining and analyzing data from all of the modules, DOE will

[4]Each site assigns every worker a unique, permanent, coded identification number to protect the confidentiality of workers included in the program.

be able to relate adverse changes in workers' health to workplace hazards and, when necessary, initiate corrective actions to protect workers' health.

Each of the new modules is now being developed and must be tested and refined at DOE sites before implementation. According to the OEHS Director, DOE plans to test the Clinical Module at four sites during 1994 and 1995, using workers' physical examination data currently available at the sites' occupational medical departments. Under this same schedule, the Exposure Module will be tested using workers' health physics data from several sites. If the tests are successful, the Clinical Module and health physics data will be incorporated into the comprehensive health surveillance program by 1997. However, DOE does not expect to incorporate industrial hygiene exposure data into the program until 1998 because the Office of Health must first work with the Offices of Environmental Restoration and Defense Programs to define the essential industrial hygiene hazards that workers are exposed to and then define the types of measurements required for workers. According to the OEHS Director, many sites lack industrial hygiene data that can be linked to individual workers. Instead of individual data, most sites collect data on chemicals, gases, and other potential toxins through area sampling methods to determine compliance with Occupational Safety and Health Administration (OSHA) contaminant exposure standards. Because the health surveillance program requires exposure data for individual workers, most industrial hygiene data that currently exist throughout the DOE complex are not useful to the program.

Technical Problems and Understaffing Delay Program Implementation

According to the OEHS Director, DOE's diverse activities and multiple contractors complicate the effort to collect useful industrial hygiene exposure data. Because multiple contractors manage and operate the sites, different methods are used to track and maintain employee information. Contractors' automated data processing resources vary, which also affects contractors' ability to collect and store records. The Office of Health is currently funding a project at the Lawrence Livermore National Laboratory to develop better indicators of individual exposures to chemicals and other potential toxins to support the Exposure Module. However, the results of the project are not expected until September 1994.

According to the Deputy Assistant Secretary (DAS) of the Office of Health, implementation of a comprehensive health surveillance program has been slow because the Office of Health has not had sufficient staff. According to the OEHS Director, until January 1992, the Office of Health had no

occupational medical director, which hampered efforts of headquarters staff to communicate with site medical directors about requirements for a comprehensive health surveillance program. In addition, in 1990, the Office of Health proposed a staff level of 86 by fiscal year 1992 to implement its plan. According to the OEHS director, he expected that 5 of the 86 would carry out the development and management of the program. In mid-1992, however, the staff level was frozen at 65, and, through mid-1993, only one full-time epidemiologist worked on the program. According to the OEHS Director, additional staffing is unlikely. As a result, a comprehensive program will not be fully implemented until 1998.

In addition to limited staff resources, competing priorities within the Office of Health have contributed to delaying program implementation, according to the OEHS director. Among the competing priorities were the expansion of the monitoring program for beryllium workers to the Y-12 population at Oak Ridge and the development of DOE's comprehensive epidemiologic data resource.

Moreover, lack of program planning within the Office of Health has contributed to the delays in the program's implementation. For example, the most recent Health Surveillance Program Plan, dated September 1993, does not contain an implementation strategy that outlines the specific tasks to be accomplished or establishes milestones for their completion. According to the DAS, the Office of Health has no written plan for completing the remaining tasks of the comprehensive program because he views the development of the program as an evolving process.

In July 1993, the DAS assigned specific responsibility for developing the health surveillance program to all three Office of Health suboffices. Before that, only one suboffice, OEHS, had managed the program. According to the DAS, this change was made to better utilize the unique expertise of each suboffice in developing the program's modules. With this change, OEHS will retain responsibility for the Health Events and Demographic Modules, the Office of Health Physics and Industrial Hygiene will assume responsibility for the Exposure Module, and the Office of Occupational Medicine will be responsible for the Clinical Module. According to the DAS, his office is responsible for overall management of the program's development, including coordination of the modules from each suboffice.

