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Report to the Chairman, Committee on Governmental Affairs, U.S. Senate

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NUCLEAR HEALTH AND SAFETY

Oversight at DOE's Nuclear Facilities Can Be Strengthened

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GAO

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Resources, Community, and
Economic Development Division

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July 8, 1988

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

Dear Mr. Chairman:

We testified before your Committee on Governmental Affairs in a series of hearings in 1987 on the Department of Energy's (DOE) environment, safety, and health (ES&H) activities at its nuclear defense complex. Our testimonies included one in March which focused on the safety aspects of the reactors at DOE's Savannah River Plant and one in June which addressed legislation you introduced to establish an independent board to oversee the safety of the complex. Subsequent to those hearings, you requested that we continue our Savannah River work. We will provide you a report, in the near future, on that work.

As agreed with your office, this letter addresses several broader ES&H issues that were either addressed during the hearings or came to our attention during our work at Savannah River that affect DOE's other nuclear facilities as well. They include (1) the possibility that the visibility and management attention that safety and health issues currently receive within DOE could be reduced in the future, (2) legislatively mandated independent oversight of DOE's nuclear facilities, and (3) unclear safety standards.

While the Nuclear Regulatory Commission (NRC) regulates and oversees the operations of commercial nuclear reactors, DOE for the most part regulates itself. Therefore, a strong management and oversight program is needed to assure the Congress and the public that DOE's nuclear operations are carried out in a safe and environmentally acceptable manner.

We have recommended strengthening DOE's management and oversight program at both headquarters and at the field offices and instituting outside independent review. At DOE headquarters we recommended elevating the safety and health oversight organization to report to the Under Secretary, and at the field level we recommended that operations office staff involved in safety and health report directly and exclusively

to the newly established headquarters group.[1] In addition, we have called for an independent group outside DOE to oversee the safety and health activities of its nuclear facilities.

Results in Brief

Although DOE has acted to improve its ES&H Program for its nuclear facilities, problems remain which, if unaddressed, may keep the program from functioning effectively. In summary, we found the following:

- The Secretary of Energy created the Office of Assistant Secretary for ES&H in September 1985 to oversee the operations offices and contractors responsible for operating DOE's nuclear defense facilities. However, the health and safety functions of that office are not legislatively mandated. As a result, the current or future Secretary of Energy could relegate these important issues to a level within DOE which may not provide top management attention.
- DOE's newly created Advisory Committee on Nuclear Facility Safety does not meet a number of criteria that we believe are essential for effective and independent oversight. Specifically, the Committee (1) is not structurally distinct and separate from DOE and (2) does not have the authority to require DOE to address its findings and recommendations.
- DOE has not fully determined what commercial safety standards are applicable to its nuclear facilities and therefore cannot demonstrate if they are comparably safe to the commercial facilities. Moreover, without defining these standards, no clear criteria exist for determining what aspects of the facilities need to be upgraded or replaced.

We are making several recommendations to DOE and to the Congress aimed at strengthening oversight of DOE's nuclear facilities. The following sections provide details of our findings and recommendations. Appendix I includes our objectives, scope, and methodology.

[1] As we were finalizing this report, DOE officials told us that the Secretary of Energy had approved a resident inspector program for its nuclear facilities and has already placed two staff at Savannah River Plant and one at Rocky Flats reporting to the office of the Assistant Secretary for ES&H.

Safety and Health Function Should Be Legislatively Established

The Secretary of Energy created the Office of Assistant Secretary for ES&H in September 1985 to oversee the operations offices and contractors responsible for operating DOE's nuclear defense facilities. We believe this responded to our recommendations in 1981[2] and 1983[3] to establish such an organization to upgrade these functions within DOE. However, two of the functions of the Assistant Secretary for ES&H—safety and health—are not legislatively established.

DOE was established by the Department of Energy Organization Act (42 U.S.C. 7101-7375) in August 1977. Section 203 of that act created eight assistant secretaries and designated a number of specific functions such as waste management, energy research and development, and compliance with environmental laws to be the responsibility of an assistant secretary. Safety and health issues were not specifically designated.

