Improving the Regulation of Safety at DOE Nuclear Facilities

**FINAL REPORT OF THE
ADVISORY COMMITTEE ON EXTERNAL REGULATION
OF DEPARTMENT OF ENERGY NUCLEAR SAFETY**

DECEMBER 1995

MASTER

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**Advisory Committee on External Regulation of
Department of Energy Nuclear Safety**

1726 M Street NW
Washington, DC 20036

December 22, 1995

The Honorable Hazel R. O'Leary, Secretary of Energy
The Honorable Alice Rivlin, Director of the Office of Management and Budget
The Honorable Kathleen A. McGinty, Chair (designate), Council on Environmental Quality

Dear Secretary O'Leary, Director Rivlin, and Ms. McGinty,

It is our pleasure to transmit to you the final report of the Advisory Committee on External Regulation of Department of Energy Nuclear Safety. On January 25, 1995, you charged this Committee to provide advice, information and recommendations on two questions: whether and how new and existing Department of Energy (DOE) facilities and operations, except those covered under Executive Order 12344, might be externally regulated to ensure nuclear safety. The Committee has reached its conclusions on each of these charges. These are set forth in the Committee's report. We are pleased that this distinguished and diverse Committee, which represented the broad range of interests involved in regulation of DOE, has been able to reach conclusions on the difficult issues it has had to consider. We trust this report will assist the Department, the Administration, and the Congress as they consider the transition of DOE to external regulation.

It has been a privilege to serve as co-chairs of this effort.

Sincerely,

John Ahearne

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PREFACE

For much of their existence, the Department of Energy (DOE) and its predecessor agencies operated largely outside public view as self-regulated entities. During the past decade, however, with the cessation of the Cold War, DOE has become more open to public scrutiny and significant environmental and safety issues have become apparent. DOE also has become subject to some external regulation through the enactment of environmental laws and actions of the courts. Despite these developments, DOE remains today a self-regulated entity in many important areas. Continued Congressional pressure to bring all of DOE's operations under external regulation led to proposed legislation and hearings in the spring of 1994. At those hearings, DOE endorsed the concept of outside regulation, but recommended that further Congressional action await a more extended examination by affected Federal agencies and other stakeholders.

To carry out such an examination, DOE, with the support of the White House Council on Environmental Quality (formerly, White House Council on Environmental Policy), on January 25, 1995, created the Advisory Committee on External Regulation of Department of Energy Nuclear Safety. The Committee's charter calls for it to recommend whether and how DOE nuclear facilities and operations should be externally regulated to best protect human health and safety and the environment.¹

The Committee was drawn from a cross section of public, Federal, State, Tribal, industrial, and academic sectors. Its twenty-four members represent a range of public and occupational health and safety, facility safety, environmental, and regulatory backgrounds. The co-chairmen of the Committee, a former Chairman of the Nuclear Regulatory Commission (NRC) and a former Assistant Secretary of Labor in charge of the Occupational Safety and Health Administration (OSHA), were chosen for their extensive experience in directly related regulatory matters. The Committee was supported by an Executive Director and a small staff of senior civil servants from DOE, the Environmental Protection Agency (EPA), and NRC. An internal working group composed of representatives from each of the major affected organizations within DOE provided data and analytical support under the direction of the Executive Director.

The Committee held eight two-day public meetings, many of them near major DOE sites that, taken as a whole, represent a cross section of the Department's nuclear activities. These included nuclear weapons production, site or facility decommissioning and cleanup, and defense and energy research activities. The deliberations of the Committee were

open to the public in their entirety and the Committee also set aside time to give workers and members of the public opportunity to express their views. The record of the Committee's meetings contains over 4400 pages of transcript. Through these meetings, responses to letters sent to many DOE and contractor managers, and Committee staff contacts with stakeholders, contractor employees, and DOE staff, the Committee heard from a broad range of interested parties inside and outside the Department. Appendix A contains a list of invited speakers and members of the public who testified. This report presents the findings and recommendations of the Committee. Some members have provided additional views. These are found at the end of the report.

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Additional information concerning the Advisory Committee's efforts can be found in the Appendices and Reference volumes to this report.

CHAPTER I

OVERVIEW AND SUMMARY

At the opening meeting of the Advisory Committee on External Regulation of Department of Energy Nuclear Safety, Secretary of Energy Hazel O'Leary described the work at DOE's weapons and cleanup complex as "the toughest, most dangerous work in the world."² DOE is now in the early stages of a massive, multi-decade decommissioning and environmental cleanup effort that will eventually cost the Nation several hundred billion dollars. How successful that effort is, how safely it is carried out, and how well that money is spent will depend heavily on the steps the Department takes now, in the early years, to make certain that the effort is as efficient, focused and productive as possible. DOE will spend many billions more each year on key programs in support of the Nation's defense, its energy resources, and its basic scientific research. It is equally important that these ongoing programs avoid the legacy of the past by proceeding under a clear and effective mandate for safety.

The DOE complex today includes some 34 sites containing about 3500 nuclear facilities located in 13 States. Across this vast complex, the Department must manage and dispose of enormous quantities of environmental contamination and hazardous materials. Many facilities are old and deteriorating and present serious threats to those who work in and around them. The complex is regulated under a mix of internal and external regulatory and advisory bodies that administer a maze of laws, regulations, directives, orders, and guidance. The result is intense frustration throughout DOE's workforce, serious overlaps and gaps in regulatory requirements, and a failure to address hazards according to their relative risks, costs and benefits. There is a widespread conviction, within DOE and without, that money has not been well spent. And DOE suffers from deep and pervasive frustration and distrust among those whose support and cooperation the Department needs to carry out its missions effectively and efficiently.

Recommendations

We make a number of recommendations to strengthen both the regulation and the assurance of safety at DOE nuclear facilities. Three are fundamental:

- *Essentially all aspects of safety at DOE's nuclear facilities and sites should be externally regulated.*

- *Existing agencies rather than a new one should be responsible for external regulation.*
- *Under any regulatory scheme, DOE must maintain a strong internal safety management system.*

Below we describe these and other recommendations and their rationale.

Why we recommend external regulation of safety

The Committee concludes that essentially all aspects of safety at DOE's nuclear facilities and sites should be externally regulated. Although we base this conclusion on a wide variety of considerations, three are key:

1. DOE should be externally regulated for the same reasons industry and all other Federal facilities and sites are.

We find no compelling reason why DOE should be treated differently from other entities, public or private, whose activities can and do pose serious risks to human health and the environment. Resolving the difficult issues involved in the effort to ensure safety at the DOE complex requires a careful balancing of risks to the public and DOE workers, environmental values, and use of the Nation's resources. External regulation can best bring to bear, independently of the pressures of the Department's missions and internal allocation of resources, the collective wisdom of the Nation on resolving those issues. Those judgements should be made in the wider context that an external regulator can provide. An external regulator, free of responsibilities for DOE's missions (though not ignorant of their importance), and not answering to DOE, can ensure that safety receives consistent and adequate attention. External regulation also would ensure more effective enforcement by placing such authority in independent hands engaged only in achievement of safety. We believe that, properly managed, external regulation can meet the demands of both safety and national security. The entire Department is already externally regulated in the environmental area, and many of DOE's nuclear facilities are not defense facilities.

2. Credibility is critical to the success of both safety regulation and DOE's missions.

The inherent conflict of interest between mission and self-regulation of safety at DOE, aggravated by a long legacy of secrecy, is at the root of many of the safety problems in the nuclear complex, much of the contamination that has occurred, and the loss of credibility the Department has suffered. External regulation would end that conflict by placing regulatory authority in bodies that are, and are seen to be, independent, impartial, and competent. It would improve public confidence in the

safety of DOE operations by making them subject to the same kind of independent regulation that applies to other public and private operations. It would enable the public, States, and Tribes to have opportunities for effective involvement in the regulation of safety at DOE facilities—as they do with similar facilities in the private sector. Finally, only independent, external regulation can ensure the stable regulatory framework—a framework that will not change as administrations and officials do—that is required to ensure credibility. The Department has been unsuccessful in its attempts to achieve credibility under self-regulation and the level of frustration at the current regulatory regime remains high within the Department, its laboratories, and its contractors, just as the credibility of its safety efforts remains low in the world outside. We believe that external regulation is essential to earning the public confidence the Department seeks and needs to free itself to carry out its important national missions.

3. Regulation of safety must both be effective and promote efficiency.

To be fully successful, regulation must be carried out in ways that both ensure safety and impose the least possible costs and burdens. DOE has essential missions in support of the public interest, and the goal of regulation should be to enable DOE to perform those missions both safely and well. External regulation can provide the focus required to remove some of the greatest obstacles the Department now faces in trying to do its job as effectively as possible: the lack of stability in safety policy and management and the confusing, complex, and evolving internal and external regulation and oversight that now consume so much of DOE's resources without ensuring that safety itself is effectively and efficiently achieved. Freed of the burden of regulating itself, DOE would be able to concentrate on carrying out its missions. We believe that, if properly done, the move to external regulation can enable the Department to perform its decommissioning, cleanup, defense, and other essential national missions far more productively and credibly.

The recommended approach would emphasize, where appropriate, risk- and performance-based rather than prescriptive and detailed regulation and would tailor requirements to suit the different situations at different sites and facilities. Such a flexible approach would enable the Department to proceed as expeditiously and as effectively as possible to meet its pressing and important safety needs.

We cannot predict significant savings in the direct cost of regulation through reforms in the regulatory regime. DOE costs for internal oversight of safety management will diminish and those for internal regulation of safety will disappear. Instead, there will be startup and transition costs in moving

to external regulation and additional costs to maintain the external regulators. It is also likely that costs of compliance will go up in the short term. However, the direct cost of regulatory oversight is, in general, a small part of the total cost of regulation, and significant long-term savings should occur through greater productivity and the prevention of further contamination and hazards.

We recommend the following framework for external regulation

In deciding on a regulatory framework, we sought to follow two principles: *First, DOE nuclear facilities should be regulated the way private sector nuclear facilities are regulated but, second, there should be only one regulator for each of the three major areas of safety at any DOE nuclear facility: facility safety, worker safety, and environmental protection.* These principles sometimes conflict, and we were thus sometimes forced to choose between them.

After careful evaluation of a wide variety of options, *the Committee recommends that:*

- *An existing agency—either the Nuclear Regulatory Commission (NRC) or a restructured Defense Nuclear Facilities Safety Board (DNFSB)—regulate facility safety at all DOE nuclear facilities under the Atomic Energy Act (AEA).*
- *The Occupational Safety and Health Administration (OSHA) regulate all protection of workers at DOE nuclear facilities under the Occupational Safety and Health Act (OSH Act), unless regulation of worker risks at a given facility could significantly interfere with maintaining facility safety (for example, if nuclear criticality is possible), in which case the regulator of facility safety should regulate all worker protection at that facility under the AEA.*
- *The Environmental Protection Agency (EPA) continue to regulate environmental protection matters for all DOE nuclear facilities and sites under the environmental statutes.*
- *States with programs authorized by EPA, OSHA, or the regulator of facility safety acquire or continue to have roles in regulation of environmental protection, facility safety, and worker protection comparable to those they now exercise in the private sector.*

We believe these and other recommended changes would strengthen, streamline, and simplify the regulation of safety at DOE nuclear facilities. Under the regulatory framework we recommend, the lines of responsibility

and accountability would be drawn more clearly and simply. External regulation of each facility would be carried out by a single regulator for each major area of safety: facility safety, worker safety, and environmental protection. The internal DOE safety structure would be freed both of overlaps and of the regulatory functions transferred to the external regulators. The management of each facility would be responsible and accountable to external regulators for its safety, and the Department would retain a small, focused "corporate" safety function to provide broad policy guidance and other assistance. To help ensure the achievement of these objectives, we make the following further recommendations:

Externally Regulate Nearly All Safety at DOE Defense Facilities: We believe it is entirely possible to ensure nuclear safety and at the same time protect national security through properly managed and circumscribed external regulation. *We recommend that external regulation of DOE's defense facilities be the same, in most respects, as regulation of any other DOE nuclear facility. However, regulation of the specialized area of "nuclear explosive safety" should remain a DOE responsibility and, at least initially, safeguards and security should remain a DOE function.*

Use Existing Agencies: The Committee considered many ways of distributing regulatory authority over the DOE complex. Some of the options centered around existing agencies, but others would have required establishing new agencies with varying degrees of authority. One option would have called for establishing an entirely new agency to regulate almost all aspects of environment, safety and health at DOE facilities, both nuclear and non-nuclear. Several members found that idea attractive. Ultimately, we reached consensus that *a regulatory scheme using existing agencies would provide the most practical and reliable means to ensure that each of our criteria for successful regulation can be met.*

Neither NRC nor the DNFSB was designed to carry out the kinds of responsibilities required of a regulator of facility safety at the DOE nuclear complex. Both would have to undergo significant changes before they could adequately meet those responsibilities. The Committee did not determine which of the two agencies could more readily undergo these changes. Instead, *we present two options for facility regulator—NRC, with a more flexible approach and incorporating the resources of the DNFSB, or a restructured and enlarged DNFSB. We urge that a prompt decision be made on which should be the facility regulator so that the move to external regulation of facility safety can proceed expeditiously. In the meantime, actions to implement external regulation of the two other areas of nuclear safety—worker safety and environmental protection—can and should proceed independently.*

Agree on "lead agencies": The regulatory framework we recommend removes much, but not all, of the overlapping and uncertain jurisdiction that afflicts the current system. *We recommend that at each major DOE site the external regulators work together to resolve jurisdictional conflicts among themselves and set priorities across the spectrum of safety at the site. They should agree through an open process that one of them become the "lead agency" for any specific area of safety in conflict at a given site—the only agency DOE and its contractors would have to deal with in that area.*

Employ a Range of Regulatory Approaches: DOE's facilities and hazards differ widely, and a rigid, "one size fits all" regulatory approach will not work. In our view, the use of a variety of models for regulation of safety is essential to successful and economically feasible regulation of the DOE complex. For that reason, *we recommend that regulators apply a range of models—from audited self-regulation to NRC's full licensing model—and, in any given case, select the model most appropriate to the activities and hazards being regulated. In particular, wherever it is reasonable to do so, performance-based requirements (where these are well-defined, as in the case of numerical release limits) should be used to maximize the potential for cost savings and flexibility.*

Ensure Effective Public and Worker Participation: We recommend that legislation establishing external regulation of facility safety at DOE contain specific provisions to ensure effective public involvement throughout the process of developing, adopting, and enforcing regulatory standards. That legislation should include the right of citizens to challenge a regulatory decision in court and to sue DOE directly to enforce compliance with regulators' health and safety requirements. A related matter is the involvement of workers under regulation of occupational health and safety, as well as facility safety. To ensure improvements in health and safety, it is essential to involve workers and their representatives in DOE's "corporate" health and safety programs.

Provide Adequate Resources: Finally, regulation can be no more effective than its resources will allow, and *each regulator must have the funds and other resources it needs to carry out additional responsibilities.* Existing regulatory agencies are already sorely strapped for funds and people and they cannot undertake the new and difficult task of regulating safety at DOE nuclear facilities without adequate resources.

DOE must maintain a strong internal safety management system

Regulators and managers of safety have entirely different responsibilities and roles. Regulators and regulations establish the conditions for achieving safety, but they do not achieve safety. It is the regulated managers and

workers who achieve safety. Under our recommendations, the responsibilities for the regulation and the management of safety at DOE nuclear facilities are clearly separated. The Department and its contractors bear the ultimate responsibility for safe operations at DOE nuclear facilities. To help it carry out this responsibility, *the Department should retain—separate from organizations with responsibilities for carrying out DOE's missions—a small, focused "corporate" safety management function of the sort typical of corporations that operate large facilities.*

The Transition to External Regulation Must Be Carefully Managed

The Committee reached its decision to recommend external regulation only after considerable thought and discussion. We are, however, nearly unanimous in that decision. We also agree that *a strong internal DOE safety management system is essential under any regulatory regime and, for that reason, the transition to external regulation must be done carefully so that it does not disrupt efforts already underway to strengthen and streamline that internal system.* We also stress that health, safety, and environmental protection must be the primary responsibility of the facility managers and operators and that no regulatory regime should lessen that imperative. The Department must maintain its focus on safety throughout the transition, and take steps to ensure that both the Department and the external regulators have the expertise required to deal with the diverse hazards and difficult situations at the DOE complex.

Steps that can be taken now

The Committee believes that the Secretary and others can take actions now to improve safety regulation at DOE. These actions can also smooth the transition to external regulation.

The Secretary should:

- *Complete the process already underway for placing the responsibility for safety at the operating level and removing the layers of safety oversight in line programs.*
- *Consolidate safety oversight functions into DOE's Office of Environment, Safety and Health (EH). The responsibilities of that office should include the sole authority to determine safety requirements and grant exemptions, and to approve the construction and startup of new facilities and new activities.*
- *Encourage the existing external regulators to establish "lead agencies" at DOE sites.*

- *Ask EPA to expedite the development of environmental standards for cleanup, recycle, and waste management.*
- *Expedite the transition of worker safety regulation to OSHA.*

The DNFSB should:

- *Make its processes more open. The Board has taken steps in this direction but needs to do more. Its recommendations have had the finality of rules, and they go through the public comment process only after they are issued. We recommend that the Board issue future recommendations in draft form for public and Department comment, and that the Board's recommendations indicate the disposition of those comments.*

A Broad View of Safety

At the opening meeting of this Advisory Committee, Secretary O'Leary invited it to take a broad view of its charter.³ The Committee agreed, and the scope of its concern has embraced all aspects of safety at DOE nuclear facilities. It reached that decision for two reasons: First, since the life cycle of a nuclear facility includes not only its design and operation, but also decommissioning and site restoration and the waste implications of these activities, the Committee found that the radiological aspects of public and worker health and safety, facility safety, environmental releases, emergency planning and response, site cleanup, and waste management should all fall within the scope of its consideration. Second, safety requires a coordinated approach encompassing not only radiological protection, but also protection against the hazards of industrial accidents and toxic chemicals. The Committee has therefore considered the entire range of nuclear safety functions in the context of the whole fabric of health, safety, and environmental regulation—that is, in the context of the coordinated regulation of all physical, chemical, and nuclear hazards at nuclear facilities. Pursuant to its charter, the Committee did not consider DOE's non-nuclear facilities, such as those engaged in coal, oil, and solar research, and did not address activities in the naval reactor program.

Roadmap to the Report

In the report that follows, we first summarize the current state of the DOE complex and its missions, the chief criticisms that have been made of DOE safety, and our view of the key symptoms and causes of problems with regulation of safety at DOE facilities. In order to describe the origins of these problems, we then briefly review the history of DOE

regulation and examine the internal and external regulatory structure that now applies to the DOE complex. Following this background information, in the succeeding three chapters we discuss and make recommendations on a number of issues that must be addressed by any successful regulatory scheme for DOE, identify the key criteria that a successful regulatory scheme should meet, weigh the relative merits of internal and external regulation, describe and evaluate options for external regulation, and set forth our recommendations for external regulation. In the next-to-last chapter, we stress the importance of an effective internal system and a well-managed transition, and we identify actions to achieve these objectives that can be carried out now. We conclude by presenting our view of the future of safety at DOE.

Conclusion

We believe the external regulatory framework that we recommend will clear the path to greater productivity and efficiency within the Department by removing regulatory redundancies and overlaps that now burden its work, by clarifying roles and responsibilities so that every member of the Department who is regulated for any activity knows what is expected, and by ensuring a stable regulatory framework that will not change as administrations and officials do. The flexibility we have urged in regulation will allow a more cost-effective approach to ensuring safety. We believe external regulation will improve public confidence in DOE and provide increased assurance that its future record of nuclear safety will be free of the mistakes of the past. We believe, as we have said, that external regulation will enable the Department to perform its missions both safely and well.

CHAPTER II

THE STATE OF SAFETY IN THE DOE NUCLEAR COMPLEX

DOE's Current Nuclear Missions and the State of the Complex

Recent evolution of the missions

The end of the Cold War brought profound changes to DOE's missions and the resources devoted to them. For nearly half a century, DOE's primary mission had been weapons production and, to a lesser extent, the development of commercial nuclear power and naval reactors and the conduct of energy and basic scientific research. Today, the primary emphasis has shifted sharply away from weapons production and nuclear power activities. Approximately half of DOE's nuclear budget⁴ is now devoted to three activities: materials management, decommissioning and cleanup, and waste management—a collection of activities the Department has aptly characterized as “Closing the Circle on the Splitting of the Atom.”⁵ The other half is devoted mainly to stewardship and dismantling of weapons and to energy and basic scientific research, with smaller portions devoted to naval reactors and nuclear power.

The shift from production to cleanup is illustrated by the portions of DOE's nuclear budget specifically allocated to decommissioning and cleanup and to weapons. The largest single element of DOE's nuclear budget (41%, or \$6.3 billion in 1995) is now devoted to decommissioning and cleanup activities, primarily at the former weapons production facilities. DOE's current estimate of the total future cost to clean up its facilities is \$230 billion.⁶ In terms of budget, the waste management and cleanup program at the DOE nuclear weapons complex is the Federal Government's most significant environmental effort. It now annually consumes more than half of all Federal facility cleanup expenditures and about one-third of Federal expenditures on all environmental initiatives. The weapons portion of the DOE nuclear budget is now only 29% (or \$4.5 billion in 1995), and more than half of that portion is spent on stewardship, dismantlement and disposal, and nuclear materials management activities, some of which are scheduled to be transferred to environmental restoration and waste management in the near future.

DOE 1995 Nuclear Budget

Although major changes in the weapons and cleanup missions dominate the picture, DOE also has large and important basic research and energy development missions, many of which are carried out in nuclear facilities. This portion of the nuclear budget (16%, or \$2.5 billion in 1995), although it includes some unusual operating facilities like those in the fusion and high energy accelerator programs, does not pose the same level of regulatory challenges and safety costs as the cleanup and weapons programs.

State of the complex

At its height, the DOE nuclear complex comprised 16 major and a large number of smaller sites, and included vast reservations of land in Idaho, Nevada, New Mexico, South Carolina, Tennessee, and Washington. Today, although a few sites have been turned over to other uses, the complex retains most of these holdings. It includes some 34 individual sites containing about 3,500 nuclear facilities⁷ and extending over 2.1 million acres and more than 85 million square feet of building space in 13 States.⁸

These facilities and sites vary greatly in kind and size. The facilities (not all of which are currently in operation) include uranium separation facilities, chemical processing and reactor fuel fabrication facilities, nuclear production and research reactors, fuel reprocessing facilities, nuclear weapons assembly and disassembly facilities, tritium recovery facilities, nuclear materials storage vaults, some of the world's largest high energy particle accelerators, a fusion laboratory, and a variety of large and small defense and non-defense research laboratories. Some major sites are relatively small—Fernald in Ohio and Rocky Flats in Colorado are 1,450 and 6,550 acres, respectively. Others are much larger. Savannah River in South Carolina covers 192,000 acres, Hanford in Washington State 360,000 acres, and the Idaho National Engineering Laboratory 570,000 acres.

The DOE complex is undergoing radical changes in structure, in physical size, and in hazards.

As a result of the shift from weapons production to dismantlement, decommissioning and stewardship, and thence to environmental cleanup, waste management and disposal, the DOE complex itself is undergoing radical changes in structure, in physical size, and in hazards. Most importantly, a substantial portion of the original complex is being decommissioned. Many of DOE's old and deteriorating facilities present serious threats to those who must work around and within them. The Department lacks reliable data for many of these facilities, such as how buildings were constructed, the nature of past uses, inventories of hazardous (including radioactive) materials, or the status of electrical and ventilation systems.

Beyond these decommissioning activities, the Department has major ongoing responsibilities for maintaining the Nation's weapons capability and managing the reduction of the stockpile of weapons, for energy research

and development, and for basic research. While the international situation has allowed the U.S. to cease underground testing and shift from weapons production to dismantlement, the continuing stewardship of the enduring stockpile is still a critical DOE mission. A program is underway to define the weapons complex for the future. Implementation of current plans will complete the downsizing of the complex that was started several years ago, and will add to the list of facilities that need to be decommissioned. Some of DOE's continuing functions will use existing facilities and others will require new facilities. Although large-scale weapons production does not now occur, facilities will be needed in the future for continued weapons research and small-lot production, for secure storage of plutonium and other materials from weapons dismantlement, and for maintaining the residual nuclear arsenal (e.g., for tritium production). New and expanded facilities also will be required to treat, store, and dispose of the waste legacy of weapons production.

The environmental restoration effort currently includes activities at more than 130 sites in 33 States and one Territory.⁹ These include 320 actions at sites on the "Superfund" National Priorities List (NPL) and 80 other actions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 97 closures and 108 corrective actions under the Resource Conservation and Recovery Act (RCRA), 24 cleanup and disposal actions at uranium tailings sites under the Uranium Mill Tailings Radiation Control Act (UMTRCA), 46 remedial actions at "formerly utilized sites" (primarily from the World War II "Manhattan Project"), and 156 other decommissioning and cleanup projects.

Many workers and managers who will be involved in the cleanup effort at DOE sites are not prepared to handle the hazards involved. The dramatic mission changes present DOE workers with tasks unfamiliar to many and with highly dynamic workplaces where hazards can be numerous and varied and exposures difficult to predict.

Across this vast complex, today the Department is responsible for managing and disposing of enormous quantities of radioactive and other hazardous materials and contaminated soils and ground water. For example, this includes 26 metric tons of plutonium, not including the amounts in weapons, resulting from the cessation of weapons production.¹⁰ Plutonium that previously had been recycled into new warheads was left in containers and facilities in conditions not suited for safe long-term storage in a variety of locations across the complex. Other inventories include about 2700 metric tons of spent reactor fuel, more than 430 metric tons of other radioactive materials, and more than 1.9 million cubic meters of radioactive waste, much of it stored in ways not suited to safe long-term storage. Over the past several decades, DOE operations have improperly tracked, stored, and disposed of large quantities of hazardous chemical and radioactive

materials, creating threats of unplanned chemical reactions, worker exposures, environmental releases, and, in some cases, criticality. Finally, although the hazards they pose to individuals may not be as great, past operations and waste management practices have created huge inventories of contaminated water and solid materials—about 800 million cubic meters of ground water and 80 million cubic meters of soil, solids, and rubble and debris—which could pose public health threats to populations, especially in the future. In the decades ahead, DOE—or some other entity—will have to devote substantial and growing resources to the safe and secure management and disposition of each of these inventories.

Criticism of Safety at DOE's Nuclear Facilities

Criticism of DOE safety has been widespread, especially during the last decade, as the consequences of the Department's unsuccessful safety and environmental management practices have emerged. As the Secretary said in her opening remarks to the Committee: "They [the public] have no confidence, no trust in us, as we have attempted to do this work *ad hoc*..."¹¹ The two most fundamental criticisms of DOE self-regulation have been that: (1) no organization should be permitted to practice "self-regulation,"¹² because this inevitably places safety in conflict with primary mission objectives,¹³ and (2) self-regulation is particularly ineffective when conducted under the cloak of secrecy. Below we first summarize the written record on criticism of DOE self-regulation and secrecy and their consequences for DOE's safety culture. We then note criticism based on the safety record at DOE facilities, specifically in the environment and for workers, and, finally, criticism focused on various aspects of the internal management of safety at DOE.¹⁴

The Atomic Energy Act (AEA) states that Federal nuclear policy, while intended to contribute to the general welfare, shall, at all times, take as its "paramount objective...making the maximum contribution to the national defense and security."¹⁵ However, that objective must be carried out with proper attention to implications for health, safety, and the environment and for costs to current and future generations. In retrospect, it is clear that, too often, this has not been done. A General Accounting Office (GAO) representative testified in 1994 that the historical emphasis on weapons production had compounded environment, health, and safety problems in numerous instances and that DOE had reinforced that message to its contractors by basing profits primarily on production, without adequate emphasis on safety.¹⁶

Secrecy has been used "as a shield to keep the public and State and local governments from knowing what has gone on in their facilities," declared Colorado Radiation Control Director Robert Quillin in 1994 Congressional

testimony.¹⁷ Environmentalists previously had charged that secrecy had been used to cover up embarrassing mistakes, environmental hazards, and safety risks. At the same Congressional hearing, a witness for the Congressional Office of Technology Assessment (OTA) testified that the Department's record of long-term secrecy and lack of external accountability has undermined public trust and credibility.¹⁸ A representative of the Natural Resources Defense Council (NRDC), commenting that "public confidence in DOE is extraordinarily low," expressed the view that, to regain some credibility, DOE must give up some control over its activities.¹⁹ The DNFSB also has been criticized for lack of openness and access and the Committee has heard some testimony to this effect, although the Board notes that it has taken remedial steps.²⁰

An important effect of the coupling of self-regulation with secrecy has been DOE's failure to achieve a successful safety culture. In 1989, DOE's Advisory Committee on Nuclear Facility Safety (ACNFS) warned incoming Secretary Watkins that DOE's nuclear facilities had suffered from lack of coherent direction on safety matters, loss of contact with progress in the outside world, and creeping complacency.²¹ Complacency about safety was found throughout the complex, and such a weak safety culture was proving difficult to change, reported the GAO in 1990.²² OTA reported in 1993 that managers and workers remained unconvinced that occupational safety and health was a top priority and that it was frequently undermined by production pressures and failure to penalize contractors.²³ In 1994, the Conference of Radiation Control Program Directors told Congress that decades of self-regulation had cultivated radiation safety practices demonstrably inferior to those used elsewhere.²⁴ The Congressional Budget Office (CBO) reported in 1994²⁵ that one legacy of the secrecy in which DOE conducted business over several decades was a culture of not being accountable to outsiders for meeting health, safety, and environmental commitments.

