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# DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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August 1, 1996

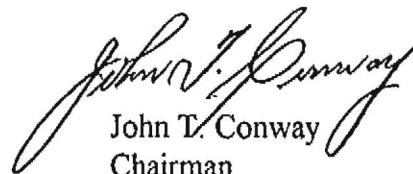
The Honorable Hazel R. O'Leary  
Secretary of Energy  
1000 Independence Avenue, SW  
Washington, DC 20585-1000

Dear Secretary O'Leary:

Enclosed for your consideration are two documents just issued by the Defense Nuclear Facilities Safety Board (Board) related to safety oversight of decommissioning activities at Department of Energy (DOE) defense nuclear facilities: Board Policy Statement No. 3, entitled "Policy Statement on Board Oversight of Department of Energy Decommissioning Activities at Defense Nuclear Facilities" and a Board technical report, DNFSB/TECH-12, "Regulation and Oversight of Decommissioning Activities at Department of Energy Defense Nuclear Facilities." Together, these documents examine the various definitions of decommissioning in use by nuclear organizations, delineate the Board's oversight responsibilities for decommissioning activities at defense nuclear facilities, and review the roles of federal and state regulators for aspects of decommissioning, including environmental cleanup and final restoration.

The Board believes these documents are important because they provide structure and guidance for continuing Board safety oversight of the decommissioning phase, which encompasses an expanding number of activities throughout the defense nuclear complex. As DOE's mission continues to evolve, and an emphasis is placed on decommissioning, waste processing, and environmental restoration, it becomes increasingly important that the Board and other federal and state regulators cooperate to provide a smooth transition from oversight of Atomic Energy Act nuclear materials to regulation of environmental restoration and cleanup. DNFSB/TECH-12 outlines the principles for cooperation and efficient, nonduplicative, oversight and regulation of decommissioning activities. These principles were incorporated in the 1996 Memorandum of Understanding entered into by DOE, the Board, the United States Environmental Protection Agency, and the State of Colorado for decommissioning activities at the Rocky Flats Environmental Technology Site, near Denver, Colorado. As recently acknowledged by the Senate Armed Services Committee, similar arrangements could result in efficient and effective oversight and regulation of the decommissioning phase at other defense nuclear facilities throughout the complex.

Sincerely,

  
John T. Conway  
Chairman

Enclosures

c: Mr. Mark B. Whitaker, Jr.

# Defense Nuclear Facilities Safety Board

Washington, D.C. 20004

## Policy Statement

PS-3

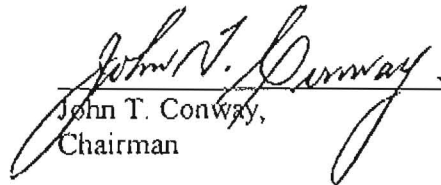
Date: August 19, 1996

### Subject

Policy Statement on Board oversight of Department of Energy decommissioning activities at defense nuclear facilities.

### Summary

This policy statement describes the decommissioning phase of a DOE defense nuclear facility and identifies the Board's safety oversight responsibilities for decommissioning activities.



John T. Conway,  
Chairman

Congress directed the Defense Nuclear Facilities Safety Board (Board) to oversee Department of Energy (DOE) practices at defense nuclear facilities that could adversely affect public health and safety during any stage in the life cycle of those facilities, from design, construction, and operation through decommissioning. The Board's objective during decommissioning is identical to its objective during any other phase of a facility's life cycle: to ensure that DOE provides adequate protection of worker and public health and safety at defense nuclear facilities. Congress specifically tasked the Board with reviewing and evaluating:

*the content and implementation of the standards relating to the design, construction, operation, and decommissioning of defense nuclear facilities of the Department of Energy (including all applicable Department of Energy orders, regulations, and requirements) at each Department of Energy defense nuclear facility. The Board shall recommend to the Secretary of Energy those specific measures that should be adopted to ensure that public health and safety are adequately protected. 42 U.S.C. § 2286a(a)(1) (emphasis added).*

Thus, the Board's principal oversight function during the decommissioning phase of a facility is to ensure that appropriate nuclear safety rules, orders, and procedures are developed by DOE and then put in practice while the facility is being taken out of service.

An unambiguous definition of "decommissioning" is essential to understanding the Board's responsibilities for safety oversight during this phase, and to establishing effective cooperation and/or processes for transition to external regulation by federal and state agencies having statutory responsibilities for final cleanup and site restoration activities that the term decommissioning also encompasses. As used in the Board's enabling statute, decommissioning is a broad term that encompasses activities leading up to environmental restoration, including deactivation, decontamination, final process runs, removal of special nuclear material, residues, and wastes, and other activities necessary to ensure adequate protection of public health and safety. Under the Atomic Energy Act (AEA), decommissioning begins when operation ceases, and ends when source material, byproduct material, and special nuclear material ("AEA materials"), as well as radioactive materials related to the defense mission, such as tritium, have been adequately removed from a facility. When completed properly, these actions taken to remove radioactive materials obviate the need for continued Board oversight to ensure adequate protection of worker or public health and safety from radiological hazards.

This definition of decommissioning is broader than that currently used administratively by DOE. DOE segments the period following operation into a deactivation phase and a decommissioning phase. The DOE Office of Environmental Management separates the deactivation phase from other functions commonly associated with operations, and defines it as:

The process of placing a facility in a safe and stable condition to minimize the long-term cost of a surveillance and maintenance program that is protective of workers, the public, and the environment until decommissioning is complete. Actions include the removal of fuel, draining and/or de-energizing of nonessential systems, removal of stored radioactive and hazardous materials and related actions. As the bridge between

operations and decommissioning, based upon facility-specific considerations and final disposition plans, deactivation can accomplish operations-like activities such as final process runs, and also decontamination activities aimed at placing the facility in a safe and stable condition. *Decommissioning Resource Manual*, DOE/EM-0246, § 3.3.