Consequently, unless responsibility for the health and safety functions was legislatively assigned to a separate assistant secretary, the Secretary of Energy could choose to relegate it to a level lower than assistant secretary within DOE or combine them with other functions assigned to an assistant secretary. Either has the potential to lessen their importance and both have been the case in the past. For example, we stated in our 1983 report that the nuclear safety function had been elevated from reporting to a division director (two levels below the assistant secretary) to reporting to a deputy assistant secretary (one level below the assistant secretary). In addition, from 1981 to 1984, health and safety were the responsibility of the Assistant Secretary for Environmental Protection, Safety and Emergency Preparedness. That Assistant Secretary was responsible not only for health and safety, but also the naval petroleum and oil shale reserves, the Strategic Petroleum Reserve, and planning for energy emergencies.

DOE's Advisory Committee Does Not Meet GAO Criteria for Independent Oversight

Since 1981, we have highlighted the need for outside, independent reviews of DOE's defense complex. We reiterated that concern in a March 18, 1988, letter to you assessing whether DOE's newly appointed Advisory Committee on Nuclear Facility Safety satisfies our criteria for effective independent oversight. We identified the criteria in our June 16, 1987, testimony before your Committee. They are (1) independence,

[2]Better Oversight Needed for Safety and Health Activities at DOE's Nuclear Facilities (EMD-81-108, Aug. 4, 1981).

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

(2) technical expertise, (3) the ability to perform reviews of DOE facilities as needed, (4) clear authority to require DOE to address the organization's findings and recommendations, and (5) a system to provide public access to the organization's findings and recommendations.

DOE established the 12-member Advisory Committee in response to a recommendation by the National Academy of Sciences that an advisory committee to the Secretary be formed to provide independent safety oversight for DOE's nuclear facilities. However, the Advisory Committee, as described in its charter, does not meet two of our criteria for an effective independent oversight organization: independence and clear authority to require DOE to address the organization's findings and recommendations. In addition, it is unclear whether another criterion—public disclosure—is met.

For an oversight organization to be independent it must be structurally distinct and separate from DOE so that DOE has no influence on the organization's funding, staffing, and setting of safety agendas. Only in this way can conflicts between DOE's programmatic and safety goals be prevented. DOE's new Advisory Committee is not structurally distinct and separate from DOE. The members are appointed by the Secretary of Energy and its activities funded by DOE. While DOE has stated that the Advisory Committee has the freedom to consider any safety issue, any new endeavor must first be coordinated with the Secretary before it can be pursued, thus giving the appearance of secretarial control over issues the Committee can examine.

Besides being independent, any effective oversight organization should have authority to require DOE to address the organization's findings and recommendations. Such accountability is important so that DOE will seriously consider and act on these findings and recommendations. DOE's new Advisory Committee, as spelled out in its charter, is "solely advisory" in its duties. In this regard, the Committee will provide to the Secretary of Energy technical information, advice, and recommendations concerning the safety of DOE's production and utilization facilities. While the Committee can make recommendations, the Secretary is not compelled to act on them or even provide rationale as to why the recommendations will not be implemented.

In addition, it is unclear from the charter of the Advisory Committee whether its nonclassified findings, conclusions, or recommendations would be made available to appropriate congressional committees or the public. We believe such disclosure is necessary to keep the Congress and

public fully informed of the problems DOE faces and the risks of operating the nuclear defense complex. Furthermore, public disclosure would make DOE more accountable for its actions.

Safety Standards Should Be Clearly Defined

DOE's nuclear facilities are not required by law to adhere to standards that have been established for commercial nuclear facilities. However, DOE currently has a policy that its facilities will be at least as safe as comparable commercial nuclear facilities. We found that DOE (1) has not clearly defined this policy nor what commercial nuclear regulations and standards apply to its nuclear facilities and (2) has not assessed its nuclear facilities in a systematic way to ensure they comply with its safety policy. Therefore, DOE cannot determine if its facilities are comparably safe to commercial nuclear facilities.