Current Program's Effectiveness Is Limited

Without a comprehensive health surveillance program, DOE is operating a program that began as a pilot at the University of Washington in Seattle in 1983. The current program is limited to evaluating patterns of illness at DOE facilities based on demographic information provided by the sites (the Demographic Module) and information on workers' injuries and illnesses (the Health Events Module). However, the coverage provided under this program is limited, the reports generated are not timely, and it is questionable whether the current program provides an early warning of health problems because health data are not provided for all employees.[5]

Program Coverage Is Limited

As of September 1993, 7 of DOE's 33 facilities are participating in the current program. The seven facilities, the dates participation began, and the approximate number of workers covered are shown in table 1.

Table 1: DOE Contractor Workers Covered Under the Current Health Surveillance Program

Facility	Date	Workers
Hanford Site	1983	15,560
Idaho Falls	1983	5,150
Brookhaven Laboratory	1989	3,460
Rocky Flats	1991	6,965
Savannah River	1992	17,030
Fernald	1993	2,000
Sandia	1993	8,590
Total		**58,755**

Although the seven facilities are among the largest DOE facilities, about 60 percent of DOE's 150,000 contract workers still are not included in the current health surveillance program. The Office of Health is testing the current program at selected cleanup sites, production facilities, and national laboratories and plans to expand the program to six more sites in 1994. The DAS said that new sites will be included in the program on the basis of the cleanup priority given to sites by the Office of Environmental Restoration and Waste Management, since the cleanup sites are where the hazardous exposure risk is greatest for workers.

Current Program's Reports Do Not Meet Users' Needs

At the participating sites, medical directors were concerned about the reports received from the health surveillance program. At the time of our review, Savannah River, Fernald, and Sandia, relatively new participants,

[5]During fiscal year 1993, the Office of Health budgeted $4.5 million for its health surveillance program activities.

had not yet received reports from the program because of the time required to both train personnel on program requirements and submit required data to the University of Washington. As a result, our review focused on the four sites that had submitted data and received reports from the university. While the medical director at Brookhaven Laboratory was generally satisfied with the current program, the directors at Hanford, Idaho Falls, and Rocky Flats, as well as the contractor at the University of Washington, had the following concerns:

Timeliness and Usefulness of Reports

- The health surveillance program provides three regular reports to participating sites. On a monthly or quarterly basis (the timing is based on each site's wishes), the program provides a report that summarizes the information on workers' illnesses and injuries received from the site. On a semiannual basis, the program provides a more comprehensive analysis of workers' injuries and illnesses, reporting, by occupation, the observed and expected number of cases and the calculated risk for each type of illness or injury at the site. Annually, the program reports to each site demographic analyses of its workforce—for example, the percentage of the workforce represented by each occupational group, by age and sex.
- Three medical directors said that these reports add little value to the occupational health program at their sites. Two medical directors said that by the time they receive the semiannual analysis from the program, they have already recognized and acted on any medical problems at their sites. Two medical directors also told us that the report that summarizes illness and injury data has little utility because it simply lists the workers' medical incidents submitted by the sites. One medical director said that physicians at his site typically see 15 to 30 patients a day and have little time to analyze extensive data.
- Office of Health officials agree that the reports have been a problem. The officials told us that they have recently revised both the data submission requirements and report formats. The program now requires sites to submit health data on a monthly basis, no later than 15 days after the end of the month. DOE also has revised the reports to provide more comprehensive analyses, including illness trends at the sites. These comprehensive reports will be returned to the sites at the end of each quarter, rather than on a semiannual basis.

Use of Job Titles as Surrogate for Workers' Exposures

- Because the Exposure Module is not yet functioning, the current program uses job titles as an indication of the type of hazards to which a worker might be exposed. According to the university contractor, without specific exposure data, knowledge of a person's job provides a first estimate of exposure to an occupational hazard; for example, nuclear reactor

operators could be exposed to ionizing radiation. However, both the contractor and one of the medical directors said that the broad job classifications, that are often used at sites, such as "Specialist," "Experienced," "Non-Exempt," and "Professional," provide few specifics about potential exposures.

