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Dealing With Major Problem Areas in the Nuclear Defense Complex Expected to Cost Over $100 Billion

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Before the
Committee on Governmental Affairs
United States Senate

Mr. Chairman and Members of the Committee:

Over the last few years, we have issued over 30 reports--many to you and this committee--that identify problems associated with the Department of Energy's (DOE) nuclear defense complex. My testimony today focuses primarily on our two most recent reports.[1] One addresses the enormous cost in dealing with problem areas within the complex and the other with a continuing theme of our work--strengthening oversight at DOE facilities. The three major problem areas that DOE faces are

-- upgrading existing capability to meet nuclear defense needs and to ensure that these capabilities are operated in a safe and environmentally acceptable manner,

-- environmental restoration to clean up existing contamination at DOE installations around the country, and

-- safely disposing of radioactive wastes and decontaminating nuclear facilities.

Our analysis of DOE's preliminary data indicated it will cost anywhere from $100 billion to over $130 billion to address problems in the DOE complex. This includes about $20 billion to upgrade existing facilities, $35 billion to $65 billion for environmental restoration, and over $45 billion to dispose of radioactive wastes and to decontaminate facilities. I would like to stress that this cost information is not budget quality information and should only be used to illustrate the magnitude of effort needed to address the problem areas. The overall figures do not include the day-to-day

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[1]Nuclear Health and Safety: Dealing With Problems in the Nuclear Defense Complex Expected to Cost Over $100 Billion (GAO/RCED-88-197BR, July 6, 1988) and Nuclear Health and Safety: Oversight at DOE's Nuclear Facilities Can Be Strengthened (GAO/RCED-88-137, July 8, 1988).

operational costs associated with producing nuclear material and weapons and ensuring compliance with existing standards. Finally, it does not include expanded capability or relocation of existing capabilities within the complex. According to DOE information, expanded capabilities and relocation could add another $15 billion to $25 billion to the overall cost.

I would now like to briefly discuss the major problem areas and point out important differences between our study and DOE's July 1, 1988, report entitled Environment, Safety, and Health Report for the Department of Energy Defense Complex.

UPGRADING EXISTING CAPABILITY

Much of DOE's nuclear defense complex was built in the 1940s and 1950s, and many facilities are approaching the end of their useful life. Some have deteriorated to the point where they now have safety or operational problems. Others are expected to deteriorate rapidly in the near future. In addition to aging, many facilities were constructed to comply with less stringent codes and standards than exist today. Finally, some equipment and/or processes used within the complex have become obsolete, making repair work difficult and spare parts virtually impossible to procure. Overall, the current condition of some facilities in the complex has resulted in safety concerns that could lead to prolonged shutdowns, thus threatening the nation's ability to produce nuclear weapons.

In 1987, DOE assessed major facilities in the complex as part of a strategic planning effort. A key part of this effort was to assign a fragility rating to the facilities. The rating system used a scale of from one to five, where three meant the condition of the facility was "average for industry," four meant the condition was "marginal" in need of constant attention, and five meant the condition was "serious" with no near-term solution. This

rating system allowed the flexibility of rating a facility below "industry average" (between three and four) and less than "marginal" (between four and five). The ratings were done by officials at the facilities and not by an outside, independent group.

Many DOE facilities were rated below the "industry average," "marginal," or less than "marginal." The Savannah River Plant reactors in South Carolina were rated less than "marginal." The "marginal" facilities included a number of buildings at the Rocky Flats Plant in Colorado, a key operation at the F-area separation facility at the Savannah River Plant, some operations at the Feed Materials Production Center in Ohio, and some operations at the Y-12 Plant in Tennessee. Two other important facilities were rated below the "industry average"--the N-Reactor in Washington and the Idaho Chemical Processing Plant in Idaho.

Because many of the facilities have been operating for 30 years or more, the equipment has deteriorated to the point where it requires constant attention. Some facilities have unique safety or operational problems that warrant their marginal condition. For example, concerns about the emergency core-cooling system at the Savannah River Plant reactors have resulted in those reactors having their power levels reduced three different times in the last 18 months. They are now only allowed to operate at about half their designed power levels. Technical and design problems with one of the plutonium operations at Rocky Flats have resulted in the operation's being shut down. Finally, safety, health, and environmental upgrades are necessary at these facilities to bring them into compliance with today's codes and standards. For example, areas at the Savannah River Plant reactors and the F-area separation facility do not meet fire protection codes.