DOE distinguishes deactivation from decommissioning activities for administrative purposes including budget determinations and delineation of various responsibilities within DOE. The Board believes that DOE's functional description of what takes place during deactivation is useful, but also recognizes that deactivation is a continuation and completion of the operations which are necessary to accomplish decommissioning. The Board's inclusion of deactivation as a part of decommissioning is consistent with Nuclear Regulatory Commission and International Atomic Energy Agency policies on decommissioning.

DOE defines decommissioning more narrowly as only those activities which take place:

After deactivation and includes surveillance and maintenance, decontamination and/or dismantlement. These actions are taken at the end of life of the facility to retire it from service with adequate regard for the health and safety of workers and the public and protection of the environment. The ultimate goal of decommissioning is unrestricted release or restricted use of the site.

\* \* \* \*

Surveillance and Maintenance is a program established during deactivation and continuing until phased out during decommissioning to provide in a cost effective manner for satisfactory containment of contamination; physical safety and security controls; and maintenance of the facility in a manner that is protective of workers, the public, and the environment. *Id.* § 3.3.

To avoid confusion, the Board refers to surveillance and maintenance which occurs during decommissioning as "decommissioning surveillance and maintenance" to distinguish between the routine surveillance and maintenance activities that occur during normal operations. Nuclear safety organizations generally consider operations to be ended and decommissioning initiated once reactor fuel has been removed from a nuclear reactor; for nonreactor facilities, decommissioning begins with the removal of radioactive process materials.

The Board's interest in decommissioning activities follows the risk to worker or public health and safety from exposure to radioactive materials at or near defense nuclear facilities. DOE's separation of activities into such categories as decontamination, surveillance and maintenance, and demolition may be descriptive and useful to DOE. However, labels or designation applied to the different activities within the decommissioning phase of a facility do not determine the scope of the Board's duties. The Board retains oversight responsibility and interest so long as residual quantities and states of radioactive materials are sufficient to require continued Board oversight in the interests of public and worker safety. Given this condition, the Board will continue to exercise its oversight jurisdiction to ensure that standards applicable to the DOE activity, including DOE safety orders, rules, and other

requirements, are sufficient to provide adequate protection to the worker or public health and safety, and are implemented by DOE and its contractors in accordance with a safety management plan that does, in fact, provide such adequate protection.

The Board's concern for safety at a facility diminishes as radioactive materials are withdrawn and the facility is removed from service. The Board is ready to work with the federal and state regulatory agencies also involved in these decommissioning activities to effect a coordinated, integrated decommissioning effort. Together with this policy statement, the Board is endorsing and issuing Board technical report, DNFSB/TECH-12, prepared by senior staff entitled, "Regulation and Oversight of Decommissioning Activities at Department of Energy Defense Nuclear Facilities." That document elaborates upon the issues discussed in this policy statement and fully describes the type of cooperative arrangement the Board envisions with federal and state regulators.

The Board's oversight responsibility for decommissioning activities focuses primarily on the health and safety aspects of the facility and materials within the facility. To a lesser extent, the Board involves itself with protection of the environment surrounding the facility which is subject to substantial regulation by other agencies. Specifically, the Board is concerned if the immediate environment contains or can be contaminated with radioactive materials from a facility under the Board's jurisdiction, and can possess a sufficient concentration of radionuclides to pose a potential threat to worker and public health and safety. Similarly, the Board is concerned if the environment poses a nonradiological hazard which can cause an undue risk to worker and public health and safety as a result of its proximity to a defense nuclear facility. The Board's environmental interest is greatest if the materials originated with DOE defense nuclear facility activities and exposure to the materials could result in undue harm to workers or the public. The Board's interest is shared with agencies that have regulatory responsibilities where the contaminants result (1) from a release, bringing Comprehensive Emergency Response, Compensation, and Liability Act (CERCLA) or Resource Conservation and Recovery Act (RCRA) requirements into play, along with United States Environmental Protection Agency (EPA) or state regulation of removal and remediation activities, or (2) from activities under a RCRA permit. In such cases, the Board is prepared to work in an advisory or assist role with federal or state agencies having statutory responsibility for forcing corrective or remedial measures.

The Board shares oversight responsibility with regulatory agencies for other facilities containing or contaminated with radioactive materials mixed with RCRA hazardous waste. RCRA mixed waste has two components: a RCRA hazardous waste (which excludes AEA materials) and a radioactive waste. Such facilities are subject to regulation by EPA and state agencies with environmental responsibilities. Treatment, storage, and disposal of the hazardous waste component must meet RCRA requirements and is regulated by the EPA, or the state when authorized by EPA. Treatment, storage, and disposal of the radioactive component must meet AEA requirements and is regulated by DOE subject to Board oversight. Thus, the Board has a primary interest in the radioactive component, but must share its responsibility for oversight of the mixed waste with the regulator of the hazardous component. If the mixed waste is scheduled for treatment and disposal without separating the two components, the treatment and disposal facilities must meet both the hazardous waste laws and those pertaining to radioactive waste.

Board oversight of public health and safety practices at a defense nuclear facility does not end until decommissioning has been completed. However, it does diminish as the inventory of radioactive materials is reduced. This policy statement is designed to provide guidance pertaining to the Board's interpretation of its statutory role in decommissioning activities. The Board will be structuring future Board reviews and oversight of the decommissioning process at defense nuclear facilities accordingly. The policy statement recognizes that the Board shares responsibility for public health, safety, and environmental issues with state agencies and EPA during decommissioning at defense nuclear facilities. In the delineation of the Board's responsibilities and interest, the Board's objective is to facilitate a smooth transition of Board oversight to state and federal regulation as a defense nuclear facility passes through operational and decommissioning phases to state and EPA-regulated final cleanup, demolition, and environmental restoration activities.

