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GAO's Views on DOE's Modernization Plan for the Weapons Complex

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United States Senate

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Mr. Chairman and Members of the Committee:

We are pleased to be here today to provide our views on the Department of Energy's (DOE) recently issued plan to modernize the nuclear weapons production complex. Since 1981, Mr. Chairman, GAO has issued over 50 products dealing with environmental, safety, and health problems associated with DOE's nuclear weapons complex.

About 2 years ago in testimony before this Committee--building on a body of GAO work that had been underway since 1981--we outlined numerous safety and environmental problems facing an aging nuclear weapons complex. We pointed out that DOE did not have an adequate plan for addressing the problems and assuring the Congress that it could meet the nation's need for nuclear material for weapons. We called on DOE to develop a strategic plan setting forth (1) the projected facility requirements for an updated nuclear weapons complex; (2) a comprehensive picture of the environmental, safety, and health issues that had to be addressed; and (3) a framework for prioritizing the billions of dollars in federal expenditures needed to remodel or build new facilities, as well as to clean up environmental contamination.

As we learned more about the significance of the problems facing DOE's nuclear complex, we revised the estimates of what it would cost to modernize and clean up the complex from billions to between $100 billion and $155 billion. Let me stress that while these estimates have evolved over the past few years, they are not

budget quality, but clearly illustrate the formidable size of the challenge ahead, and, as we have told you before, all indications are that the final cost of modernizing the complex could be higher than these estimates.

In December 1987, the Congress mandated that the President prepare a plan to modernize the nuclear weapons complex.[1] DOE delivered that plan to Congress early this January. Somewhat earlier, DOE issued a separate report detailing the environmental, health, and safety needs of all of its facilities, including the nuclear weapons complex.

Since the hearings you held 2 years ago, as well as several others conducted by you and others, DOE recognized through public statements and now through these reports that serious problems exist within its complex. In fact, while DOE was further identifying or characterizing the extent of the problems in the complex, several safety problems surfaced which have in effect shut down the nation's ability to produce nuclear material for weapons. These problems include:

-- In January 1987, the N-reactor was temporarily shut down to upgrade safety systems. Safety upgrades have now been

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[1]National Defense Authorization Act for Fiscal Years 1988/1989 (P.L. 100-180, Dec. 4, 1987).

suspended, and the reactor is being maintained in cold standby status, with no plans for restarting it.

-- In August 1988, the P-reactor at Savannah River was shut down amid concerns about the need for improvement in operator training and procedures, technical specifications, and DOE and contractor management of reactor operations. Subsequently, evidence of cracks in the primary cooling systems of the reactors has surfaced. This is in addition to the problems of the emergency core cooling system and the continuing need for ultrasonic testing of the reactor tanks, both of which we highlighted before this Committee in March 1987. All three reactors are down while DOE finalizes its plan to address these and other concerns. DOE presently plans to restart at least one of the three reactors near the end of this year.

-- In October 1988, a major plutonium processing building at Rocky Flats was shut down because of safety concerns. DOE plans to resume operations at this facility sometime this spring.

DOE has also begun to learn more about the extent of environmental, health, and safety problems within the complex. Actions in the last year by DOE to hire technically qualified staff to investigate and report on the extent of contamination and safety

problems that need to be addressed has been a real plus. While it is encouraging that DOE has a program to assign permanent resident inspectors at its major facilities, we note that permanent inspectors have only been assigned at Savannah River and Rocky Flats, with one inspector on loan to Fernald until someone permanent can be hired. These inspectors have been instrumental in disclosing significant safety problems at these facilities within the past several months and clearly have proven the worth of having resident inspectors at major weapons complex facilities.

As we begin this session of Congress, the important point is that the debate can now move from recognition that there are serious problems in the nuclear weapons complex to how we can best deal with the problems. Your persistence for better information has been instrumental, Mr. Chairman, in the development of the two recent DOE reports which provide a beginning framework for the debate. The remainder of my testimony today provides perspective on the scope and direction of DOE's modernization and cleanup plans, the reasonableness of the cost estimates to address these plans, and the structure needed to most effectively and efficiently resolve the problems.