DOE data on upgrading costs indicated that about $20 billion is necessary to maintain the nation's existing capability for

producing nuclear weapons and to ensure that the capability is operated in a safe and environmentally acceptable manner. These costs are preliminary and subject to change as more detailed plans are developed. Further, we believe these costs could increase as further assessments are conducted at DOE facilities. For example, in our recent July 8, 1988, report, we pointed out that DOE has not clearly defined its nuclear facilities' safety policy, including what commercial standards should be applied to DOE facilities. We further pointed out that DOE does not have a formal program to systematically assess the extent to which its nuclear facilities meet commercial standards. Until the safety policy is established and assessments are made to determine the extent to which the policy is met, DOE will not be in a position to identify all necessary upgrades. It is quite likely that further costly upgrades will be necessary to ensure the safe operation of facilities in the complex.

ENVIRONMENTAL RESTORATION

Besides upgrading existing capabilities, DOE faces a massive cleanup effort at various locations around the country. For over 30 years, hazardous and radioactive wastes have been disposed of at many DOE locations. In many cases, wastes were disposed of in a manner that allowed them to enter the environment. As a result, DOE now faces two interrelated problems at virtually all of its installations--groundwater contamination and inactive waste sites.

Groundwater at most DOE installations is contaminated to various degrees with hazardous and/or radioactive material. At many DOE installations, the on-site groundwater contamination levels are hundreds or, in some instances, thousands of times above the drinking water standards. Further, at a few installations, the groundwater contamination has spread off-site or into rivers. Interrelated with the groundwater problem are inactive waste sites, one of the principal causes of groundwater contamination. These

waste sites are a continuing problem in themselves because large amounts of hazardous and radioactive wastes are present and can cause further groundwater contamination or spread into the surrounding soil and move off-site. Virtually all DOE installations have inactive waste sites.

The amount of cleanup costs is very uncertain at this time because the full extent of the problems may not be known and the extent of cleanup is uncertain. DOE does have preliminary data which indicate that the cleanup cost could range from $35 billion to $65 billion. These figures are subject to change, depending on the cleanup method chosen and the level of cleanup decided upon by DOE, the Environmental Protection Agency, and state governments. In any event, it may not be possible to totally clean up some installations; thus they may require long-term institutional care.

DISPOSING OF RADIOACTIVE WASTES AND DECONTAMINATING EXISTING FACILITIES

Another major problem DOE faces is disposing of radioactive wastes and the cleanup of contaminated facilities. DOE has been temporarily storing high-level radioactive waste[2] and transuranic[3] waste for eventual disposal in geological repositories. DOE also routinely disposes of low-level radioactive waste.[4] Finally, DOE

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[2]High-level waste is generated in producing nuclear material. It is characterized by high levels of radiation and heat, and must be handled with special equipment.

[3]Transuranic waste is material contaminated with man-made elements heavier than uranium. This material is generally toxic and long-lived.

[4]Low-level radioactive waste generally decays within a few months or years and usually requires no shielding for handling.

must eventually decontaminate its nuclear facilities at the end of their useful life.

DOE has detailed plans for solidifying high-level radioactive waste and encapsulating it for disposal in a geological repository. It estimates the cost for high-level waste disposal at about $20 billion over the next 25 years. In the case of transuranic waste, DOE plans to use special facilities to prepare and package this waste for final disposal in a geological repository--the Waste Isolation Pilot Plant in New Mexico. For low-level waste, DOE plans to process and dispose of some of this waste using improved confinement techniques. DOE estimates it will cost about $10 billion over the next 25 years to dispose of transuranic and low-level waste.

Finally, DOE has hundreds of buildings that require special cleanup at the end of their useful life to remove radioactive material that has contaminated the facilities. DOE estimates that decontaminating its nuclear facilities could eventually cost over $15 billion.

DIFFERENCES BETWEEN GAO'S REPORT AND DOE'S JULY 1, 1988, REPORT

DOE recently provided you a report regarding corrective actions needed to address environmental, safety, and health problems and carry out ongoing compliance activities. That report estimated it would cost from $66 billion to $110 billion for corrective action and compliance activities. There are three important differences between the cost estimates in our report and those in DOE's report.

