FROM WEAPONS TO WASTE: THE FUTURE OF THE NUCLEAR WEAPONS COMPLEX

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ABSTRACT

This paper examines how decision-making power has shifted within the nuclear weapons complex, from the federal government operating agency, in which power was originally vested by the Atomic Energy Act, to the states and to regulatory authorities. Additionally, when the original operating agency, the Atomic Energy Commission (AEC), was abolished in the 1970s, substantial decision-making power shifted from Washington to the field sites.

This paper identifies the needs for future materials and weapons production, and recommends that restart of old plants be abandoned as no longer militarily necessary. Instead, the U. S. should take advantage of what may be a unique opportunity to "leapfrog" to new, smaller, technologically-advanced plants that will meet the needs of the nuclear arsenal in the post-Cold War world.

This paper then looks at the current state of DOE's environmental restoration/waste management program, and the technological, legal and political problems it faces in trying to accomplish its mission of cleaning up all nuclear weapons sites. This paper argues that the U. S. government no longer has the exclusive authority to make and carry out critical decisions affecting a cleanup program that will cost the U. S. over $200 billion over the next 20-40 years. Moreover, there are competing theories about the principles that should guide the cleanup program. Finally, the author examines alternative futures for the DOE's environmental restoration/waste management program.

INTRODUCTION

I addressed this Tucson conference three years ago in 1989. At the time, I was working on the Senate Armed Services Committee for Senator Sam Nunn, the Committee Chairman. The panel was called "DOE Defense Programs: Working Towards Solutions." The title perhaps unwittingly, foreshadowed the "ultimate solution" that sealed the fate of the weapons complex as a producer of nuclear weapons. That, of course, was the collapse of the Soviet Union and the Warsaw Pact, and with them, the end of the Cold War.

As a result of these events, the nuclear weapons complex is at a critical juncture in 1992: its primary mission of nuclear weapons production has become virtually obsolete with the collapse of the Soviet Union, and it is poised to transform itself from a bomb-making enterprise to a full-fledged cleanup industry.

This paper examines how decision-making power has shifted within the weapons complex. By decision-making power, I mean the power to make and implement major decisions affecting the weapons complex, from facility siting and facility operations, to cleanup programs. Understanding these shifts is important for everyone in or doing business with the complex. In terms of the center of gravity of decision-making power, three phases can be identified. First, when the complex was created after World War II, power was vested in the federal government institution, known as the Atomic Energy Commission. Second, by the time the AEC was abolished in the early 1970s, a power vacuum arose at Washington headquarters and power shifted to the field sites. Third, in the 1980s and 1990s, with the growth of environmental and safety regulation, power is shifting increasingly to the states.

HISTORICAL CONTEXT

The Early Years

When the weapons complex was created in 1946, the Atomic Energy Act vested power in the executive branch institution, the Atomic Energy Commission. The AEC was considered one of the most powerful executive branch agencies ever created. It had three types of decision-making powers: power to make policy decisions, power to make managerial decisions, and power to make budgetary decisions. Although it shared budget authority with Congress, and especially the Joint Committee on Atomic Energy (JCAE), its collaborative relationship with Congress and the JCAE served to reinforce its budget authority.

Another key feature of federal power in these early years was the secrecy of weapons production. Because of the secrecy considered necessary to protect knowledge of nuclear weapons from the Soviets and other enemies, the weapons production industry was shielded from public scrutiny. One of the most compelling statements on this secrecy is by David Lilienthal, the first chairman of the Atomic Energy Commission, who said: "So greatly did [nuclear weapons] seem to transcend the ordinary affairs of men that we shut it out of those affairs altogether, or rather, tried to create a separate world, a world of the atom."(1) This world of the atom answered only to the AEC, which had the power to carry out its policies and regulate plant operations. The AEC also had a uniquely collaborative relationship with industry.