DOE FOCUSES ON MODERNIZATION

DOE must deal with modernizing its aging complex because of past mistakes--overemphasis on production, negligence in the

environmental area, and complacency with regard to safety. While the modernization plan lays out DOE's view of what facilities will be needed in 2010 to meet production needs, it does not clearly define what environmental cleanup problems will be resolved during the same time frame. In addition, DOE's view of the complex will likely change as the Congress assesses the plan and further information is developed.

By 2010, if the plan is followed, DOE will have upgraded many of its plants, including the plutonium infrastructure at the Savannah River Plant and uranium facilities at the Y-12 plant. DOE will have two new production reactors and a Special Isotope Separation Facility. Finally, DOE will have largely relocated and/or phased out other installations such as the Rocky Flats Plant and Fernald. In our reading of the plan, it appears that modernization activities would essentially be completed by 2010 and the nation would have a revitalized weapons complex. However, problems in the environmental area would still be with us. In our opinion, the plan does not adequately address the cleanup of existing facilities and decontamination of facilities as they are retired from service. The plan provides little perspective on how these important problem areas will be solved or what needs to be done in these areas between now and 2010.

While the plan does provide DOE's views on the future configuration of the complex, it is just a first step that raises

a series of issues the Congress will need to consider. For example:

-- Does the nation need two new production reactors? DOE's plan calls for two reactors as a top priority. Reactors will be built at different sites and one will utilize a new technology.

-- Does DOE have the capability to meet nuclear material needs while the new reactors are being built? Currently all DOE's production reactors are shut down. It is unclear to what extent the reactors can be relied upon in the future to produce nuclear material.

-- Should the special isotope separation facility be a priority activity? DOE's plan places high priority on this project which is to be used to convert fuel-grade plutonium to weapons-grade plutonium. Given the other planned upgrades of plutonium facilities within the complex, questions regarding the emphasis placed on these facilities need to be addressed.

-- Are DOE's plans to upgrade facilities which it plans to later phase out appropriate? DOE's plan calls for a number of upgrades at facilities it plans to shut down within

several years. The trade-offs between upgrade and shut down need to be carefully studied.

In addition to these and other questions, DOE's views on how the complex will look in 2010 may be significantly altered as additional information becomes available. For example, a report within DOE proposes that a linear accelerator could provide tritium more cheaply and sooner than a new production reactor. Such information could greatly change the direction of DOE's plan.

In our view, as pictured by DOE in its plan, modernization is on a faster track than environmental cleanup and decontamination. DOE still has not made key decisions on the extent of environmental cleanup or which sites get cleaned up first. Also, the plan raises new issues that the Congress must consider in addition to balancing modernization and cleanup needs. Accordingly, we believe the plan should only be viewed as a first step in establishing a national consensus to rebuild and clean up the complex.

COST ESTIMATES VERY UNCERTAIN

The second issue I want to briefly discuss is the reasonableness of the cost estimates set forth in DOE's recent reports. In 1986, we reported that it would cost billions to address problems within the complex. In 1987, we reported that the estimates had grown to tens of billions of dollars. In 1988,

we reported the cost would likely be over $100 billion to address the major problem areas within the complex. Today, we have three studies before us which suggest or specify costs far in excess of $100 billion: (1) the GAO report entitled Dealing with Major Problem Areas in the Nuclear Defense Complex Expected to Cost Over $100 Billion, issued in July 1988;[2] (2) DOE's Nuclear Weapons Complex Modernization Report, issued by the President in January 1989;[3] and (3) DOE's Environmental, Safety, and Health Needs Report, issued in December 1988.[4]

Of all three reports, we believe our report of July 1988, which provides cost estimates ranging from $100 billion to over $155 billion, to be the most comprehensive. The DOE studies differ from GAO's in their methodology and scope. For example, the DOE modernization report highlights $81 billion for modernization and environmental restoration over the next 21 years. This $81 billion represents the additional funds (an increment) needed during the next 21 years over and beyond funding DOE programs each year at the fiscal year 1989 level. For example, DOE already has a large radioactive waste management program underway--currently allocated

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[2]Dealing With Major Problem Areas in the Nuclear Defense Complex Expected to Cost Over $100 Billion (GAO/RCED-88-197BR, July 6, 1988).

