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# HEALTH AND SAFETY

# Protecting Department of Energy Workers' Health and Safety

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GAO/T-RCED-94-143

Mr. Chairman and Members of the Subcommittee:

We are pleased to participate in this hearing on the Department of Energy's (DOE) efforts to protect the health and safety of its workers. Over the past five decades, the weapons complex produced tens of thousands of nuclear weapons. In the process, it also produced huge volumes of radioactive and other toxic substances. These included the radionuclides uranium, plutonium, and cesium; toxic metals such as mercury, beryllium, and lead; organic solvents and chlorinated hydrocarbons. All of these represent potential threats to the over 600,000 men and women who have worked at the complex over the last 50 years, as well as to the people who have lived in communities surrounding the weapons sites. Over the last decade, we have reported on DOE's problems with health and safety issues throughout the complex, and we recently reviewed DOE's management of its Health Surveillance Program.

On the basis of our work, I would like to discuss the following issues.

-- Worker health and safety has been and continues to be a problem for DOE. Historically, DOE's overemphasis on weapons production has meant limited attention to the potentially adverse health effects of working within the weapons complex. In the future, problems in protecting workers from radiation and other hazardous substances at DOE sites will remain, and the cleanup program will expose workers to additional dangers. Recently, the Secretary has taken actions to strengthen DOE's organization for ensuring worker health and safety.

-- Last year, when we evaluated DOE's Health Surveillance Program, one of the programs managed by the Office of Environment, Safety and Health, we found that the program is still at least 4 years away from being fully implemented, that the coverage of workers is limited, and that some data on workers' health are not included in the program's analyses.[1] As a result, we recommended that DOE (1) develop an implementation plan for the program that outlines the tasks to be performed, as well as specific milestones, and (2) correct the problems with data collection in the current program before expanding it to additional sites. DOE has not officially indicated what action it intends to take on our report.

-- You asked us to provide information about the quality of the data collected at DOE sites on workers' exposures to

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[1]Health and Safety: DOE's Implementation of a Comprehensive Health Surveillance Program is Slow (GAO/RCED-94-47, Dec. 16, 1993).

toxic substances. While we have not systematically studied the issue, evidence from our previous work and the work of others suggests that problems have occurred with the monitoring of exposures and the collection of exposure data within the complex. For example, DOE's internal appraisals, such as the Tiger Teams, have found problems with radioactive monitoring practices at DOE's sites. These problems raise questions about DOE's ability to accurately determine the health risks to workers in the complex.

I would now like to discuss each issue in greater detail.

## HEALTH AND SAFETY CONCERNS HAVE BEEN A PROBLEM FOR DOE

Workers within DOE's industrial complex face hazards from being exposed to radiation and toxic chemicals, cleaning up the complex, and repairing and maintaining aging facilities. Historically, the overemphasis on weapons production, along with complacency about workers' safety, has meant that DOE management has given limited attention to the potentially adverse health effects of working at DOE sites. Beginning in the early 1980s, we have repeatedly reported on problems with DOE's oversight of health and safety issues within the complex.[2] In addition, DOE's own technical safety appraisals, implemented in 1985, have identified the extent of the Department's health and safety problems. We reviewed these appraisals in 1990 and reported that 18 of the sites appraised had over 1,700 health and safety problems.[3] Of these, 113 represented a clear and present danger to workers or the public and 160 represented a significant risk or substantial noncompliance with DOE orders.

Inadequate radiological protection programs and procedures were a major deficiency throughout DOE, according to the safety appraisals. For example, a 1988 appraisal at the Rocky Flats plant in Colorado found inadequate capabilities for monitoring and sampling air to detect radiation releases. In addition, a 1988 followup appraisal at the Fernald site in Ohio found that

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[2]See, for example, Better Oversight Needed for Safety and Health Activities at DOE's Nuclear Facilities (EMD-82-36, Jan. 27, 1982); DOE's Safety and Health Oversight Program at Nuclear Facilities Could Be Strengthened (GAO/RCED-84-50, Nov. 30, 1983); Nuclear Health and Safety: Oversight of DOE's Nuclear Facilities Can Be Strengthened (GAO/RCED-88-137, July 8, 1988); Safety and Health: Key Independent Oversight Program at DOE Needs Strengthening (GAO/RCED-93-85, May 17, 1993).

[3]Nuclear Health and Safety: Need for Improved Responsiveness to Problems at DOE Sites (GAO/RCED-90-101, Mar. 28, 1990).

the site's contamination control program did not adequately ensure that personnel and material leaving the site were free of contamination.

Protection from chemical hazards has also been given less than adequate emphasis at DOE sites. According to a 1989 review by the National Research Council, DOE's contractors lacked stringent controls for conventional, as opposed to nuclear, hazards.[4] For example, at the Y-12 Plant at Oak Ridge, Tennessee, Council reviewers found that cyanide solutions in the plating shop were handled with potentially inadequate ventilation. They also found cartons and bags of chemicals, some toxic and some leaking onto the floor, stored on pallets in work areas and near high-traffic routes.