Widespread environmental contamination at DOE facilities and the immense costs associated with its cleanup (some of which may never be possible) provide clear evidence that self-regulation has failed. We do not repeat the extensive documentation of those problems here. The NRDC has testified that "we simply must ensure that such contamination never happens again, and we must start by scrapping the self-regulation system that made it happen."²⁶ According to testimony of the Ohio Attorney General, the AEA provides poor protection of the environment, and DOE's record of environmental contamination resulted largely from exemption of AEA materials from environmental laws, such as the Federal Water Pollution Control Act (FWPCA) and RCRA.²⁷ According to the CBO, as a result of DOE's damaged credibility, when it cannot meet its environmental commitments, regulators often do not believe DOE's explanations and are reluctant to reopen negotiations.²⁸

Widespread environmental contamination at DOE facilities and the immense costs associated with its cleanup provide clear evidence that self-regulation has failed.

With respect to worker safety, DOE is the only Federal agency to claim for its own facilities and contractors the Federal exemption available under the Occupational Safety and Health Act (OSH Act)²⁹. According to a 1993 OTA report, although the Department had ordered its contractors to follow standards established by OSHA and has worked to improve compliance, DOE's then existing organizational structure presented "serious obstacles to progress in safeguarding worker health and safety."³⁰ An OSHA report in the same year sharply criticized DOE's Office of Environment, Safety and Health (EH) as lacking the necessary staff and authority to ensure worker health and safety and found that production pressures at some facilities compromised worker health and safety.³¹ In 1993, an internal Departmental review observed that "DOE facilities...have been averaging around 64,000 reportable items of non-compliance with OSHA standards per year over the past two years."³² The Department has documented widespread vulnerabilities associated with the use of hazardous chemicals and plutonium in separate comprehensive reports issued in 1994 that surveyed the entire complex.³³ Problems related to intentional exposure of human subjects and populations to radiation by AEC and its contractors, including exposures in excess of then current norms for public exposure, have been extensively reviewed by an independent advisory group to the Secretary of Energy in a report issued in late 1995.³⁴

Many observers of DOE have commented on the lack of adequate internal management of safety. For more than a decade, GAO issued reports finding that DOE's internal environment, safety, and health (ES&H) oversight had insufficient authority and influence.³⁵ A 1993 OTA study found that EH lacked independent enforcement capability and that DOE had no other reliable or credible process for rewarding or punishing managers' ES&H performance.³⁶ A GAO study in the same year found that on-site oversight officials were unable to require site managers to respond to their findings.³⁷ Other criticisms focused on inadequate allocation of funding, lack of technically competent oversight personnel, fragmentation of responsibility, and inconsistency and weakness of standards. Independent regulation requires independent funding to carry out ES&H responsibilities, testified a witness on behalf of the Environmental Policy Institute in 1987.³⁸ DOE's over-reliance on contractors for the safe operation of its production reactors resulted partly from insufficient DOE staff technical capability, according to a report of the National Research Council in 1987,³⁹ and a similar view was repeated in a 1991 publication of the Union of Concerned Scientists on the weapons complex.⁴⁰

Many critics have commented on the fragmentation of and overlapping responsibilities for ES&H at DOE facilities. In 1988, the ACNFS said, "Currently there is confusion on what is oversight, what is advisory, and

what is management, with several organizations having (or taking) overlapping roles."⁴¹ The Environmental Policy Institute charged that contractors were subject to "scattered and fragmented" internal oversight and viewed the problem as a result of long standing deference to contractors, lack of technical expertise in ES&H management, and high turnover in DOE leadership.⁴² DOE's own "Tiger Team" evaluations in 1991-92 confirmed these findings and noted that, in some cases, staff responsible for managing ES&H also were carrying out program oversight.⁴³

Finally, DOE's safety standards compare poorly to those of NRC, according to a study conducted for the DNFSB in 1990.⁴⁴ The House Interior Committee reported in 1992 that "each DOE contractor developed its own [*de minimis* release] standards and testing methods for hazardous waste disposal, none of which received DOE approval."⁴⁵ And the DNFSB concluded, in its 1994 annual report,⁴⁶ that the DOE order system omits some important safety areas and that some orders are undermined by inconsistent and inadequate implementing standards.

Some of the above criticisms are outdated and DOE is working hard to put in place a self-regulation system for safety that works. Nevertheless, the persistence of these problems and their seriousness demonstrate that they have fundamental causes that DOE has been unable to address under the existing regulatory scheme. We now turn to those causes.

Symptoms of the Problems and Their Underlying Causes

Which regulatory scheme may work best for the Department depends largely on the problems that need to be resolved. For that reason, the Committee has devoted considerable time to identifying and understanding the symptoms and causes of public dissatisfaction with DOE regulation, weaknesses in the DOE regulatory regime, and key regulatory issues that must be addressed to resolve these problems. The Committee supplemented the extensive record reviewed above with its own investigations. Through hearings, site visits, and inquiries, we have sought the views of a wide range of interested parties inside and outside DOE. From a long list, we find that the following are key *symptoms of the existence of serious problems* in the way DOE is being and has been regulated:

- Major problems stemming from poor safety practices, including extensive contamination of sites throughout the DOE complex, leaving large portions of sites unfit for unrestricted human use; serious worker hazards associated with fissile and toxic chemical materials;⁴⁷ and the historical exposure of individuals and exposure of populations to large releases of radioactive materials.⁴⁸

- Huge costs that stabilization, decommissioning, and cleanup of Departmental facilities and sites will entail; and a widespread conviction that fiscal and personnel resources are being wasted or not effectively used for these purposes.
- A deep and pervasive distrust of DOE across the public at large and among members of Congress and other Federal, State and local governmental agencies.⁴⁹
- Frustration throughout DOE's workforce, which is caught up in a regulatory morass that often impedes, rather than aids, its efforts to do its job both safely and well.
- Numerous cases of non-compliance with established safety requirements, uncovered by a series of different investigators during the past decade.⁵⁰
- Failure to address and, in some cases, roadblocks to addressing hazards according to their relative importance.

In the Committee's view, most of these "symptoms" have fundamental causes rooted in DOE's historical approach to safety and in its regulatory structure. Although the Department has made substantial progress in recent years, we found that most of the root causes of the problems identified by previous observers remain. These include:

- *The built-in conflict of interest between safety and mission under self-regulation.* The single overarching cause of DOE's problems is the conflict of interest inherent in allowing an organization, particularly one whose operations are hazardous, to regulate itself. Self-regulation is a significant departure from the normal practice under the U.S. system of checks and balances, which is to separate the responsibility for regulating an activity from that for conducting it. DOE's historical emphasis on weapons production and secrecy and the resulting materials management and environmental legacies have severely undermined its credibility. The dramatic and abrupt change in mission brought on by the end of the Cold War has exacerbated the Department's safety problems through accelerated shutdown of facilities.
- *A legacy of secrecy that has historically shielded DOE's operations and activities from outside view.* The resulting isolation led to DOE safety practices less sound than those used in the outside world. It also created growing suspicion and distrust of the agency and its activities. Later revelations of accidents, near accidents, extensive releases of hazardous materials, exposures of humans to hazardous materials, and sloppy waste management practices

displayed the existence of poor safety practice and validated this distrust. The Department has taken a number of steps in recent years to raise its credibility, including a sharp reduction of secrecy, but all indications are that DOE's credibility remains low.

- *Lack of stability in safety management and policy.* According to one senior DOE official: "The regulatory/oversight regime of DOE has been in a state of nearly constant transition since the late 1980s. This lack of stability has led to much confusion, duplication of effort, and in some cases failure to identify and implement requirements throughout the entire DOE nuclear complex."⁵¹ DOE's leaders are of necessity political appointees whose tenures are limited, and are often replaced by individuals with very different backgrounds and priorities. Program managers and those implementing safety have had no confidence that the requirements of the past would be the requirements of the future and, as a result, have often ignored initiatives or become enmeshed in trying to respond to simultaneous, changing requirements and priorities. This confused situation has also led, in some cases, to many officials, and therefore no one, in effect, being responsible.
- *Lack of management accountability and inadequately coordinated regulatory and oversight functions.* The division of responsibilities for health, safety, and the environment between the various DOE headquarters organizations and between headquarters and field organizations, as well as the division of responsibility for safety between DOE and its government-owned contractor-operated facilities, have been fluid and inadequately defined. The result has been uncoordinated multiple audits, inspections, and assessments; redundant reporting; misplaced priorities; and substantial expenditures with little demonstrated improvement in safety. (There are also similar problems created by overlapping jurisdictions of external regulators and advisors, e.g., State, EPA, and the DNFSB.)
- *Redundant, confusing safety requirements.* The Department has had a bewildering number of rules, directives, orders, and guidance; uncertain compliance methods; and overlap or conflict with internal and external requirements for comparable situations. In the past, DOE's internal requirements often were not implemented, in part because many were duplicative, vague, inappropriately prescriptive, or deemed irrelevant.
- *Lack of balance in addressing hazards.* The Department's statutory authority for self-regulation, the Atomic Energy Act, as amended, has led DOE to focus its management of safety and development

Root Causes of Problems Under Self-Regulation

- *Built-in conflict of interest between safety and mission under self-regulation.*
 - *Legacy of secrecy that has historically shielded DOE's operations and activities.*
 - *Lack of stability in internal safety management and policy.*
 - *Lack of management accountability.*
 - *Redundant, confusing safety requirements.*
 - *Lack of balance in addressing hazards.*
-

of safety expertise on radiological hazards. The priority of hazards is different now that decommissioning and cleanup are dominant activities. For example, industrial and construction health and safety hazards are now key worker protection concerns. (There also are prioritization problems between hazards regulated internally and those regulated externally. This has led to fixing hazards based on the strength of enforceable sanctions rather than on risk or cost/benefit considerations.)

The severe problems the Committee has identified with DOE's approach to safety have their roots in DOE's unique regulatory history and current regulatory framework. The next chapter describes that history and framework.

CHAPTER III

REGULATION OF SAFETY AT DOE NUCLEAR FACILITIES

DOE Regulatory History: A Brief Summary

Until the mid-1980s, DOE's regulatory history was shaped by the authorities for the principal missions of the Department and its predecessors: nuclear weapons and nuclear power. Under the authority for the Manhattan Project and the Atomic Energy Act (AEA) and its various amendments, for nearly half a century DOE and its predecessors operated the vast majority of the Federal government's nuclear research and production facilities essentially exempt from outside regulation. This self-regulation excluded other Federal agencies, States, local jurisdictions, and the general public from participation in health and safety oversight and decision-making for these activities. The 1970s and 1980s saw enactment of major environmental legislation applicable to DOE, growing public awareness and concern about the health and safety management of the DOE nuclear complex, successful lawsuits, and the winding down of the Cold War. As a result of these and other factors, DOE gradually has become subject to increasing environmental regulation and other forms of oversight. Nonetheless, today DOE continues to self-regulate major aspects of its nuclear operations, including all worker safety; almost all of the design, operation, and decommissioning of its nuclear facilities; and some of its environmental discharges and waste management.

Born with the highly secret race to develop a nuclear bomb during World War II and continued and expanded with the onset of the Cold War, DOE's nuclear complex initially operated in a world that lacked both external regulation and external regulators qualified to deal with these kinds of nuclear issues.⁵² It was not until the 1970s that Congress created independent Federal regulatory agencies competent to address radiological health and safety (EPA in 1970 and NRC in 1974) and not until the end of the 1980s that independent technical oversight of DOE nuclear facility safety began, first through the Advisory Committee on Nuclear Facility Safety (ACNFS) and then by the DNFSB. At least in the early years, the perceived overriding need for secrecy and the concentration of nuclear expertise within the DOE nuclear enterprise made self-regulation appear to be the only rational course.

DOE's internal regulatory structure has been shaped by the unique relationship between the Federal government and private contractors that was created to develop the atomic bomb under the Manhattan Project.

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DOE's internal regulatory structure has been shaped by the unique relationship between the Federal government and private contractors that was created to develop the atomic bomb under the Manhattan Project.

This undertaking required an immense collaborative effort between the Federal government—in particular, the military—and the nation's scientific and industrial resources and expertise. The Federal government managed and oversaw this work, but it was performed under contract by an array of private companies and universities. In 1946, Congress transferred the responsibilities and facilities of the wartime Manhattan Project to a newly-created civilian Atomic Energy Commission (AEC) and expanded its mission to include civilian uses of atomic power.⁵³ The new agency continued to rely on contractors to manage and operate its nuclear complex and instituted a policy of decentralization which gave substantial authority and independence to field offices across the country. Although the AEC issued health and safety contractual requirements, contractors at the various sites were responsible for day-to-day operations and safety decisions under the general oversight of the field offices. This decentralized pattern of broad governmental oversight over relatively independent contractors, exercised primarily through contractual and fiscal means, has prevailed throughout the Department's history.

During World War II and the ensuing Cold War, the AEC's paramount concern in its defense operations was the development and production of weapons. The AEC, early on, did place a high priority on health and safety issues but, because of its decentralized management structure, it never developed a coordinated, agency-wide internal safety organization with significant authority. Nuclear safety also suffered as the result of a heavy reliance on secrecy and the AEC's apparent regard of environmental and waste management matters as secondary since, over the near term at least, they appeared to pose little risk. But in the late 1960s and early 1970s, growing safety and environmental concerns focused greater public scrutiny on the AEC. A major fire at the Rocky Flats site, serious leaks at Hanford, and other events drew national attention. Through requirements to disclose environmental impacts, the National Environmental Policy Act of 1969 (NEPA) created a mechanism that began to open the AEC nuclear complex, its weapons materials production and reprocessing activities, in particular, to scrutiny by other Federal agencies and the public.

The weapons and research portions of the AEC were transferred to the Energy Research and Development Administration in 1974 and merged into the new DOE in 1977. These administrative changes brought reduced continuity in top management, and the new Department's broader mission led to less focus on nuclear matters. New revelations in the early 1980s about releases of radioactive and other hazardous materials, as well as occupational safety and health problems and newly enacted environmental laws, put mounting pressure on DOE to open its nuclear complex to outside analysis and regulation. By 1984, a Federal court had ordered DOE to comply with all provisions of the 1976 Resource Conservation

and Recovery Act (RCRA).⁵⁴ RCRA covers the management of hazardous (but not most radioactive) wastes and subjects Federal facilities to EPA and State regulation. DOE had argued that, under the AEA, it was exempt from RCRA.⁵⁵ In 1986, Congress required DOE to enter into cleanup agreements under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, also known as "Superfund") for all hazardous (including radioactive) sites listed on the National Priorities List (NPL). By the early 1990s, EPA had listed most of DOE's major sites on the NPL and they had become subject to cleanup under agreements reached among DOE, EPA, and the relevant States.

While these developments in external regulation were occurring, DOE was working to improve its internal management of safety at nuclear facilities. In 1985, Secretary of Energy John Herrington created the office of Assistant Secretary for Environment, Safety, and Health (EH) in response to a highly critical internal report on DOE's environmental, health and safety programs.⁵⁶ The new office had no regulatory authority, but was authorized to make on-site appraisals of safety at DOE's nuclear facilities. In 1988, Secretary Herrington created the ACNFS in response to a report of the National Research Council of the National Academy of Sciences.⁵⁷ The same year, Congress established a five-member independent Defense Nuclear Facilities Safety Board to review safety and environmental conditions at DOE's defense nuclear facilities and make recommendations to the Secretary of Energy. The Board was given no standards-setting or enforcement authority.⁵⁸

DOE has been working to improve its internal management of safety at nuclear facilities.

Soon after taking office in 1989, Secretary of Energy James Watkins expressed his intent to end the existing culture of secrecy, to emphasize safety over the production of weapons, and to improve DOE's management and oversight of safety at its facilities.⁵⁹ EPA and the FBI conducted, with his cooperation, criminal investigations at the Rocky Flats site,⁶⁰ and he initiated a number of measures intended to strengthen DOE's safety activities, including formation of "Tiger Teams" to conduct assessments at thirty-five major facilities. Over the years, a series of mishaps at DOE reactors had resulted in the shutdown of facilities at Hanford, Savannah River, and elsewhere. In late 1989, Secretary Watkins established an Office of Nuclear Safety reporting directly to the Secretary and charged it with overseeing and monitoring safety at DOE facilities. He also established an Office of Environmental Restoration and Waste Management to manage DOE's environmental cleanup and waste management activities.

Secretary of Energy Hazel O'Leary, who succeeded Watkins in 1993, took further steps to strengthen internal management of safety. She moved the Office of Nuclear Safety into EH and undertook a broad series of safety initiatives. These included announcing the Department's desire to

relinquish regulatory authority over all workers at DOE facilities to OSHA, reinstating the authority of the Assistant Secretary for Environment, Safety and Health to order the immediate shutdown of any operations that posed immediate nuclear safety concerns (it had been removed to line managers in 1989), and initiating review of DOE's internal regulations and reform of DOE's contract requirements for safety.

However, the basic issues associated with self-regulation remained. In early 1994, the House Subcommittee on Energy and Mineral Resources held hearings on proposed legislation to establish external regulation of new DOE nuclear facilities and explore the options for external regulation of existing facilities. At those hearings, Under Secretary Charles B. Curtis expressed the Department's view that the issues required a thorough assessment and proposed that DOE should initiate a Federal examination of whether and how the Department might be externally regulated to strengthen nuclear safety and protection of human health and the environment. DOE established the present Committee in January 1995 to perform that function.

DOE Under Secretary Curtis testified that a decision on external regulation of DOE required a thorough assessment and proposed an examination of the issues.

The Current Regulatory Scheme for DOE Nuclear Facilities

Today, the DOE nuclear complex is regulated under a mix of internal and external regulators and advisory bodies that administer a maze of laws, regulations, directives, orders, and guidance.⁶¹ DOE continues to regulate most of its own activities, especially in areas such as worker health and safety and the design, operation, and decommissioning of nuclear facilities. EPA and the States have the largest external regulatory role, primarily in cleanup, environmental releases, and waste management. The DNFSB provides external oversight of safety at defense facilities, through non-binding recommendations to the Department. NRC regulates uranium tailings sites (to EPA's standards) and will license any DOE-developed high-level waste storage or disposal site and certify gaseous diffusion plants under DOE lease to private operators. OSHA provides only an advisory function for DOE's worker safety standards. The Department of Transportation regulates the transportation of radioactive materials. Principal external regulatory and oversight bodies are described in Table 1 at the end of the report.

Who now regulates what

A useful way to describe the current regulatory framework is in terms of what broad aspects of safety are regulated by whom. In general, safety at DOE nuclear facilities can be broken down into three areas:

- *Safety of facilities:* ensuring that the facility itself is designed, built, operated, modified, and decommissioned such that any radioactive or other hazardous materials are managed in an adequately safe manner and that worker and environmental protection requirements can be met. Training, security, emergency planning, and on-site storage of materials also are included.
- *Worker protection:* ensuring the health and safety of workers by requiring proper working conditions, monitoring of workers, preventing or mitigating unsatisfactory conditions, and addressing worker safety and health complaints, including whistleblower protection.
- *Environmental protection:* protecting public health and the environment by keeping within acceptable levels radiological and other hazardous materials released, or potentially released, to the environment or remaining on the site after decommissioning and cleanup for other use, and by regulating the treatment, storage, and disposal of wastes.

The current regulatory regime for safety at DOE nuclear facilities may be summarized for these three areas as follows:

Safety of facilities

Under the AEA, DOE is responsible for ensuring public and worker health and safety through the design, construction, and operation of almost all of its nuclear facilities. The DNFSB advises DOE on the safety of its defense facilities, except those which are part of the naval reactor program, and must give its approval before resumption of operations involving plutonium at certain Rocky Flats facilities. NRC will soon regulate the two uranium enrichment facilities leased by DOE to the United States Enrichment Corporation.

Worker protection

Under the AEA, DOE regulates all aspects of worker health and safety at almost all of its nuclear facilities, through an exemption to the Occupational Safety and Health Act. OSHA advises DOE on worker protection and the Mine Safety and Health Administration regulates underground worker safety. DOE has announced its desire to transfer regulatory authority over worker protection at all of its facilities to OSHA in the next few years.⁶² On June 19, 1995, DOE entered into a Memorandum of Understanding with OSHA that establishes a task force to "explore, identify, and develop strategies to facilitate" transition to OSHA enforcement and commits DOE and the Department of Labor to prepare "a report that

examines the advantages and disadvantages of a possible transfer of DOE oversight to OSHA enforcement."⁶³

Environmental protection

Under statutes applicable to the environment, EPA and the States now regulate or establish the relevant standards for most aspects of protection of health and the environment for all (radiological and non-radiological) releases from operating facilities, site restoration, and waste management. The major exceptions are radiological releases to water and certain radiological wastes, which are regulated by DOE under AEA-based exemptions to the FWPCA and RCRA.⁶⁴ EPA and the States regulate non-radiological releases to water from operating facilities (under FWPCA) and the management of hazardous wastes (under RCRA). They regulate radiological and non-radiological releases to air from operating facilities (under the Clean Air Act (CAA)) and cleanup of sites on the NPL (under CERCLA).⁶⁵ NRC regulates the final disposal sites for uranium mill tailings and will regulate any future high-level waste repository, applying EPA's environmental standards. EPA and the State of New Mexico are the primary regulators of the Waste Isolation Pilot Plant (WIPP) repository for transuranic wastes.⁶⁶ EPA is developing cleanup standards under the AEA for DOE sites and DOE will be responsible for their implementation at non-CERCLA sites.

The statutes under which the functions described above are carried out each have their own provisions for standards-setting, authorizations, compliance monitoring, enforcement, and the roles of the States, Tribes, and the public. A list of relevant statutes is provided in Table 2 at the end of the report. A more comprehensive summary of these statutes, as they now apply to DOE's operations, will be found in Appendix B.

DOE's internal regulatory system

DOE imposes ES&H requirements at its nuclear facilities under Section 161(i)(3) of the AEA. Unlike NRC's authority under the AEA, which is limited to regulation of source, special, and byproduct radioactive materials, DOE regulates all radiological, chemical, and physical hazards at its nuclear facilities. This self-regulation has three elements: (1) a directives system and nuclear safety regulations, (2) internal and external oversight, and (3) enforcement.

The directives system documents requirements and guidance for management and technical functions. Fifty-one directives address ES&H requirements, standards, and processes to be followed by DOE and its contractors. These are typically Department-wide consensus documents generated with limited or no public participation. They tend to be prescriptive and process-oriented and many are redundant or not generally

applicable at all DOE facilities. The Price-Anderson Amendments Act (PAAA) of 1988 required DOE to strengthen its nuclear safety requirements.⁶⁷ DOE is changing relevant nuclear safety directives to regulations under the Administrative Procedure Act, which includes a public process. These rules are developed by EH, but must be approved by each of the program offices before they are promulgated. By the end of 1995, only four rules were final: enforcement and adjudication procedures, occupational radiation protection, quality assurance, and contractor employee protection regulations.⁶⁸ Eight others are in process.⁶⁹

Internal oversight of compliance with ES&H Directives and regulations is accomplished through a complex and changing array of inspections and audits. Appraisals may be conducted by DOE headquarters organizations (EH and the Defense, Energy Research, Nuclear Energy, and, until recently,⁷⁰ Environmental Management program offices), by Operations Office teams and personnel, by Area or Site Office and EH site representatives, and through contractor self-assessments. As deficiencies are identified, contractors are required to respond with plans and schedules for corrective actions. These are reviewed, changed as needed, accepted, and monitored, in most cases, by essentially the same complex and changing array of inspection and auditing authorities that identified the original deficiency. In addition, at defense nuclear facilities, detailed external oversight is carried out by the DNFSB, which provides its recommendations to the Secretary of Energy. The DNFSB has a technical staff of about 100, conducts frequent site assessments, and has permanent representatives at Hanford, Pantex and Rocky Flats, and, in the future, will have permanent representatives at Oak Ridge and Savannah River.

The Assistant Secretary for ES&H can issue stop-work orders if a clear and present danger to workers or members of the public exists.⁷¹ Remedies, such as adjustment of fees, stop-work orders, and contract termination, for lesser violations of ES&H Directives can be required only when they are incorporated into a contract. In the past, many contracts have been inadequate in this respect. DOE also can take enforcement actions under the PAAA for violations of nuclear safety rules, to the extent they have been promulgated. These include compliance orders, notices of violation, civil penalties, and referral to the Department of Justice for criminal prosecution. In this case, DOE's enforcement capability mirrors the practices of external regulators.

DOE is currently implementing three groups of initiatives to improve the internal management of safety at nuclear facilities: (1) redefining safety policy and standards, (2) tailoring ES&H requirements to the needs of facilities, and (3) improving oversight.⁷² The first group includes initiatives to redefine basic safety policy; to strengthen and to issue as rules nuclear safety standards, and strengthen their implementation and staffing; and to

consolidate existing safety directives and incorporate private sector standards. The second group includes an analysis of the completeness and adequacy of existing ES&H standards on an activity-specific basis; an effort to identify those standards that are "necessary and sufficient" on a facility-specific basis;⁷³ and a program under which senior headquarters and field managers certify compliance with their assignment of responsibilities. Finally, the Department has established in EH an independent office for oversight of ES&H, safeguards, and security, independent of policy development and ES&H technical assistance. Some of these initiatives are completed; most others are scheduled for completion within a year or two.

The Characteristic Regulatory Approaches of Key External Regulators

Not surprisingly, the principal external regulators, operating under widely differing statutory requirements, have developed some significantly different approaches to regulation.

Because NRC's most important concern is safety at complex facilities, such as power reactors, in which accidents and failures can have catastrophic consequences, NRC regulates primarily through the issuance of licenses, without which facilities cannot be built or operated. NRC issues and enforces detailed and prescriptive specifications and procedures covering the design, construction, operation and decommissioning of such facilities. In the case of so-called "materials" licensees (primarily those that use small quantities of radioactive materials, often in sealed sources, or that handle low levels of radioactivity, such as uranium ores and tailings), NRC pursues a less prescriptive licensing approach. NRC's recent rulemakings on nuclear power plant training and maintenance also show a more non-prescriptive approach.

Because its primary concern is the long-term effect of environmental contamination, EPA usually regulates through the use of performance-based standards.⁷⁴ This approach allows the regulated entity to decide how best to meet standards. Depending on the statute, EPA's standards are based on chronic risks to health or the risk levels achievable by best available technology (the latter also are performance-based, since they do not mandate use of a particular technology). Although EPA does not normally become involved in the design of, technical specifications for, or management of, a facility, RCRA permits for waste disposal facilities often become prescriptive and cleanup agreements under CERCLA typically have incorporated detailed schedules and conflict resolution provisions.

OSHA standards for worker protection range from performance-based (e.g., exposure limits or process safety management) to prescriptive (e.g., excavation shoring requirements). Traditionally, OSHA has implemented its regulations through citations and the imposition of penalties, invoked as a result of onsite inspections, through consultation, and through the Voluntary Protection Program,⁷⁵ each coupled with training and outreach programs for workers and employees. Currently, OSHA is pursuing voluntary approaches to assessment and correction of safety hazards and administration of corporate and federal safety and health programs, as exemplified by the Maine 200⁷⁶ initiative. This initiative uses OSHA personnel to assist rather than to inspect and rewards good performance. Pilot programs have resulted in greatly improved compliance and more efficient use of OSHA resources.

The States commonly have adopted standards promulgated by Federal regulators. Important exceptions are those for naturally occurring radioactive materials, for which there are, at present, few useful Federal standards, and for x-ray sources. Since States usually do not regulate facilities with the accident potential of power reactors, State regulations typically do not reach the degree of prescriptiveness of NRC power reactor license conditions and tend to be more performance-oriented.

The DNFSB provides external oversight of design, construction, operation, and decommissioning of defense nuclear facilities. It acts not as a regulator, but principally as an agency to push for change through recommendations to the Secretary of Energy. To fulfill this function, it may conduct investigations of any aspect of safety at nuclear defense facilities and make recommendations for improvements. These may deal with detailed specifications of individual facilities, procedures, or general requirements. The DNFSB does not suggest new standards but reviews and acts on the basis of either its own judgement or applicable or comparable requirements from other sources. Thus, it may recommend adherence to either prescriptive or performance-based approaches, although it usually uses the former.