[3]United States Department of Energy Nuclear Weapons Complex Modernization Report (Report to the Congress by the President, December 1988).

[4]Environmental, Safety, and Health Needs of the U.S. Department of Energy (U.S. Department of Energy, December 1988).

at more than half a billion dollars a year. The amount specified in the plan for this program--$7.5 billion--reflects only the additional costs needed above the half billion dollar annual expenditure for each of the next 21 years. Further, the $81 billion only represents cost through 2010. In the environmental restoration area, DOE recognized that costs would extend beyond 2010 and, in total, will range from $40-70 billion. The DOE Environmental, Safety, and Health Needs report differs from the GAO report primarily because it does not address modernization activities. (Appendixes I and II provide a detailed comparison of DOE's reports with GAO's.)

It is important to note that all of these estimates are not budget quality and are designed only to roughly approximate the funds needed. In the final analysis, the true cost may be far higher. Many uncertainties exist with regard to how we can clean up existing environmental contamination and decontaminate large nuclear facilities. DOE's modernization plan does not shed much light on the extent DOE's sites will be cleaned up or what cleanup procedures will be used. Some of the planned facilities will utilize new technologies such as the isotope separation facility and the high temperature gas-cooled reactor. DOE's construction of such facilities has been prone to huge cost overruns. Further, the experience in building commercial reactors indicates that the cost of new production reactors could be much higher than DOE's estimate of $6.6 billion for two reactors.

Finally, we are not sure that all the problems within the complex have surfaced. For example, DOE still has not applied a detailed safety policy with accompanying standards throughout its complex. Once this is accomplished, it would likely reveal needed safety upgrades. In the environmental area, uncertainty still persists not only regarding the size of problems but also regarding the extent to which DOE sites will be cleaned up. Some locations may be irreversibly contaminated.

DOE's STRUCTURE

The last key issue is whether DOE is properly structured to manage this massive rebuilding effort, which we have discussed as one of the largest industrial rehabilitation programs ever undertaken. This is important to ensure that past mistakes are not repeated. Some changes in DOE's current structure may be warranted to acquire the necessary technical expertise, provide strong safety oversight, and establish needed policies and procedures as a basis to manage the modernization effort.

In regard to technical expertise, in 1981, a DOE task force looking at the Three Mile Island accident criticized DOE for not having sufficient technical resources to manage its nuclear facilities. This criticism was repeated in the October 1987 National Academy of Sciences report on DOE's production reactors. Sufficient technical resources are needed to undertake the

modernization effort--upgrading existing facilities and building new ones. In addition, DOE must continue to hire quality technical people to manage and oversee ongoing operations. For example, the Office of the Assistant Secretary for Environment, Safety, and Health must continue its program to place resident inspectors at DOE facilities. As I noted earlier in my statement, these inspectors have been key to understanding and characterizing safety problems. However, we still believe the question is open as to whether DOE has sufficient technical expertise to accomplish all the tasks ahead.

In addition, we have long supported the need for an independent organization outside the control of DOE that oversees the agency's internal safety program. Public Law 100-456 created such an entity--the Defense Nuclear Facilities Safety Board--but we are concerned that the law excludes certain weapons facilities from the Board's oversight, including Pantex and the Nevada Test Site.

Finally, all the necessary policies and standards are not currently in place to guide the modernization effort. For example, in our July 1988 report on the oversight of DOE's nuclear facilities, we recommended that DOE establish a meaningful safety policy, related standards and implementation policies to guide continued operation of its facilities.[5] The policies and standards

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[5]Oversight at DOE's Nuclear Facilities Can Be Strengthened (GAO/RCED-88-137, July 8, 1988).

can also be used as a baseline safety criteria for developing the future strategy for the weapons complex. A DOE safety policy has been in draft since May 1988. DOE believes it will be issued in a few months. The detailed implementing procedures are expected to be issued sometime after the policy. Once they are in place, DOE will apply them to existing facilities and to the design for new facilities. This probably will entail safety upgrades, which may increase the costs estimated in the 2010 modernization plan.