DOE orders are not complete in defining what commercial regulations and standards should be applied to its nuclear facilities. DOE Orders 5480.6 covering reactors and 5480.5, covering other nuclear facilities, state that these facilities will operate in accordance with standards, guides, and codes which are consistent with those applied to comparable commercial facilities. Further, DOE Order 5480.4 states that DOE should review nationally recognized standards and prescribe those that are applicable to DOE activities. However, DOE has been lax in implementing this requirement.

For example, in March 1987, the Assistant Secretary for ES&H sent a memorandum to the Assistant Secretaries for Defense Programs, Nuclear Energy, and Energy Research listing 21 NRC rules completed since 1981 which were not all listed in DOE Order 5480.4, last updated in 1984. The memorandum requested that these offices, in conjunction with the operations offices and contractor personnel, determine if the rules listed are applicable to their facilities. This was a first step to identify more recent commercial requirements that might be applicable to DOE nuclear facilities. The memorandum stated that other pertinent licensed facility requirements have been issued as policy statements, guides, or in other forms and will be addressed at a later date. According to a DOE official, no decision had been made on how to address industry standards established prior to 1981. The official also said that ES&H is reviewing the responses to the March 1987 memorandum and is still deciding how best to resolve any problems.

The National Academy of Sciences also found that DOE had not clearly specified the levels of safety that must be attained at the production

reactors. The Academy believes this lack of specificity resulted in arbitrary and inconsistent application of commercial standards at Savannah River and Hanford, and in some instances, nonapplication of some standards. The Academy found confusion and disagreement over the basic safety objective for the reactors. It therefore recommended that DOE clarify its safety objective for operating the production reactors to provide a clear foundation on which the implementation of safety can be built.

Clarifying DOE's safety policy or standards is also a critical component in decisions to modernize DOE's nuclear defense complex. DOE is developing a modernization strategy for the nuclear defense complex which will necessitate upgrading old facilities or building new ones. A clearly articulated safety policy and standards would be the basis on which a systematic approach to assessing how each facility measures up to the policy and standards could be developed. DOE has not systematically assessed its facilities in the past.

For example, a detailed comparison to commercial industry criteria is required as part of DOE's safety analysis report as one way to demonstrate safe operation. However, DuPont, DOE's contractor at Savannah River, has not done such a comparison since 1967. In September 1987, DuPont's Program Manager for Reactors told us that DuPont has continually updated the reactors over the years to respond to some changes in the commercial nuclear industry and believed that the reactors were as safe as commercial reactors. However, because clear documentation does not exist, it is difficult to demonstrate what standards the reactors did or did not meet.

In March 1987, DOE issued the results of a review of the extent to which the Savannah River reactors conform to a limited number of commercial nuclear design practices. Of the 55 criteria reviewed, 16, or about 30 percent, were not fully met. For example, the safety computers that activate the backup system to shut down the reactors are not seismicly qualified and the heat exchangers which are part of the reactor coolant process are designed to a less stringent American Society for Mechanical Engineers standard than should have been applied.

DuPont has a program underway which draws from NRC's experience with older commercial nuclear plants. It includes a probabilistic risk assessment, severe accident analysis, and an analysis similar to the NRC's Systematic Evaluation Program for older commercial nuclear plants. NRC initiated the Systematic Evaluation Program in 1977 to

review the designs of older operating nuclear plants to confirm and document the safety relative to current licensing requirements. The Reactor Program Manager told us that when their efforts were complete, DuPont would be in a better position to assess whether the safety of the reactors at Savannah River is comparable to that of NRC's licensed reactors. According to a DOE official, DOE is assessing whether to review other nuclear facilities using this approach.