**REGULATION AND OVERSIGHT  
OF DECOMMISSIONING ACTIVITIES  
AT DEPARTMENT OF ENERGY  
DEFENSE NUCLEAR FACILITIES**

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**Defense Nuclear Facilities Safety Board**

**Technical Report**



**August 19, 1996**

**REGULATION AND OVERSIGHT  
OF DECOMMISSIONING ACTIVITIES  
AT DEPARTMENT OF ENERGY  
DEFENSE NUCLEAR FACILITIES**

This technical report was prepared for the Defense Nuclear Facilities Safety Board by the following staff members:

Robert M. Andersen  
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August 19, 1996



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## **I. INTRODUCTION**

Congress directed the Defense Nuclear Facilities Safety Board (Board) to oversee Department of Energy (DOE) practices at defense nuclear facilities that could adversely affect public health and safety during any stage in the life cycle of those facilities, from design, construction, and operation through decommissioning.<sup>1</sup> Since the Board was established, the mission of DOE's defense nuclear complex has undergone considerable change. Pursuant to national policy determinations by the President, United States nuclear weapons production has stopped and disassembly of many nuclear weapons in the stockpile has begun. DOE has closed sites engaged in the production of weapons components and has consolidated operations required for stockpile maintenance. In short, DOE's mission has changed from production of special nuclear materials, weapons, and related materials to safe stewardship of existing weapon stockpile materials, activities leading to the decommissioning of surplus or outdated facilities, waste storage, and environmental restoration.

This technical report: (1) reviews the detailed definitions of decommissioning currently in use by nuclear organizations; (2) delineates the Board's statutory oversight role during decommissioning activities at DOE defense nuclear facilities; (3) identifies how the Board's oversight role during decommissioning relates to the regulatory roles played by other federal and state agencies during decommissioning; and (4) outlines possible principles for structuring federal and state cooperation in the regulation and oversight of decommissioning activities.

One of the purposes of this report is to facilitate the application of existing Board recommendations regarding safety standards and safety management plans to DOE decommissioning activities. Another is to assist the Board and its staff in structuring future reviews and oversight of the decommissioning process at defense nuclear facilities. Finally, the Board shares responsibility for public health, safety, and environmental issues at defense nuclear facilities with state agencies and the United States Environmental Protection Agency (EPA). A careful delineation of the Board's responsibilities will facilitate a smooth transition from Board oversight to regulation as defense nuclear facilities pass from operations, deactivation, and decommissioning to state and EPA-regulated cleanup, demolition, and environmental restoration activities.

## **II. FUNDAMENTALS OF DECOMMISSIONING**

Generally speaking, the decommissioning phase consists of those activities undertaken toward the end of the operations phase of a facility's life cycle to prepare the facility and its surrounding environment for transition to final cleanup, environmental restoration, or demolition activities as the facility is retired from service or redirected to other uses.

### **A. Overview of Board Jurisdiction During Decommissioning Phase at Defense Nuclear Facilities**

The Board's objective during decommissioning is identical to its objective during any other phase: ensure that DOE provides adequate protection of worker and public health and safety at

defense nuclear facilities. Congress specifically tasked the Board with reviewing and evaluating “the *content and implementation* of the standards relating to the design, construction, operation, and *decommissioning* of defense nuclear facilities of the Department of Energy.” 42 U.S.C. § 2286a(a)(1) (emphasis added). Such standards include DOE safety orders, regulations, and other requirements at each defense nuclear facility. After these reviews and evaluations are completed, the Board recommends to the Secretary of Energy those specific measures that should be adopted to ensure that public health and safety are adequately protected.<sup>2</sup>

Thus, the Board’s principal oversight function during the decommissioning phase of a facility is to ensure that appropriate nuclear safety rules, orders, and procedures are developed and then put in practice while the facility is being taken out of service. The Board and its staff discharge this responsibility for overseeing the decommissioning phase by reviewing decommissioning plans and schedules, conducting inspections and technical reviews, and by evaluating the development and implementation of hazards analyses, Safety Analysis Reports, Standard/Requirements Identification Documents (S/RIDs), and other essential components of integrated safety management plans tailored to the hazards at each defense nuclear facility. These reviews and evaluations are currently structured to further the implementation of Board Recommendations 90-2, 94-5, and 95-2.

Activities during decommissioning are often different from normal operations. Because cleanup and dismantlement requires that workers be brought into close proximity with nuclear materials, residues, and waste, decommissioning requires heightened vigilance to ensure adequate protection of the workers, especially from radiological hazards. Decommissioning is unique in another way. Operational defense nuclear facilities have a vital national security mission and are the responsibility of the Department of Energy, with external safety oversight provided by the Board in a manner statutorily tailored to accommodate the facilities’ unique mission. During operations, DOE is, for the most part, self-regulated with respect to radioactive materials, subject to Board oversight, and state and federal regulation pursuant to Resource Conservation Recovery Act (RCRA), Clean Air Act, and Clean Water Act in appropriate circumstances. As will be discussed in detail later, as a defense nuclear facility moves toward decommissioning, state and federal agencies with environmental, safety, and health responsibilities assert greater jurisdiction over aspects of systems, waste, and materials at the facility. Therefore, DOE and the Board must provide for a smooth transition from DOE self-regulation and independent Board oversight of nuclear safety during facility operation to eventual external regulation during final environmental restoration.