In November 1991, the Department's Advisory Committee on Nuclear Facility Safety issued its final report on safety issues throughout the complex. The committee's report noted that its work had confirmed the negative findings on radiation protection of the technical safety appraisals, as well as the more recent Tiger Team assessments. The committee recommended that DOE address the root causes of the deficiencies it and others had identified, noting that increasing management attention and committing more resources--such as qualified personnel--to these issues would be necessary.

In addition to the hazards faced by workers during the weapons production era, other dangers at DOE sites will exist for workers in the cleanup program. As we noted in our June 1993 report, a major component of the cleanup will be the decommissioning and decontamination of as many as 7,000 inactive facilities throughout the complex.[5] Much of the weapons complex is old, presenting serious risks to individuals who work in and around the aging facilities. For example, at the Hanford site, years of inadequate maintenance and deteriorating conditions contributed to an April 1992 fatality at an inactive reactor building when a worker fell through the roof.

In addition to posing safety problems because of their poor physical condition, inactive facilities can contain known and unknown contaminants that increase the dangers for workers in and around these facilities. For example, in August 1992, during decommissioning and decontamination, nuclear research equipment at the Hanford site exploded spreading caustic lithium acetate

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

[5]Department of Energy: Cleaning Up Inactive Facilities Will Be Difficult (GAO/RCED-93-149, June 25, 1993).

throughout the building. DOE's contractors contributed to this explosion by eliminating, part way through the project, an interim work step that was intended to remove any remaining lithium; they eliminated this work step in an effort to complete the long-delayed project without determining how much lithium remained or considering the likelihood of chemical reactions.

In a similar vein, the Office of Technology Assessment's February 1993 report stated that the number and variety of toxic chemicals present at many of the hazardous waste sites and the potential interaction of contaminants make it difficult to accurately assess all potential chemical or radiological hazards.[6] The Office noted that in the weapons complex, work situations may therefore include numerous and varied hazards possibly posing an immediate danger to life or health.

Secretary O'Leary has introduced a number of initiatives aimed at addressing health and safety problems. Specifically, in April 1993, the Secretary announced a major restructuring of DOE, which included consolidating headquarters' health and safety policy and oversight functions within the Office of Environment, Safety and Health and elevating the position of the Assistant Secretary for Environment, Safety and Health to report directly to the Secretary. Furthermore, in May 1993, the Secretary announced a set of health and safety initiatives that included issuing a health and safety policy statement that defines the principles the Department will use and strengthening the authority of the Office of Environment, Safety and Health.

## DOE'S HEALTH SURVEILLANCE PROGRAM HAS HAD PROBLEMS

Because DOE workers are often exposed on a daily basis to hazardous conditions that can seriously affect workers' health, it is essential that DOE evaluate its health and safety procedures to determine their effectiveness and to identify areas for improvement. The Office of Environment, Safety and Health is responsible for managing programs to protect workers' health and safety. As I have noted, we and others have expressed concerns over the past few years about the adequacy of this office's programs.

One key program we recently reviewed, the Health Surveillance Program, is designed to systematically collect and analyze data about workers' health and workplace exposures to toxic substances. The goal of this program is to limit workers' exposures, identify the causes of adverse health effects,

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[6]Hazards Ahead: Managing Cleanup Worker Health and Safety at the Nuclear Weapons Complex, Office of Technology Assessment (Feb. 1993).

intervene to minimize or eliminate the causes of the adverse effects and institute policies and procedures to prevent reoccurrences. Our review of the Health Surveillance Program found that, although DOE intended to fully implement the program by March 1992, the Department currently projects that it will take until 1998 before the program is fully implemented. As a result, DOE cannot systematically determine if hazardous conditions at the sites affect workers' health.

The Health Surveillance Program is intended to consist of four modules, each of which is designed for specific data from DOE sites. The four modules are the Health Events Module, the Demographic Module, the Exposure Module, and the Clinical Module. 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. The Exposure Module, which is currently under development, is designed to contain exposure data for each worker, while the Clinical Module, also under development, is intended to contain information from workers' physical examinations and laboratory tests. Because of the number and variety of potential hazards to workers at DOE sites, it is critical that this program provide regular and timely analysis and feedback about workplace conditions to DOE headquarters and site management.

DOE is currently operating a program that is limited to analyzing patterns of injuries and illnesses on the basis of information provided by the sites. The program does not routinely correlate exposure data with health data because the Exposure and Clinical Modules are not yet functioning. Thus, DOE cannot systematically determine if hazardous conditions at the sites affect workers' health. DOE told us it plans to test these modules at four sites during 1994 and 1995 using currently available data on workers' physical examinations and radiation exposure. However, because many sites lack exposure data--on exposures to chemicals, gases, and other hazardous substances--that can be linked to individual workers, a fully functioning Exposure Module is still years away.