CHAPTER IV

ISSUES TO BE RESOLVED FOR ANY REGULATORY SCHEME FOR DOE

This chapter presents the Committee's conclusions on how certain aspects of the regulation of safety at DOE nuclear facilities should be carried out by any regulator. The following chapters apply these conclusions to the issues associated with resolving the basic question of self- or external regulation, recommending a specific external regulatory scheme, and suggesting ways of improving the internal management of safety and of managing the transition to an improved overall regulatory scheme. Here we concentrate on what regulatory models are needed to best achieve safety at the DOE complex and on how to correct regulatory gaps and overlaps, achieve safety efficiently, ensure that the public and the States and Tribes are adequately represented, use resources efficiently, set the right priorities, ensure that national security is not impeded, enforce safety requirements, and enhance the stability of safety regulation.

1. One Size Does Not Fit All

The degree and the nature of regulation of safety required across the DOE complex vary greatly. Operational facilities range in complexity and hazard potential from nuclear production reactors and fuel reprocessing plants at one extreme to research laboratories using small amounts of radioactive tracers or small sealed sources at the other. Facilities and sites can exist in a wide variety of conditions: not yet constructed, currently operating, in standby, under decommissioning, in final cleanup, or as waste repositories. To achieve cost-effective assurance of safety over this range of situations, a variety of different forms of regulation is needed. In the private sector, NRC accommodates this range in the degree and nature of regulatory attention needed through differences in the specificity of its licensing requirements. That range of regulatory approaches could be readily used by an external regulator of the DOE complex at new DOE facilities and at DOE laboratories that use small amounts of radioactive materials or operate up-to-date research accelerators and comparable devices.

In fact, much of the work conducted at the Department's laboratories falls within the same scope of activities as do those regulated in the private sector under materials licenses from NRC or its Agreement States. These licenses depend primarily on performance-based requirements. During

its deliberations, the Committee heard from most of the Directors of the Department's laboratories. Virtually all of them enthusiastically endorsed external regulation based on the above model. The Committee agrees and supports the use of performance-based requirements⁷⁷ in these situations wherever such use is feasible.

Although the flexibility already available for NRC's private sector licensees would be useful at many DOE facilities, there are more fundamental needs for flexibility that require different approaches at other facilities and sites. A majority of DOE's large facilities are one-of-a-kind and old and many do not have documentation adequate to satisfy current licensing procedures. Many of these facilities were constructed in the past under safety requirements that have since been superseded. Often, it is important that safety improvements be carried out promptly and updated frequently as the facility is upgraded. In other cases, the facility may have to suspend operation temporarily or permanently, but maintenance of facility safety will remain a major concern. To ensure that prompt attention is paid to safety requirements, it is important to avoid a slow, sometimes trial-like process like formal licensing, to make it possible for essential work to proceed. For these cases, a more flexible process is appropriate, perhaps one similar to "certification" as it is being practiced on a pilot scale at the gaseous diffusion plants currently being operated by the U.S. Enrichment Corporation.⁷⁸ Under such a process, permission to operate should be based on an ongoing assessment of facility safety and upgrades, as needed, to maintain acceptable levels of safety.

Another large class of activities is represented by the major parts of the complex that are shut down and entering, or are already in the process of, decommissioning and cleanup. For the most part, these facilities are located on sites governed by agreements among DOE, EPA, and the States under CERCLA (and in some cases RCRA) for decommissioning and cleanup. For most of these facilities and sites, neither traditional licensing nor a process like certification is the most reasonable form of regulation. Essential elements of regulation for such situations are performance-based standards, flexibility for site-specific solutions, and, especially when the site is to be released, State and local involvement. This kind of approach is provided under EPA's CERCLA and RCRA processes.

Any regulatory scheme must be able to accommodate each of these different situations to be successful and universally applicable. *DOE's facilities and hazards differ widely, and a rigid, "one size fits all" regulatory approach will not work. The use of a variety of models for regulation of safety is essential to successful and economically feasible regulation of the DOE complex. In particular, wherever it is reasonable to do so, performance-based requirements⁷⁹ (when these are well-*

defined, as in the case of numerical release limits) should be used to maximize the potential for cost savings and flexibility.

However, we do not intend by the discussion above to endorse any particular existing "licensing," "certification," or "permitting" scheme, especially for facility safety or worker protection, the two areas in which DOE is still largely self-regulating. Instead, we describe the functional elements of a regulatory process that has the flexibility, effectiveness, and openness necessary to deal with the great variety of DOE nuclear facilities (we will address openness further in Section 3 of this chapter).

There are three steps to the regulatory process we envision. In the first step, the standard-setting process, the regulator establishes (through notice-and-comment rulemaking) the criteria for safe operation. These criteria will be prescriptive or performance-based, as appropriate, though we would hope performance-based wherever possible. In the second step, the regulator undertakes a proceeding in which it applies the criteria to a facility or activity in order to determine whether the facility or activity is safe. The nature of this proceeding, in particular the degree of formality it has, can and should vary depending on the character of the facility or activity and the degree of hazard it presents. If the regulator concludes, based on the application of these criteria, that the facility will operate, or the activity proceed, safely, the regulator issues authorization through a license, certification, permit or similar device. The authorization document should contain conditions designed to ensure continued safe operation of the facility, or conduct of the activity. Since the conditions will be based on the standards that establish the criteria for authorization of a facility or activity, the conditions will be prescriptive or performance-based, as appropriate. In the final step, there is a mechanism for enforcing the scheme, including the criteria contained in the authorization document.

We stress some important concepts behind this scheme. First, in this description we have consciously avoided using the terms "certification" or "licensing" or any other phrase that might be construed as a term of art under the existing NRC or any other specific regulatory system. We are aiming to describe a flexible, functional approach, rather than to adopt any existing regulatory model. For some very complex, high-hazard facilities such as a reactor, it may be appropriate to apply the safety standards through an elaborate, trial-type, adjudicatory proceeding (although, for reasons we give in Section 3 of this chapter, we generally find such elaborate proceedings to be expensive in time and money and unnecessary). For most facilities and activities a less elaborate proceeding will likely make sense. The point is that there are available different types of proceedings in which to apply the safety criteria to a facility or activity, and the regulatory system should select the one that allows full

The use of a variety of models for regulation of safety is essential to successful and economically feasible regulation of the DOE complex.

consideration and airing of the relevant issues while consuming the least amount of time and resources necessary.

Second, whatever type of authorization proceeding is selected, the proceeding must be structured to allow adequate public participation in the authorization decision. We define public participation as adequate when the public has the opportunity to fully air its concerns and views on all issues it believes are relevant to the permitting decision, to have the regulator carefully consider and respond to those views and concerns before the authorization decision is made, and to obtain judicial review of the authorization decision if necessary.

Third, it should go without saying that any authorization scheme will include allowances for phasing in the system—to allow existing facilities to operate under interim status for a limited period of time pending a full transition to the new regulatory system.

2. Overlaps and Gaps in External Regulation

The Committee frequently heard that regulatory overlap was a serious impediment to “getting on with the job.” We heard about many kinds of overlap, the most frequent being multiple internal oversight and multiple external regulators. We address the overlaps due to problems with self-regulation elsewhere. Here we focus on problems with external regulation stemming from overlaps under existing statutory responsibilities. We also address the converse situation—gaps in external regulatory authority which, although not often brought to the Committee’s attention as a problem, nonetheless must be considered in formulating the Committee’s recommendations.

Overlapping and conflicting external regulation has caused competition for jurisdiction, as well as significant costs and delays in decommissioning and cleanup activities.

Overlapping and conflicting external regulation has caused competition for jurisdiction as well as significant costs and delays in decommissioning and cleanup activities. Some forms of overlap are healthy, at least in principle, because they serve the legitimate purpose of providing a forum for balancing national and local interests. The challenge is to ensure a process that expedites and simplifies this balancing so that DOE can get on with the job. Other forms of overlap are not healthy. The overlaps between DOE, EPA and the States under the AEA, CERCLA and RCRA fall into both of these categories. From the viewpoint of the site operator, the overlapping authority of EPA and the States for cleanup of sites that are subject to both RCRA (which excludes AEA materials and can be administered by authorized States) and CERCLA (which includes AEA materials and does not pass final authority to States) presents a confusing array of masters to be satisfied.⁸⁰ The situation is further complicated by the fuzziness of the dividing line between facilities entering or undergoing

decommissioning that are subject only to DOE authority under the AEA, because they have no potential for releases, and those also subject to CERCLA, because they do.⁸¹ Delays and costs caused by these types of overlap can be reduced through the kind of cooperative arrangements now being worked out by the affected parties under the tripartite agreements for cleanup at the NPL sites.⁸² These typically involve mutual agreement on a "lead agency" designation for each of specified portions of decommissioning and cleanup activities. *To minimize the adverse impacts of jurisdictional overlaps, the Committee strongly supports use of a cooperative approach by the regulatory agencies based on the designation of a "lead agency" for specific elements of decommissioning and cleanup activities.* We do not recommend fundamental changes in the statutory approaches to these problems, which involve a complex interplay of local, State, and national public health and environmental issues that extend far beyond the safety issues at DOE nuclear facilities. However, great care must be taken to avoid the types of agreements entered into in the past that commit to unmeetable schedules or unrealistic funding profiles. We address "lead agencies" further in Chapter VI.

Some other regulatory overlaps also do not serve any obviously useful purpose and can cause waste of resources or force inappropriate priorities for action. One example involves disposal of mixed wastes. The technical requirements for disposal of low level radioactive waste are different from those for hazardous chemical wastes, with the result that there have been major obstacles to disposal of mixed waste. This result was possible because RCRA exempts AEA materials and the AEA does not contain specific statutory requirements for wastes, as does RCRA.⁸³ Another example is the disparity in enforcement between hazardous materials under RCRA and for AEA materials, which are exempt from RCRA enforcement. Other kinds of overlap also can cause unproductive use of resources. An example is duplicative rulemaking for radioactive materials by DOE under AEA authority transferred to EPA.⁸⁴ These overlaps and lack of equity in the treatment of safety hazards should be avoided by 1) facilitating equitable treatment of all safety hazards, and 2) defining regulatory responsibilities in a way that removes jurisdictional overlap between regulation of safety of facilities and environmental protection. The Committee has proposed remedies based on these principles in laying out its recommendations for external regulation in Chapter VI.

There also are potential gaps in external regulatory authority for facility safety and worker health and safety. Taking facility safety first, NRC's jurisdiction under the AEA extends only to hazards from source, special, and byproduct materials and does not include other sources of radiation (accelerator-produced radiation or materials and naturally occurring radioactive materials)⁸⁵ or non-radiological hazards, all of which are

regulated by DOE under Section 161(i)(3) of the AEA, which permits such regulation at any AEA-authorized facility. *Gaps in regulatory authority under the AEA, as currently exercised by NRC, should be closed by extending to any external regulator of facility safety, for DOE nuclear facilities, the authority currently given to DOE under the AEA.* We note that, although facility safety issues also may exist at DOE non-nuclear facilities, such as those engaged in coal, oil, and solar research, or at the various other non-nuclear enterprises within the Department's mission, DOE's authority to regulate safety under the AEA does not extend to these facilities and the Committee did not include them within its scope of consideration.

There are also some gaps in the coverage of workers, even assuming extension of OSHA and State jurisdiction over worker protection at DOE facilities. To begin with, the OSH Act does not extend to State employees,⁸⁶ and some of DOE's laboratories are operated by State universities. Although most such States have OSHA-approved plans (and therefore can be expected to apply standards comparable to OSHA's standards to State employees), they may not be able or willing to assume a major role in regulating large DOE facilities, especially at out-of-state locations. Moreover, when the employee of one State works at a DOE facility in another State, say a University of California employee at Los Alamos, it is not clear that the employee is covered by either State, even though both are OSHA Plan States. *The Committee recommends that the OSH Act be amended to cover all DOE and DOE contractor employees at DOE nuclear facilities regulated by OSHA,⁸⁷ and that DOE maintain a robust internal or "corporate" worker safety program as a complement to external regulation of worker safety under any future regulatory scheme.*

3. Public, State, and Tribal Roles

We first address the role of citizens and then the roles of States and Tribes, who provide the regulatory interface closest to citizens and the sources of the hazards of concern.

The role of the public

A meaningful role for citizens and workers is essential to the development of credibility and trust.

A meaningful role for citizens is essential to the development of credibility and trust. But, far more importantly, in a democratic society it is vital to the success of regulation—the existence of regulation, after all, is justified only to the extent that it serves the public interest. Two elements are required to implement effective public participation in the regulatory process: timely and adequate information and effective means to influence the outcome. Successful regulation requires an enlightened public

involvement, and public acceptance of regulation and its outcomes depends on the existence of reasonably accessible and effective means to change those outcomes.

As one Committee member observed, "[G]ood information is absolutely critical... If people don't think they have information, it doesn't matter if they have the safest facilities in the country. They're not going to think it's safe."⁸⁸ The need for timely, accurate, and understandable information and meaningful dialogue based on that information is now well recognized. The Department has made great strides in recent years to eliminate unessential secrecy, to make information about its facilities accessible and understandable, and to create a wide variety of forums in which the views of members of the public and workers and those of responsible DOE officials can be exchanged, both at the local and at the national level. Paradoxically, a danger (in practice) is that DOE's problems are sufficiently numerous and difficult that the public may become so overwhelmed by the volume and complexity of information and the multiplicity of new forums for dialogue that meaningful interaction will be inhibited. The Committee concludes that sometimes this has occurred, reinforcing the need for clear and well-presented information and care in structuring the dialogue. We have no recommendations in this area, except to encourage the Department to continue to improve its good work already in progress. A related matter is the involvement of workers under regulation of occupational health and safety as well as facility safety. To ensure improvements in health and safety, it is essential to involve workers and their representatives in DOE's "corporate" health and safety programs.

Although information and dialogue are important, they are not a substitute for effective means to change outcomes. The public should be able to influence regulators effectively in three different areas: (1) the establishment of safety standards through rulemaking; (2) the establishment of requirements at specific facilities and sites; and (3) the enforcement of requirements and the implementation of non-discretionary statutory duties by regulators.

In implementing each of these regulatory areas, there are some simple principles that must guide DOE and the regulatory agencies. The first is that people affected by activities at a given facility must be informed of the issues, and their views must be sought early in the decisionmaking process. The second is that all public comments must be honestly considered by the regulators and either adopted or responded to with written explanations of the reasons for not adopting them. These principles must be embodied in the cultures of both DOE and the regulatory agencies. At all times, members of the public must be treated with respect and their views taken seriously.

The public should be able to influence regulators in three regulatory areas:

- *The establishment of safety standards through rulemaking.*
 - *The establishment of requirements at specific facilities and sites.*
 - *The enforcement of requirements and the implementation of non-discretionary statutory duties by regulators.*
-

In the first of the three regulatory areas, establishing safety standards through rulemaking, public views may be sought at an early stage in the development of a proposal through an Advance Notice of Proposed Rulemaking and then again when a proposed rule is issued for public comment. All comments must be considered and responded to in the written record supporting the rule. However, when citizens believe the regulator has not responded adequately or required a satisfactory level of safety, or done this in a timely manner, the opportunity for successful legal recourse depends on the specificity of the statute involved. Although most environmental statutes and the OSH Act contain some relatively specific safety criteria (and, in a few cases, deadlines for action), these vary widely and have not led to consistent results. On the other hand, the AEA contains less specific guidance than these other statutes on the criteria that should be applied, making recourse to the courts by citizens more difficult. The AEA simply gives the standard-setting agency authority to set standards as "...will provide adequate protection to the health and safety of the public" and as it "...may deem necessary or desirable to...protect health or to minimize danger to life or property,"⁸⁹ formulations that give more discretion than other statutes in deciding how protective of health and safety its regulations must be. According to Federal judicial interpretation of the AEA, NRC *must* ensure that any use or production of nuclear materials provides "adequate protection to the health and safety of the public," but NRC is only *empowered* but not required to "minimize danger to life and property."⁹⁰ The health and safety provision of the AEA to "minimize danger to life and property" could be strengthened by making it a non-discretionary requirement for the regulation of DOE nuclear facilities. It is important to note, here, that as read by the courts, "minimize" here does not mean "reduce risk to zero." It does mean that factors such as risks, costs, and available technology should be taken into account before more stringent requirements are established.⁹¹ *The Committee recommends that Congress give consideration to strengthening this discretionary health and safety provision of the AEA by making it a non-discretionary requirement for the regulation of DOE.*

In the second regulatory area, establishing specific requirements at a facility through licensing, certification, permitting, or some similar process, as noted earlier, the regulatory agency's safety evaluation and proposed action should be published for comment and all comments considered and responded to in writing. The regulator should establish a public docket that includes the agency's safety evaluation and other relevant agency documents and the public comment on the proposed action. Beyond this, when the issues and public concern warrant, public hearings of the kind conducted by legislatures will be useful. There may also be some facility safety cases in which the appropriate vehicle for public participation by affected citizens is a full, trial-type, adjudicatory hearing to resolve issues

in dispute and to ensure access by the public to essential information. However, the Committee has great skepticism about the fruitfulness of the regulator's conducting a full-blown trial to settle a regulatory issue. Very diverse elements of the Committee—regulators, regulated parties, and citizens' and environmental groups—find such trials not always to be useful in the regulatory context. They too often consume a disproportionate amount of time in highly formal processes such as "discovery" and cross-examination and they are expensive for all concerned. The objective should be to illuminate the issues with the least impediment to eliciting essential information and to free exchange of views. Whatever the level of formality in a proceeding to authorize a facility or activity, the regulated party or affected members of the public who took part in the proceeding should be able to seek judicial review of the regulator's decision.

Legislation providing for external regulation of facility safety should allow use of a process, simpler and less formal than that for NRC licensing hearings for nuclear power plants, that provides an effective means for public participation in the authorization process. This process should provide opportunity to raise all substantive health, safety, and environmental issues.

With regard to the third and last of the regulatory areas, enforcement of requirements, there is no substitute for the regulatory agency having a presence at the facility or site, an effective inspection program, and the imposition of administrative penalties for significant violation of the regulations. The public must have access to all inspection findings and enforcement actions. Further, the regulator's procedures should allow for the public to petition the regulator to take enforcement action, and the petitions must be carefully considered and responsive action taken. For reasons given more appropriately in Section 7 of this chapter, the Committee also recommends that citizens be able to sue DOE directly to enforce compliance with regulators' health and safety requirements and to sue regulators to require them to carry out non-discretionary statutory duties. The Committee believes that citizens' suits are essential to an effective, credible enforcement scheme, and are especially important when one Federal agency is being regulated by another Federal agency.

The role of the states and tribes

Historically, health and safety have fallen within State or Tribal jurisdiction. However, in the case of radiation, although independent authority to regulate non-AEA sources of radiation (x-ray sources, accelerators, and most naturally occurring radioactive materials) exists in most States, current State authority to regulate many radioactive materials is circumscribed by Federal statutes. States may legally regulate the hazards of both nuclear and non-nuclear materials at Federal facilities under most Federal

environmental statutes (CERCLA is the principal exception, although even here States have a strong role in the selection of standards and remedies), and States may regulate certain classes and quantities of man-made radioactive materials under the AEA. But, importantly, health and safety regulatory authority under the AEA currently is reserved to Federal regulators in some key areas, including Federal facilities, reactors, and high-level radioactive waste disposal facilities.⁹² The OSH Act does not allow States to regulate worker hazards at Federal facilities.⁹³

For the purpose of delegating its regulatory authority for the management and protection of lands and natural resources, most environmental statutes allow EPA to treat Indian Tribes in a manner similar to the way it treats States. Many Tribal governments now exercise such authority (although, as far as we know, no Tribe regulates a DOE facility). No Tribal government can exercise authority under the NRC Agreement State program.⁹⁴ However, NRC consults often with the Tribes, under various provisions of law (e.g., Title I of the Uranium Mill Tailings Radiation Control Act, and Parts 60 and 61 (waste disposal) of NRC's regulations). There are no special provisions for Tribes in the OSH Act). Tribal jurisdiction over worker protection tends to be decided by the Federal Courts on a case-by-case basis. Most of the following text regarding States also applies to Tribes. In the interest of brevity, we do not point this out in each instance.

In considering the role of States, several questions are relevant: Must a State demonstrate that it is qualified to regulate? Should a State be able to set different standards? What powers should Federal regulators retain? Should the Federal government help fund State programs that regulate Federal facilities in their States? Are any changes in the statutory provisions on delegation of regulation of Federal facilities to States warranted?

All the relevant statutes require that the Federal regulator assess whether a State is qualified to exercise authority under a Federal statute. Other questions are answered in different ways, although some differences stem as much from how regulators implement the statutes as from the statutes themselves. The AEA requires its Agreement States' standards to be "compatible." NRC, until recently, has generally interpreted this to prohibit more protective State standards.⁹⁵ Environmental statutes explicitly allow more protective standards, as does the OSH Act (although the OSH Act requires States not to impede interstate commerce and to justify more stringent standards based on local conditions). EPA, NRC, and OSHA each may act in emergencies if the State response is not timely, or may revoke State authority, if the State is not fulfilling its obligations. EPA typically also retains non-emergency authority to act in particular cases. Although the AEA allows NRC to provide States with training and other assistance, the States always have borne most costs.⁹⁶ Under the environmental statutes, States may receive Federal grants to help run

regulatory programs. OSHA is required by the OSH Act to provide 50 percent of the operational costs for OSHA-approved State Plans, through matching funds.

Many States have strong regulatory capabilities and also can relieve Federal regulators of significant burdens. States usually also have superior knowledge of local conditions. *In keeping with decades of precedent under most Federal safety and environmental statutes, the Committee believes the States should continue to exercise their current authorities and in addition should be able to exercise considerable regulatory authority over facility safety and worker protection at DOE nuclear sites, so long as this does not lead to the regulatory overlap problems described earlier. As is the case in the private sector, the Committee recommends that certain limitations on State authority should continue. For example, at DOE reactors or high level waste repositories, States should not regulate facility safety or worker protection.*

States should continue to exercise their current authorities and should also be able to regulate facility safety and worker protection at some DOE nuclear facilities.

States should have to qualify under an approval process to assume such regulatory authorities from the Federal regulators of facility safety and worker protection. Following the model under most existing Federal safety and environmental statutes, a State that wished to exercise regulatory authority over DOE in lieu of the Federal regulator would have to apply to the Federal regulator and, as part of that application, demonstrate the adequacy of its program. The law should also authorize the Federal regulator to revoke the authority if the State program proves inadequate in practice.

Although uniform standards are desirable for the sake of equity and efficiency, historically States have adhered closely to national standards even when they have had authority to do otherwise. *In principle, the States should be able to enact more stringent standards, even in the area of facility safety, as long as these do not unduly hinder a DOE mission.*

4. Efficient Use of Resources to Achieve ES&H Objectives

The prospects for cost savings

The Committee cannot predict, and it will be difficult for the Department to realize, significant direct savings, that is, savings in the cost of regulatory oversight, through reforms in the regulatory regime. Although costs for internal oversight should decrease in most programs and self-regulatory costs should disappear, there will be startup and transition costs to the Department for any external regulatory scheme. It also should be recognized that realizing the benefits of external regulation, such as independent assessment and the credibility that flows from this, will entail

The potential for savings is through greater efficiency and productivity.

additional costs to maintain the external regulators. However, *the cost of regulatory oversight is, in general, a small part of the total cost of satisfying regulatory requirements, and the potential for savings through greater efficiency and productivity is real.* The Committee has heard, repeatedly, that the present system is consuming large amounts of resources and seriously inhibiting progress in doing the work of the Department. *The primary goal of any transition to an improved regulatory system should be to achieve increased assurance of safety and public confidence in that safety. A secondary, but important, goal should be cost savings to the Government, gained primarily through improved productivity from simplifying and clarifying the regulatory scheme rather than from large reductions in the cost of oversight.*

Removing redundant functions in internal management of safety

There is redundancy in DOE's existing scheme for managing safety. These duplicative functions not only consume resources themselves but, because they are redundant, often operate to reduce the efficiency of the rest of the Department's workforce. Key examples are the duplication of safety oversight between EH and the program offices and, within each of the programs, among headquarters, operations offices, and the field. Further, at most of these locations, there is often a confounding of the distinctions between safety management, regulation and oversight, and compliance.

In an ideal system, the responsibility for ensuring that ES&H requirements are met would be a function that is transferred down the chain of responsibility to the highest level of management directing the operations of the facility itself, and, with a strong safety culture in place, the only headquarters internal oversight necessary would be that located in a small corporate safety function, with enforcement of compliance vested in an external regulator. Headquarters program offices would still be responsible for managing their programs in the field. Field offices would continue to exercise day-to-day oversight of contractors. The Department is moving toward this sort of structure⁹⁷ (for example, EM has recently reorganized to reduce its headquarters ES&H oversight functions), and *the Committee urges that elimination of redundancies continue.* It will not only save some resources, but also will improve the effectiveness of oversight by eliminating dilution of the function. It is essential to successful and efficient achievement of safety that line organization safety management functions (including conducting audits and ensuring compliance) be separated from regulatory functions and that the responsibilities for and location of each of these be focused clearly.

Finally, in the presence of external regulation, several functions would no longer be necessary. Although DOE would need to continue an adequate

internal safety management function, with key roles vested in line organizations, DOE's current regulatory functions would be assumed by the external regulator. The Department now carries out extensive rulemaking, regulation/oversight, and enforcement of compliance. These activities would no longer be needed and these resources, though not large, could be transferred to an external regulator, as needed.

It is essential to successful and efficient achievement of safety that line organization safety management functions be separated from regulatory functions.

5. Achieving Rational Priorities for Risk Management

The broad spectrum of hazards at DOE facilities leads to some special regulatory problems. For example, DOE has traditionally focused on protection of workers from radiological hazards but under its present mix of missions, industrial and chemical hazards often may pose a greater threat. Conversely, in another case, because some statutes carrying strong enforcement provisions do not cover AEA materials, low-level chronic hazards covered by these statutes can receive higher priority for correction than more significant acute hazards from AEA materials.

Hazards to workers

Imbalance in past attention to worker hazards is recognized by DOE: "Common industrial accidents are the dominant contributors to workforce impacts. Chemical incidents are next in importance. Low-probability high-consequence radiological accidents are important, but are not one of the dominant contributors to workforce risks."⁹⁸ However, in the past, traditional industrial accident and chemical exposure hazards have been the least adequately addressed. Most DOE weapons facilities are no longer in production and the work has shifted to decommissioning and site cleanup. This shift in the DOE mission has the potential to increase the risk to workers of construction injuries and exposure to hazardous chemicals. However, it should be noted that, based on the overall record, DOE has been a safer place to work than most private industries.⁹⁹

The choice of a regulatory approach to worker safety must reflect these changes in the nature of the DOE mission, but this will not be easy. OSHA, the traditional regulator for industrial and chemical hazards, has little capability in radiological hazards and currently suffers from a shortage of resources. NRC, the regulator of radiological hazards in the private sector, has limited capability in OSHA's areas of expertise (industrial safety, industrial hygiene, and health and safety on construction and cleanup sites) and, operating under the AEA, traditionally focuses on nuclear hazards. (The DNFSB, in its DOE oversight role, also has very limited experience in OSHA's area of expertise.) Nonetheless, there is no apparent reason why DOE workers at nuclear facilities should be treated differently from workers at DOE non-nuclear facilities, or from workers in private

DOE should maintain a strong internal worker safety and health program.

industry. *The Committee recognizes that DOE and OSHA are exploring how to make a transition to external regulation, and recommends that this process be expedited. Improved worker protection that addresses all hazards adequately is of increased importance, given the major shifts in DOE's mission. A coordinated approach can be envisioned that makes use of each of these external regulatory resources, but the Committee believes that this is a feasible solution only if DOE maintains a strong corporate capability for worker safety that ensures that adequate attention is paid to all worker hazards. An external regulatory function is required to serve: (a) as a stimulus to ensure this capability is properly maintained, (b) as a source of national standards of performance, and c) as an independent "court of last resort."*¹⁰⁰ This is the kind of model that provides the basis for OSHA's Voluntary Protection Programs (VPP) and the recent Maine 200 initiative for corporations in the private sector.¹⁰¹ The Department has already initiated its own DOE-VPP program (one site has been approved by OSHA¹⁰²), and this initiative should continue.

Cleanup and waste disposal

The achievement of rational priorities in cleanup and waste disposal activities of the Department is hampered by exemptions in RCRA (for AEA materials) that do not exist in CERCLA,¹⁰³ coupled with the current absence of external enforcement provisions under the AEA comparable to those available under CERCLA and RCRA. These discrepancies between RCRA/CERCLA and the AEA may create irrational pressures for inappropriate priorities in decommissioning and cleanup activities. This problem has also been addressed above in the discussion of overlaps in external regulation. *The underlying objective, in the view of the Committee, should be to provide a regulatory regime that permits and encourages attention and resources to go first to where the risks are in most need of immediate action and the resources can do the most good, regardless of the type of hazard involved.* In Chapter VI, we propose some ways to bring about such a regulatory regime.