The 1970s

By the time the AEC was abolished in the 1970s, power was shifting away from Washington and to the field sites. The AEC was replaced by the Energy Research and Development Administration (ERDA), a weak organization who saw its primary mission as domestic energy policy, not weapons

plants. The weapons complex was a step-child in this agency. It lacked attention by senior policymakers. Nuclear weapons and nuclear power had been the AEC's primary missions. In ERDA, the weapons complex was one of six directorates in a multi-purpose agency.

The organizational changes of the 1970s, including the creation of DOE, had three debilitating effects on the weapons complex. First, decision-making power became fragmented and diffused. With a vacuum in Washington, power shifted to the field sites, which had greater technical knowledge and maintained the key relationships with industry operators.

Second, weapons plants became further isolated from the public, this time due to the explosion of safety and environmental regulation in the 1970s that provided greater public scrutiny over commercial industry, including the commercial nuclear power industry. Moreover, the weapons complex lost the safety oversight organization it had under the AEC. This safety oversight organization migrated to NRC, leaving DOE plants cut off from improvements occurring in the commercial sector. Not even the Three Mile Island accident changed this isolation. The government also took the position that many of the new environmental laws of the 1970s, such as RCRA, did not apply to federal facilities, such as weapons plants.

Third, there was a significant brain drain from the weapons complex in the 1970s. Safety experts went to the NRC or the commercial sector. Industry moved many of its technical experts to commercial operations, at least while nuclear power appeared a viable option.

These problems did not abate when DOE was created in 1977. If anything, they worsened as DOE focused on energy policy. The weapons complex remained a step-child in its new home.

The Present

The third shift in power, the phase we are presently in, is to the states and local authorities. Expanding environmental regulation and enforcement has diluted the authority of DOE as the operating agency. Today, states (and EPA regional authorities) have significant power over how decisions are implemented, due to their power to regulate, and increasingly, to enforce their regulations.

While DOE headquarters still has authority to make policy decisions, it can no longer implement them itself. For one, DOE Headquarters still shares significant authority with the field offices in such important areas as contracting and is dependent upon the field sites for basic budget data, such as that used in the Five Year Plans. Secondly, DOE must share its budget authority with Congress to a greater extent than ever before. Close to twenty Congressional committees and subcommittees claim jurisdiction over some part of DOE.

DOE, under President Bush and Secretary of Energy James D. Watkins (USN-Ret.) has attempted to recapture some of the authority exercise by headquarters in days of yore. Admiral Watkins, for example, has attempted to instill within DOE the concept of line management responsibility that he himself learned in Admiral Rickover's nuclear navy. However, recapturing the past is an impossible task, both in weapons production and cleanup.

FUTURE OF WEAPONS PRODUCTION

Current Conditions

What are the current conditions against which the future of weapons production should be considered? First, there has been virtually no nuclear materials production since 1989, when the last operating production reactors at Savannah River and the plutonium processing facilities at Rocky Flats were shut for safety reasons. Since that time, the Warsaw Pact and the Soviet Union have collapsed, ending forty years of Cold War military confrontation.

Both bilateral and unilateral weapons reductions are being taken. The START Treaty of July, 1991 will bring major reductions in nuclear weapons. In addition to bilateral cuts, both the U. S. and independent republics of the former Soviet Union have announced major unilateral reductions in their nuclear forces. On September 27, 1991, President Bush announced dramatic unilateral reductions in U. S. nuclear forces, including all tactical weapons. This proposal has been modestly described by DOE's Assistant Secretary for Defense Programs as a "watershed event for the defense mission of the department."(2) Even beyond the President's announcement is the expressed intent of independent former Soviet republics to dismantle and destroy their nuclear weapons.