## **B. Detailed Examination of Various Definitions of Decommissioning**

An examination of the precise definition of “decommissioning” is essential to understanding the Board’s responsibilities during this phase, and to establishing effective processes for transition to external regulation. As used in the Board’s enabling statute, decommissioning is a broad term that encompasses operations and activities leading up to final disposition of the facility and environmental restoration, including deactivation, decontamination, final process runs, removal of special nuclear material, residues, and wastes, and additional steps necessary to ensure adequate protection of public health and safety. Under the Atomic Energy Act (AEA), decommissioning begins when operation

ceases, and ends when source material, byproduct material, and special nuclear material,<sup>3</sup> as well as other radioactive materials related to the defense mission, such as tritium, have been adequately removed from a facility. Removal activities, when completed properly, obviate the need for continued Board oversight to ensure adequate protection of worker or public health and safety from radiological hazards. A fully decommissioned facility loses its status as a defense nuclear facility when it is no longer capable of producing or utilizing special nuclear material, or storing defense nuclear waste, and hence is no longer subject to Board oversight jurisdiction.<sup>4</sup>

This definition of decommissioning is broader than that used administratively by DOE. DOE segments the period following operation into a deactivation phase and a decommissioning phase. The DOE Office of Environmental Management separates the deactivation phase from other functions commonly associated with operations, and defines it as:

The process of placing a facility in a safe and stable condition to minimize the long-term cost of a surveillance and maintenance program that is protective of workers, the public, and the environment until decommissioning is complete. Actions include the removal of fuel, draining and/or de-energizing of nonessential systems, removal of stored radioactive and hazardous materials and related actions. As the bridge between operations and decommissioning, based upon facility-specific considerations and final disposition plans, deactivation can accomplish operations-like activities such as final process runs, and also decontamination activities aimed at placing the facility in a safe and stable condition. *Decommissioning Resource Manual*, DOE/EM-0246, § 3.3.

DOE distinguishes deactivation from decommissioning activities for administrative purposes including budget determinations and delineation of various responsibilities within DOE. The Department's functional description of what takes place during deactivation is useful, but deactivation is also recognized as a continuation and completion of the operations that are necessary to accomplish decommissioning. The Board's inclusion of deactivation as a part of decommissioning is consistent with Nuclear Regulatory Commission and International Atomic Energy Agency policies on decommissioning. See Figure 1. As a practical matter, the Board's jurisdiction and safety responsibility flow smoothly through the various phases following operations, regardless of the label or name applied by DOE to the phases.

DOE defines decommissioning more narrowly as only those activities which take place:

After deactivation and includes surveillance and maintenance, decontamination, and/or dismantlement. These actions are taken at the end of life of the facility to retire it from service with adequate regard for the health and safety of workers and the public and

protection of the environment. The ultimate goal of decommissioning is unrestricted release or restricted use of the site. *Id.* § 3.3.

Nuclear safety organizations generally consider operations to be ended and decommissioning initiated once reactor fuel has been removed from a nuclear reactor; for nonreactor facilities, decommissioning begins with the removal of radioactive process materials. *See* Figure 1.

Surveillance and Maintenance is a program established during deactivation and continuing until phased out during decommissioning to provide in a cost effective manner for satisfactory containment of contamination; physical safety and security controls; and maintenance of the facility in a manner that is protective of workers, the public, and the environment. *Id.* § 3.3.

To avoid confusion, we note that routine surveillance and maintenance, as well as decontamination, are activities conducted for a variety of purposes throughout the life cycle of a facility. We will refer to “decommissioning” surveillance and maintenance or decontamination when we intend to distinguish them from activities that occur during normal operations.

### **III. BOARD JURISDICTION AND SAFETY RESPONSIBILITIES DURING DECOMMISSIONING**

#### **A. Oversight Responsibilities Related to Facilities**

The Board’s safety responsibility for decommissioning activities is linked to the potential hazards to workers or public health and safety from exposure to radioactive materials at or near defense nuclear facilities. DOE’s separation of activities into such categories as decontamination, surveillance and maintenance, and demolition may be descriptive and useful for DOE. However, labels or designation applied to the different activities within the decommissioning phase of a facility do not determine the scope of the Board’s duties. The Board retains oversight responsibility so long as radioactive materials, sufficient to pose a threat to public and worker safety, remain under DOE’s control or jurisdiction at the facility. Private facilities used for production, utilization, or storage of defense-related nuclear materials or waste are similarly subject to Board oversight if those facilities are operated under the control or jurisdiction of the Secretary of Energy.<sup>5</sup> Given either of these conditions, the Board will continue to exercise its oversight jurisdiction to ensure that standards applicable to the DOE activity, including DOE safety orders, rules, and other requirements, are sufficient to provide adequate protection to the worker or public health and safety, and are implemented by DOE and its contractors in accordance with a safety management plan that does, in fact, provide such adequate protection.

## **B. Oversight Responsibilities Related to Area's Surrounding Facilities**

The Board's oversight responsibility for decommissioning activities focuses primarily on the health and safety aspects of the facility and materials within the facility.<sup>6</sup> To some degree, the Board has safety responsibility for the external environment surrounding the facility. Specifically, the Board is concerned if the immediate environment contains or is contaminated with radioactive materials from a facility under the Board's jurisdiction, and possesses a sufficient concentration of radionuclides to pose a potential threat to workers and public health and safety. Similarly, the Board is concerned if the environment poses a nonradiological hazard which can cause an undue risk to workers and public health and safety as a result of its proximity to a defense nuclear facility. An example of the latter is the presence of hazardous nonnuclear material which presents a risk of major explosion, and is located adjacent to a plutonium storage facility. It should be noted that adequately protecting the public and workers from hazards during the decommissioning of buildings/facilities also serves to protect the environment. The chief threat to each is the potential for release of, and exposure to, radioactive or other hazardous materials.