Moreover, we found that the coverage provided under this program is limited. Currently, only 7 of DOE's 33 facilities are participating in the program, covering about 40 percent of DOE's 150,000 contract workers. DOE plans to expand the program to six more sites in 1994. During our review, we also found that some information on grave illnesses among these workers may not be provided to the program. For example, the primary source of data on injuries and illnesses for the Health Events Module is the "return-to-work medical clearance." After a worker's absence, this form is completed by a physician in the site's medical department, certifying that the 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. But we found that an employee with a major illness or injury who does not return to his or her job is not issued this clearance. Thus, major illnesses and injuries are not reported in the Health Events Module, as the following example shows. In 1991, a University of Washington 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 only 39 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 and do not report back through the site's medical departments.

As a result of the weaknesses found in the Health Surveillance Program during our review, our December 1993 report recommended that DOE (1) develop an implementation plan that outlines the tasks to be performed, as well as specific milestones, and (2) correct the problems with data collection in the current program before expanding it to additional DOE sites. DOE has not indicated what action it intends to take.

## QUALITY OF EXPOSURE DATA RAISES QUESTIONS ABOUT DOE'S ABILITY TO DETERMINE RISK TO WORKERS

Mr. Chairman, you asked us to provide information about the quality of the exposure data that DOE collects and maintains. While we have not systematically reviewed this issue in our work to date, we have found during previous audits, and others have also noted, that problems exist with monitoring workers' exposures and collecting exposure data at DOE sites. Accurate data are important for two reasons. First, as I just noted, accurate data are needed to ensure that current workers' exposures are not leading to adverse health effects. Second, an accurate historical record of exposures is vital to answer questions about the long-term health effects of continuous exposure to radiation and hazardous substances and to establish standards for workplace exposures.

According to DOE's technical safety appraisals, to ensure the accuracy of exposure data, the instruments used to obtain measurements of radioactivity, or personnel dosimetry, should be calibrated and maintained, but at Rocky Flats in 1987, for example, the appraisers found that the plant did not have an instrumentation calibration program meeting DOE's standards and that instruments were often not adequately calibrated.

The issue of accuracy of exposure data was also addressed in

a 1991 report by the Office of Technology Assessment.[7] The report noted that a review of six weapons facilities by DOE's own Tiger Teams through December 1989 revealed many problems with the practices for monitoring radiation and assessing doses. For example, air sampling techniques were inadequate at 83 percent of the facilities assessed and shortages of personnel trained in radiation measurements were found at several sites.

We also found information in the technical safety appraisals regarding problems with the completeness of the exposure data collected at the sites. For example, at Rocky Flats, some dosimeters were not returned to the contractor prior to final processing. Yet in these instances, the contractor did not require an estimate of exposure. This situation can result in errors in the data reported to DOE and to the employees in their exposure report cards.

During our review of the Health Surveillance Program, we interviewed the Pacific Northwest Labs staff scientist who chairs a DOE group working on issues concerning the radiation dosimetry data to be included in a comprehensive data base. He noted problems with the comparability and accessibility of exposure data. Specifically, he pointed out that for most DOE facilities, the methods used to calculate recorded radiation doses for workers varied considerably over the years and that the documentation of historical dosimetry practices is fragmented. The documentation for workers employed in the early periods of DOE's operations is particularly uncertain and individuals with direct knowledge about workers' exposure are rapidly retiring and leaving DOE. He also noted that the status of radiation protection records is highly variable among DOE facilities. In many cases, electronic files of dosimetry information do not exist, and manual retrieval is difficult, expensive, and time-consuming.

Finally, the National Research Council addressed the issue of data quality in its 1989 review of workers' health and safety in the weapons complex. The council stated that the data collected at DOE sites during ongoing monitoring and surveillance programs are useful in assessing risks to workers' health only to the extent the data are accurate, comprehensive, accessible and comparable. The data collected in the past, the Council concluded, are inadequate--because of both the kinds of data collected and the means in which they are stored.

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[7]Complex Cleanup: The Environmental Legacy of Nuclear Weapons Production, Office of Technology Assessment (Feb. 1991).

SUMMARY

In summary, Mr. Chairman, health and safety problems continue to exist at DOE sites. GAO and other external organizations continue to report problems at DOE sites in protecting workers against radiation and hazardous chemicals. The cleanup program will expose workers to additional dangers. As a result, DOE needs a vigorous health and safety program that can accurately determine and minimize the risks to workers. The Secretary has recognized the need for improvement, and has moved to strengthen the Office of Environment, Safety and Health. However, our examination of a key program, the Health Surveillance Program, has found many problems. Moreover, important issues such as data quality have been raised by this Subcommittee and others--and evidence suggests that DOE's data on workers' exposures to hazardous substances may not be reliable. Without reliable data, DOE cannot accurately determine the risks to workers in the weapons complex.

We look forward to working with this Subcommittee to further its goal of protecting DOE's workers.

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Mr. Chairman, this completes my prepared statement. I will be glad to respond to any questions you may have.

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