Needs

As a result of the current conditions, there is no urgent need for new nuclear materials. Given the extensive supplies of plutonium and uranium, there is no need to produce either of these materials. The decision to cancel production of the W88 warhead for Trident II eliminates the need for production of plutonium pits for new warheads. These plutonium pits were manufactured at the Rocky Flats plant, which has been temporarily shut down since 1989 for safety reasons. Since we are no longer building new warheads and are instead retiring warheads at a rapid rate, we do not need to produce tritium for the foreseeable future. However, since tritium decays at the rate of 12.5 percent each year, the prudent course would provide for some capability as a hedge against future threats.

What is now needed is an expanded warhead dismantlement and material storage capability As such, the Pantex weapons assembly plant in Amarillo, Texas is the primary beneficiary of post-Cold War changes. Additional safeguards are needed for extra nuclear material from newly dismantled weapons to guard against terrorist threats and other proliferation possibilities.

Finally, it will be important to maintain the safety and reliability of the existing stockpile as a hedge against future threats.

Constraints affect the ability to meet the needs of weapons production. For one, the existing plant is technologically obsolete and in some cases unsafe to operate. Moreover, resources to modernize and improve the plants are limited. Additionally, the political process will affect the relocation and reconfiguration of the weapons plants.

Recommendations

First, DOE should abandon restart of the K-reactor at the Savannah River Plant and other old plants that are not critical to national security needs.

Second, DOE should shift its focus to designing a smaller, modern complex premised on reduced materials needs and

the maintenance of existing capabilities. To accomplish this, DOE should take the opportunity created by current conditions to "leapfrog" to new technologies that represent advances in efficiency, safety and environmental protection. For example, DOE should examine again alternatives, such as an accelerator, to building a new reactor for tritium production.

Much of the work needed in the future is in "downsizing". Here, DOE should apply the lessons of the private sector's recent experience in such industries as computers. DOE should also consider allowing the private sector to perform certain non-nuclear production activities.

ENVIRONMENTAL RESTORATION/WASTE MANAGEMENT

Needs

What are the basic needs for environmental restoration and waste management at the weapons plants? Most primarily, they are to cleanup the legacy of over 40 years of nuclear weapons production. This task involves waste management, environmental restoration, and decontamination and decommissioning of old plants. DOE also needs to develop technologies and solutions for mixed waste problems. Third, the process of cleanup should be both fair and efficient.

Problems

Numerous problems confront the cleanup program. For one, there are technological problems, such as waste mixtures for which cleanup technologies do no yet exist. There are also problems of utilizing plants whose technology is now outdated. For example, DOE planned to use the B-plant at Hanford to process high level radioactive waste; however, the plant did not meet environmental standards because the technology considered would eat through piping at the plant.

Some current technological solutions have failed. For example, in the pondcrete program at Rocky Flats, cracks occurred in one-half of 16,000 blocks that mixed low-level radioactive waste with concrete to create blocks of low-level waste.

Legal problems also exist. Multiple legal authorities govern cleanup at each site. In the federal arena, there are the major environmental laws, such as CERCLA, RCRA, the Clean Air Act and the Clean Water Act, to name just a few. These laws set the minimum standards the facilities must meet. State laws may impose stricter standards. In some cases, particularly in the regulation of mixed waste, the laws can be overlapping. For example, hazardous waste is covered by RCRA, but radioactive waste is governed by the Atomic Energy Act. Mixed hazardous and radioactive waste is thus governed by both RCRA and the Atomic Energy Act.

Politics only complicates cleanup. The many Congressional committees and subcommittees that claim jurisdiction over DOE compete for control. Congress sends mixed messages to DOE. Other "stakeholders" are also influential. States want tougher cleanup standards. Environmental groups have, their own agendas, and localities need to address their citizens concerns.

Issues

Two fundamental issues need to be addressed. First, there are the competing needs of fairness and efficiency. The trend is to provide for greater procedural fairness through such mechanisms as public participation. This occurs as the veil of secrecy is lifted. Multiple stakeholders may ensure fairness but not efficiency. New contracting procedures may more fairly allocate liabilities but lead, at least in the short term, to great inefficiencies. And inefficient programs can lead to delay and waste. DOE's Environmental Management Program will likely suffer similar, and even greater, criticism than the Superfund Program as it proceeds on its current course.