The regulatory regime should permit and encourage attention and resources to go to where the risks are most immediate and where resources can do the most good.

6. Ensuring External Regulation Does Not Impede National Security

Essential national security responsibilities continue to be vested in DOE. These responsibilities include stewardship of the nuclear arsenal, weapons dismantlement, management of special nuclear materials, and continuing weapons research and development activities. The Committee considered four matters related to national security: 1) balancing nuclear safety and national security, 2) regulation of nuclear explosive operations, 3) protection of classified information, and 4) regulation of safeguards and facility security.¹⁰⁴

Balancing nuclear safety and national security

DOE's nuclear weapons activities have had widespread and costly deleterious implications for health, safety, and the environment and continue to be a concern for the present and for the future. Regaining public trust requires that DOE's defense activities be subjected to the same general regulatory scheme and standards of performance as its non-weapons facilities and nuclear facilities in the private sector. Any exceptions in the regulation of nuclear safety (and we note one, below) should be carefully justified, defined, and limited. At the same time, *an external regulator clearly must not have the capability to impede legitimate national security interests.*

The Committee concludes that it is entirely possible to ensure nuclear safety and at the same time to protect national security through properly managed and circumscribed external regulation, and that this regulation should not be different from that applied to other DOE facilities. The essential element needed to preserve national security interests is a provision, in case of conflicting views, for an effective and prompt method for resolution that, when necessary, invokes an independent, higher authority. The regulatory scheme should be flexible and include issue resolution mechanisms that are timely and minimize the necessity for appealing to authorities outside DOE and the regulator. However, if these fail (and, based on experience, such a case should be extremely rare), the scheme should provide for the President, or the President's designee, to make a final decision in a timely manner. Longstanding precedents for this approach already apply to DOE's weapons facilities under most environmental statutes. In those cases, the necessary procedures are set forth in Executive Orders, which provide for recommendations to the President by DOE and EPA through the Office of Management and Budget, which recommends a proposed resolution to the President. Similar procedures should apply to any new area of nuclear safety transferred to an external regulator.

The essential element needed to preserve national security interests is a provision, in case of conflicting views, for an effective and prompt method for resolution that invokes an independent, higher authority.

Regulating nuclear explosive operations

Nuclear explosive operations, which include assembly, transportation, maintenance, storage, testing, and disassembly of nuclear explosives or weapons, often involve the use of high explosives in proximity to fissionable nuclear material. Because these operations involve the nation's weapons stockpile and highly sensitive design information, they are among the most important national security functions undertaken by DOE. We define "nuclear explosive *safety*" as the formalized program designed to prevent accidental or unauthorized detonation of high explosives while the explosives are in the proximity of fissionable nuclear material during nuclear explosive operations.

The Committee recommends that regulation of the specialized area of "nuclear explosive safety" remain a DOE responsibility. In other words, the external regulator would not be able to regulate or assess the *safety* of the nuclear explosive device itself (i.e., whether the device will detonate) during nuclear explosive *operations*. This avoids drawing the regulator into the unique national security interests and specialized knowledge involved in nuclear explosive safety, in particular the classified design and configuration of a nuclear weapon or explosive device. However, all aspects of operations with nuclear explosives other than nuclear explosive safety, as defined above, should be subject to external regulation, and the regulator would have access to the information required to determine whether nuclear explosive operations conformed to safety standards. Precedent already exists for the special consideration required to ensure a smooth interface between DOE responsibilities and external regulation in implementation of the Hazardous Materials Transportation Act, under which shipment of fissionable material and high explosives now occurs under authority of the DOE, and is not subjected to DOT regulation.¹⁰⁵ Additional clarification of this important matter is contained in Appendix E.

Protecting classified information

Although an external regulator would need access to classified information and operations, it is important that classified information remain protected by subjecting regulatory personnel to the DOE security regime, including clearance processes and training programs. Currently, EPA, State, and DNFSB officials must obtain the appropriate level of clearance and must have a "need to know" before gaining access to classified information or operations. In addition, certain training programs are required with respect to nuclear explosive safety, so as to avoid problems in this sensitive area. Such special processes for clearance and training of regulators have worked well in the past and should not pose a problem for a system of external regulation.

Regulating safeguards and facility security

DOE employs an integrated system of security programs to protect fissile materials, classified information, and property. Except for the specialized areas of nuclear weapons and the DOE's Transportation Safeguards System, the security required is similar to that for NRC-licensed fissile material or Department of Defense sensitive installations. The program addresses materials control, physical security, and personnel security. Key elements include control and accounting systems and devices for fissile materials; site safeguards and security plans; and security clearances, supplemented, for persons with access to strategic quantities of fissile material or holding critical positions that could affect national security, by a personnel security

assurance program¹⁰⁶ and, for those with access to nuclear weapons, by a nuclear explosive safety program, the Personnel Assurance Program.¹⁰⁷

The Committee considered whether these programs should fall under an external regulatory regime. Although there are models for external regulation in these areas, *the Committee proposes that, at least initially, safeguards and security remain a DOE function to avoid diluting a regulator's focus on safety at nuclear installations.* However, an external regulator would require information and the opportunity to observe DOE regulation of safeguards and facility security as necessary to understand and evaluate any impacts on safety.

7. Enforcing Regulation at Federal Facilities

The ability to enforce regulations against DOE and its contractors varies by statute. We focus here on the environmental statutes because these already apply to DOE and they present most of the important issues. All the major environmental statutes require Federal agencies to comply with Federal and applicable State and local requirements, although the President may exempt a Federal facility for "paramount or national security" interests.¹⁰⁸ Executive Order 12088 reiterates these requirements for all Executive agencies. These statutes are implemented by EPA or qualified States.

EPA's enforcement against Federal agencies varies with the statute. In general it differs from enforcement in the private sector in that EPA does not seek civil judicial action against other Federal agencies. This difference arises from the Department of Justice's (DOJ) "unitary executive" theory. Simply put, the theory argues that the executive branch cannot sue itself and concludes that, as Chief Executive, the President, not the courts, should resolve disputes between sister agencies.¹⁰⁹ The public has no clear right to participate in the President's resolution of such disputes. Because of the unitary executive theory, EPA enforcement against Federal agencies usually takes the form of negotiated compliance agreements and consent orders.

Under certain statutes, EPA's administrative authority explicitly includes the ability directly to assess civil penalties. For example, the 1992 Federal Facilities Compliance Act states that EPA may take any administrative enforcement action available under RCRA (including civil penalties) against a Federal agency in the same manner and circumstances as against any person.¹¹⁰ Under CERCLA, EPA has the authority to assess civil penalties against Federal agencies for violations of an administrative order, consent decree, or interagency agreement for facilities on the NPL.

Where EPA has the authority under a given statute (e.g., CERCLA) to initiate an enforcement action against an owner or operator of a facility, EPA may exercise its discretion to pursue enforcement against the Federal agency, the contractor-operator, or both. Importantly, EPA may treat the *contractor-operator* the same as it treats all other private parties that are subject to environmental statutes. In regulating contractors, EPA is not subject to the unitary executive theory. Therefore, EPA has the full range of enforcement mechanisms available against contractors and may issue administrative compliance orders and penalties or initiate judicial action for injunctive relief and civil penalties. In addition, sanctions may be sought against individual employees of Federal agencies for criminal violation of environmental statutes. States regulating under the environmental statutes are not bound by the unitary executive theory and may exercise the full range of enforcement actions consistent with any statutory waiver of sovereign immunity and relevant case law.

Under the AEA, NRC, although also subject to the unitary executive theory, can and does issue notices of violation and administrative penalties against Federal agencies, but not against DOE.¹¹¹ NRC can seek sanctions against Federal employees for criminal violations. NRC also has authority to proceed against deliberate misconduct by unlicensed persons, including contractors of regulated parties. Under existing regulations, NRC does not relinquish to States its AEA authority over its Federal licensees.¹¹² The DOE's gaseous diffusion plants leased to the U.S. Enrichment Corporation are not licensed and, therefore, the only enforcement tools available against these privatized facilities will be refusal to certify, or orders to comply. We note that OSHA does not have authority to fine other Federal agencies for violations of health and safety standards.

As noted earlier, citizen authorities differ between the environmental statutes and the AEA. The environmental statutes contain citizen suit provisions that allow a citizen to initiate a civil action for violation of an environmental regulation. (DOE compliance with RCRA resulted from such a suit.) Citizen involvement in enforcement under the AEA is limited to petitions to NRC to take enforcement actions,¹¹³ but NRC decisions on these petitions are generally unreviewable in court.

In practice, administrative enforcement actions against Federal entities may not be significantly different from those against private parties. Both EPA and NRC have imposed millions of dollars in penalties against Federal agencies. Settlements and other forms of compliance agreements can be as effective against public parties as private ones and were a major part of all the principal options considered by the Committee. Shutdown authorities, which no doubt would be judiciously used against cabinet-level agencies, also are carefully exercised against private parties. Since

much of the DOE work is done by contractors and the main Federal compliance activities are implemented under political appointees, the impact on careers in both sectors may be comparable. Also, as we noted, Federal employees and Federal contractors are subject to DOJ enforcement of the criminal statutes. The Committee concludes that mechanisms and remedies comparable to those available in the private sector are already in use against Federal agencies and should be available at DOE nuclear facilities.

We recommend that any external Federal regulator of DOE nuclear facilities be given the power to impose "administrative penalties." EPA and NRC often can levy such penalties on Federal agencies without consulting the DOJ or going to court and can include the issuance of orders and imposition of monetary penalties. Challenges to such penalties would first have to go through an administrative process at EPA or NRC before being resolved by the DOJ. That process can involve adjudication before administrative judges or administrative law judges. Citizens would have opportunities to intervene in these adjudications.

Any external Federal regulator of facility safety at DOE nuclear facilities should be given the power to impose "administrative penalties."

We have already said in Section 3 of this chapter that we believe that citizens' suits should be used against DOE or the regulated entity for failing to meet regulatory requirements, or against the regulators for failing to meet their non-discretionary duties¹¹⁴ (the environmental statutes already provide for such suits). Some important reasons for having citizens' suits in the regulation of DOE nuclear facilities have to do with the difficulties of one Federal agency enforcing against another: First, under the unitary executive theory, one Federal agency cannot sue another; and second, sister agencies, recognizing their mutual political and budgetary constraints, are more likely to be lenient in the enforcement of regulations. Also, citizens' access to the Federal courts for enforcing against DOE may indirectly help the Department acquire greater credibility with the public. There are also significant counterarguments,¹¹⁵ but the Committee on balance believes that citizens' suits are necessary for effective regulation of safety at DOE nuclear facilities. ***The Committee recommends that citizens' suits provisions, comparable to those in existing environmental statutes, be available for regulation of safety at DOE nuclear facilities, both with respect to enforcement against DOE and its contractors and with respect to non-discretionary statutory duties of the regulators.***

Citizens' suits are necessary for effective regulation of safety at DOE nuclear facilities.

8. Stability of Safety Regulation

The Department has suffered from instability in its management of safety since its inception in 1977. This has occurred in part because of the nature of the political process—top management has changed at least every four years throughout this period—and in part because each of these

politically appointed managers has had to deal with an unsolved heritage of major safety problems in a changing external regulatory climate and with the inherently ineffective internal management system under self-regulation. In Chapter VII we discuss some suggestions for improving that internal system, but the Committee remains convinced that these alone are unlikely to solve the problem of instability.

The Department has suffered from instability in its management of safety since its inception.

The problem has several symptoms: Instability infects policy, internal management systems, and safety budgets. Each of these, however, has at its root the inherent conflicts between mission, public credibility, and self-regulation of safety, and these all are focused in the constantly changing individuals, with their different backgrounds and viewpoints, charged with the difficult responsibilities of top management in the Department. ***The Committee has concluded that a stable system of safety regulation cannot emerge unless basic safety policy, requirements, and compliance capability are exercised independently of decisions on the Department's primary missions.*** This can be implemented only by full external regulation.

CHAPTER V

WHY EXTERNAL REGULATION

Our charter asks us whether there should be external regulation of the Department's nuclear facilities. We believe there should be. In this chapter we say why and in the next we say by whom. We first lay out the criteria we used to reach this conclusion and we then apply those criteria.

Criteria for Effective Regulation

The Committee's deliberations have been guided by a simple view of the objective of regulation and the essential elements required for its success: The objective of regulation is to protect individuals, society, and the environment from unacceptable risks posed by the pursuit of human activities. The essential elements for success are, first, well-defined and generally agreed-upon norms for unacceptable levels of risk; second, a credible means to judge conformance to these norms; and, last, effective means for avoiding, and when necessary, correcting non-conformance. To be fully successful, regulation also must be carried out in ways that impose the least possible costs and burdens. DOE has important missions to perform in the public interest, and the goal of regulation should be to enable DOE to perform those missions both safely and well.

The objective of regulation is to protect individuals, society, and the environment from unacceptable risks posed by the pursuit of human activities.

Before deciding to recommend external regulation, we formulated a set of criteria that we believe any scheme for regulation of safety at the Department's facilities should be able to satisfy. These were based, in part, on our conclusions about the causes of the Department's problems that were enumerated in Chapter II and, in part, on the recommendations developed in Chapter IV on issues common to any regulatory scheme for DOE. We believe that regulation of the Department should satisfy the following criteria:

- Safety:** **Ensure protection of public and worker health and safety and of the environment. The Department should be held to the same goals as the private sector.**
- Credibility:** **Justify public confidence by being transparent and responsive to public and worker concerns. Secrecy should be minimized, and the public and workers should have meaningful access to information, input to decisions, and legal redress.**

Stability:	Be reasonably predictable and resistant to unnecessary change, or to political change.
Accountability:	Require managers to be accountable for nuclear safety, encourage a consistent safety culture, have the power to enforce, and hold the regulator accountable.
Efficiency:	Minimize redundancy in regulation and oversight and make safety cost-effective, using performance- and risk-based requirements where possible.
Focus:	Promote a consistent and clearly focused framework for regulation for the entire DOE establishment. View nuclear risks in the context of all risks, nuclear and non-nuclear, so that the most important work is done first.
Flexibility:	Allow DOE to carry out its missions effectively. Ensure that national security needs are satisfied. Use flexible regulatory models that accommodate the diversity of operations and reflect the degree of risk.
Practicality:	Make use of existing expertise, have adequate numbers of trained people, and be implementable without a negative impact on safety.

The Case for External Regulation

We discuss, in turn, each of the above eight criteria with respect to a decision between self-regulation and external regulation, noting, in the appropriate places, how each of the underlying causes of DOE's problems identified in Chapter II is likely to be affected by external regulation as well as noting the relevant conclusions of Chapter IV.

Safety: Moving to external regulation would remove the built-in conflict between safety and mission under self-regulation. This change would increase the assurance of safety, which is the chief aim of an external regulator. Today, the "culture" of safety varies across the DOE complex and historically the Department's missions have sometimes pushed safety considerations into the background. DOE's historical emphasis on weapons production and secrecy has created a vast legacy of environmental, waste disposal, and occupational problems. Requiring that the Department is held to the same safety goals as the private sector would ensure that generally agreed-upon norms for safety are used. An external regulator, free of responsibilities for DOE's missions (though not ignorant of their importance), and not answering to DOE, can ensure that safety receives consistent and adequate consideration.

Credibility: A move to external regulation is a key step in restoring the Department's credibility. It is not impossible for a self-regulated organization to have the confidence of the public, but it is difficult, and DOE does not. Even if there were not an immense cleanup made necessary by past practices, the public would always have difficulty accepting the safety judgment of an organization whose missions could make safety secondary. It was for this reason that the regulatory portion of the Department's predecessor, the AEC, was separated out and made into NRC, and likewise that the DNFSB was established.

The public and workers will have more confidence in the safety of DOE operations if those operations must adhere to generally applicable laws, and if the public and workers have the same access to information, opportunities for participation in decisions on safety issues, and opportunities for legal redress concerning DOE that they have with similar facilities in the private sector. The public will also have greater confidence in a system that provides the same opportunities for State and Tribal involvement on their behalf as does the private sector. An external regulatory function is needed to achieve this. Finally, although an external regulator cannot ensure that the use of secrecy will be minimized with respect to availability of public information, an external regulator can act as the public's surrogate in overseeing safety at secret installations.

Stability: Safety is not served by frequent and abrupt change in standards and other regulatory requirements and systems. Change has been a recurring problem in DOE's history of self-regulation. Change itself eats up resources. For example, the Department has had a bewildering number of changing rules, directives, orders, and guidance; uncertain compliance methods; and overlap or conflict between internal and external requirements for comparable situations. Practically speaking, self-regulation of DOE cannot be as stable as external regulation, and change has been difficult to avoid. Elections can change the Department radically and, as experience has shown, *have* changed the Department radically, particularly its programs and priorities for environment, safety, and health.

Some regulators, such as NRC, are headed by commissioners with staggered terms and political diversity to insulate them from change. However, even when the head of an external regulator serves at the pleasure of the President, the external regulator's policies will be more stable than the self-regulator's, because the external regulator's policies will be embodied for the most part in rules, which can be changed only with due deliberation; because the regulator itself is answerable in court to the public and to the regulated parties; and because, when safety is an organization's primary mission, a degree of resistance to abrupt change builds up on behalf of safety, a degree that is not easily reduced or reversed. DOE can increase stability by converting many of its safety

standards to rules, but rules alone cannot provide the necessary stability. As we concluded earlier, a stable system of safety regulation cannot emerge unless basic safety policy, requirements, and compliance capability are exercised independently of decisions on the Department's primary missions—and this requires an external regulator. Because of the importance of stability, we devote a chapter of this report to the subject of transition between the current regulatory regime at DOE and the one we are recommending.

Accountability: The division of responsibilities for health, safety, and the environment between the various DOE headquarters organizations and between headquarters and field organizations, as well as the division of responsibility for safety between DOE and its government-owned, contractor-operated facilities, have been fluid and inadequately defined. External regulation makes both the regulator and the regulated accountable. The regulated, of course, must satisfy the external regulator. That necessity by itself will help induce clearer lines of accountability in the regulated party. Moreover, external regulation can make it clearer just who is the regulator. Without clarity on that point, there can be little accountability for safety.

The regulator itself must adhere to government-wide processes for establishing standards, submit to Congressional oversight of its policies, and submit to judicial review of its standards and actions. It is not always clear what recourse can be had against a self-regulator. The ultimate accountability is through enforcement. The authority to force certain actions is the chief distinguishing mark of the external regulator and the chief guarantee that safety will get its due. A self-regulator can be overridden by higher management with mission responsibilities. As we laid out in some detail in Chapter IV, an external regulator, even of Federal facilities, can enforce its rules effectively.

Efficiency: We do not know how much is now being spent regulating DOE, both internally and externally (the Department has been unable to provide an estimate of what it spends to carry out its regulatory functions), but it is conceivable that the costs of regulating might go up in the move to external regulation. OSHA will need more resources.¹¹⁶ The Committee asked NRC to estimate how much it might cost NRC to take on the kinds of responsibilities that the Committee recommends in the next chapter the facility safety regulator take on. NRC, after cataloging and categorizing DOE nuclear facilities, determining which of them are comparable to facilities NRC now regulates, and taking into account NRC's budgeted costs for regulating comparable facilities, estimated that, if it took on the tasks our recommendations assign to the facility safety regulator, the agency would need 1100 to 1600 more staff, and \$150 to \$200 million per year.¹¹⁷ These figures have large uncertainties surrounding them, and

may be overestimates. Still, in the DOE complex, with some 3500 nuclear facilities, an annual budget of \$18.5 billion, and over 100,000 employees, Departmental and contractor together, this estimate does not appear to be wildly out-of-line. It is also likely that the costs of compliance would go up in the short-term.

However, none of these increases is a certain thing. What is certain is that, as we argue elsewhere in this report, increased external regulation should free up resources the Department now spends on redundant self-regulation carried out by several offices, and, most important, that due consideration to safety now can prevent enormous expense later. Ordinarily, the expense of safety precautions is present and concrete, while the much greater expense which is being prevented is merely possible and abstract. However, the costs of the DOE cleanup operations are a striking exception to this rule and persuasively make the case for external regulation of safety. We have noted elsewhere that the cost of regulatory oversight is, in general, a small part of the total cost of satisfying regulatory requirements, and the potential for savings through greater efficiency and productivity is real. The Committee has heard, repeatedly, that the present system is consuming large amounts of resources and seriously inhibiting progress in doing the work of the Department. If our recommendations for a flexible regulatory approach with emphasis on performance-based requirements are adopted, transition to an external regulatory system should result in cost savings to the Government, gained through improved productivity from simplifying, clarifying, and improving the regulatory scheme.

Focus: Resources are finite and so must be deployed where they will do the most good. The Department's statutory authority for self-regulation, the AEA, has led DOE to focus its management of safety and development of safety expertise on radiological hazards. The priority of hazards is different now that decommissioning and cleanup are dominant activities. For example, industrial and construction health and safety hazards are now key worker protection concerns. Further, at present, some aspects of nuclear safety are externally regulated and others are not, and some aspects of non-nuclear safety are externally regulated and others are not. Thus, neither the Department nor any external regulator is in a position to view the whole and set priorities accordingly. Wholly-external regulation of all aspects of DOE safety would be more likely, we believe, for reasons we have already given, to result in safety being given its due in the setting of priorities. It would also provide the opportunity to clarify and simplify regulatory responsibilities so that overlaps between internal and external regulation are eliminated and those between external regulators are minimized.

Flexibility: It might appear that self-regulation would be better than external regulation in ensuring that DOE can perform its mission. Not

legally bound to anyone else's safety judgment, a self-regulated organization is free to give its missions what priority it thinks they deserve. However, there is no inherent reason why safety considerations must threaten the accomplishment of mission. To the contrary, early and adequate consideration of safety can prevent accidents and cleanups that devour resources that might have been used to accomplish missions other than safety, and external regulation can free the Department of some of the burden of trying to be an adequate regulator in addition to carrying out its missions. Similarly, it might appear that because a self-regulator is closest to the changing nature of the organization's work, an external regulator's virtue of stability might be, from this point of view, the vice of inflexibility. However, that need not be the case and, to encourage a "stable flexibility," we recommend that external regulators use a variety of models to regulate DOE in the most reasonable way. We also recommend that risk-informed, performance-based regulation that takes costs and benefits into consideration be used whenever practical. But we would rather rely on an external regulator that is held accountable for considering these factors than a self-regulator that must answer to management with mission responsibilities.

Practicality (and Transition): It is conceivable that, even when the end point is better than the starting point, so much could be lost in moving from the one to the other that the change would not have been worth the cost. As we note elsewhere, the Department has many laudable safety initiatives underway. The transition to a fully external regime would take a few years at least. Efforts to improve safety cannot be suspended in the interim. So important is the subject of transition that we devote Chapter VII to it. It has also been a factor in our recommending that existing agencies with relevant experience be the external regulators of safety at DOE's nuclear facilities.

We have listened to many days of testimony and have deliberated among ourselves for almost a year. *We conclude that every major aspect of safety at DOE nuclear facilities—facility safety, worker protection, public and environmental protection—should be externally regulated.* Almost all of the Committee believe this the only reasonable conclusion, but a few favor external regulation with some reservation or are concerned that valuable progress could be lost during a transition to external regulation. The majority have taken these concerns very seriously but have, in the end, concluded that the best option is to regulate externally every major area of nuclear safety at the Department.^a

^a We recommend, however, that the narrow aspect of safety known as "nuclear explosive safety," as well as safeguards and security, be excluded from external regulation at the few defense facilities where they are relevant (see Chapter IV).

Even if there were not several hundreds of billions of dollars yet to be spent on cleaning up the DOE complex, there would still be a strong argument for increased external regulation. From early in the history of manufacturing in this country, the usefulness of regulation in helping to ensure quality and in building public confidence in the products and activities of manufacturers has been acknowledged, even by the regulated parties. There would be significantly less confidence, for example, in nuclear power or commercial airline travel were they not regulated. The significance of regulation to public confidence in the activities carried out by DOE is no different. There is too little confidence in DOE's nuclear operations now, in significant part because those operations are not externally regulated. Why should DOE, among all organizations operating nuclear facilities, not be externally regulated? Its national security mission is not sufficient to preclude external regulation, as we discussed in the last chapter. Moreover, the Department has many nuclear facilities that are not directly connected with national security, and some of these are being externally regulated today.

Finally, *we believe that it is sound public policy to ensure through external regulation that DOE is regulated to standards and other requirements comparable to those to which the private sector is regulated.* External regulation can reflect best the collective wisdom of the Nation on the difficult issues surrounding the balancing of risks to the public and workers, environmental values, and use of the Nation's resources. Those difficult judgments should be made in the wider context that an external regulator can provide, independently of the pressures of the Department's missions and internal allocation of resources.

It is sound public policy to ensure through external regulation that DOE is regulated to standards and other requirements comparable to those to which the private sector is regulated.

CHAPTER VI

OPTIONS FOR EXTERNAL REGULATION; RECOMMENDATIONS

We have described what we believe to be the symptoms of safety problems at the Department's nuclear facilities and what we think are the underlying causes of those symptoms. We have also set down what we believe to be the important characteristics of a regulatory system that could deal effectively with those underlying causes. In Chapter V, we argued that such a regulatory system was best implemented through external regulation. We now consider what external agency or agencies should implement such a regulatory system for safety at DOE nuclear facilities.

The Committee considered many ways of distributing regulatory authority over the DOE complex. A subcommittee of the full Committee met on this question several times and made two reports to the full Committee. Draft descriptions of options for the distribution of regulatory authority were considered at four meetings of the full Committee. Some of the options centered around existing agencies, but others would have required establishing new agencies, with varying degrees of authority. One option would have called for establishing an entirely new agency to regulate almost all aspects of safety at DOE facilities, both nuclear and non-nuclear. Ultimately, for reasons to be set out shortly, the Committee decided to recommend that existing agencies be the external regulators, but the idea of a new agency with jurisdiction over the full range of safety issues at DOE nuclear facilities remained attractive to several members. We describe that idea briefly here, as useful background for the full description of the option we recommend later in this chapter.

The Attractions and Drawbacks of a New Agency

During our deliberations, we tried to articulate an ideal single regulator of safety at DOE nuclear facilities, one that might be a model for health and safety regulation in both the public and the private sectors. Such a new agency would have authority to select standards for facility safety at DOE nuclear facilities, defense and non-defense, and for environmental protection and worker safety at all DOE facilities, both nuclear and non-nuclear, defense and non-defense. In consultation with existing oversight agencies, the new agency would establish requirements to be applied to DOE, choosing from existing requirements where appropriate, but making use of its flexibility to apply to each nuclear facility the regulatory model appropriate to that facility and to make full use of

risk-based, performance-based requirements. Its plenary jurisdiction over DOE would enable it consistently to consider nuclear hazards in the context of non-nuclear hazards in setting standards and priorities. Overlapping jurisdictions among the Federal regulators of DOE (but not between Federal and State regulators) would be eliminated, because the new agency would have sole Federal jurisdiction over DOE. It would assess compliance with its standards and would have the authority to take enforcement action when appropriate, but it would be free to adopt methods other than the traditional enforcement methods to encourage compliance with its requirements. It would have the same authority the DNFSB and NRC now have to hire scientific and technical personnel from outside the civil service system. It would have authority to delegate regulatory powers to States it judged to be qualified (although the States could not regulate, for example, DOE reactor safety). States would have the authority to set standards more stringent than those established by the new agency, as long as those standards did not unduly impede DOE's performance of any of its missions. Citizens would be afforded the right to file suit in Federal court to force the new agency to perform any act which is not discretionary, or to force DOE to come into compliance with the agency's requirements in cases in which the agency was not taking enforcement action. Over the long term, the new agency would optimize use of regulatory resources by integrating them into a single management structure, and would optimize use of DOE's resources by focusing them on the most important hazards first, and by enabling DOE to have to deal with essentially just one regulator.

However, such an ideal agency has its drawbacks, mainly because the founders of a new agency would not be writing on a clean slate. As we have said before, one of our guiding principles is that, generally speaking, DOE should be regulated the way the private sector is regulated. A new DOE-dedicated regulator would perpetuate, and probably even aggravate, the perception that DOE was being treated as a special case. It would add yet another regulatory agency to the large number of regulators already in existence. This would create the potential for disrupting the work of existing regulators because of the possibility of different standards of performance for DOE, on the one hand, and the private sector and all other Federal agencies, on the other. Moreover, DOE is already externally regulated to a substantial extent, especially in the area of environmental protection. Establishment of the new agency would entail severe disruption of the existing relations between DOE and external regulators, relations which have been worked out in good faith and much hard work among all the parties involved, particularly at the many cleanup sites, but also at the uranium mill tailings sites, the WIPP repository, the gaseous diffusion facilities, and Yucca Mountain. External standards—especially environmental standards—that have been applicable to DOE for many years could be replaced by less adequate standards, potentially wasting

years of effort. Finally, if the new agency performed below expectations, it might come to be viewed as a device for avoiding subjecting DOE to the same safety goals the private sector has to meet.