## **C. Detailed Analysis of Decommissioning Activities Subject to Board Oversight**

Potential decommissioning scenarios at DOE defense nuclear facilities can involve special nuclear, source, or byproduct materials (AEA materials), RCRA hazardous waste,<sup>7</sup> or mixtures of radioactive and hazardous wastes. At any given facility, one or more of these materials or wastes may be present, in a number of combinations, quantities, and concentrations, inside facilities or in the environment immediately around the facility. The potential combinations are shown graphically in Figures 2 and 3, which represent the same scenarios in different ways. Figure 2 presents all of the sixteen discrete logical combinations of four types of facilities containing various radioactive and nonradioactive materials with four possible adjacent environments. Figure 3 simplifies the display by surrounding each of the four types of facilities with the four basic types of adjacent environments.

Radioactive materials subject to Board oversight in a decommissioning-phase facility may include stored AEA materials, nonwaste residues in process systems awaiting final processing, stored nuclear waste awaiting final disposition or disposal, and radioactive contamination awaiting cleanup and disposal. Facilities containing only AEA materials are of prime interest to the Board. Assuming no release or threat of release of these materials to the environment as defined under Comprehensive Emergency Response, Compensation, and Liability Act (CERCLA),<sup>8</sup> the Board is the sole oversight agency of DOE's activities at these facilities, pursuant to the AEA. This is shown by the "Buildings/Facilities" upper rows of red boxes<sup>9</sup> labeled 4a, 4b, 4c, and 4d in Figure 2, and the red facility box number 4 in Figure 3, all of which contain only AEA materials.

The Board shares oversight responsibility with regulatory agencies that have responsibilities for facilities containing, or contaminated with, radioactive materials mixed with RCRA hazardous waste. RCRA mixed waste has two components: a RCRA hazardous waste (which excludes AEA materials) and a radioactive waste. Such facilities are subject to regulation by EPA and state agencies with environmental responsibilities. This shared responsibility is illustrated by the "Buildings/Facilities"

rows of blue boxes labeled 3a, 3b, 3c, and 3d in Figure 2, and the combined red and blue facility box number 3 in Figure 3. Treatment, storage, and disposal of the hazardous waste component must meet RCRA and other environmental requirements and is regulated by the EPA, or the state when authorized by EPA. Treatment, storage, and disposal of the radioactive component must meet AEA requirements and is regulated by DOE subject to Board oversight.<sup>10</sup> Thus, the Board has a primary responsibility for the radioactive component, but must share its responsibility for oversight of the mixed waste with the regulator of the hazardous component. If the mixed waste is scheduled for treatment and disposal without separating the two components, the treatment and disposal facilities must meet both the hazardous waste laws and those pertaining to radioactive waste.

The Board has indirect safety responsibility for certain DOE facilities that contain no radioactive materials, as shown by the green boxes in the “Buildings/Facilities” rows of Figure 2, and green facility boxes 1 and 2 in Figure 3. The Board has jurisdiction over activities in these facilities without radioactive materials if those activities could adversely affect other facilities located at a DOE defense nuclear site. Potential adverse effects are those which could cause an undue risk to the health and safety of workers or the public as a result of exposure to radioactive materials.

Board oversight of environmental issues is focused primarily upon the air, land, and water within the boundaries of a major DOE site containing defense nuclear facilities. Examples include the Savannah River Site, in Aiken, South Carolina, and the Pantex Plant near Amarillo, Texas. If unmixed radioactive materials contaminate the environment surrounding a facility, shown by the blue “Surrounding Environment” boxes in Figure 2 and blue sectors “c” and “d” in Figure 3, the Board has independent oversight responsibility for the treatment and disposal of the materials, but shares that responsibility with federal and state regulators. The Board’s responsibilities are greatest if the materials originated with DOE defense nuclear facility activities and exposure to the materials could result in undue harm to workers or the public. The Board’s responsibility is shared with EPA or a state agency because the environmental contamination resulted from a release, bringing CERCLA, Clean Air Act, or RCRA requirements into play. If the bounded environment contains no radioactive materials, shown by the row of green “Surrounding Environment” boxes in Figure 2, and by the green “a” and “b” sectors in Figure 3, the Board responsibilities focus upon activities in those areas that could adversely affect facilities in which the Board has a primary or shared jurisdiction.

#### **IV. INTERACTION WITH DOE REGULATORS DURING DECOMMISSIONING**

##### **A. Overview of Shared Federal and State Responsibility for Safety During Decommissioning**

Naturally, the Board’s concern for safety at a facility diminishes as radioactive materials are withdrawn and the facility is removed from service. Therefore, the Board must prepare for a smooth transition in the oversight and regulation of defense nuclear facilities as the Board passes primary oversight responsibility sometime during decommissioning to federal and state environmental regulatory agencies. Figure 4 displays one view of the oversight and regulatory responsibilities of DOE, the Board, EPA, and state environmental, safety, and health organizations just before, during, and after decommissioning of a defense nuclear facility.



The vertical columns of Figure 4 specify the types of radioactive, hazardous, and other materials that may be present at defense nuclear facilities. Those materials include nuclear defense materials (source, special nuclear and byproduct materials, transuranics (TRU), and nonwaste residue awaiting further processing), radioactive waste (not mixed with other hazardous waste), solid and liquid high-level radioactive waste mixed with hazardous waste, low-level radioactive waste mixed with hazardous waste, mixed waste outside the facilities and in the environment, and nonradioactive hazardous and solid waste.

The horizontal rows describe the kinds of operations and activities that typify a facility going through various phases of decommissioning, including final operational runs, storage, deactivation, decontamination, dismantlement, and final disposition. The individual boxes on the chart identify the agencies with statutory jurisdiction over the decommissioning activities and materials represented by each box. In some areas, more than one agency has jurisdiction. For example, in the mixed waste columns, two agencies have statutory safety responsibility for the material or activity.