DOE has begun to reexamine how it addresses the safety of its nuclear facilities. On May 2, 1987, the Deputy Assistant Secretary for Safety, Health and Quality Assurance issued a preliminary draft of DOE's new Safety Objectives policy statement for review by DOE headquarters and operations office personnel. According to the Deputy Assistant Secretary, this is the first step in clarifying DOE's safety policy and putting in place a complete program that will assure a systematic way of ensuring the safety of DOE's nuclear facilities. He expected that this policy, along with a backfit policy, would be in place to begin a 2-year test in January 1989. More detailed DOE orders will follow these policy statements.

The safety policy ultimately adopted may have significant impact on DOE's nuclear defense complex. The Deputy Assistant Secretary told us that since the policy is still evolving, DOE is unable to factor in the effects of that policy on the nuclear defense complex modernization strategy it is to provide to the Congress in December 1988. Thus, he said modernization costs may be understated and positions taken in the strategy could possibly change.

Conclusions

DOE has taken positive steps to improve its oversight of the safety of DOE's nuclear defense facilities. The current Secretary of Energy established the position of Assistant Secretary for ES&H with responsibility for safety and health. However, unless this position is legislatively mandated, a newly appointed secretary could assign the safety and health functions to a lower level official within DOE. This could reduce the visibility and attention given to these important issues by top DOE management, especially when compared with nuclear material production.

DOE has recently established an oversight committee reporting directly to the Secretary of Energy. We continue to support independent oversight of DOE nuclear facilities. However, we believe that the oversight committee, as established, does not meet at least two and possibly three of our criteria for effective independent oversight. In addition, since the

committee is not legislatively established, its continued existence is at the discretion of the Secretary of Energy.

DOE has a policy that its nuclear facilities be comparably safe to commercial nuclear facilities, however, that policy is not clearly defined. DOE orders are incomplete concerning what commercial standards should be applied. In the case of the reactors, this has led to inconsistent application and in some cases, nonapplication of important safety standards. While DOE has drafted a new safety policy and begun to better identify standards that might apply to its facilities, DOE has no formal systematic program for assessing its nuclear facilities to determine the extent to which they meet current commercial standards. In addition, once it is determined that a facility does not meet certain standards, no criteria exist to determine if the facility should be upgraded to meet that standard. This is particularly important as DOE develops its strategy for the future of the defense complex. Without the two components—the safety policy and standards and a systematic assessment program—there will be no clear benchmark from a safety standpoint to determine what needs to be upgraded, the level of the upgrade, and/or what needs to be replaced.

Recommendations to the Congress

We recommend that the Congress

- amend the Department of Energy Organization Act to specifically establish the position of Assistant Secretary for ES&H to institutionalize this key component of DOE's oversight program and
- legislatively establish independent oversight of DOE's nuclear defense facilities which will satisfy our five key criteria.

Recommendation to the Secretary of Energy

We recommend that the Secretary of Energy revise DOE orders to establish meaningful safety standards and implementation policies to guide continued operation of existing facilities and to use as baseline safety criteria for developing its future strategy for the defense complex. This revision should include a formal process to (1) clearly identify the commercial standards, guides, and codes that should be applied to DOE's nuclear facilities and (2) justify when a standard is not met.

As requested, we did not obtain official agency comments on a draft of this report. However, we discussed the contents of this report with agency officials who generally agreed with our findings. Unless you

publicly announce its contents earlier, we do not plan to distribute this report until 30 days from its issuance date. At that time we will send copies to the Secretary of Energy and other interested parties.

This work was performed under the direction of Keith O. Fultz, Senior Associate Director. Other major contributors are listed in appendix II.

Sincerely yours,

J. Dexter Peach
Assistant Comptroller General

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Abbreviations

DOE	Department of Energy
DuPont	E.I. du Pont de Nemours and Company
ES&H	Environment, Safety, and Health
GAO	General Accounting Office
NRC	Nuclear Regulatory Commission

Objectives, Scope, and Methodology

We testified before the Senate Committee on Governmental Affairs on March 12, 1987, about our concerns at the DOE's Savannah River Plant and DOE's nuclear complex as a whole. In another hearing before that same Committee in June 1987, we laid out five key criteria which we believe would be needed for effective independent oversight. During our work at Savannah River and in preparing for the two hearings, we became concerned about several issues that affected the entire nuclear defense complex. In discussing those issues with Committee staff, in October 1987, they asked us to

- determine if DOE had addressed our earlier recommendations concerning DOE's organizational structure to effectively oversee environmental, safety, and health activities,
- identify DOE's reactor safety policy, and
- determine if DOE's proposed independent oversight committee meets our criteria for effective independent oversight.