As the debate continues, other questions concerning DOE's structure will be raised. These could include: (1) Is DOE's current organizational structure for managing its nuclear complex appropriate? For example, to ensure that there is proper balance between production and the environment, should DOE establish a separate office to manage the environmental cleanup effort? (2) Should safety upgrades be separated from operational funds in the budget, like DOE has separated environmental cleanup, so that the level of funding for safety and specific safety-related projects can be separately tracked?

SUMMARY

The 2010 modernization plan brings DOE and the Congress to an important crossroad--that of making critical decisions about the balance between restructuring its aging weapons complex to provide new and expanded production capability; assuring that new and

existing facilities meet environmental, safety, and health laws and regulations; and cleaning up the result of years of environmental contamination. Congress must make these decisions within the framework of the conflicting demands for limited resources necessitated by the budget deficit, while recognizing that the nuclear material from the complex is critical to our national defense.

The 2010 modernization plan is a first step in framing the debate. Today, we have a better understanding of the problems facing the complex. However, DOE is continuing to develop information on the extent of the problems and to address and prioritize what needs to be done to correct them. While all the problems are not yet completely understood, the national debate can now widen to finding solutions. Because of the enormous costs associated with the solutions, the Congress will be making decisions about the complex for many years.

DOE can assist the Congress in its deliberations in future years by periodically updating the 2010 modernization plan. Safety upgrades resulting from the application of the safety policy and reprioritization of environmental cleanup activities resulting from completing the environmental surveys are just two reasons for an update. Such an update would keep the Congress and the public informed on the overall direction, priorities, and progress DOE is making as the modernization effort continues. Any subsequent plan

should also include a discussion of how DOE is structured to ensure that all operations are safely carried out in an environmentally acceptable manner.

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

APPENDIX I

COMPARISON OF GAO'S REPORT WITH DOE 2010 MODERNIZATION REPORT

	Estimate in: GAO July report	Estimate in: DOE 2010 report[a]	Explanation of major differences
	(dollars in billions)		
DEFENSE COMPLEX			
Upgrading existing capabilities plus modernization	$ 35- 45	$44.7	GAO has not had the opportunity to review the supporting documentation to 2010 study.
Disposal of radioactive waste	$ 30	$ 7.5	DOE's estimate reflects the incremental cost. It does not include costs beyond 2010.
Decontamination	$ 15	$ 4.7	DOE's estimate reflects the incremental cost. Further, it does not include active facilities and does not include costs beyond 2010.
Environmental restoration	$ 35-65	$24.1	DOE's estimate does not include costs beyond 2010.[b]
Total	$115-155	$81.0	

[a]Incremental costs represent the additional funds needed during the next 21 years over and beyond funding DOE programs each year at the fiscal year 1989 level.

[b]The plan does acknowledge that the total cost could be between $40 billion and $70 billion.

APPENDIX II

COMPARISON OF GAO'S REPORT WITH DOE NEEDS REPORT (12/88)

	GAO July report (dollars in	DOE needs study billions)	Explanation of major differences
DEFENSE COMPLEX			
Upgrading existing capabilities plus modernization	$35-45	$6.5-13.4	DOE's estimate does not include modernization.
Disposal of radioactive waste	$30	$4.0-4.7	DOE's study does not include waste fees or ongoing interim storage activities.
Decontamination	$15	$2.5-4.3	DOE's estimate includes only those facilities presently designated inactive.
Environmental restoration	$35-65	$34.6-63.0	These estimates are essentially comparable.
NON-DEFENSE FACILITIES			
ES&H Cost	-0-	$5.6-6.2	GAO estimate relates only to the nuclear defense complex.
Total	$115-155	$53.4-91.6	

Note: Numbers may not add due to rounding.