- Broad job titles affect the program's ability to efficiently investigate occupational hazards and protect workers' health. As the program currently operates, if a greater than expected number of health events are observed at a site, such as an unexpectedly high number of respiratory problems, an investigation is carried out, using the job titles as the first step toward determining a potential occupational hazard. According to the university contractor, investigation of respiratory problems could proceed more efficiently if the job titles better reflected more specific information about the type of work performed and, thus, about potential hazards.
- Office of Health officials told us that the use of job titles will be replaced when the Exposure Module is incorporated into the program. Until the Exposure Module is functioning, however, separate analyses will be provided for workers in occupations for which known hazards exist in the work environment. For example, the program will provide separate analyses of injuries and illnesses for asbestos, beryllium, or lead workers.

No Aggregate Analysis of Workers' Data

- Medical directors at two sites were concerned about the limitations of the current site-by-site analysis of the medical data. In addition to site-specific reporting, the directors said that the medical data from all the sites should be aggregated and analyzed. Both directors considered the amount of individual site population data too small to provide statistically precise estimates of health risks within the complex. Furthermore, the directors noted that by pooling the data, each site could compare its own experience to the DOE complex as a whole. The chairperson of the SPEERA panel told us that aggregate analysis would provide more powerful statistical analysis because the number of illnesses at any one site may not be enough to detect trends. She also noted that providing participating medical directors with DOE-wide analysis of workers' medical data would allow them to compare workers' experiences at their site with the DOE experience as a whole.
- According to the OEHS Director, aggregate analysis of data will be provided to participating sites in 1995. The director also said that the program has not conducted this type of analysis to date because of the small amount of data on workers available under the current program.

Current Program May Not Provide Early Warning of Health Problems

The current health surveillance program's ability to provide early warnings of potential hazards at DOE sites is questionable because health events data are not provided for all workers. DOE depends on return-to-work medical clearances as the primary source of data on injuries and illnesses for the Health Events Module. A physician in the site's occupational medical department completes the return-to-work form, certifying that an employee is physically able to return to work. The form reports identification information, the number of days absent, and, most importantly, the type of illness or injury.

Although required by DOE's Occupational Medical Order (DOE Order 5480.8A), workers' compliance in obtaining these medical clearances is limited, particularly among salaried staff. DOE's Savannah River Site medical administrator told us, for example, that only 60 to 70 percent of salaried employees are cleared by the medical department after an absence. A 1989 study at the Hanford Site found that only 60 percent of the salaried workers were cleared by the medical department while 87 percent of the hourly workers were cleared. Information on salaried workers is important because these employees usually have had long experience on the shop floor prior to becoming salaried employees. Because many occupationally induced diseases, from cancer to mercury intoxication, can have long induction and latent periods, some illnesses may only become apparent long after a worker is exposed.

Moreover, employees with major illnesses or injuries who do not return to their jobs are not issued the return-to-work clearances. Thus, major illnesses are not reported in the Health Events Module. For example, in 1991, the university contractor compared Hanford's cancer data in the Health Events Module with national cancer data over the period 1985 to 1990. Among Hanford's 60 to 64 age group, he found 39 percent of the cases he expected when he compared Hanford's data with the national cancer data. For the 65 to 69 age group at Hanford, he found only 28 percent of the cases expected. The most plausible explanation, according to the contractor, is that people who become sick and have cancer diagnosed often simply retire. However, these elderly workers are the very group that will suffer from any cancers induced by occupational exposure 10 or 20 years earlier.

Because not all injuries and illnesses are reported, DOE's current health surveillance program may not be an effective early warning system. The university contractor told us that the program has no way of knowing the completeness of workers' health data sent by the sites. According to the

contractor, no verification procedures are used; the program simply accepts the submitted data. The contractor also told us that limited compliance with DOE orders, such as the return-to-work clearance procedures, results from DOE's general lack of control over the site contractors.

According to the OEHS Director, the office is taking steps to determine the extent of incomplete reporting of injuries and illnesses by the participating sites. For example, the office is exploring alternative sources, including state cancer registries, for identifying any additional cases of cancer occurring in the work force. In addition, a comparison of return-to-work clearance records with payroll information is being conducted at Rocky Flats to identify workers with absences due to illness who did not clear through the medical department. DOE also intends to follow this method at all participating sites and develop incentives for sites to increase their compliance rates when necessary.