Reading from the top down in each column of the chart, facilities containing a specified type of material or waste can be viewed as moving toward full decommissioning. In general, reading across the chart from left to right, incremental shifts are made from materials solely or primarily in buildings to those primarily, and then solely, in the environment. Also, DOE's defense mission becomes more and more attenuated, because the materials involved have fewer and fewer national security implications. Taken together, and moving from top left to bottom right on the chart, the transition from defense mission in buildings to an environmental mission outside buildings is illustrated, while also demonstrating the shift from predominantly Board oversight jurisdiction and safety responsibility to EPA and state regulation of environmental hazards as decommissioning is completed. The heavy black line below "Final Disposition" represents the removal of all significant amounts of radioactive materials from the facilities. The Board's safety concerns for the materials decreases as the hazard is attenuated. This in turn reduces the ordinary role of the Board to commenting, when it deems appropriate, on environmental and safety activities of other organizations, recognizing the expanded responsibility of environmental regulators.

## **B. Interactions Among Federal and State Regulators During Decommissioning**

The Board maintains an independent oversight role during decommissioning. The Board must also interact with DOE, EPA, and state agencies, which have regulatory authority over aspects of decommissioning. Independent oversight authority is the ability to scrutinize the programs and activities of another person or agency, in this case DOE, to determine compliance with an established set of legal or technical requirements. Typical functions of an oversight agency are to investigate, observe, and evaluate performance against applicable requirements and standards, conduct technical assessments and hearings, gather technical information, and suggest corrective action to the overseen agency. Oversight functions are often performed by regulatory agencies. However, oversight authority alone does not confer full regulatory powers.

Regulatory authority is the ability, granted by statute, to oversee and control, direct, or restrict another person's or agency's action by regulation/rule or other legally enforceable order, specification, or requirement. Rulemaking, licensing, permitting, compliance agreements, and enforcement actions are among the means used by an agency to implement its regulatory authority.

### **C. Providing for Interagency Cooperation and Streamlining Concurrent Regulation/Oversight of the Decommissioning Phase**

#### **1. Advantages of Streamlined Cooperation Among Agencies**

In areas where jurisdictional overlaps exist, such as in oversight and regulation of DOE's mixed-waste activities, benefits can be achieved from cooperation among regulatory and oversight agencies. The objective of the cooperative venture is to avoid costly, duplicative, and unnecessary oversight and regulation, reach agreement upon a consistent and comprehensive set of safety requirements, and to interact with DOE using a single point of contact for specific materials and activities.

To achieve these objectives, a primary regulatory/oversight agency, chosen from the state, EPA, or the Board, should take the lead in regulation or oversight of designated DOE activities. Figure 4 is a starting point for identifying primary and secondary agencies, and reflects statutory realities. A primary agency should be selected based upon the scope and depth of the agency's legal responsibilities for the activities and materials covered, and upon the recognized expertise which each primary agency brings to the environmental, safety, and health problems associated with those activities and materials.

A secondary regulatory/oversight agency chosen from the state, EPA, or Board, should possess special expertise or legal responsibilities for regulating or overseeing aspects of the activities or materials covered and should agree to work through the primary agency in resolving environmental, safety, and health issues with DOE, to the extent allowed by law. Secondary agencies support monitoring or inspection activities of the primary agency, but should not be precluded from conducting independent inspection activities or acquiring information, consistent with statutory responsibilities. A secondary agency's health, safety, and environmental comments, findings, and concerns should be presented to, and resolved with, DOE through the primary agency, to the extent allowed by law.

This form of cooperation could provide the following advantages during the decommissioning process:

- Efficiently satisfying the environmental, safety, and health priorities of each agency without duplication or redundancy;
- Identifying a single set of consistent requirements for each specific activity;

- Preserving mandatory statutory responsibilities of each agency in the event unilateral independent action is warranted by events; and
- Identifying a process to resolve concerns before an agency exercises its enforcement or other statutory authority.

## 2. Principles of Cooperation

Cooperation among agencies during decommissioning of defense nuclear facilities should adhere to some general principles.

First, legitimate national security interests and information must be protected. Second, each of the regulating/oversight agencies (including DOE which regulates or is responsible for all of its own activities) must recognize the legitimate interests of the other agencies, the citizens of the state in which the facility is located, and the nation at large, in the safe and effective operation, decommissioning, cleanup, and environmental restoration of facilities being decommissioned.

Third, statutory responsibilities and jurisdiction of the agencies should not be expanded, diminished, or altered by any cooperative agreements. The AEA, and federal and state environmental, safety, and health statutes prescribe responsibilities that must be accommodated. For example, regardless of the designation of a primary agency, federal agencies retain emergency response powers that cannot be overridden given a substantial threat of release of a hazardous substance into the environment, or an imminent or severe threat to public health or safety. Moreover, a state must protect its citizens from any threats to their health and safety arising at a facility. Both EPA and state authorities must retain responsibilities for enforcement against violations of the law, and the Board must retain responsibility for issuance of safety recommendations to the President or the Secretary of Energy if “necessary to adequately protect public health and safety.”

Fourth, each of the agencies should agree that the primary agency will keep the public appropriately informed of environmental, safety, and health activities at the site and involve the public in the decision-making processes to the extent required by law. Finally, to avoid inefficient duplication of regulation and oversight of DOE activities at the facility the agencies should agree to:

- Recognize the need for different agencies to play primary, secondary, and other roles in the regulation and oversight of different activities occurring at facility until completion of environmental restoration. These roles should be determined largely by the strength of statutory mandates and the expertise possessed by the various agencies;
- Cooperate in preparing and commenting on, or concurring with, deactivation and decommissioning plans for facilities; and
- Review and comment on, or concur with, project plans for major facilities and S/RIDs governing the cleanup, deactivation, and decommissioning processes with an eye toward

early resolution of any environmental, safety, and health issues and toward avoiding conflicts and disputes which can delay the process.