First, our report includes a discussion on disposing of radioactive wastes and decontaminating nuclear facilities estimated to cost over $45 billion. DOE's report does not address this

problem area. We believe the permanent disposal of radioactive wastes and decontaminating nuclear facilities is a long-standing problem that DOE must eventually address. It also has important environmental and safety implications. Accordingly, we believe any discussion of DOE problem areas should include radioactive waste disposal and decontaminating nuclear facilities.

Second, DOE's report provides cost on its "base" environmental, safety, and health program. This "base" program is the day-to-day activities to ensure compliance with environmental, safety, and health requirements and is estimated to cost $40 billion through 2045. We consider this cost a normal cost of doing business that would be necessary whether DOE had any problems or not. They are not reflected in our report. The cost estimates presented in our report are to illustrate the magnitude of effort needed to address the major problem areas over and above the day-to-day cost of making nuclear weapons.

The last major difference concerns upgrading DOE facilities. In our report, we included upgrades needed because of operational problems (e.g., deteriorating equipment) as well as environmental, safety, and health upgrades. We believe this is appropriate because operational problems can result in shutdowns and thus affect this country's ability to make nuclear weapons. Further, in many cases, operational problems are closely linked to or can lead to environmental, safety, or health problems. For example, at Rocky Flats, a new building was built to lower workers' radiation exposure levels and reduce the danger to the public in the event of an earthquake and/or high winds. This building never became fully operational because of technical and design problems. Upgrades included in our report are aimed at not only correcting the operational problems with this building, but also will result in some plutonium processes, being discontinued in old buildings that have been the subject of safety concerns.

Attachment I explains in more detail the major differences between the GAO and DOE reports. For example, you can see that we included $45 billion for disposal of radioactive waste and decontaminating facilities while DOE did not. We believe our report provides a more comprehensive picture of the level of effort needed to address the major problem areas facing DOE over and above the normal operating expenses.

SUMMARY

Let me close my testimony by calling attention to key GAO recommendations resulting from our work done for this Committee that remain important today, namely,

-- the need for outside, independent oversight of DOE operations and

-- a comprehensive strategy to address the problem areas of the nuclear defense complex.

Outside, independent oversight is needed to ensure that DOE's nuclear defense complex is safe and environmentally acceptable. Such an organization should also play a key role in DOE's rebuilding and/or restructuring of the complex. The comprehensive strategy is necessary to clearly show how the major problems will be addressed. DOE's recent study along with an ongoing modernization study could provide the framework for the comprehensive strategy that we have recommended.

Finally, the cost estimates discussed here today highlight the formidable task ahead in weighing the enormous cost of correcting problem areas in the nuclear defense complex against competing budget priorities in a deficit-conscious era. Further, fundamental questions such as "What should our nuclear capabilities be?"; "How clean is clean?"; and "How safe is safe?" will

continually be asked as DOE restructures, rebuilds, and cleans up the nuclear defense complex. The answer to these questions, and the need to set priorities will provide difficult choices for the Congress and for current and future administrations.

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Thank you, that concludes my testimony. I would be happy to answer any questions.

EXPLANATION OF GAO AND DOE COST ESTIMATES

	GAO Report[a]	DOE Report[b]	Explanation of difference
	(billions)		
Upgrading existing capability	$20	$5	DOE's report was limited to environmental, safety, or health upgrades
Disposal of radioactive wastes and decontamination of facilities	45	-	Item not addressed in DOE report
Environmental restoration	35-65	35-65	-
Cost to maintain compliance with existing standards	-	26-40	Not included in GAO report
Total	$100-$130[c]	$66-$110	

[a]Nuclear Health and Safety: Dealing With Problems in the Nuclear Defense Complex Expected to Cost Over $100 Billion (GAO/RCED-88-197BR, July 6, 1988).

[b]Environment, Safety, and Health Report for the Department of Energy Defense Complex, dated July 1, 1988.

[c]These are not budget-quality estimates but they do illustrate the magnitude of effort needed to address the problem areas in the DOE nuclear weapons complex over the next 25 years. GAO's report also included DOE information showing that expanded capability and relocation cost could add another $15 billion to $25 billion. Furthermore, GAO's report did not include the day-to-day costs to produce nuclear material and weapons or activities to ensure compliance with standards and laws.

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