To address these issues, we reviewed DOE orders, internal memoranda and reports, the March 1987 Design Review of the Savannah River Production Reactors, and the October 1987 National Academy of Sciences report "Safety Issues at the Defense Production Reactors." In addition, we reviewed pertinent sections of the Department of Energy Organization Act (42 U.S.C. 7101-7375) and discussed them with an attorney from DOE's Office of Legislation and Regulations. We also interviewed DOE officials in the Offices of the Assistant Secretaries for ES&H and Defense Programs. At the field level, we interviewed DOE and contractor officials at DOE's operations office at Savannah River, South Carolina.

In addition, to determine if DOE's proposed advisory committee meets our criteria for effective independent oversight, we reviewed the committee's charter.

We performed our work between October 1987 and June 1988 in accordance with generally accepted government auditing standards.

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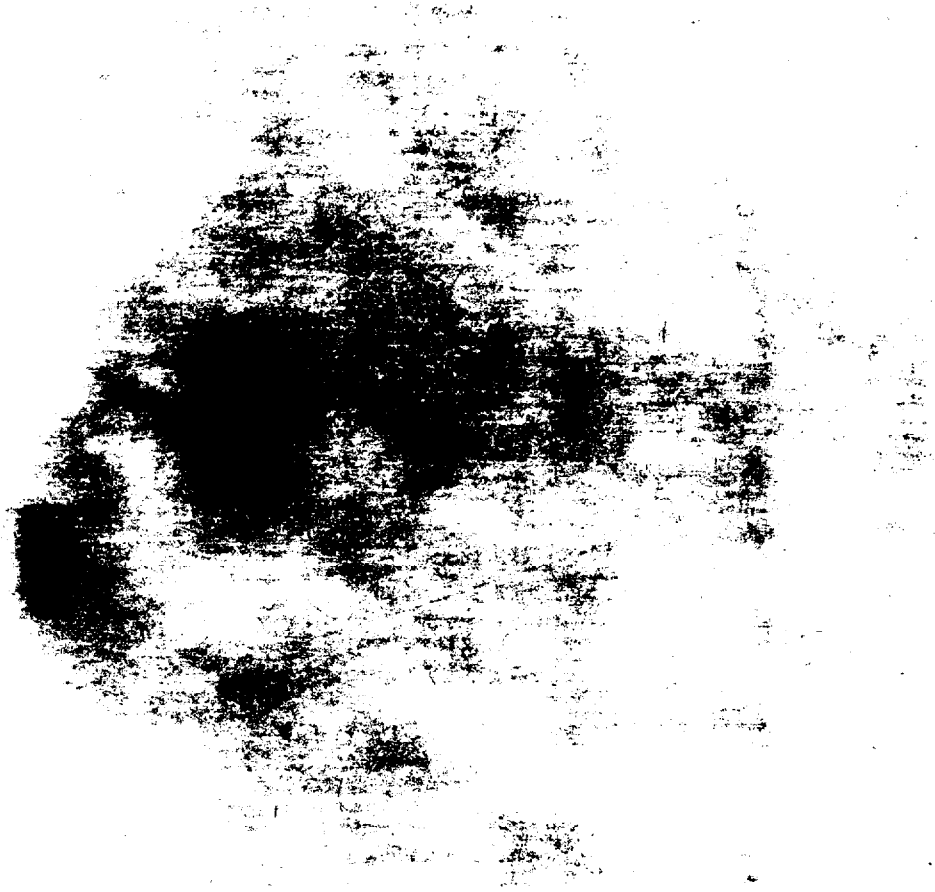

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