In a world in which regulatory agencies could be established as easily as they can be imagined, we might have recommended that a new agency be established to regulate all aspects of safety at DOE nuclear facilities. However, the problems created by and the practical difficulties of establishing a new agency have caused us to recommend what we believe is a more practical approach. We hope, however, that those responsible for implementation of any scheme would keep the ideal in mind.

We also briefly considered a broader approach that retains many of the advantages and avoids the disadvantages of establishing a new agency by consolidating existing regulatory agencies. The advantages and disadvantages of applying this same unitary approach to health, safety, and environmental regulation across both the public and the private sectors would be worth consideration by a deliberative body with a less limited charter than our own. The task of such a body would not be easy, for there are many questions to consider here. For example, should facility safety and environmental regulators be part of a single safety and environmental agency, or should they be spread out as, for example, EPA and NRC are now? Should worker safety be included in such a consolidation? Also, would establishment of a unified approach across both the public and the private sector require only organizational changes, or would it require fundamental changes in the substantive statutes and regulatory standards already in effect? Specifically, would it be necessary to modify or unify the AEA, the environmental statutes, and/or the OSH Act?¹¹⁸ However, the attractions of a more unified approach to safety, health, and environmental regulation would make consideration of questions like these worthwhile. Because our charter was limited to DOE facilities, we did not pursue this option to a conclusion.

Recommendations for Distribution of External Regulatory Authority

None of the options we considered was superior to the others in every respect. Not surprisingly, therefore, there were some members whose preferred options differed from the ones in this chapter. However, a clear majority of the members believe that the recommendations below, taken together, describe an option that is both practical and likely to succeed in regulating safety at DOE nuclear facilities.

We first give a quick overview of who regulates what under this

recommendation. We are trying here to follow two principles: *First, DOE nuclear facilities should be regulated the way private sector nuclear facilities are regulated, but, second, there should be only one regulator for a given major area of safety at any DOE nuclear facility.* These principles sometimes conflict, and we are thus forced to choose between them. We will note where.

- *An existing agency (NRC or a restructured DNFSB, see below) regulates facility safety at DOE nuclear facilities under the AEA.^a*
- *OSHA regulates all protection of workers at DOE nuclear facilities under the OSH Act, unless regulation of worker risks at a given facility could significantly interfere with maintenance of facility safety (for example, if criticality is possible), in which case the regulator of facility safety regulates all protection of workers at that facility under the AEA.*
- *EPA continues to regulate environmental protection matters for all DOE nuclear facilities and sites under the environmental statutes.^b*
- *States with programs authorized by EPA, OSHA, or the regulator of facility safety acquire or continue to have roles in regulation of environmental protection, facility safety, and worker protection comparable to those they now exercise in the private sector.*

We recommend that one of two *existing* agencies—either NRC or the DNFSB—become the regulator of DOE nuclear facility safety. However, either agency would have to undergo significant changes to satisfy all of our recommendations for a successful DOE nuclear facility safety regulator. Under our recommendations, either agency would exercise the same jurisdiction, and thus the description of the distribution of regulatory responsibilities that follows does not distinguish between these two agencies. However, the choice between the two agencies is an important one, and toward the end of this chapter we spell out the relevant attributes of these

^a There are a few exceptions: DOE would continue to regulate, under the AEA, in the narrow areas of “nuclear explosive safety,” safeguards, and security; under existing statutes, EPA would continue to regulate the WIPP, along with the State and the Mine Safety and Health Administration; and NRC would continue to regulate the leased gaseous diffusion plants and, under EPA’s environmental standards, the Title I UMTRCA sites and the high-level waste repository.

^b This includes environmental releases from facilities, decontamination and cleanup of facilities and sites, and waste management; the principal relevant statutes are the AEA, CAA, CERCLA, FWPCA, and RCRA. Waste management under RCRA in a facility would fall under the responsibilities of the facility safety regulator; however, in cases where States now exercise this responsibility under existing RCRA agreements, it would continue to be passed to the States.

agencies and their strengths and weaknesses as external regulators of DOE nuclear facility safety.

In Chapter IV and Appendix E, we discussed in detail our recommendation that external regulation of DOE's *defense* facilities be the same, in most respects, as regulation of any other DOE or, for that matter, private sector nuclear facility. It is worth recapitulating briefly some of the things we said on this issue. We believe that it is entirely possible and, indeed, highly desirable to protect safety and national security at the same time under external safety regulation. We have said why in Chapters IV and V. Except primarily for nuclear explosive safety, by which we mean the formalized program designed to prevent the accidental or unauthorized detonation of high explosives in proximity to special nuclear material, the external regulators should be authorized to regulate all safety issues at defense facilities. Even in the area of nuclear explosive safety, the external regulator of facility safety should continue external oversight of the sort now provided by the DNFSB. We believe that whenever a DOE facility is having difficulty complying with an external safety regulation, the regulator and DOE can work constructively and cooperatively to achieve a technical path forward and that the need to appeal to the President to resolve a conflict between safety and national security should seldom, if ever, occur. We believe that our proposal ensures that weapons-specific issues are dealt with in a timely manner, using the most relevant technical resources, and that the regulator's performance-based requirements would give DOE adequate flexibility and discretion in devising operating procedures. At the same time, the exception we are recommending is narrowly drawn, and the regulator would have access to a considerable amount of information that would help determine whether nuclear explosive operations conformed to safety standards, including safety analysis documentation, bounding data on special nuclear material, manuals, guides, operating procedures, and even closed-circuit television access to bays or cells where nuclear explosive operations are underway.

We now proceed to a detailed description and evaluation of our recommended distribution of regulatory responsibilities, and to some indication of the legislative changes that would be required to implement the recommended distribution. As in earlier chapters, it is useful, in describing the option, to focus on who would regulate each major area of safety at DOE facilities. The three areas of safety addressed below, safety of facilities, worker protection, and environmental protection, are those described in Chapter III.

Safety of facilities

The agency responsible for facility safety should regulate the design, construction, operation, modification, and decommissioning (but not decontamination) of DOE nuclear facilities. Training, emergency planning, and storage of materials (but not facility security or safeguards) also are included. The AEA should be amended to enable the agency or its authorized States to regulate facility safety at DOE sites. By "nuclear facility" we mean not only facilities which use or produce materials regulated by NRC in the private sector under the Atomic Energy Act, but also particle accelerators and all other sources of ionizing radiation, thus closing a gap in regulatory authority we discussed in Chapter IV. The external regulator should ensure that its regulation of facility safety is consistent with EPA and State regulation of radioactive releases to air and water. Legislation should allow the regulator to license new facilities, and to use some form of authorization process for existing facilities that has the characteristics set forth in Chapter IV's discussion of the regulatory process (Section 1), as well as the public process and enforcement features described there (Sections 3 and 7). NRC and EPA should retain their jurisdiction at DOE where statutes now grant it, for example, over the gaseous diffusion facilities, WIPP, the national high-level waste repository, and the "Title I" uranium mill tailings sites. DOE should continue to be responsible, under the AEA, for nuclear explosive safety, safeguards, and security, as described in Chapter IV.¹¹⁹

The States: The AEA should be amended to permit qualified States to exercise jurisdiction over DOE facility safety questions, through waiving sovereign immunity at DOE facilities. This is already the case under RCRA. However, a State should not be permitted to regulate at reactors and in questions involving exports or imports, or disposal of wastes into the oceans. No State should exercise regulatory authority over facility safety at DOE unless the Federal regulator of facility safety at DOE has approved the State's regulatory program. At active defense facilities¹²⁰ the State should also have to satisfy the requirements of an external regulator of defense facilities for expeditious resolution of conflicts between safety and national security. The requirements for resolution were identified in Chapter IV and Appendix E. As we recommended in Chapter IV in our discussion of State regulatory authority, *States found qualified by the external regulator should be able to set more stringent standards for the areas of facility safety regulated by them, as long as those standards do not unduly hinder DOE in the performance of its missions.* The limitation we are suggesting be put on State standards authority is an adaptation, to the DOE circumstances, of a similar limitation in the OSH Act. That Act says in pertinent part that States may set more stringent standards, as long as those standards do not "unduly burden interstate commerce". We also note that this condition is roughly equivalent to the condition that NRC

implemented in recent cases involving low level waste disposal limitation in Illinois and Pennsylvania, and that NRC is considering implementing on a wider scale.¹²¹

Worker protection

OSHA, or under specified circumstances, the regulator of facility safety should exercise regulatory authority over hazards affecting the health and safety of workers at DOE nuclear facilities. This responsibility includes ensuring the health and safety of workers by requiring proper working conditions, monitoring of workers, preventing or mitigating unsatisfactory conditions, and addressing worker safety and health complaints, including whistleblower protection. In Chapter IV, we noted the need for DOE to maintain a strong corporate capability for worker safety that ensures that adequate attention is paid to all worker hazards. We also noted that, to ensure improvements in health and safety, it is essential to involve workers and their representatives in DOE's corporate health and safety programs. Finally, we discussed our reasons for splitting authority over worker protection issues. We say here only that we might have preferred that all hazards to workers be regulated by OSHA, in keeping with the idea that nuclear hazards should be considered in the context of all hazards, so that no single hazard receives inadequate attention. However, we recognize that inappropriate regulation of worker protection could, under some circumstances, interfere with the maintenance of facility safety. Thus we are recommending a division of labor between OSHA and the regulator of facility safety.

Some facilities contain hazards to workers that should clearly fall within the jurisdiction of the regulator of facility safety, for instance radiological hazards associated with criticality in nuclear materials. At other facilities, the most significant hazards should just as clearly fall within OSHA's jurisdiction, for example physical and chemical hazards at cleanup sites where radiological safety considerations are of a routine nature. However, it is not always clear who should regulate facilities with other mixes of hazards. Here we recommend the following rule of thumb: ***OSHA should have jurisdiction over all worker protection issues at a given facility, unless regulation of occupational risks at that facility could significantly interfere with maintenance of facility safety, for example, if criticality is possible, in which case the regulator of facility safety should have jurisdiction over all worker protection issues at that facility.*** This division of authority between OSHA and the regulator of facility safety should be the subject of an MOU between the two agencies and they would have to work together to determine at which facilities the facility safety regulator would regulate worker protection. We do not expect that the number of such facilities would be large. NRC and OSHA have for several years operated under an MOU that assigns to NRC regulatory responsibility for

all radiological hazards to workers and for all chemical and physical hazards that have radiological implications. We are not suggesting that that MOU be changed. It was tailored to a different set of circumstances. We are, however, recommending drawing the lines at DOE facilities differently, in acknowledgment of the predominance of chemical and physical hazards to workers at many DOE facilities, particularly cleanup sites, and out of our desire to ensure adequate treatment of all hazards by using a single regulator of worker safety at any facility.

Legislation would be required to *ensure* OSHA authority over DOE facilities. The OSH Act does not directly prohibit OSHA from regulating at DOE nuclear facilities. It simply prohibits OSHA from regulating anywhere a Federal agency or an NRC Agreement State chooses to exercise authority over worker protection. However, legislation would be needed to remove DOE's power of self-regulation of worker hazards. Moreover, to the extent the facility safety regulator chose to exercise authority, OSHA would continue to be prohibited from exercising its own. We are recommending that the facility safety regulator exercise its preemptive power under the OSH Act only when regulation of occupational risks could significantly interfere with maintenance of facility safety.¹²²

The States: We recommend that States be authorized to regulate worker protection at DOE facilities under programs approved by OSHA or the facility safety regulator in situations comparable to those in which States now regulate in the private sector. As in the case of facility safety, this increase in the jurisdiction of the States would require legislation waiving sovereign immunity at DOE facilities.¹²³ However, a State should not be permitted to regulate worker protection at facilities where the State could not regulate facility safety, for instance, at reactors. Again, the States should have authority to set more stringent standards, but not to unduly hinder DOE's performance of its missions. As we noted earlier, this limitation is comparable to the limitation the OSH Act places on State authority.

Environmental protection

EPA and qualified States should continue to regulate DOE nuclear facilities under the environmental statutes. *For any question having to do with limits on releases from DOE nuclear facilities to the environment, environmental standards governing the management and disposal of waste from DOE facilities, or cleanup of sites, either EPA or a State to which EPA had delegated authority should have sole jurisdiction.* Facility safety and worker protection issues in all these areas would remain within the purview of OSHA and the external regulator of facility safety. However, the facility safety regulator should be precluded by legislation from exercising AEA authority to regulate the environmental aspects of DOE

activities regulated by EPA and the States. This will ensure that DOE is subject to environmental requirements as effective as those which apply to other Federal agencies and the private sector and avoid disruption of existing relations between DOE and external regulators. In establishing external regulation of DOE nuclear facilities, the Committee recommends that Congress establish external regulation of all of DOE's nuclear waste and pollution. Such regulation should include, and wherever possible integrate, the protections found under nuclear and environmental statutes. Consistent with the idea that nuclear hazards should be considered in the context of all hazards, we also recommend that EPA expedite its promulgation of AEA standards for cleanup, DOE low-level waste, and effluents to water. Finally, we note that facility safety questions can sometimes arise under RCRA. These, we believe, should be the responsibility of the external regulator of facility safety or an authorized State, consistent with the idea that there should be only one regulator for each aspect of nuclear safety.

This division of regulatory responsibilities is not always the situation in the private sector (e.g., for AEA materials). There NRC and EPA are continually working out the distribution of responsibility between the two agencies for environmental protection. Here, then, is one instance in which our principle that DOE should be regulated the way private facilities are regulated has given way to the principle that there should be only one regulator for a given area of safety at a given location, and that existing and reasonable external regulation of DOE should not be disturbed. Another example of application of the principle of a single regulator is our recommendation that the facility safety regulator be responsible for hazardous waste management in a facility. As in the cases of facility safety and worker protection, we are not recommending that any change be made in the jurisdictions of the regulators over private facilities or Federal agencies other than DOE. The regulators there have reasonably effective methods of coordination.

Nonetheless, some of the lines between the environmental regulator and the other regulators would sometimes remain difficult to draw. For example, though it is easy to say that the facility safety regulator would regulate deactivation of the facility, and that EPA or a State would regulate cleanup, there are many steps between deactivation and cleanup and the division of responsibility is not always bright. The facility safety regulator and the environmental regulator have to work together to ensure a smooth passing of the baton from facility safety oversight of decommissioning to EPA or State oversight. EPA and DOE have already developed an interagency policy on this subject for DOE sites on the NPL that should provide a format for this process.¹²⁴ We address this matter further under the heading "Lead Agencies" below.

The States: The environmental statutes already permit qualified States to administer the statutes and to set standards more stringent than Federal standards. ***We recommend no change in the States' authority under the environmental statutes.*** This system of environmental regulation already applies to DOE and is consistent with the principles that DOE should be regulated as private sector facilities are regulated and that existing and reasonable external regulation of the Department should not be disrupted, principles which in this instance are not in conflict. This recommendation includes the responsibilities of the States under RCRA.¹²⁵

Other features of the recommendations

Several features of our recommendations affect more than one aspect of safety. They are discussed below:

The ultimate responsibility for safe operations at DOE nuclear facilities remains with the Department and its contractors.

To help it carry out this responsibility, the Department should retain, separate from the line organizations, a small focused, internal "corporate" safety function.

"Corporate" Safety Function and "Delaying": An axiom of safety regulation is that the ultimate responsibility for the safe operation of any nuclear facility remains with the operator of the facility. Where this axiom is not acknowledged, the regulator becomes confused with the operator, lines of accountability become blurred, and the independence of safety judgment can become compromised. ***Therefore, under our recommendations, the ultimate responsibility for safe operations at DOE nuclear facilities would remain with the Department and its contractors. To help it carry out this responsibility, the Department should retain, separate from the line organizations, a small, focused, internal "corporate" safety function of the sort that is typical of corporations that operate large, multiple operations.*** However, that function should be free of the multi-layered, internal oversight the Department has exercised in the past and it should be separate from line responsibility for safety of operations.

As we have noted before, internal oversight and regulation in the Department until recently have been carried out by four different parts of the Department, some of them line organizations with responsibilities for safe operation: EH, Program Offices, Operations/Field Offices, and Area/Site Offices. These parts, and indeed individuals within any one part, have not always agreed on what the applicable standards were, nor on how they were to be applied in a given context. It appears that strategic realignment in the Department¹²⁶ may eliminate some of this redundancy and conflict, but it may not eliminate all, and the resources still devoted to regulatory functions—standard-setting, compliance assessment, and enforcement—will be more than is required to carry out the sort of internal, corporate safety function we envision. Such a function would include setting safety policies which are consistent with external regulatory requirements and are aimed at more than mere compliance, assisting line offices in developing programs and procedures for meeting external

regulatory requirements, evaluating particular problem areas or accidents, and, from time to time, conducting internal audits of the organization's safety performance. This corporate function should be devolved to the site level as much as possible, as is typical of industrial practice for multi-site corporations. If large organizations in the private sector are any guide, the corporate safety function need not require great resources. In particular, the headquarters part of the function would be small, because so much of the function would be carried out at the site level. Thus, some of the resources which had been devoted to regulatory functions in EH and people who have been doing environment, safety, and health oversight in the Field and Program offices could be moved to external regulators. However, the transfer could not safely take place all at once. The transition between the current regulatory scheme and the one we are recommending should proceed in carefully thought-out stages (we discuss transition in Chapter VII).

"Lead Agencies": As we have noted in various places in our description of the distribution of authorities, our recommendation does not entirely do away with the potential for overlapping or uncertain jurisdictions. For example, the regulator of facility safety and EPA or the States will share some responsibility for regulating decommissioning; OSHA or the regulator of facility safety each will have responsibility for regulating worker protection. Although there will be multiple regulators at any one site (at least one apiece for each major aspect of nuclear safety—facility safety, worker protection, and environmental protection), these regulators will have different responsibilities. Each of these regulators, guided by its own organic statutes and longstanding practices, could have its own ideas of what the Department should attend to first at a given site. These priorities (and sometimes even the laws upon which they are at least partly based) might sometimes come into conflict, although this should not be frequent, since, in general, we have defined the responsibilities of these agencies to have much less overlap than in the private sector. Resolutions can be achieved in such cases through use of the "lead agency" concept, as recent experience at some DOE sites with EPA, the States, and DOE demonstrates,¹²⁷ and as the existing MOUs between NRC and OSHA and between NRC and EPA also demonstrate.

The concept of lead agency has come to mean many things to many people. In the context of regulation of safety at DOE nuclear facilities and sites, the concept is meant to encompass a process by which a multidisciplinary approach to safety, based on a scheme of prioritization taking into account risk, cost-effective use of resources, and other relevant factors, is embraced. Where there are overlaps in jurisdiction and conflicting statutory or regulatory requirements of regulators, (e.g., OSHA, the facility regulator, EPA, or the State on a particular matter at a DOE

Where regulatory conflicts arise, the external regulators at a site should resolve conflicts, set priorities, and designate a "lead agency" for any particular matter.

site), a lead agency should be named. The purpose of this lead agency is to coordinate and develop, in consultation with all the regulatory stakeholders, an action plan for the best path forward to resolve safety-related issues at the facility or site. A process should be created for a final determination in the eventuality of any unresolvable dispute between the parties.

We recommend that where such conflicts can arise at DOE sites, the external regulators at the site work together to resolve conflicts among themselves and set priorities across the entire spectrum of safety at the site. Those conflicts should be resolved by having the agencies in conflict agree which of them will become the "lead agency" for any particular matter at the site. This would be the only agency that DOE and its contractors at the site would have to deal with on that matter, and this decision should reflect the regulators' negotiated consensus—arrived at in an open process and approved by the agencies involved—about priorities and about statutory and regulatory requirements. Some conflicts would require coordination among the heads of the external agencies, and might well have DOE complex-wide application, but a great deal can be accomplished by site-specific coordination. *This coordination is important enough that we also recommend that use of the lead agency concept be institutionalized through some form of administrative process, (e.g., an MOU among the various agencies), and encouraged by statute.*

Regulation of Contractors: Up to this point in our report, we have written as if DOE, not its contractors, was the principal object of regulation—as if DOE, not the contractors, would be the recipient of licenses, permits, and certificates, and the object of compliance orders and penalties. However, that approach does not fit all cases. There is a difficulty here that we will describe but not entirely remove. Any legislation establishing external regulation of DOE nuclear facilities should leave the regulator some flexibility to decide whether the Department or the Department *and* its contractors should be the regulated party or parties at a given site.

In choosing whom to regulate in the private sector—the contractor or the party who hired the contractor—NRC follows a well-established pattern. The general principle behind the pattern is applicable to the DOE, though the way NRC implements the principle in the private sector may not be: NRC generally focuses on the highest level of management directing the operations being regulated. Thus, for example, in regulating nuclear power plants, NRC licenses a utility or an operating company, even though much of the work at a given plant site may be done by contractors of the utility or the operating company; NRC holds the utility or operating company responsible for the conduct of its contractors.¹²⁸ (Note that the owner of a facility is not necessarily the highest level of management directing operations at the facility: DOE owns the gaseous diffusion

facilities that NRC will soon regulate, but NRC will give the annual certificates to the U.S. Enrichment Corporation (USEC), because the Corporation ultimately is responsible for operations at the plants.)¹²⁹

The principle behind this well-established pattern is straight-forward: If the highest levels of operating management do not adhere to the external standards, the people closest to the work will very likely find it harder to adhere to those same standards, particularly if management insists that the work be done in a way which is inconsistent with external standards. Management has power to punish and to reward. That power needs to be aligned with the regulator's.

This principle should be followed by the external regulators of safety at DOE. *The principle leads, in the Committee's view, to the conclusion that DOE should always be one of the objects of regulation.* However, DOE exercises less control over activities at some sites than it does at others. At sites where there are several contractors, for example at Hanford, the Department exercises a great deal of control over activities, but it exercises significantly less control over activities at sites managed by one contractor, for example at the national laboratories. Here, to follow the general principle might mean that the contractor should be a co-object of regulation. It would appear that each site will have to be considered on its own terms.

Fees: All the external safety regulators except OSHA have authority to collect fees from the parties they regulate now. This authority usually includes authority to collect fees from Federal parties also.¹³⁰ These fees enable governments to recover at least some of the costs of regulation without relying on general taxation. Indeed, NRC is *required* to recover almost its entire budget through fees. Although many environmental statutes authorize EPA and the States to collect fees from Federal facilities, EPA seldom does so.¹³¹ We take no position on whether the costs of regulation should be recovered through general taxation or through fees. However, we recommend that, as long as the existing authorities to collect fees are continued, then OSHA, the facility safety regulator, EPA and qualified States also be given authority to collect such fees from DOE. Such fees would not be just a transfer of funds from one Federal account to another. They could be a source of revenue to the States. Moreover, authority to collect fees from DOE would be important to NRC also, even though it cannot keep such fees, because, in the absence of such authority or some equivalent arrangement, existing statutes would force other parties regulated by NRC to bear the costs of regulating DOE. For this reason, NRC already has authority to collect fees for regulating the gaseous diffusion facilities.

Expertise: The Committee has heard that the Department may not have enough personnel with the scientific and technical competence and experience necessary to conduct its operations at a high level of safety. As recently as early October of 1995, the Defense Board, in its Recommendation 95-2, felt obliged to recommend that the Department "take such measures as are required to ensure that DOE itself has or acquires the technical expertise to effectively implement" the safety management system the Board was recommending. The problem of finding an adequate number of personnel is not easily solved in this case, even assuming that the labor market provides an adequate supply of such personnel. The Federal government's hiring practices are only partly to blame here. The Department already has authority to hire 400 technical and scientific personnel outside the civil service system, 200 under the DOE Organization Act of 1977, and another 200 under the Defense Authorization Act of October 1994, the latter at the urging of the Defense Board. To date, the Department has hired only 27 persons under these authorities. A hiring moratorium prevents filling any of the remaining 373 slots, and exemptions from the moratorium are rare.

The regulator of facility safety

One question remains unanswered in the description of our recommended distribution of regulatory authority over safety at DOE nuclear facilities: Which of two existing agencies—the Defense Nuclear Facilities Safety Board and the Nuclear Regulatory Commission—should regulate facility safety and, at selected facilities, worker protection? We emphasize again that *how* nuclear safety is to be regulated is as important to our recommendations as *by whom*. Whether NRC or the DNFSB regulates facility safety, the kind of regulation we are recommending is different in some respects from what either agency implements now. Nonetheless, the choice has great bearing on the changes the Committee is recommending, because most environmental protection at the Department is already externally regulated, and thus the only new regulators of the complex would be the regulator of facility safety and OSHA. The question of who should regulate facility safety has elicited a variety of views from Committee members. Below we review the arguments *pro* and *con* each of the two agencies.

NRC: NRC is an established agency with long experience in regulation of nuclear safety. It has a full regulatory apparatus already in place and has extensive experience in establishing standards for nuclear facility safety. It has a large number of experienced personnel with relevant scientific and technical expertise and the power to hire more such personnel without having to go through the civil service system. Much of what it lacks in experience of some DOE facilities it can gain by incorporation of the resources of the DNFSB. Thus, NRC could acquire a major, immediate

capability to build upon, and disruptions during transition would be lessened. Its commission structure and the fact that its members do not serve at the pleasure of the President have enabled it to establish a record of reasonable stability. It has a body of law and guidance which is respected and relied upon everywhere nuclear materials are used, including at DOE. Much of that law and guidance is applicable to parts of the DOE complex, in particular the test and research reactors and the laboratory uses of radioactive materials. NRC already regulates the UMTRCA sites and is authorized to regulate certain facilities in the DOE complex. It has inspection and enforcement programs to ensure compliance with its rules. It utilizes many forms of public participation, ranging from trial-type hearings at crucial points in the life-cycle of a license to rulemakings that reach out to diverse interests. Twenty-nine States already exercise authority under NRC's Agreement State program, and more want to enter into such agreements. The agency is experienced in working with other regulators, EPA and OSHA in particular, to reduce overlaps and fill gaps in jurisdiction. No agency is in a better position to ensure that defense facilities adhere as closely to private sector standards as is consistent with national security.

Perhaps most important, with NRC as the facility safety regulator in the DOE complex, the Department's nuclear facilities and private nuclear facilities would be subject to the same regulator. The DNFSB oversight function was created in response to growing criticism of DOE's operations, particularly a series of reports by the National Research Council and GAO. During the Congressional debate, the military committees opposed giving authority to NRC because of concern that public access would undermine national security.¹³² Although the DNFSB has performed diligently, DOE's record of implementation of the DNFSB's recommendations and improving safety and efficiency of programs is spotty. With the Cold War ended and after six years of DNFSB oversight, DOE continues to suffer from a lack of public credibility and from more problems in DOE operations. It could be argued that the oversight of DNFSB was an interim step and that it is now time to accept full regulation by the existing external safety regulators.¹³³

NRC's regulatory models now vary from the well-established, detailed, prescriptive, process-oriented regulation of nuclear power plants to a more performance-based approach for other uses of nuclear materials. It is learning how to be more flexible even with the nuclear power industry, as its recent rulemakings on maintenance and training show. During the 1980s, the agency voluntarily established by rule and policy a more systematic consideration of risks and costs. NRC's recent rulemaking on decommissioning and decontamination shows that the agency is attempting to engage radically diverse interests in rulemakings on difficult and controversial issues. If, as we recommend, citizens' suits are made available for regulation of DOE facilities, this will provide citizens access to the

Federal courts without the prior need for time and resource consuming adjudicatory hearings. NRC's size (around 3000 personnel, and an annual budget of around \$500 million) and high level of technical competence make it one logical choice for the expansion of external regulation of safety at DOE facilities.

On the other hand, there are two major concerns. Established agencies have a good deal of inertia to change and, despite some signs of increasing flexibility in NRC's choices of regulatory models, most of its resources, in both persons and dollars, are devoted to detailed, prescriptive regulation, which will have far more limited application to the great variety of facilities at DOE than it does to commercial nuclear power reactors. The agency in the past has often argued that the agency's high standards might too often come into conflict with the needs of national security. Some of the agency's public participation mechanisms have been severely criticized, particularly the trial-type hearings used in licensing proceedings involving nuclear power plants. These hearings are said by some to restrict the public too much, and by others to be costly, slow and inefficient ways to make decisions. This cumbersome regulatory process is ill-suited to the urgent task of regulating large parts of DOE's aging complex, particularly those facilities entering deactivation. The agency has yet to find out how to have more open and efficient, but at the same time less formal, proceedings.