Any cooperative arrangement among the agencies needs to recognize that DOE is responsible for all activities at its facilities, including: (1) nuclear defense activities and deactivation under the AEA, subject to Board oversight of safety in defense nuclear facilities; (2) compliance with applicable environmental laws and requirements, including permits and other requirements under RCRA and state statutes, subject to EPA and state agency regulation; and (3) hazardous substance and hazardous constituent removal, decommissioning and site remediation under applicable environmental laws and requirements, including CERCLA, state statutes, and RCRA, subject to EPA and state agency regulation.

## **V. CONCLUSION**

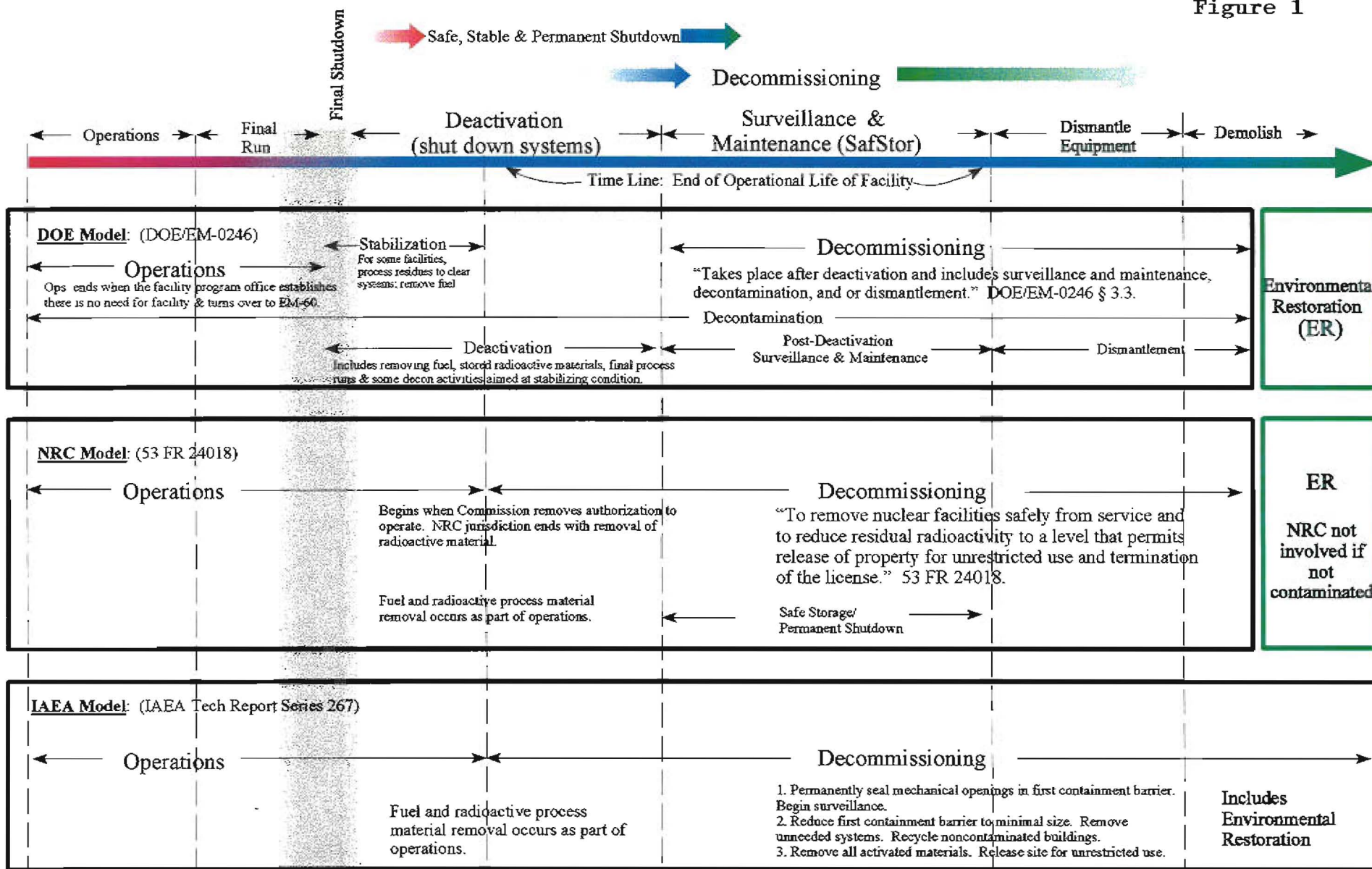
A clear understanding of the responsibilities of DOE, the Board, EPA, and the various states during decommissioning activities is a prerequisite for efficient and effective safety oversight and regulation at defense nuclear facilities. With properly structured cooperation, scarce governmental resources need not be spent on costly and duplicative evaluations or regulation of the same activities or materials by multiple agencies. A cooperative approach based on an appreciation of other parties' legitimate roles in the decommissioning process promotes interaction and early resolution of disputes which, if deferred or prolonged, may be costly and even inimical to safety.

The principles just analyzed were effectively incorporated into a "Memorandum of Understanding" agreed to by DOE, EPA, the Board, and the State of Colorado in 1996 for structuring cooperation among those entities during decommissioning activities at the Rocky Flats Environmental Technology Site, near Denver, Colorado. As recently acknowledged by Congress,<sup>11</sup> similar arrangements could result in efficient and effective oversight and regulation of the decommissioning phase at other defense nuclear facilities throughout the complex.