Secondly, there are competing theories about cleanup at a time when the United States Government no longer possesses sufficient authority to establish and carry out the terms of cleanup. On one hand, existing environmental laws create a regulatory regime to which federal facilities must adhere. Additional enforcement tools, such as waiver of sovereign immunity, would strengthen this regime. On the other, many would like to see a formal priority system based on "worst-first" principles that would prevent piecemeal cleanup based on which State Attorney General gets to the courthouse first. DOE has recognized the inability to completely cleanup certain sites. Its new euphemism for less than complete cleanup is "land-use planning".

Trends

Several trends in the management of DOE cleanup can be identified. First, the current course set by DOE and existing environmental regulation means that DOE cleanup is driven by multiple and competing requirements. The Interagency Agreements, established by the authority of CERCLA, govern cleanup at many sites. These Agreements, however, do not resolve many of the conflicts between DOE, EPA and the state regulatory authorities.

A second trend is toward more formal and consolidated environmental and safety regulation. This trend might be called the "NRC" model. Evidence of this trend can be found in the creation of the Defense Nuclear Facilities Safety Boards (DNFSB), established by Congress in 1988 to provide independent oversight concerning the safety of nuclear weapons plants. The DNFSB is charged with making recommendations to the Secretary of Energy on a safety policy for DOE sites and on safety orders used to enforce safety requirements. Although the DNFSB is presently an advisory, rather than regulatory authority, some of its original Congressional sponsors saw the DNFSB as the predecessor to a formal regulatory agency.

Some policy analysts have recommended that a formal regulatory structure be established. A study of the weapons complex by the Congressional Office of Technology Assessment (OTA) recommends creation of a permanent full-time regulatory agency for radioactive waste management.(3) The OTA study suggests that independent regulation of DOE's radioactive waste management activities would enhance the credibility of these activities in the public's eyes by separating DOE the operator from DOE the regulator. While this may be true, the way in which regulation is imposed is critically important. The NRC, for example, has little credibility today as a regulatory authority. Any regulatory body must first address the range of issues and problems associated with regulatory reform.

A fact of the future is that states and municipalities are gaining increasing authority to determine outcomes of DOE activities and the fate of DOE sites. A recent decision by the

U. S. District Court for District of Columbia on the Waste Isolation Power Plant (WIPP) is an important example of how judicial intervention will likely shift further to states power to regulate DOE facilities. The recent WIPP ruling provides that the State of New Mexico must issue a hazardous waste storage permit, known as "Part B," under New Mexico's version of RCRA before DOE can ship any waste to WIPP. Second, DOE is permanently enjoined from effecting the procedure known as land withdrawal, the transfer of land from Interior Department to DOE authority, by using an administrative procedure requiring only executive branch approval. DOE must get Congressional approval, another shift of authority from the federal government to states. There is a real question whether cleanup can be effectively carried out under current regulatory regime. The jury is still out. But, it is possible that the public backlash against the cost of regulation could help DOE establish standards that protect public health and the environment, but may not guarantee total remediation of all contamination.

CONCLUSION

The connection to public involvement is that those working at DOE sites must demonstrate by their work all aspects of knowledge, integrity and credibility that permit citizens to accept activities that involve some degree of risk and uncertainty. Better communication must replace the secrecy that has characterized DOE sites.

The shift of power from the federal government to the states is likely to continue. The pending sovereign immunity bill will take this even further. The lesson for industry is to pitch your products not just to DOE but to states, localities and other stakeholders who will have increasing influence over the cleanup program. The lesson for those in government is to recognize that you do not hold all the cards and to develop implementation strategies that attempt to manage, not just control, the decision-making process.

REFERENCES

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