A second area of concern is the potential conflict with the agency's present responsibilities. Even with substantial additional resources, some who believe NRC should not take on responsibility for DOE facility safety argue that upper management at the agency would have to divide its attention among a greater number of issues, including some politically difficult ones. There is concern by these commenters that the agency might thereby become less effective in carrying out its current responsibilities, especially its responsibility for regulating commercial nuclear power plants. However, NRC Chairman Shirley Ann Jackson has advised the Committee that she is confident that NRC "can handle the policy, as well as the technical and safety issues," and that, given adequate resources and proper management of the transition, "the time and attention needed...to oversee the commercial nuclear power industry should not be unduly impacted."¹³⁴ Nonetheless, the nuclear power industry may not welcome association with the Department's cleanup and credibility problems.

The DNFSB: The DNFSB too has experienced scientific and technical personnel (although far fewer than NRC), and the power to hire more such personnel without having to go through the civil service system. Like NRC, the Board now has a commission structure and this, together with the fact that its members, like NRC's, do not serve at the pleasure of

the President, gives the Board reasonable stability. The Board is relatively new, with both the strengths and weaknesses that newness entails. A new, growing agency can mold itself to the requirements of its charge. The Board can give adequate consideration to risk, priorities, and cost. Indeed, the Board is required by statute to take cost into consideration. Despite its broad responsibilities, the Board is small: Its current budget is \$18 million, and it has fewer personnel than the 150 allotted to it by statute. Of course, with significant new responsibilities, the Board would need a major infusion of new resources. The Board has matured in its knowledge of the DOE complex, in particular the defense facilities. It has made some significant progress in stimulating improvements in safety at DOE's defense nuclear facilities. It has supported use of the "lead agency" approach. Some argue that it would not be possible for defense-related work to distract the Board as it could NRC, because the Board would not have to operate in two different regulatory arenas, public and commercial, as would NRC. It is accustomed to considering the requirements both of nuclear safety and of national security. Further, the Board, being a relatively new agency, would have greater flexibility to adopt the regulatory models most appropriate to the great variety among DOE's nuclear facilities.

The Board's limited scope has raised some doubts about whether it is the fittest candidate for regulating facility safety (and some worker protection) at all DOE nuclear facilities. It has no enforcement mechanism in place; it has established no new nuclear safety standards; it has never had to judge formally whether a State is qualified to assume some of the Board's responsibilities; and so on. However, a number of the Board's personnel have had extensive experience in regulation before joining the Board. Moreover, although the Board does not make or enforce rules, many of its functions are found in the typical regulator: It can launch investigations, issue subpoenas, conduct hearings (it has conducted many), establish reporting requirements, and set up resident inspectors; its recommendations are required by statute to undergo a public comment process after they are issued; its actions are subject to Congressional oversight and judicial review, the latter applying even, apparently, to the Board's recommendations. Its reviews of the safety management plans it is recommending under Board Recommendation 95-2 will be much like NRC licensing reviews. The Congress has even given it one clearly regulatory task: DOE is not allowed to restart plutonium operations in any plutonium operations building at Rocky Flats until the Board is satisfied with DOE's response to certain of the Board's recommendations.

The Committee has heard that the Board is regarded by some as not being sufficiently open, and as not having to answer to the same checks and balances to which established regulators must answer. For example, the statutorily-required public comment process on recommendations seems

closely patterned on the typical rulemaking process—with recommendation, public comment, the Secretarial response, public comment again, and another round for everyone if the Secretary rejects the Board's recommendation even in part. However, for not entirely clear reasons, the process does not appear to operate with the same degree of openness as rulemaking does. One sign of the difference is that, as the Board notes in its Fifth Annual Report, the Department has accepted all of the Board's recommendations. By comparison, many safety rules proposed by external regulators are significantly modified because of comments. The Committee heard testimony that the Board's recommendations should be issued in draft form before going to the Secretary, and that the Department does not feel free, politically, to disagree with a recommendation (perhaps the Department's reluctance here stems in part from the fact that, under the AEA, the Secretary must report his or her reasons for disagreeing with a Board recommendation to the Senate Committees on Armed Services and Appropriations and to the Speaker of the House of Representatives; see sec. 315(d) of the Act). The recent exchange between the Chairman of the Board and the Assistant Secretary for Environment, Safety and Health have left a question for some about the judgement of the Board.¹³⁵ Some are concerned that the Board's recommendations receive more weight in the assignment of resources and priorities than they should when compared to some of the significant non-nuclear risks present at DOE facilities. However, it should be noted again that the Board, like a regulator, is subject to Congressional oversight and judicial review. Moreover, if our recommendations were to become law, the process for issuing and commenting on Board recommendations would be replaced by the rulemaking procedures required by the Administrative Procedure Act, and the Board would become part of the effort to establish "lead agencies" and to set priorities without giving undue weight to any one hazard.

Against the Board's becoming the regulator, it can be argued that the Board has a longer road to go to become a regulator than NRC has to become more knowledgeable about DOE. The Board has much of the required expertise, but needs to put in place the administrative structure for issuing rules, inspecting, enforcing, delegating authority to States, and eliciting public participation. NRC already has the regulatory structure but needs to acquire more of the necessary expertise. It could do that, however, by transfer of personnel from the Board. Creating a regulator would seem to be a more difficult task than transferring expertise.

Importantly, assigning facility safety regulation and some worker protection to the Board would generate two nuclear regulatory agencies. This could undermine public confidence by creating several regulatory splits: First, two different regulatory agencies—the Board and NRC—would regulate the same aspects of nuclear safety in different parts of the DOE complex, because under our recommendations NRC would retain its current statutory

authority over certain DOE facilities, such as the proposed national high-level waste repository. Second, the Board would regulate most of the DOE complex, but NRC would regulate all private nuclear facilities, thus creating two regulators of nuclear safety and the possibility that facility safety in the DOE complex would be regulated to a set of standards that differed from the standards to which comparable private facilities were regulated. The fact that the Board would regulate only DOE, while a different agency regulated private sector facility safety, is, we acknowledge, a drawback, one shared by the idea of a single agency with full jurisdiction over all safety issues at DOE only. There we commented on the disadvantage of adding yet another regulatory agency to the large number of regulators already in existence, and the potential for disrupting the work of the existing regulators. Close coordination would need to be established between the Board and NRC to achieve true equity. Similarly, EPA and OSHA would have to coordinate with both NRC and the new regulator of DOE facility safety.

From these arguments *pro* and *con*, we conclude the following:

Neither NRC nor the DNFSB was designed to carry out the kinds of responsibilities required of a regulator of facility safety at the DOE nuclear complex. Both would have to undergo significant changes before they could adequately meet those responsibilities. The Committee did not determine which of the two agencies could more readily undergo these changes. Instead, we present two options for facility operator—NRC with a more flexible approach and incorporating the resources of the DNFSB, or a restructured and enlarged DNFSB. We urge that a prompt decision be made on which should be the facility regulator so that the move to external regulation of facility safety can proceed expeditiously. In the meantime, actions to implement external regulation of the two other areas of nuclear safety—worker safety and environmental protection—can and should proceed independently.

A prompt designation of the facility safety regulator is needed.

In the meantime, external regulation of worker safety and health and environmental production should proceed independently.

What Implementation of These Recommendations Can Do

We believe that our recommendations can deal with several of the main drawbacks to internal regulation. Most importantly, our recommendations can end a situation in which DOE has been the ultimate judge of its own safety case—setting priorities, writing standards, assessing compliance, and enforcing, all while carrying out some missions that could come into conflict with safety. We would instead assign DOE's regulatory functions to external, stable, experienced regulators. Our recommendations would also remove from DOE the rare task of balancing safety and national security and give that task to the most visible and politically accountable officer in the Executive Branch, the President. Out of this reassigning of

these crucial functions, we believe there could come a significant increase in safety at DOE nuclear facilities. At the very least, our recommendations would assure that, thirty to fifty years hence, the Department would not face the huge cleanup costs it now faces.

Not only will safety be increased; so too, we believe, will the Department's ability to accomplish its greatly varied missions. For the past several years, the Department's efforts to accomplish its missions have been beset by overlapping jurisdictions over safety, changing safety policies, and insecure funding for safety. The Department has struggled to regain credibility with the general public. Our recommendations do not completely do away with any of these difficulties. For example, they will not do away with all overlaps; nor do they—nor should they—fix forever policies and funding. External regulation by itself will not fully restore the Department's credibility. However, our recommendations entail less overlap among overseers than now exists, and even less than exists in the regulation of private nuclear facilities (mainly because EPA and qualified States would not be sharing environmental protection authority with the facility safety regulator). Our recommendations would also bring to bear on DOE nuclear facilities the reasonably stable policies of the external regulators and would give the public the knowledge that the Department will be subject to external safety judgments. All these actions should enable the Department to work more efficiently.

Also, there is much about our recommendations that can help minimize the inevitable difficulties of transition to a new regulatory regime. They would make efficient use of existing resources. They would not disrupt existing relations between the Department and EPA or its qualified States. Although the transitions to regulation by OSHA and the facility safety regulator would require much work, the work has in a sense begun—in the transition to NRC regulation of USEC, and in the most recent MOU between the Department and OSHA. And though our recommendations cannot be implemented without legislation, several of the necessary changes to existing statutes have been the subjects of discussion for some time.

However, the promise of our recommended regime cannot be fulfilled without sufficient attention to the way regulatory authority would be exercised under it. We return to two of the points we argued in Chapter IV. First, the external regulators must not apply the same model of regulation to every activity at DOE nuclear facilities. Those facilities are too varied in their missions and in the hazards they pose to be treated the same way. To make them all conform to the same model would divert resources from important safety questions and unnecessarily impede the Department's accomplishment of its missions. For example, new facilities that carry risks of large releases of radioactivity should probably be regulated using the full panoply of approaches available in a licensing regime like

NRC's. Older facilities, or facilities posing lesser risks, might be candidates for authorization under a process like the one now being used by NRC to regulate the Department's gaseous diffusion facilities. In general, the regulators should apply a range of models—from audited self-regulation, which both NRC and OSHA now employ to some extent in regulating certain private sector organizations, to a full licensing model—and the choice of model should be proportioned to the activities and hazards being regulated.¹³⁶

Second, the external regulators cannot afford to give nuclear safety more than its due. This may sound paradoxical, even careless. However, while some nuclear risks are large, others are small, and, even more important, some non-nuclear risks are larger than many nuclear ones. More than a third of the Department's Fiscal Year 1995 appropriations went to environmental cleanup, and many of the most significant risks faced in cleanup are non-nuclear, in particular chemical and physical hazards to workers. We said in Chapter IV that due consideration for workers' health and safety would require that OSHA and the facility safety regulator work together and that DOE maintain a strong corporate capability to pay attention to all worker hazards. Worker health and safety will not be protected without giving adequate attention to chemical and physical risks. Resources should be allocated in proportion to the hazards being regulated.

Such are the chief principles to be adhered to once the new regulatory regime is established. However, in the near future, the transition to a new regime is more important than the new regime itself. We now turn to the subject of transition.

CHAPTER VII TRANSITION TO EXTERNAL REGULATION

Transition to external regulation of facility safety and worker protection at DOE's nuclear facilities will require some years. Add to that the time it will take to enact legislation establishing increased external regulation. In the interim, internal regulation of DOE nuclear facilities and external oversight of the defense nuclear facilities by the DNFSB must continue while the external apparatus prepares to take on its new responsibilities. To consolidate the gains that have been made in safety at DOE nuclear facilities in recent years, and to ensure continued improvements in safety at those facilities, many Department initiatives to enhance safety should be continued, and the transition to increased external regulation must be carefully thought out and managed. We also recommend certain actions to improve internal regulation and to support a smooth transition to external regulation of facility safety and worker protection. Some of these actions can be undertaken now.

DOE's Efforts to Strengthen Its Internal System of Regulation Must Continue

DOE needs an effective internal system for managing safety whether or not it moves toward increased external regulation. Therefore, it is essential that the Department complete its current efforts to clarify roles, responsibilities, and accountability. Under any regulatory regime, line managers must be given the responsibility and held accountable for implementing health and safety requirements. These requirements must be clearly defined and must address all of the hazards present at any given time. Workers and managers should possess the technical competence to assess and deal with the hazards associated with the operations for which they are responsible. They should, among other things, plan work with the proper attention to hazards, set priorities on the basis

of risk, provide for safety priorities in budget requests, establish clear safety expectations in contracts, and set up management systems to identify and track hazards. In all of this, workers and managers should aim for more than mere compliance. *The Committee underscores the need for an effective internal health and safety system and urges the Department to continue efforts already underway to clarify and strengthen that system.*

Although in the transition period DOE will be performing both the internal safety management as well as the regulatory oversight functions, after an external regulator has assumed the regulatory functions DOE will need to continue the internal safety management function. This function should include an appropriate balance of: (1) oversight within the line organization to assure DOE that an adequate level of safety and compliance is being achieved, and (2) a corporate support ES&H function to facilitate line performance. If large organizations in the private sector are any guide, these functions need not require great resources. In particular, the headquarters part of the function would be small, because so much of the function would be carried out at the site level. Nonetheless, after DOE's regulatory functions have been fully assumed by external regulators, DOE cannot afford to take a hands-off approach to its and the contractors' safety performance.

We note in particular that the Department is implementing DNFSB recommendations, reducing unnecessary and redundant requirements in Orders and Standards, implementing contract reform to make greater use of contract incentives and performance-based expectations to hold contractors accountable, converting nuclear safety directives to rules issued in accordance with the Administrative Procedure Act,¹³⁷ using a "necessary and sufficient" closure process to institutionalize the use of a graded approach in determining what requirements should apply to each facility (the Department must be careful here not to weaken existing, useful standards), initiating independent oversight to hold line managers accountable for performance, beginning to exercise enforcement authority against contractors for violation of nuclear safety requirements, and removing some of the overlap in regulatory and oversight work between the Office of Environment, Safety and Health and the Program and Operations offices. These efforts should continue.

Additional Actions to Improve Safety Regulation Can Be Taken Now

The Committee believes that the Secretary and others can take actions now to improve regulation of DOE. These actions will also facilitate a transition to increased external regulation.

Consolidate Internal Regulatory and Oversight Authority: Program and Operations offices now perform many oversight, and regulatory-like, functions, though less so now after the Department's "Strategic Realignment." Until regulatory functions are transferred to external regulators, we recommend that these functions be wholly consolidated in DOE's Office of Environment, Safety and Health (EH), resources being transferred along with the functions (none of these additional duties should require giving DOE more personnel; they involve only a shift of existing resources):

- Program offices should be able to comment on, but not concur in, rules and standards being developed by EH. While consensus is worth seeking, the regulator must have sufficient authority to determine adequate safety requirements independently.
- EH, and only EH, should have authority to approve any exemptions from DOE safety requirements at nuclear facilities, unless EH delegates approval authority to operations office management. Giving EH this responsibility would entail significant change. Currently, EH has authority to approve exemptions to radiation protection requirements only.
- Using a graded approach, proportionate to the hazards in a particular case, EH should approve construction, operation, a significant change in use of a facility, or a significant new phase of an activity. This too would represent a significant change in EH responsibilities. Currently, EH has authority to immediately shut down any operation that poses immediate nuclear safety concerns, but authority to approve startup and the like resides in the DOE line organizations.
- EH should exercise full authority and responsibility to inspect DOE operational organizations and contractors for compliance with nuclear safety requirements. Currently, EH focuses on DOE line organization performance.
- EH should also have full access to all operations office budget requests, to determine whether those requests adequately address safety issues, and to ensure that the proper safety input is made to budget decisions made by Headquarters officials.

*Actions to Improve
Safety Regulation Now*

- *Consolidate internal regulatory and oversight authority.*
 - *Encourage the establishment of "lead agencies."*
 - *Request that EPA expedite development of certain standards.*
 - *Make the DNFSB processes more open.*
 - *As soon as possible, complete the transition to regulation of worker safety by OSHA.*
-

We also recommend that funding for EH's functions be maintained as a line item in DOE's budget. A line item may be a target for Congress, but EH's resources are probably even more vulnerable when they are hidden away in other line items that may themselves be vulnerable, or are subject to reallocation by managers with operations responsibilities. Any reduction

in the resources of the internal regulator should not take place except in full public view.

We aim here not to weaken program and operations offices, but only to recommend against dispersing regulatory and oversight functions throughout those offices. As we have said elsewhere, these offices have the ultimate responsibility for safe operations, and they need adequate expertise and other resources to carry out that responsibility. However, they should not at the same time carry out regulatory and oversight functions. The changes we are recommending here can help those offices focus on their missions, and can clarify who are the internal regulators.

Encourage the establishment of "lead agencies": In Chapter VI, we recommend that at each major DOE site the external regulators at the site work together to resolve conflicts among themselves and set priorities across the entire spectrum of safety at the site. Ideally, the external regulators would reach a consensus, in public, on which external regulator would take the lead for each particular matter at a given facility, so that DOE and its contractors would have to deal with only one external regulator on any one matter at a given facility. In Chapter VI we recommend that the "lead agency" idea be institutionalized by a Memorandum of Understanding. Of course, DOE cannot on its own bring about this coordination, but it is in the Department's interest to do whatever it can to encourage the existing external regulators to establish "lead agencies."

Request that EPA expedite development of certain standards: The Secretary should urge the Administrator of EPA to expedite development of environmental standards for cleanup, recycle, and waste management. These standards are urgently needed to expedite major portions of the DOE decommissioning and cleanup missions. Their absence causes uncertainty, delay, and costs.

Make the DNFSB's processes more open: This is, of course, a task for the Defense Board, and it is, moreover, one which the Defense Board began some time ago, for example, by having more public hearings, and by making the Board's recommendations and other important material accessible on the World Wide Web. However, as we have noted in Chapter VI, the Board's recommendations seem in practice to have a finality that is not entirely in harmony with the elaborate and highly public comment process that the AEA says must take place after a Board recommendation. Therefore, we recommend that the Board issue future recommendations in draft form for public and Department comment, and that the Board's recommendations indicate disposition of the comments.

As soon as possible, complete the transition to regulation of worker safety by OSHA: The commitment to this process is now several years

old and little progress has been made. The results of the study not yet begun are an essential prerequisite to an effective and smooth transition to external regulation. OSHA reports that a grant to conduct this study will be awarded in the very near future and that the study will be completed six months after the grant is awarded.

The Transition Must Be Managed Carefully

The transition to external regulation of facility safety and worker protection will be difficult. First, there is the challenge of transferring to new hands the many safety problems the Department faces. The Department has about 3500 nuclear facilities at 34 sites in 13 States. At some of these facilities, there are significant risks that have no equivalent in the private sector: hundreds of large underground high-level radioactive waste tanks, many of which have leaked, most of which have not been appropriately characterized, and some of which may pose a threat of explosion; highly radioactive spent fuel, in some cases corroding, in various types of storage; radioactively contaminated buildings near populated areas; and large volumes of contaminated drinking water, soils, and surface water. A majority of these facilities are old and do not have adequate health and safety documentation, and there is an enormous backlog of non-compliance actions, some significant, some not.¹³⁸

Moreover, some of the expertise necessary for coping with these difficulties is found only in the Department and its contractors. For example, for some isotopes bioassay and internal dosimetry programs are uniquely available, at least in the United States, in DOE.¹³⁹ Handling plutonium requires special expertise. There are mixed radioactive wastes raising new radiation protection questions, decommissioning and decontamination techniques still in the experimental stage, and accelerators and separation operations that produce substantial quantities of materials that are not covered by NRC regulation under the AEA (although States routinely regulate many of them). Both the Department and the regulators will need special expertise.

Without adequate resources external regulators will be only paper tigers—none of the external regulators can take on significant new tasks without adequate resources. It is essential, therefore, that each of the external regulators be assured the staff and funding needed to do the jobs it is charged to carry out. In some cases this will entail significant additional resources.¹⁴⁰

Without adequate resources external regulators would only be paper tigers.

Also, the Department itself will have to decide what safety functions it no longer needs, and what functions it must retain, so that it can carry out its

front-line responsibility for safe operations and comply with new external requirements.

Great as these challenges are, the transition can go well. Similar transitions have taken, or are taking, place, for example, to regulation of environmental protection by EPA and the States and to regulation of the gaseous diffusion facilities by DOE. Also, the Department has long contemplated a transition to regulation by OSHA. There is much experience here and elsewhere to draw on. A basic requirement for a successful transition is coordination between the Department and the regulators-to-be, who must be willing to learn and to be flexible, especially with respect to the challenges faced by the existing external regulators of DOE. Moreover, the Department and the new regulators must establish an orderly process for transfer of functions, personnel, and funds. Because so many of the details of the transition will depend on the legislation establishing external regulation, and the particulars of particular sites, we cannot offer detailed recommendations at this point. The details will have to be worked out by the Department, the external regulators, and the Congress. However, with so much at stake, we recommend that, if new laws establish external regulation of DOE nuclear facility safety and worker protection, the Department should establish an internal group to coordinate with the external regulators and help manage the transition.

CHAPTER VIII CONCLUSION

The Nation is in the midst of an evolution toward developing more effective ways to deal with the massive cleanup of the hazards and environmental contamination caused by past activities in both the public and private sectors. That effort will require the investment of substantial national resources. To make the most efficient use of those resources, we need to involve the Federal government, the States and the public in the most productive ways possible. The Committee believes that its recommendations for moving to external regulation at DOE are an important step in that direction

The external regulatory framework that we recommend will clear the path to greater productivity and efficiency within the Department by removing the regulatory redundancies and overlaps that now burden its work, by clarifying roles and responsibilities so that every member of the Department who is regulated for any activity knows what is expected, and by ensuring a regulatory framework that remains stable as Administrations and officials change. The flexibility we have urged in the regulatory approach through, for example, relying where possible on performance standards rather than rigid prescriptions will allow a more cost-effective approach to ensuring safety. We believe external regulation will improve public confidence in DOE and provide increased assurance that its future record of nuclear safety will be free of the mistakes of the past. Our recommendations do not resolve all the problems with the current regulation of DOE safety. However, we believe they can resolve the most acute ones and offer a sound framework for eventually resolving the others.

We believe, as we have repeatedly stressed, that the transition to external regulation must be planned and performed so that the important efforts already underway to improve DOE's internal safety structure are not disrupted. The regulatory regime we recommend cannot be put in place overnight and all at once. It will need to be developed in stages over time. But some changes can be made immediately, as we have outlined in the previous chapter, and others can follow once legislation is passed.

The Committee is most encouraged by the clear evidence it has found during its investigations that the Department is firmly committed to carrying out its missions as safely and efficiently as possible and to ensuring a smooth and effective transition to an improved regulatory framework.

SUMMARY OF RECOMMENDATIONS

For External Regulation of the Department of Energy (DOE):

1. Every major aspect of safety at DOE nuclear facilities— facility safety, worker protection, public and environmental protection— should be externally regulated by existing agencies. However, regulation of the specialized area of “nuclear explosives safety” should remain a DOE responsibility and, at least initially, safeguards and security should remain DOE responsibilities.
2. We recommend the following framework for external regulation of DOE nuclear facilities:
 - An existing agency—either the Nuclear Regulatory Commission (NRC) with a more flexible approach and incorporating the resources of the Defense Nuclear Facilities Safety Board (DNFSB), or a restructured and enlarged DNFSB—should regulate facility safety at all DOE nuclear facilities under the Atomic Energy Act (AEA).
 - The Occupational Safety and Health Administration (OSHA) should regulate all protection of workers at DOE nuclear facilities under the Occupational Safety and Health Act (OSH Act), unless regulation of worker risks at a given facility could significantly interfere with maintenance of facility safety (for example, if criticality is possible) in which case the regulator of facility safety should regulate all worker protection at that facility under the AEA.
 - The Environmental Protection Agency (EPA) should continue to regulate environmental protection matters for all DOE nuclear facilities and sites under the environmental statutes.
 - States with programs authorized by EPA, OSHA, or the regulator of facility safety should acquire or continue to have roles in regulation of environmental protection, facility safety, and worker protection comparable to those they now exercise in the private sector.
 - The ultimate responsibility for safe operations at DOE nuclear facilities should remain with the Department and its contractors. To help it carry out this responsibility the Department should retain—separate from organizations responsible for carrying out DOE’s missions—a small, focused, internal “corporate” safety function of the sort typical of corporations that operate large, multiple operations.

SUMMARY OF RECOMMENDATIONS (cont.)

Additional Recommendations:

1. DOE's facilities and hazards differ widely, and a rigid, "one size fits all" regulatory approach will not work. Use of a variety of models for regulation of safety is essential to successful and economically feasible regulation of the DOE complex. In particular, wherever it is reasonable to do so, performance-based requirements (when these are well-defined, as in the case of numerical release limits) should be used to maximize the potential for cost savings and flexibility.
2. Where there are overlaps in jurisdiction or conflicting statutory or regulatory requirements at a DOE site, the external regulators should work together to resolve conflicts among themselves and set priorities across the entire spectrum of safety at the site. They should agree which of them will become the "lead agency" for any particular matter at the site. Use of the "lead agency" concept should be institutionalized through some form of administrative process, such as a Memorandum of Understanding among the various agencies, and encouraged by statute.
3. Gaps in regulatory authority under the AEA, as currently exercised by NRC, should be closed by extending to any external regulator of facility safety, for DOE nuclear facilities, the authority currently given to DOE under the AEA. The OSH Act should be amended to cover all DOE and DOE contractor employees at DOE nuclear facilities under OSHA regulation.
4. Citizens' suits provisions, comparable to those in the environmental statutes, should be available for regulation of safety at DOE nuclear facilities, both with respect to enforcement against DOE and its contractors and with respect to non-discretionary statutory duties of the regulators. In addition, any external Federal regulator of DOE nuclear facilities should be given the power to impose "administrative penalties."
5. The Committee recommends that Congress give consideration to strengthening a discretionary health and safety provision of the AEA by making it a non-discretionary requirement for the regulation of DOE.
6. Legislation providing for external regulation of facility safety at DOE should allow use of a process, simpler and less formal than for NRC licensing hearings

SUMMARY OF RECOMMENDATIONS (cont.)

for nuclear power plants, that provides an effective means for public participation in the authorization process. This process should provide opportunity to raise all substantive health, safety, and environmental issues.

7. As is the case in the private sector, certain limitations on State authority should continue. For example, States should not regulate facility safety and worker protection at DOE reactors or at high-level waste repositories. In principle, the States should be able to enact more stringent standards, even in the area of facility safety, as long as these do not unduly hinder a DOE mission.
8. DOE should maintain a strong corporate capability for worker safety that assures adequate attention is paid to all worker hazards. An external regulatory function is required to serve: a) as a stimulus to assure this capability is properly maintained, b) as a source of national standards of performance, and c) as an independent "court of last resort."
9. It is entirely possible to assure nuclear safety and at the same time to protect national security through properly managed and circumscribed external regulation, and this regulation should not be different from that applied to other DOE facilities.

For the Transition to External Regulation:

1. A strong internal DOE safety system is essential under any regulatory regime and, for that reason, the transition to external regulation must be done carefully so that it does not disrupt efforts already underway to strengthen and streamline that internal system. The Department must maintain its focus on safety throughout the transition.
2. In an ideal system, the responsibility for ensuring that safety requirements are met should be a function which is transferred down the chain of responsibility to the highest level of management directing the operations of the facility itself, and, with a strong safety culture in place, the only headquarters internal oversight necessary should be that located in a small "corporate" safety function, with enforcement of compliance vested in an external regulator. The Department is moving toward this sort of structure and the elimination of redundancies should continue.

SUMMARY OF RECOMMENDATIONS (cont.)

3. Actions can be taken now to improve DOE safety regulation and smooth the transition to increased external regulation:

The Secretary should:

- Complete the process already underway for placing the responsibility for safety at the operating level and removing the layers of safety oversight in line programs.
- Consolidate corporate safety oversight functions in DOE's Office of Environment, Safety, and Health (EH). EH, and only EH, should have the authority to establish safety requirements and grant any exemptions and to approve construction and startup of new facilities and activities, unless it delegates approval authority to operations office management.
- Encourage the existing external regulators to establish "lead agencies" at DOE sites.
- Request that EPA expedite the development of environmental standards for cleanup, recycle, and waste management.
- Expedite the transition of worker safety to OSHA. DOE and OSHA are exploring how to make a transition to external regulation of worker safety, and this process should be expedited.

The DNFSB should:

- Make its processes more open. The Board has taken steps in this direction but needs to do more. Its recommendations do not go through the public comment process until after they are issued. The Board should issue future recommendations in draft form for public and Department comment, and the Board's recommendations should indicate the disposition of those comments.
4. Each regulator should be ensured the resources it needs to carry out additional responsibilities and steps should be taken to ensure that both the Department and the external regulators have the expertise required to deal with the diverse hazards and difficult situations at the DOE complex.
5. A prompt decision on whether NRC or the DNFSB should become the facility regulator should be made so that the move to external regulation of facility safety can proceed expeditiously. In the meantime, actions to implement external regulation of the two other areas of nuclear safety—worker safety and environmental protection—can and should proceed independently.