Conclusions

DOE has not implemented the comprehensive health surveillance program SPEERA envisioned in 1990. Resource constraints, competing priorities, and most importantly, the lack of a clear approach for completing the program's remaining components means that a comprehensive program will not exist until 1998, if then. Recently, the Deputy Assistant Secretary of the Office of Health assigned responsibility for developing the program modules to the offices possessing the right expertise. However, unless a plan is developed that establishes an implementation strategy, identifies specific milestones for completing the remaining tasks, and assigns adequate resources, the 1998 goal may not be met.

While DOE is improving the timing and organization of reports provided to the sites participating in the current program, the lack of complete reporting of illnesses and injuries limits the current program's ability to provide the early warning of health hazards needed to protect workers from occupationally related diseases, injuries, and premature deaths. Expanding the current program to additional sites before correcting the problems already identified will simply make a program with limited effectiveness larger and will not contribute to improving the health of DOE's workers.

Recommendations

We recommend that the Secretary of Energy direct the Assistant Secretary of Environment, Safety and Health to

- develop an implementation plan for a comprehensive health surveillance program that outlines the tasks to be performed, as well as specific milestones based on the priority and resources assigned and
- correct the data collection problems in the current program before expanding it to additional DOE sites.

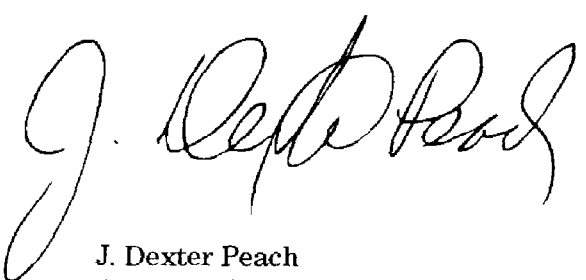
We performed our review between July 1992 and October 1993 in accordance with generally accepted government auditing standards. We interviewed DOE headquarters officials and the DOE contractor who operates the current health surveillance program at the University of Washington in Seattle. We also interviewed the occupational medical directors at Hanford, Idaho Falls, Rocky Flats, Brookhaven Laboratory, and Savannah River, as well as the chairperson of the SPEERA panel. (See app. I for details on our objectives, scope, and methodology.)

We discussed the facts presented in the report with DOE program officials, including the Deputy Assistant Secretary, Office of Health. In general, they agreed the information was both factual and presented from a balanced perspective. However, the officials provided additional information about both the planned completion date of 1992 for the comprehensive program and the responsibilities of the Office of Health suboffices before the July 1993 reorganization. We made changes in the report where appropriate. As requested by your office, we did not obtain written agency comments on a draft of this report.

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days after the date of this letter. At that time, we will send copies to DOE and other interested parties. We will make the report available to others on request.

This work was performed under the direction of Victor S. Rezendes, Director, Energy and Science Issues, who may be reached at (202) 512-3841. Major contributors to this report are listed in appendix II.

Sincerely yours,



J. Dexter Peach
Assistant Comptroller General

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Abbreviations

DAS	Deputy Assistant Secretary
DOE	Department of Energy
GAO	General Accounting Office
OEHS	Office of Epidemiology and Health Surveillance
OSHA	Occupational Safety and Health Administration
SPEERA	Secretarial Panel for the Evaluation of Epidemiologic Research Activities

Objectives, Scope, and Methodology

Concerned about the health effects of the Department of Energy's (DOE) industrial activities on workers, the Chairman, Senate Committee on Governmental Affairs, asked us to determine the status of DOE's efforts to implement a comprehensive health surveillance program and to assess the effectiveness of DOE's current program. To determine the status of the program, we (1) reviewed recommendations to DOE from external organizations regarding DOE's health and safety programs; (2) interviewed DOE headquarters officials about the program's implementation; (3) reviewed relevant DOE directives, orders, and program plans; and (4) interviewed the chairperson of DOE's Secretarial Panel for the Evaluation of Epidemiologic Research Activities.

To assess the effectiveness of the current health surveillance program, we interviewed (1) DOE headquarters officials regarding the program's procedures and reports and (2) the program contractor at the University of Washington and occupational medical directors at five DOE sites regarding their views of the program. We selected the five DOE sites that had participated in the current health surveillance program for at least 1 year.

Major Contributors to This Report

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