SUMMARY OF LEGISLATIVE IMPLICATIONS OF THE RECOMMENDATIONS

Legislation should:

- Authorize the facility safety regulator to regulate all facility safety at DOE nuclear facilities, including defense facilities, but not "nuclear explosive" safety or safeguards and security. This authority should include the authority currently given DOE under the AEA to regulate all sources of ionizing radiation. The existing regulatory arrangements at U.S. Enrichment Corporation, Title I UMTRCA sites, and the high-level waste repositories should not be changed.
- Remove DOE's power of self-regulation of worker hazards.
- Give OSHA jurisdiction over all DOE and DOE contractor employees at DOE nuclear facilities where OSHA would regulate worker hazards.
- Preclude the facility safety regulator from exercising AEA authority to establish environmental standards. Authorize the facility safety regulator to handle all facility safety questions that might arise under RCRA.
- Authorize qualified States to regulate facility safety and worker hazards, but not at DOE reactors, nor in questions involving exports and imports, ocean waste disposal, or the high-level waste repository.
- Authorize qualified States to set more stringent standards for the areas of facility safety and worker hazards regulated by them, as long as those standards do not unduly hinder DOE in the performance of its missions.
- Allow use of a process that is simpler and less formal than that for NRC licensing hearings for nuclear power plants, and that provides an effective means for public participation, and an opportunity to raise all substantive health, safety, and environmental issues.
- Allow citizens to sue to force DOE or its contractors to comply with applicable statutes and regulations, and to force an external regulator to carry out statutory non-discretionary duties.

SUMMARY OF LEGISLATIVE IMPLICATIONS OF THE RECOMMENDATIONS (cont.)

- Give the regulators the flexibility to decide whether the Department, or the Department *and* its contractors, should be the regulated party, or parties, at a site.
- Authorize the Federal regulators to impose “administrative penalties”.
- Encourage the external regulators to work together to resolve conflicts among themselves and to set priorities across the entire spectrum of safety at a site; facilitate designation of a “lead agency” for any particular matter at the site.
- Ensure that there is a mechanism for the President to resolve conflicts between safety and national security.
- If existing statutes continue to provide for fee collection, authorize OSHA, EPA, the facility safety regulator, and States to collect fees from DOE.
- Provide the external regulators with adequate resources to carry out their new tasks.

Congress should also give consideration to making the current health and safety provision of the AEA to “minimize danger to life and property” a non-discretionary requirement for the regulation of facility safety at DOE nuclear facilities.

Tables

 

Table 1. KEY EXTERNAL REGULATORY ENTITIES

The Defense Nuclear Facilities Safety Board (DNFSB). Established in 1988, the DNFSB investigates safety at DOE's defense facilities and makes recommendations to the Secretary for improvements. It does not possess standards-setting or enforcement authority.

The Environmental Protection Agency (EPA). Established in 1970, EPA administers the major national environmental laws. These cover air and water pollution, solid and hazardous waste management and disposal, drinking water protection, ocean dumping, hazardous chemicals use, and the cleanup of contaminated sites. EPA provides guidance to Federal agencies for public, worker, and environmental protection from all sources of radiation, standards for environmental releases and for the disposal of radioactive wastes, and advice on protection from indoor radon. Most EPA authorities may be delegated to or shared with the States and Tribes; States or Tribes may often set more restrictive standards.

The Nuclear Regulatory Commission (NRC). Created in 1974 from the regulatory part of the former Atomic Energy Commission, NRC develops and enforces its regulations and EPA's Federal guidance and environmental standards to protect public and worker health and safety in civilian nuclear activities using materials covered by the Atomic Energy Act (AEA). NRC licenses commercial nuclear power plants, fuel-cycle facilities, and industrial and medical use of AEA materials, as well as high- and low-level waste disposal, including a future high-level waste repository, and it will certify certain DOE facilities. NRC delegates regulatory responsibilities for many nuclear materials (but not at Federal facilities or power reactors) to its Agreement States; they must use "compatible" standards in most cases.

The Occupational Safety and Health Administration (OSHA). Under the Occupational Safety and Health Act of 1970, OSHA regulates health and safety of all U.S. workers who are not covered by other Federal regulatory authority (DOE claimed exemption of workers at AEA-authorized facilities in 1974). States may operate their own OSHA-approved State plans.

The States and Tribes. States and Tribes may regulate Federal facilities and workers through authorized programs under a range of Federal laws covering radioactive and non-radioactive substances, as noted above. Under State laws, States also regulate accelerators, x-ray sources, naturally occurring radioactive materials, and also in some cases, Federal contractors.

The Department of Transportation (DOT). DOT regulates shipments of radioactive material, including nuclear waste, except DOE shipments made for the purpose of national security. DOT regulates the labeling, classification, and marking of all packages containing radioactive materials.

Table 2. MAJOR STATUTES AS APPLIED TO DOE FACILITIES			
STATUTE	IMPLEMENTED BY	FUNCTION	HAZARD COVERED
Atomic Energy Act	DOE	All Safety	All Hazards
	DNFSB	Defense Facility Safety	Nuclear Hazards
	NRC EPA	Radiation Safety	Radionuclides
Occupational Safety and Health Act	DOL/OSHA	Worker Health & Safety	Occupational Hazards
Comprehensive Environmental Response, Compensation and Liability Act	EPA	Cleanup of Hazardous Substances	Radionuclides and Chemicals
Resource Conservation and Recovery Act	EPA or State	Management of Hazardous Wastes	Chemicals and Natural Radionuclides
Clean Air Act	EPA or State	Control of Air Emissions	Radionuclides and Chemicals
Federal Water Pollution Control Act	EPA or State	Control of Effluents to Water	Chemicals and Natural Radionuclides
Safe Drinking Water Act	EPA or State	Drinking Water and Ground Water Protection	Radionuclides and Chemicals

ENDNOTES

1. The Committee's charter (see Appendix B) excludes the naval reactor program.
2. Transcript, p. 17, meeting of the Advisory Committee on External Regulation of DOE Nuclear Safety, March 9, 1995, Washington, DC.
3. Transcript, p. 21, meeting of the Advisory Committee on External Regulation of DOE Nuclear Safety, March 9, 1995, Washington, DC.
4. The 1995 nuclear budget request was \$15.4 billion, which is 83% of the Department's total budget request of \$18.5 billion. Materials management, decommissioning and cleanup, and waste management accounted for \$7.9 billion, or 51% of the nuclear budget. FY 1995 Budget Highlights, U.S. Department of Energy, Office of Chief Financial Officer, February 1994. DOE/CR-0019.
5. *Closing the Circle on the Splitting of the Atom*, U.S. Department of Energy, Office of Environmental Management, January 1995.
6. Office of Environmental Management, *Estimating the Cold War Mortgage: The 1995 Baseline Environmental Management Report*, U.S. Department of Energy, March 1995. The \$230 billion estimate is the midrange of the so-called "Base Case," for which the full range is \$170 to \$330 billion. Other cases have midrange values from \$175 to \$500 billion.
7. The Committee has defined nuclear facilities generally, for its purposes, to include all operations that involve radioactive materials or the use of ionizing radiation. More precisely, we have taken nuclear facilities to include any facility or operation (activity) that involves radioactive materials or radiation sources such that a radiological hazard, or a perceived radiological hazard, exists or potentially exists to workers, the public, or the environment. There are other ways to define nuclear facilities. This one is intentionally broad.
8. The Committee went to some trouble to obtain an accurate characterization of the Department's nuclear facilities, since this was not available when we began our work. Detailed findings are reported in the *Compendium of DOE Nuclear/Radiological Facilities and Sites: Current and Possible Future*, Background Report for the Advisory Committee on External Regulation of DOE Nuclear Safety. U.S. Department of Energy, Office of the Associate Deputy Secretary for Field Management, February 1995.
9. Ibid.
10. *Plutonium Working Group Report on Environmental, Safety and Health Vulnerabilities Associated with the Department's Plutonium Storage*, U.S. Department of Energy, November 1994.
11. Transcript, p. 16, meeting of the Advisory Committee on External Regulation of DOE Nuclear Safety, March 9, 1995, Washington, DC.
12. The term "self-regulation" is used in this report to refer to the absence of external regulation.
13. It has been said that, under United States law, no other entity is allowed to regulate the health and safety aspects of its own production activities (Natural Resources Defense Council, testimony before U.S. Congress, House Committee on Natural Resources, Subcommittee on Energy and Mineral Resources, in *Federal Nuclear Facilities Licensing and Regulation Act*, Serial No. 103-72, March 1, 1994. pp. 152, Washington, DC.)
14. Mark Holt, *Safety Regulation of Department of Energy Nuclear Facilities: A Catalog of Criticisms and Options*, Prepared for the House Committee on Natural Resources, Congressional Research Service, December 12, 1994, Washington, DC.
15. 42 U.S.C. 2011.
16. Rezendez, Victor S., testimony before U.S. Congress, House Committee on Natural Resources, Subcommittee on Energy and Mineral Resources, in *Federal Nuclear Facilities Licensing and Regulation Act*, Serial No. 103-72, March 1, 1994, pp. 46-47, Washington, DC.
17. Quillin, Robert M., testimony before U.S. Congress, House Committee on Natural Resources, Subcommittee on Energy and Mineral Resources, in *Federal Nuclear Facilities Licensing and Regulation Act*, Serial No. 103-72, March 1, 1994, p. 62, Washington, DC.
18. Johnson, Peter A., testimony before U.S. Congress, House Committee on Natural Resources, Subcommittee on Energy and Mineral Resources, in *Federal Nuclear Facilities Licensing and Regulation Act*, Serial No. 103-72, March 1, 1994, p. 37, Washington, DC.
19. Caputo, Andrew P., testimony before U.S. Congress, House Committee on Natural Resources, Subcommittee on Energy and Mineral Resources, in *Federal Nuclear Facilities Licensing and Regulation Act*, Serial No. 103-72, March 1, 1994, pp. 152-153, Washington, DC.
20. Defense Nuclear Facilities Safety Board, *Fifth Annual Report to Congress*, pp. 101-102 and 106-108, February 1995.
21. U.S. Department of Energy, Advisory Committee on Safety at DOE Nuclear Facilities, *Final Report on DOE Nuclear Facilities*, November 1991.
22. U.S. General Accounting Office, *Nuclear Safety: Concerns About Reactor Restart and Implications for DOE's Safety Culture*. April 12, 1990.
23. Office of Technology Assessment, *Hazards Ahead: Managing Cleanup Worker Health and Safety at the Nuclear Weapons Complex*, U.S. Congress, February 1993, p. 12.
24. Mobley, Michael, testimony submitted to the U.S. Congress, House Committee on Natural Resources, Subcommittee on Energy and Mineral Resources, in *Federal Nuclear Facilities Licensing and Regulation Act*, Serial No. 103-72, March 1, 1994, pp. 112-114, Washington, DC.
25. Congressional Budget Office, *Cleaning Up the Department of Energy's Nuclear Weapons Complex: A CBO Study*. U.S. Congress, May 1994, p. 5.
26. Caputo, Andrew P., op. cit. (endnote 19), p. 152.

24. Mobley, Michael, testimony submitted to the U.S. Congress, House Committee on Natural Resources, Subcommittee on Energy and Mineral Resources, in *Federal Nuclear Facilities Licensing and Regulation Act*, Serial No. 103-72, March 1, 1994, pp. 112-114, Washington, DC.
25. Congressional Budget Office, *Cleaning Up the Department of Energy's Nuclear Weapons Complex: A CBO Study*. U.S. Congress, May 1994, p. 5.
26. Caputo, Andrew P., op. cit. (endnote 19), p. 152.
27. Payne, Jr., James O., testimony before U.S. Congress, House Committee on Natural Resources, Subcommittee on Energy and Mineral Resources, in *Federal Nuclear Facilities Licensing and Regulation Act*, Serial No. 103-72, March 1, 1994, p. 74, Washington, DC.
28. Congressional Budget Office, op. cit. (endnote 25), p. 5.
29. Office of Technology Assessment, op. cit. (endnote 23), p. 11.
30. Ibid., p. 11.
31. Dozier, Kimberly, "DOE Scorched by OSHA Review," *Energy Daily*, March 22, 1991, p. 1.
32. Stark, R.M., *Report on the Activities of a DOE Committee on the Treatment of Worker Safety in DOE Facility Safety Analysis Reports*. Systems and Analysis Division, U.S. Department of Energy, January 24, 1994, p. 11.
33. U.S. Department of Energy, *Chemical Safety Vulnerability Working Group Report*, September, 1994 (DOE/EH-396P); *Plutonium Working Group Report on Environmental Safety and Health Vulnerabilities Associated with the Department's Plutonium Storage*; November 1994 (DOE/EH-0415).
34. Advisory Committee on Human Radiation Experiments, *Final Report*, U.S. Government Printing Office, October 1995.
35. Holt, Mark, op. cit. (endnote 14), pp. 15, 34-36.
36. Office of Technology Assessment, op. cit. (endnote 23), p. 11.
37. U.S. Government Accounting Office, *Safety and Health: Key Independent Oversight Program at DOE Needs Strengthening; Report to the Chairman, Committee on Government Affairs*, U.S. Senate, May 1993 (GAO/RCED-93-85), p. 3.
38. Alvarez, Robert, Environmental Policy Institute, statement before the Subcommittee on Energy and Power of the Committee on Energy and Commerce, U.S. House of Representatives, in *Environmental, Safety and Health Issues at U.S. Department of Energy Nuclear Sites*, November 19, 1987, p. 15.
39. National Research Council, *Safety Issues at the Defense Production Reactors: A Report to the U.S. Department of Energy*, 1987.
40. Union of Concerned Scientists, *The Future of the U.S. Nuclear Weapons Complex*, May 1991, p. 30.
41. U.S. Department of Energy Advisory Committee on Nuclear Facility Safety, *Reports to the Secretary of Energy, July 1988-September 1991*, p. 35.
42. Alvarez, Robert, op. cit. (endnote 38), p. 15.
43. U.S. Department of Energy, *Analysis of Findings from the First Sixteen Tiger Team Assessments*, May 1991; DOE/EH-0191, and *Tiger Team Assessments Seventeen through Thirty-Five: A Summary and Analysis*, December 1992 (DOE/EH-0301), p. 35.
44. Weaver, Danielle, "DOE Safety Orders Not as Complete as NRC Orders-Mitre," *Energy Daily*, November 21, 1990, p. 1.
45. House Committee on Interior and Insular Affairs, U.S. Congress, 102nd Congress, 2nd session, Committee staff report, *The Department of Energy's Failure to Police Standards for Radioactivity in Hazardous Wastes*, September 1992, p. 7.
46. Defense Nuclear Facilities Safety Board *Annual Report to Congress*, February 1994, p. 10.
47. U.S. Department of Energy, op. cit., September 1994, November 1994 (endnote 33).
48. While these exposures may be considered to have presented predominantly ethical, rather than safety, issues, they almost invariably were not administered for the medical benefit of the recipients and did not satisfy public exposure limits. This record has contributed to public distrust of DOE. The history, including that of intentional releases to the environment, is extensively reviewed in the final report of the Advisory Committee on Human Radiation Experiments (endnote 34).
49. DOE's low credibility and the reasons for it have been assessed in the 1993 report of a task force on public trust and confidence of the Secretary of Energy's Advisory Board. *Earning Public Trust and Confidence: Requisites for Managing Radioactive Wastes*, Final Report of the Secretary of Energy Advisory Board Task Force on Radioactive Waste Management, November 1993, Washington, DC.
50. See endnote 43.
51. Letter from Victor H. Reis, Assistant Secretary for Defense Programs, to John F. Ahearn, Co-Chair, and Gerard F. Scannell, Co-Chair, Advisory Committee on External Regulation of DOE Nuclear Safety, June 9, 1995.
52. Beginning as early as the 1940s, the States had been developing competent regulatory programs that addressed radiological issues. But these were focused on x-ray use in medicine and industry. States were excluded from regulating the kinds of nuclear facilities involved in the Atomic Energy Commission's (AEC) weapons and reactor programs. Although the AEC regulated in the private sector as a "Federal regulator", there was no external regulator of the AEC's own facilities.

53. At the height of the Cold War, the Atomic Energy Act (AEA) of 1954 established a national policy for the development and regulation of a civilian nuclear power industry. Authority to regulate civilian uses of nuclear power and its byproducts was transferred to NRC in 1974. However, Congress reserved for itself any external oversight of the defense nuclear facilities. Although other Federal agencies and State and local governments were given no jurisdiction under the AEA, subsequent environmental legislation has modified this situation.
54. *Legal Environmental Assistance Foundation v. Hodel*, 586 F Supp. 1163 (E.D. Tenn.1984).
55. In 1992, the Congress reaffirmed RCRA's authority over DOE by enacting the Federal Facility Compliance Act, which strengthened EPA and State enforcement over hazardous wastes and the hazardous portion of mixed radioactive wastes at DOE facilities.
56. "Herrington Outlines 3-Point Plan to Strengthen Environment, Safety and Health Programs," *DOE News* (R-85-11), September 18, 1985, and "Herrington Sharpens Attention to Environmental Hazards at DOE Facilities", *Inside Energy*, September 23, 1985, p. 6a.
57. National Research Council, Committee to Assess Safety and Technical Issues at DOE Reactors, *Safety Issues at the Defense Production Reactors: A Report to the U.S. Department of Energy*. National Academy Press, 1987, Washington, DC. Also reported in "DOE Secretary Orders Immediate Actions to Respond to NAS Safety Recommendations", *DOE News*, October 29, 1987; and "NRC Report on DOE Weapons Plant Safety Calls for Stiffer Oversight", *Inside Energy*, November 2, 1987, p. 3.
58. 42 U.S.C. 2286a and 2286b.
59. Fehner, T.R. and Gosling, F.G., *The Department of Energy's Nuclear Facilities, 1942-1995: An Introduction to Regulatory and Safety Issues*, History Division, Executive Secretariat, U.S. Department of Energy, February 1995, pp. 11ff.
60. Fehner and Gosling, op. cit. (endnote 59), p. 13; and "Criminal Investigation Is Begun at Arms Plant," *The New York Times*, June 7, 1989, p. 1.
61. General Counsel Nuclear Safety Team, *Regulation of the U.S. Department of Energy Nuclear Facilities. Current Regulatory Jurisdictions - A Moving Picture; DOE Internal Workgroup Report Number 3*, U.S. Department of Energy, March 3, 1995; and U.S. Department of Energy, *Implementation of DOE Requirements: Input to the Advisory Committee on External Regulation*, U.S. Department of Energy, Report Number 8, February 15, 1995.
62. "Secretary O'Leary Announces Safety Initiatives," *DOE News*, May 5, 1993.
63. Memorandum of Understanding between the U.S. Department of Labor and the U.S. Department of Energy, Joseph A. Dear, Assistant Secretary, Occupational Safety and Health Administration and Tara O'Toole, M.D., M.P.H., Assistant Secretary, Environment, Safety and Health, DOE, June 19, 1995.
64. AEA materials are also exempted from coverage under the Toxic Substances Control Act, 15 U.S.C. 2602(2)(B)(iv).
65. EPA also regulates radiological and non-radiological contaminants in public drinking water systems and underground sources of drinking water under the Safe Drinking Water Act.
66. The State of New Mexico regulates the non-radioactive hazardous substances in WIPP wastes during the operational period and the first 30 years under State regulations patterned after RCRA.
67. Pub. L. No. 100-408, 102 Stat. 1066 (1988).
68. 10 CFR parts 820, 830, 835, and 708 (1995).
69. The following safety rules are anticipated to be published in March 1996: 10 CFR Part 830.110, Safety Analysis Reports; 10 CFR Part 830.112, Unreviewed Safety Questions; 10 CFR Part 830.310, Conduct of Operations; 10 CFR Part 830.320, Technical Safety Requirements; 10 CFR Part 830.330, Training and Qualification; 10 CFR Part 830.340, Maintenance Management; 10 CFR Part 830.350, Operational Occurrence Reporting; and 10 CFR Part 834, Radiation Protection for the Public and the Environment.
70. Thomas P. Grumbly, Implementation of the New Organization of Environmental Management, Memorandum, December 12, 1995. Also see: Assistant Secretary Thomas P. Grumbly, *Alignment Initiative Newsletter*, August 3, 1995: "The EM alignment focuses the line programs on meeting current RCRA and CERCLA program management requirements and providing the ES&H execution guidance needed for the field to implement the programs. The Office of Site Operations will focus on EM-wide ES&H guidance, cross-cutting issues, and issue resolution. I have become convinced that a small...staff can track, appraise us of problems, and remedy at high-risk, high visibility safety and conduct of operations problems at our sites..."
71. DOE Order 5480.1B. In the last three years, no stop orders have been issued.
72. *Implementation of DOE Requirements*, DOE Internal Working Group Report Number 11, June 1995.
73. EH does not currently, and is not proposed to, have final approval authority for "necessary and sufficient" determinations; this function is proposed to be exercised by ad hoc groups convened for each facility. See *The Department of Energy Closure Process for Necessary and Sufficient Sets of Standards*, Revision 3D, November 12, 1995, p. 9.
74. When a performance standard can be stated objectively and the performance itself measured with reasonable accuracy (preferably through numerical criteria), performance-based standards provide greater flexibility than prescriptive standards and can be less costly because the standard is unambiguous and the implementer has freedom to choose the least costly means to satisfy the requirement. In cases where the objectives are expressed subjectively and without definitive criteria, such standards can be costly because the regulator and the regulated may have to negotiate the application of the standard to particular cases.

75. OSHA Instruction TED 8.1.
76. President Bill Clinton and Vice President Al Gore, National Performance Review, *The New OSHA: Reinventing Worker Safety and Health*, May 1995.
77. See endnote 74.
78. The gaseous diffusion plants must periodically demonstrate either compliance with applicable laws or an acceptable plan for coming into compliance with those laws.
79. Performance-based requirements can, in principle, be of two kinds: numerical criteria, or other specific requirements that do not require interpretation; and qualitative requirements, such as quality assurance or effective training programs, that require interpretation. In this report we mean the former, unless we say otherwise.
80. EPA regulates the cleanup of both hazardous chemical and radioactive wastes at DOE facilities on the NPL (all of DOE's major facilities are on the NPL) under Section 120 of CERCLA. Although CERCLA allows the States to enter into cleanup agreements with EPA and DOE and ensure that its standards for cleanup are met, CERCLA is different than most other environmental statutes in that it does not allow EPA to delegate this authority to the States. Because these facilities invariably also contain waste management units for the treatment, storage, and disposal of hazardous wastes, they are also subject to State RCRA permits which often contain "corrective action" requirements for the release of hazardous (but not radioactive) wastes. Thus, all major DOE facilities are subject to both CERCLA and RCRA cleanup requirements.
81. Under the AEA, DOE regulates the operation of its facilities, which includes the decommissioning of its facilities and the stabilization of any radioactive materials therein. However, CERCLA applies if there is a release or substantial threat of release into the environment. Therefore, EPA's authority under CERCLA may overlap with DOE's authority under the AEA, if DOE's stabilization and decommissioning activities constitute a release or substantial threat of release of radioactive materials into the environment.
82. The CERCLA/RCRA agreements being negotiated at Hanford among the State of Washington, EPA, and DOE, and at Rocky Flats among the State of Colorado, EPA, and DOE are examples.
83. There is a similar overlap between TSCA and the AEA, since the definition of "chemical substance" under TSCA does not include AEA materials (see endnote 64).
84. Under Reorganization Plan No. 3 of 1970, the authority under the AEA to establish environmental radiation protection standards was transferred to EPA (5 U.S.C. Appendix 1 and Reorganization Plan No. 3 of 1970: 3 CFR 1072 (1966-1970)). However, DOE has also established environmental protection rules and orders for radioactive materials under the AEA.
85. U.S. NRC 1987 *Review of Naturally Occurring and Accelerator-Produced Radioactive Materials*.
86. 29 U.S.C. 653(b)(1).
87. Amendment of the OSH Act is here recommended only with respect to coverage of DOE and DOE contractor employees and not for any other segment of the national workforce (e.g., for employees of NRC licensees).
88. Schoettler, Gail, Lt. Governor, State of Colorado, transcript, pp. 227-8, meeting of the Advisory Committee on External Regulation of DOE Nuclear Safety, September 18, 1995, Atlanta Georgia.
89. 42 U.S.C. 2232(a) and 2201(b); see also 2201(i).
90. *Union of Concerned Scientists v. NRC*, 824 F.2d 108, 114-118 (D.C. Cir. 1987), interpreting 42 U.S.C. 2232(a), 2201(b) and 2201(i).
91. *Union of Concerned Scientists v. NRC*, 824 F.2d 118. The NRC currently takes risk, costs, and available technology into account through application of its requirement to maintain exposure to radiation "as low as reasonably achievable, taking into account the state of technology, the economics of improvements in relation to the state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest." Under this suggested change, the requirement to "...provide adequate protection of health and safety" would remain in place, unchanged.
92. 42 U.S.C. 2021(c); 10 CFR 150.10 (1995).
93. *Goodyear Atomic v. Miller*, 486 U.S. 174 (1988).
94. 42 U.S.C. 2021n.
95. In some recent instances involving low-level waste disposal standards, NRC has allowed some States to pursue "goals" which were significantly more stringent than NRC standards, but not to call those goals the minimum safety required.
96. Unlike EPA and OSHA, NRC must recover almost its entire budget through fees charged to those it regulates.
97. As the Assistant Secretary for ES&H stated in a recent oversight evaluation of the Rocky Flats site: "It is a basic premise of Secretary O'Leary's operating philosophy that line managers are responsible for safety, and that they should manage safety on a day-to-day basis as carefully and competently as they manage the bottom line." *Independent Oversight Evaluation of Environment, Safety, and Health Programs at the Rocky Flats Environmental Technology Site*, Office of Environment, Safety and Health, August 1995.
98. Stark, R.M., op. cit. (endnote 32), p. 1.

99. For example, over the period 1990-1994 DOE and its contractors averaged 3.8 recordable injuries per 200,000 hours, while the Bureau of Labor Statistics reported a national average of 8.6 per 200,000 hours. In the same period, DOE and its contractors reported an average annual fatality rate of 3.9 per 100,000 worker-years, while the national average was 8.3 per 100,000 worker-years. Letter, C. Paul Robinson to Dr. John F. Ahearne, August 9, 1995.
100. In addition, no currently existing regulatory authority addresses the full range of potential hazards for all workers at DOE facilities. Gaps exist in both NRC and OSHA regulations of hazards as applied to DOE operations. For example, application of the OSHA hazardous waste standard to certain DOE waste handling operations is uncertain, and NRC regulations, which in any case only address radiological hazards, do not cover plutonium operations unique to weapons. There also are gaps in the OSHA coverage of State and local government employees (e.g., State university employees at out-of-state contractor operations).
101. Dear, Joseph A., Assistant Secretary of Labor for Occupational Safety and Health, transcript, p. 475ff., meeting of the Advisory Committee on External Regulation of DOE Nuclear Safety, Santa Fe, New Mexico, July 28, 1995. See also endnotes 75 and 76.
102. The WIPP program.
103. Unlike CERCLA, RCRA does not cover radioactive wastes. This is because the definition of solid waste under RCRA does not include sources, special nuclear, and byproduct materials regulated under the AEA (42 U.S.C. 6903(27)).
104. A more detailed exploration of these national security issues is contained in Appendix E.
105. 49 CFR 173.7(b) (1995).
106. DOE 5610.11, Chapter 1 "Nuclear Explosive Safety," October 10, 1990.
107. DOE 472.1 "Personnel Security Activities," September 25, 1995.
108. See, e.g. CERCLA, 42 U.S.C. 9620(j) and FWPCA, 33 U.S.C. 1323(a).
109. According to this theory a dispute between two agencies of the Executive Branch does not amount to a "case or controversy" within the meaning of the Constitution's Article III, and judicial resolution of such a dispute would violate the separation of powers doctrine.
110. Before the administrative order becomes final, the agency must have the opportunity to confer with the EPA Administrator.
111. 42 U.S.C. 2140.
112. 10 CFR 150.10
113. 42 U.S.C. 2271; 10 CFR 2.206.
114. For example, failing to establish a regulation within a statutorily-prescribed deadline.
115. First, regulation of nuclear facility safety and similar areas (e.g., air transport by the FAA), as well as worker safety, currently is not subject to citizens' suit provisions in the private sector; second, the development of the technical basis for regulatory decisions is reserved to the regulator in these complex areas, and judicial review should not involve re-establishing that data; and third, protection of the public from environmental releases, residual contamination, and waste management is already addressed through citizens' suit provisions in the environmental statutes.
116. Dear, Joseph A., Assistant Secretary of Labor for Occupational Safety and Health, transcript, p. 498-504, 519-520, meeting of the Advisory Committee on External Regulation of DOE Nuclear Safety, Santa Fe, New Mexico, July 28, 1995. For example, there are currently two thousand inspectors carrying out the OSHA mission of assuring occupational health and safety at six million workplaces employing ninety-two million workers. OSHA could not effectively assume the additional regulatory authority over DOE under its current funding and staffing levels, and significant additional resources would be required.
117. Hugh Thompson, Jr., (NRC) to Thomas Isaacs (DOE), October 10, 1995, and October 20, 1995.
118. The concept of unified environmental legislation has been under examination for some time, and EPA currently has a Task Force on Integrated Legislation. See *Setting Priorities, Getting Results: A New Direction for the Environmental Protection Agency*, Report to Congress, National Academy of Public Administration, April 1995. For earlier work, see *The Environmental Protection Act, Second Draft*, Terry Davis, The Conservation Foundation (World Wildlife Fund), Washington DC, September 1988. Also see Grumbly, Thomas P., transcript p. 106, Meeting of the Advisory Committee on External Regulation of DOE Nuclear Facilities, Naperville, Illinois, June 6, 1995.
119. There are some cases where, as in the private sector, the assignments of regulatory responsibility may not always be obvious: e.g., for specialized contractors, such as industrial radiographers or well loggers, to the facility regulator or to the state, as appropriate; or for visitors, usually to the regulator of workers, but possibly to the facility regulator. In some unusual cases the assignment will be clear; (e.g., for exposure of patients for medical purposes, to qualified medical practitioners, but regulation of the sources of that exposure, to the facility regulator.)
120. Currently, the active defense facilities include the Pantex Plant (Amarillo, TX), Kansas City Plant (Kansas City, MO), Y-12 Plant (Oak Ridge, TN), Savannah River Plant Tritium Operations (Aiken, SC), Nevada Test Site (NV), Los Alamos National Laboratory (Los Alamos, NM), Sandia National Laboratory (Albuquerque, NM and Livermore, CA), and Lawrence Livermore National Laboratory (Livermore, CA).
121. See 60 *Federal Register* 39463, August 2, 1995.

122. OSHA has expressed the view that legislation would be needed to authorize OSHA and the facility safety regulator to enter into an memorandum of understanding that says which facilities OSHA would regulate and which the facility regulator would regulate. It should be noted, however, that OSHA and NRC have already concluded an MOU on similar matters regarding jurisdiction at NRC licensees.
123. Even after such legislation, some employees at DOE facilities might still not be covered by OSHA or an OSHA-approved State plan. These would include State employees working in a State that does not operate an OSHA-approved State plan, and employees of one State who work in another. Legislation would be needed to give OSHA jurisdiction over these employees.
124. U.S. DOE and U.S. EPA, Policy on Decommissioning Department of Energy Facilities under CERCLA, May 22, 1995.
125. With respect to our recommendation that safety matters that arise under RCRA in a facility be the responsibility of the facility safety regulator, it should be noted that in most States RCRA matters are handled under authorized State programs, not by federal regulators and that there is no reason to change this under the regulatory scheme we propose. In particular, none of the 28 mixed waste treatment plans under the Federal Facilities Compliance Act of 1992 should be affected. Responsibility for the one plan approved by EPA should pass to the facility safety regulator.
126. Secretary of Energy Hazel R. O'Leary, *Saving Dollars and Making Sense – Strategic Alignment and Downsizing*, May 1995; Strategic Realignment Initiative Bulletin Special Edition, March 2, 1995, and additional bulletins, including Environment, Safety and Health Activities, Control No. ST-4, draft, May 1, 1995.
127. Lead agency agreements are currently in the process of being finalized among DOE, EPA, and the States at the Rocky Flats and Hanford sites. *Agreement in Principle from the Rocky Flats Workout [session]*, DOE, EPA, State of Colorado (October 10-11, 1995); *Tentative Agreement on Amendment 6 to the Tri-Party Agreement*, DOE, EPA, Washington Department of Ecology (November 1995).
128. Although NRC does not license all contractors, it has authority to enforce against deliberate misconduct by unlicensed persons, including contractors (see, e.g., 10 CFR 50.5).
129. 42 U.S.C. 2297.
130. NRC cannot collect any fee from a Federally owned research reactor used primarily for educational training and academic research purposes.
131. See, e.g., RCRA 42 U.S.C. 6927(c) and CAA 42 U.S.C. 7418(a).
132. Holt, Mark, op. cit., (endnote 14).
133. Among the issues to be considered in drafting any legislation giving NRC authority to regulate the DOE National Laboratories is the following: Under section 170A of the Atomic Energy Act, NRC is barred from contracting with organizations which cannot be free of conflicts of interest in doing work for NRC. The agency often calls on the DOE National Laboratories to do research in support of the agency's mission. If the agency were to regulate facility safety and some worker protection at the labs, a lab could face a conflict of interest if it were to do research for the agency. The substantive difficulty is not unique to NRC, for other regulators must sometimes rely on assistance from organizations that could face a conflict of interest in providing the assistance. However, as far as we know, only NRC faces a statutory bar tailored to it alone. NRC has raised this issue in testimony before Congress. We do not undertake to resolve it here.
134. Letter from Shirley Ann Jackson to Andrew Kadak, November 22, 1995.
135. Correspondence from John T. Conway to Tara O'Toole, June 30, 1995; Tara O'Toole to John T. Conway, July 21, 1995; and John T. Conway to Tara O'Toole, August 1, 1995. See Transcript, p. 347, Meeting of the Advisory Committee on External Requestor of DOE Nuclear Safety, November 28, 1995, Dallas, Texas.
136. We are assuming that all the models, including audited self-regulation, provide for enforcement by the external regulators.
137. We note in particular that DOE recently promulgated occupational radiation protection rules that parallel those applied in the private sector.
138. Testimony of Tara O'Toole, Assistant Secretary for Environment, Safety and Health, U.S. Department of Energy, before the Subcommittee on Energy and Water, House Committee on Appropriations, March 8, 1995; *Spent Fuel Working Group Report*, U. S. Department of Energy, November 1993; *Chemical Safety Vulnerability Working Group Report*, U.S. Department of Energy, September 1994 (DOE/EH 396P); *Plutonium Working Group Report on Environmental, Safety and Health Vulnerabilities Associated with the Department's Plutonium Storage*, U.S. Department of Energy, November 1994.
139. Specific isotopes of concern include plutonium, curium, actinium, neptunium, and californium. Although others groups outside DOE work with some of these, they use extremely small quantities under laboratory conditions which present a small hazard. DOE is the sole manufacturer of californium in the U.S., and has tons of plutonium and extensive contamination of soil, facilities and equipment that present hazards to workers. (J. Newell Stannard, *Radioactivity and Health: A History of the Department of Energy*, DOE/RL/01830-T59, October 1988. Office of Technology Assessment, *Complex Cleanup: The Environmental Legacy of Nuclear Weapons Production*, OTA-O-484, February 1991.)
140. See endnote 116.

**Additional Views of
Committee Members**

ADDITIONAL VIEWS OF JOSEPH J. DINUNNO

RELATIVE TO THE REPORT OF THE ADVISORY COMMITTEE ON EXTERNAL REGULATION

I recognize the difficulty of achieving consensus on all aspects of a report of such detail, given the diversity of backgrounds and interest of Committee membership. However, I find so much of that detail at variance with my own views that I cannot endorse the report as a whole. I do endorse a number of the principal conclusions and observations.

A. With respect to the report in general:

1. The report in too many places, in my view, shows lack of factual rigor, impartiality, and objectivity that should obtain for a report of this importance.
 - a. The report too often makes claims and assertions that are judgement calls, representing viewpoints of either individuals or segments of the Committee, but not necessarily the Committee as a whole.
 - b. Where the report summarizes factual information and published critiques of the Department of Energy (DOE) and predecessor agencies by impartial entities, it is quite useful and informative. The report also identifies well major issues that must be examined by the Administration and Congress, if they elect to pursue the matter of increased external regulation as the Committee recommends. However, the multiplicity of detailed solutions offered as recommendations is another matter. They reflect too often the aspirations of special interest groups. The detailed meeting records (transcripts) of the spirited exchanges that took place at the Committee's public, plenary sessions attest to considerable differences in views on so-called detailed recommendations which are offered in the report as Committee consensus.
2. The report targets the statutory authority given to DOE and its predecessor agencies to establish requirements for assuring radiation protection and then implementing them (self-regulation) as the major source of difficulty. The assertion is that such authority allowed mission objectives to be given greater priority than protection of the environment, and that such authority led to environmental degradation, now the subject of costly cleanup and environmental restoration efforts. That, historically, there was substantial environmental contamination of sites and production facilities, is indisputable. However, the report labors hard to make this case as the rationale for advocating external regulation, implying that only such a measure will assure that DOE in the future would be more constrained from perpetrating environmental

damage than in the past. In evaluating this premise, I believe it important to bear in mind the following:

- a. DOE is subject today to many more statutory environmental requirements than in the pre-1980 period in which most of the conditions requiring remedial actions were created. The DOE mission today and the way it is constrained in its operations are far different from the pre-1980's DOE. The report should be read with the understanding that what the Committee really addressed was not so much whether there is to be external regulation, but rather whether there is to be MORE external regulation.
- b. Much of the fix sought by elimination of all vestiges of self-regulation by DOE has already been accomplished by environmental protection statutes. For a large fraction of the current DOE mission (cleanup and environmental restoration), problems identified do not stem from lack of regulation but perhaps from too many regulators in overlapping roles. A large fraction of DOE's program today falls into this regulatory arena. More external regulation will further complex not simplify this problem.
- c. The Committee's deliberations on external regulation centered much upon nuclear materials and their regulation under existing provisions of the Atomic Energy Act (AEA) and the Resource Conservation and Recovery Act (RCRA). Since such special materials are crucial to the sustenance of the weapons program, external regulation of their uses raises substantive issues involving and potentially affecting national security.

B. With respect to principal conclusions and observations:

Notwithstanding the above observations, there are concepts and conclusions presented in the report that I do endorse, some fully and others with qualifications. Those I wish to highlight with commentary are the following:

1. **Agree:** There is no longer any reason, in principle, to allow DOE to continue to self-regulate its nuclear activities, with the exception of certain aspects of defense nuclear facilities still required to support the weapons surveillance and stewardship program.

However: The added costs may provide a compelling reason for not so proceeding. The cost penalty to achieve change will be a function of the specifics of any external regulatory regime put in place. The value-added from additional regulation relative to the costs still remains to be established. I recognize that the Committee did not have the time or resources to analyze the costs relative to benefits of the regulatory schemes suggested in the report. However, the report has taken the position that costs for the legal changes recommended will be justified by increased safety and operating efficiencies. Such assertions without substantive supportable facts are particularly vulnerable to scepticism, and discredit. It is critical in this

era of Federal budget austerity to be able to demonstrate that additional regulatory schemes will generate the projected benefits in terms of increased safety of the worker and the public and do so at costs justifiable by those benefits.

Regulatory processes, including public participation opportunities such as those provided for cleanup under environmental statutes, may have to be limited for security reasons in regulation of the residual defense nuclear complex and for cleanup programs requiring expedited action. In my view some of the changes offered as recommendations in the report are likely to lead to more, not less, administrative proceedings and litigation of issues in the courts. Such implications deserve much more scrutiny than was possible within the time and resource constraints of this study.

In establishing the Defense Nuclear Facilities Safety Board (DNFSB), Congress determined that DOE defense nuclear facilities should be subject to independent, external oversight. Some form of external oversight should be retained for aspects of defense nuclear facilities not subjected to such external regulatory processes as might be decided for non-defense nuclear activities.

2. **Agree:** External regulation offers the potential for enhanced public credibility and greater stability in the framework and execution of DOE's safety management program.

However: Although increased public confidence and assurance may result, claims for significant increase in safety over a well-executed internal ES&H program with DNFSB oversight are not supported.

3. **Agree:** Both the DNFSB and the NRC are existing agencies whose current activities make them lead candidates for assuming such additional external regulatory functions the Congress may decide to authorize. Neither agency, as currently authorized and organized, is viewed to be totally suitable to administer to the perceived future needs for external regulation of the DOE.

However: The record of the Committee's deliberations has shown a strong bias by the drafters towards regulation by the Nuclear Regulatory Commission (NRC). The final report still shows some evidence to that effect although better balance has been achieved.

The single new agency concept discussed in the report represents an ideal against which possibilities for restructuring existing agencies might well be measured. The weighing of pros and cons of restructuring using either the Board or the NRC, should in my view, focus on the relative complexities of bringing one or the other closer to that ideal. On this choice, Committee members could not come to closure. My own views are that it is preferable to add to the functions and resources of the Board, a small agency, more readily adaptable and already dedicated to independent external oversight of the most hazardous of DOE nuclear programs

than to divert the focus of the NRC now dedicated to regulation of the commercial industry. On this, reasonable persons might well disagree.

4. **Agree:** In moving to external regulation as a better way for assuring that basic ES&H objectives are achieved, the fulfillment of the nation's national security mission is not to be thwarted or unduly impeded. This is presented as the general sense of the Committee.

However: The fulfillment of this objective could be significantly affected by report recommendations for specific language changes to existing provisions of both the AEA and the RCRA. I do not endorse such recommendations. The implications of such changes deserve much more scrutiny than the Committee was able to provide, not only for their effects upon DOE's nuclear activities but also upon the commercial industry as well. These statutory changes include:

- Altering the basic safety mandate of the Atomic Energy Act (page 38);
 - Permitting state regulation of nuclear facility safety, using standards inconsistent with Federal standards (page 41); and
 - Provision for citizen suits directly against DOE and its contractors in addition to new layers of Federal regulation of DOE (Page 49).
5. **Agree:** DOE's efforts to strengthen its internal system must continue, and any transition to increase external regulation must be carefully thought out and managed. The report underscores the need for an effective internal health and safety system and urges the Department to continue efforts already underway to clarify and strengthen that system.
 6. **Agree:** Flexibility is a key attribute needed in any regulatory regime devised by an external regulator to deal with the diversity of activities and facilities that make up the DOE complex.

However: Although this attribute is recognized in the report as essential, so much of the detail presented as recommendations would deny such flexibility. (See commentary under 4. above.)

ADDITIONAL VIEWS OF MARK GRIFFON AND JAMES MELIUS

COMMENTS TO FINAL REPORT "IMPROVING EXTERNAL REGULATION OF SAFETY AT DOE NUCLEAR FACILITIES", DECEMBER 1995

We believe that adequate time was not provided to explore and resolve several issues including: the proper configuration of external regulators with respect to worker health and safety (i.e., DNFSB vs. NRC) and whether external regulation should proceed if OSHA does not receive the necessary funding for regulating worker health and safety. For this reason, the following opinion is offered as clarification of the issue of external regulation of worker health and safety at the DOE sites.

Although we strongly support the recommendation for external regulation of occupational safety and health at Department of Energy facilities and for a predominant role for OSHA in that regulation and enforcement, we have serious concerns about the capability of OSHA, and state OSHA programs, to carry out that role without adequate resources. It is noteworthy that OSHA admits that it does not have the resources to adequately enforce their regulations in those workplaces already under their jurisdiction in the United States. Most workplaces are never inspected, and even in workplaces considered to be at higher risk, the interval between general inspections is measured in years or decades. These limitations partially account for the continued high incidence of occupational injuries and illnesses in this country.

Although the report recommends that adequate resources be provided to OSHA, including new authority for assessing fees to cover the cost of regulating DOE facilities, we are concerned that such funding will not be forthcoming. This combined with a reduced capability for DOE to self regulate could place workers at these facilities and the general public at even greater risk than under the current system. Therefore, the success, indeed the desirability, of an external regulatory regime hinges on sufficient funding for OSHA.

In the absence of a sufficient number of inspectors to provide seamless oversight at DOE sites, it is essential that workers and their elected representatives be given a strong role to ensure that adequate occupational safety and health programs are functioning at DOE facilities. Moreover, the complexity and unique hazards at the DOE facilities require that employees and their elected representatives must be given adequate authority to ensure their role in the development and enforcement of these programs. That authority should include the power to suspend unsafe operations until an inspector arrives and takes action, as well as the ability to enforce occupational safety and health regulations through private litigation when government is unwilling or unable to act. This approach is analogous to citizen suit provisions contained within almost every environmental law.

ADDITIONAL VIEWS OF ANDREW C. KADAK

As in any undertaking of this sort, particularly in a committee environment in which diverse views are represented, a final report almost certainly will contain some statements and recommendations with which not all committee members can agree. While on the whole I support many of the findings and recommendations, there are several to which I take significant exception.

The first, and most significant, is the implied recommendation that the Atomic Energy Act be amended to eliminate authority of the standard-setting agency to set standards as it "may deem necessary or desirable to protect health or to minimize danger to life or property" and replace this authority with a non-discretionary standard to "minimize danger to life and property." Although the text suggests that this does not mean zero risk standard, it is clear that this standard, when coupled with the more expansive citizen suit provisions also proposed, will result in regulatory gridlock that only the courts will be able to resolve.

The report makes great claims about how well the NRC has regulated the commercial nuclear power industry with the discretionary authority granted to it by the Atomic Energy Act. Thus, I see no compelling reason to change it. There is a lengthy legal record upon which NRC actions have been based using AEA as presently constructed. Replacing this standard, which has been proven effective, imposes more uncertainty in an already uncertain shift to external regulation of DOE facilities and it is not recommended.

The second significant concern relates to the recommendation that states be given authority to regulate facility safety and to enact more stringent standards than existing federal standards "as long as these do not unduly hinder a DOE mission." The "unduly hinder a DOE mission" standard is unspecific and, coupled with expanded citizen suit provisions, will yield yet another round of legal confrontations, delaying cleanup and raising costs. Clearly, a stricter standard can always be imposed and usually such a standard can eventually be met. However, the usual consequence is that the cost, which the American taxpayer will have to pay, is greater. I would prefer a standard that places the burden upon the state to defend why a stricter standard is necessary to address local conditions rather than giving the states the unilateral right to impose whatever standard they might deem appropriate. If we are not careful, the U.S. Government, and ultimately the taxpayer, will end up paying for cleanup to 50 different standards imposed by each state. As can be seen, this approach can quickly become unworkable.

The third concern relates to the apparently fundamental belief that the only way to achieve responsible and accountable regulation is with citizen suits. The distrust of the regulatory agencies established by Congress is so high that some feel that the only way to assure compliance is through such suits. In my judgement, if regulators are not doing

their job, Congress needs to hold them accountable directly. While, in principle, citizen suits are an appealing court of last resort, they can also be misused, used for delay and to implement agendas of special interest groups. Stringent standards and criteria need to be applied to prevent such misuse.

During the course of my work on DOE's Advisory Committee on External Regulation, I have become convinced of the need for some sort of external regulation to provide clarity, stability, and a set of clear expectations for the staff, managers, and contractors of DOE facilities. An external regulatory body also provides the necessary accountability through a meaningful enforcement policy that has at its heart the encouragement of compliance.

When I first started on the committee, I felt that an improved internal regulatory approach would be more timely and possibly effective due to the unique nature of the problems of the DOE complex and its new mission of cleanup in addition to maintaining the safety of its existing facilities. I have modified my views during the course of our deliberations due largely to the significant management and culture changes that would have to be instituted at DOE before such an internal system would work. I believe that the external regulatory system would be the force that creates the needed management changes at DOE.

The Committee evaluated several options for the external regulatory approach, but could not reach a consensus on which option to select. The two finalists, the Nuclear Regulatory Commission and the Defense Nuclear Facilities Safety Board, each brought certain strengths and weaknesses to the desired regulatory framework. The Committee did recommend a lead agency concept to avoid the regulatory overlap that was recognized as a major impediment to successful progress on cleanup activities.

A completely new single agency, which was to handle all the external regulatory obligations including worker safety, nuclear safety, and environmental protection, was widely praised but rejected because of its political difficulty. This new agency concept would have taken the best of all the regulatory approaches, harmonized risk standards for worker, public, and environmental protection, and allowed for meaningful state and public participation. This agency would have had to evaluate all present statutes that were individually passed by Congress to address specific issues and to determine how subsequent implementing regulations fit together to establish a set of standards that prioritize risks and make sure that we are getting the best of the standards to protect public health and safety. This new agency would have assumed the responsibilities of EPA, OSHA, NRC, and the Defense Board while applying standards that are performance-based and risk-informed.

The unique value of this approach would have been that this new agency would be a model which, if it worked, could be used to regulate other commercial industries in a much more effective way. This would put into one place a set of regulations that can be evaluated holistically for their effectiveness and benefit. The reason this approach makes sense for the defense establishment is that it has unique problems not found in the commercial sector that need to be addressed on a timely and cost effective basis.

The enormous cost projected for the cleanup and stabilization of DOE waste tanks, spent fuel pools and weapons grade materials demands a much more effective regulatory approach than simply laying DOE off on existing regulatory agencies and hoping for the best. Business as usual can no longer be afforded by Congress and the American people. The environmental and worker risks posed by these facilities are real and must be dealt with in the same way as the United States dealt with the military threat in World War II when the Manhattan Project was established. We need a similarly focused Manhattan Project type effort to safely store and cleanup the residues of the nuclear weapons program. A new regulatory agency dedicated to this purpose would be most efficient and effective despite the additional time required to put such an agency together. Given the long-term nature of the cleanup and the huge costs involved, this effort is surely worth making.

The bottom line is what is this cleanup going to cost the American taxpayer? Projections indicate that this number is \$230 billion. No one really knows. It is incumbent upon Congress to establish a regulatory regime that maximizes performance and minimizes bureaucratic obstacles to action. Although the recommendations of the Committee move in that direction, I believe we have missed a unique opportunity to leap-frog the status quo in terms of how we as a nation must deal more effectively in protecting the public, the worker, and the environment.

ADDITIONAL VIEWS OF MICHAEL H. MOBLEY

A DIFFERENT CONCLUSION

The Committee's activities, as well as others, have clearly identified the desire, need, and utility of external regulation for the activities of the Department of Energy (DOE) that involve radiation. Because of the digression from "nuclear safety" issues, the Committee did not have ample time to fully understand how users of sources of radiation are regulated in the private sector.

The Nuclear Regulatory Commission (NRC), Food and Drug Administration (FDA), and Environmental Protection Agency (EPA) have worked with the states to develop a comprehensive approach to managing all aspects of the hazards from all sources of ionizing radiation. This approach is an important concept that provides workers, patients, the public, and the environment protection from exposure to sources of radiation within a seamless regulatory umbrella. There are no gaps (except for the federal exclusion) such as those that exist for chemical and biological contaminants when they transition from a work place to the environment, or within the environment to different media. There are no gaps between the hazard of a material as a product, air emission, or a waste. All aspects of any potential exposure to radiation are addressed by the radiation regulator.

The concept of "facility safety, worker safety, and environmental safety" actually provides a new and very different scheme of implementation that will create more confusion and require numerous new mechanisms for implementation, guidance, etc. The simplest and easiest method to regulate the radiation activities of the DOE is to allow the NRC, FDA, EPA, and the state radiation control programs to regulate these facilities along the same lines of jurisdiction with which they regulate private industry. Those lines are well established, understood by all involved parties, with developed guidance, coordination, and communications in place.

The mechanism to effect this is a "relatively" simple change to the Atomic Energy Act (AEA) removing the exemption of the DOE to the regulation of the NRC and a more significant change, but one supported by Congress in the RCRA Federal Facilities Compliance Act. This significant change would waive sovereign immunity for federal facilities for those activities/sources of radiation regulated by states. An added benefit to this would be to allow NRC Agreement States to take responsibility for federal facilities in their jurisdiction. This would reduce NRC's costs and burden for its current programs and for some of the DOE activities it would be picking up. Similarly, existing arrangements between FDA (radiation machine regulation), EPA, and the state radiation control program would also remain as is. OSHA would regulate those worker safety issues for which it has standards and expertise, also as it currently does.

This mechanism preserves all the existing arrangements, precedents, guidance, relations (formal and informal) that exist in the regulation of sources of radiation in the private

arena and that have provided an extraordinarily high level of protection in the private sector for this dangerous, but useful, societal tool. Draft legislation is available that accomplishes this.

The transition issues, increased public involvement, and citizen suits need to be appropriately factored into the legislation.

It is extraordinarily important to understand the added complexity of establishing something that is different from the existing program (complex as it is) that provides protection from the hazards of radiation in the private sector. The transition would be difficult enough in an arena with the existing understandings. It may well be overwhelming in any other setting.

Regulate DOE as All Other Users of Sources of Radiation Are Regulated.

- Require that DOE facilities transition to regulation by the Nuclear Regulatory Commission/Agreement States (NRC/AS) for all their Atomic Energy Act (AEA) radioactive material.
 1. Reactors, Special Nuclear Material facilities regulated by NRC.
 2. In Agreement States, all other AEA radioactive material would be regulated by Agreement State program.
- Require that DOE facilities transition to regulation of all their other radiation sources by the states.
 1. Non-AEA radioactive material
 - a. Naturally Occurring Radioactive Material
 - b. Accelerator Produced Radioactive Material
 2. Radiation Machines
 - a. X-ray Machines
 - b. Accelerators
- The decontamination and decommissioning of all active operational areas would be addressed as part of the NRC/AS regulatory process as it is in the private sector.
- The cleanup of all past disposals, waste ponds, and areas of environmental contamination would be done by EPA under the Comprehensive Environmental Compensation Response and Liability Act (CERCLA) with an emphasis on assuring proper radiation protection for workers, control of radioactive material, and disposal of radioactive material.

ADDITIONAL VIEWS OF TROY E. WADE II

ADDITIONAL COMMENTS ON THE FINAL REPORT OF THE ADVISORY COMMITTEE ON EXTERNAL REGULATION OF DOE NUCLEAR SAFETY

My comments...should clearly be viewed as "additional comments" as opposed to a "dissenting opinion."

One of the goals, in my mind, as this Committee began its activities nine months ago was to create a record. I believe that has been done in a manner never ever achieved before, and that the decision-makers now have a credible data set to use as they make the decisions in the up-coming months about the future of the DOE and how it should be regulated. I have tried to insist that the common goal, to genuinely improve safety, be a clear thread through the deliberations of the Committee and be reflected in the final report, and that "risk" be a major component of any decision affecting safety or the regulation of safety. By and large the report does that, and so my participation has been worthwhile to me in that I believe objectives that protect the national interests are appropriately articulated.

There are two areas, however, that I would have wished resulted in much stronger language in the recommendations. My comments will address those two areas:

Lead Agency Concept

One of the most severe problems facing the DOE and Contractor Managers at field locations is the plethora of regulators and regulations. The Committee saw evidence at many places that conflicting regulations drove up costs and drove down commitment to comply. For example, at the Hanford Site, the Committee was briefed on the complexities of having the tanks regulated by one entity and the adjacent "cribs" regulated by another, both facilities presenting similar risks to the public, but being treated by the regulators in very different ways. If the regulation of nuclear facilities and activities is to have any increased safety and reduced cost, it can only happen if a single "risk" is identified and the most appropriate "regulator" assigned as having lead authority. It is not clear to me that, without legislation, all of the current regulators can come to a common agreement on the "lead", so I strongly suggest that implementing legislation contain a provision that designates, as a matter of law, the regulator of DOE having arbitration and assignment authority over other regulators, such as State agencies, the EPA, NRC, OSHA, etc. This designation would not adversely influence the participation of the public or of other stakeholders, but would enhance the ability to get the right work done, from a risk point of view, at the most reasonable price.

Maintaining a Strong Internal Safety Management System

No outside regulator will have maximum effect on assuring enhanced safety unless the DOE gets its own management house in order. There must be very clear understanding that the responsibility for safety is a line responsibility, and the layers of oversight must be combined and reduced such that the "line" can do the job it must. At the same time, DOE headquarters must maintain a strong organization that provides both cognizance over existing line safety initiatives, as well as the ability to influence budget decisions that may affect safety. In the past, some have alleged that program officials at DOE Headquarters have made decisions that adversely affected safety because of budget pressures. To prevent that from happening, DOE internal orders should establish a mechanism by which the senior staff safety officer, presumably the Assistant Secretary for Environment, Safety and Health would have access to field generated input to the program offices in areas that could affect public safety. This would allow that Official to make independent judgements about the potential health and safety benefits of not building a building, or not ordering new filters, etc, etc. If any step of the internal budget process, to include reviews by OMB, has resulted in budget cuts that could potentially effect true safety, the designated safety officer would have both the position and the influence to affect final disposition of those decisions.

Genuine desire for increased or enhanced safety, at an affordable price based on the calculated risk, is a goal we all have. I believe the Committee strived to meet that goal, and inclusion of the above considerations during legislative deliberations would indeed strengthen the determination to proceed along those lines. Worker safety and public safety have always been goals of the DOE. It is therefore appropriate to make the changes necessary to apply today's political and philosophical yardsticks in a manner that meet both the safety and prudent investment goals.

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