## ENDNOTES

1. A “defense nuclear facility” is a production, utilization, or waste storage facility as defined in 42 U.S.C. § 2286g, and as further defined in 42 U.S.C. §§ 2014(v) and (cc). Note that the term “facility,” as defined in the AEA, is considerably broader than “building” and includes equipment, devices, and components.
2. 42 U.S.C. § 2286a(a)(1). Senator Nunn referred to this as a “broad mandate” during the confirmation hearings for the initial Board members. *Nominations Before the Senate Armed Services Committee, S. Hrg. Rep. No. 537, 101st Cong., 1st Sess. 718 (1989).*
3. As defined in 42 U.S.C. §§ 2014(e), (z), and (aa).
4. **Defense Nuclear Facilities Safety Board’s First Annual Report to Congress, Part II.**
5. *See* 42 U.S.C. § 2286g.
6. A “defense nuclear facility” is a production, utilization, or waste storage facility as defined in 42 U.S.C. § 2286g, and as further defined in 42 U.S.C. §§ 2014(v) and (cc). Note that the term “facility,” as defined in the AEA, is considerably broader than “building” and includes equipment, devices, and components. However, to simplify this discussion and Figures 2 and 3, facility refers to those which are buildings or enclosed structures.
7. RCRA hazardous waste materials are those defined under the Solid Waste and Resource Conservation and Recovery Acts, codified in 42 U.S.C. § 6901 *et seq.*, and supporting regulations.
8. *See* 42 U.S.C. § 9601 *et seq.*, and associated regulations and case law. The Clean Air Act regulates releases of radionuclides to the atmosphere. *See* 42 U.S.C. § 7401 *et seq.*
9. On black and white versions of Figures 2 through 4, gray shading corresponds to red, white corresponds to blue, and gray cross-hatched corresponds to green.
10. *See, e.g.*, the Atomic Energy Act of 1954, as amended, the Nuclear Waste Policy Act of 1982, as amended, and the Low Level Radioactive Waste Policy Act, as amended. Exposure standards are developed by EPA. *See, e.g.*, 40 C.F.R. Part 191 (high level and transuranic waste).
11. S. Rep. No. 267, 104th Cong., 2d Sess., 417 (1996).

Figure 1



# Potential Decommissioning Scenarios

Figure 2

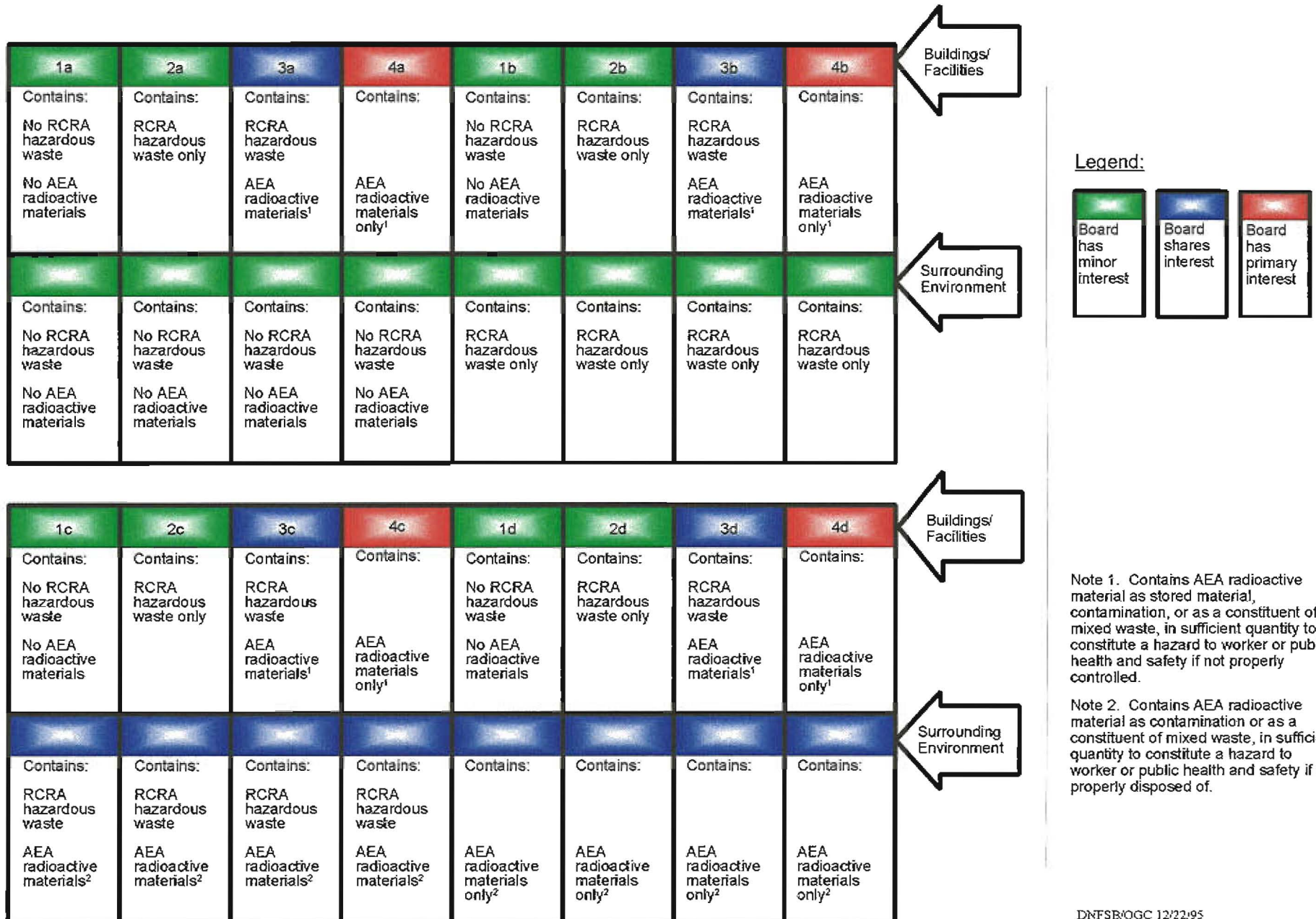
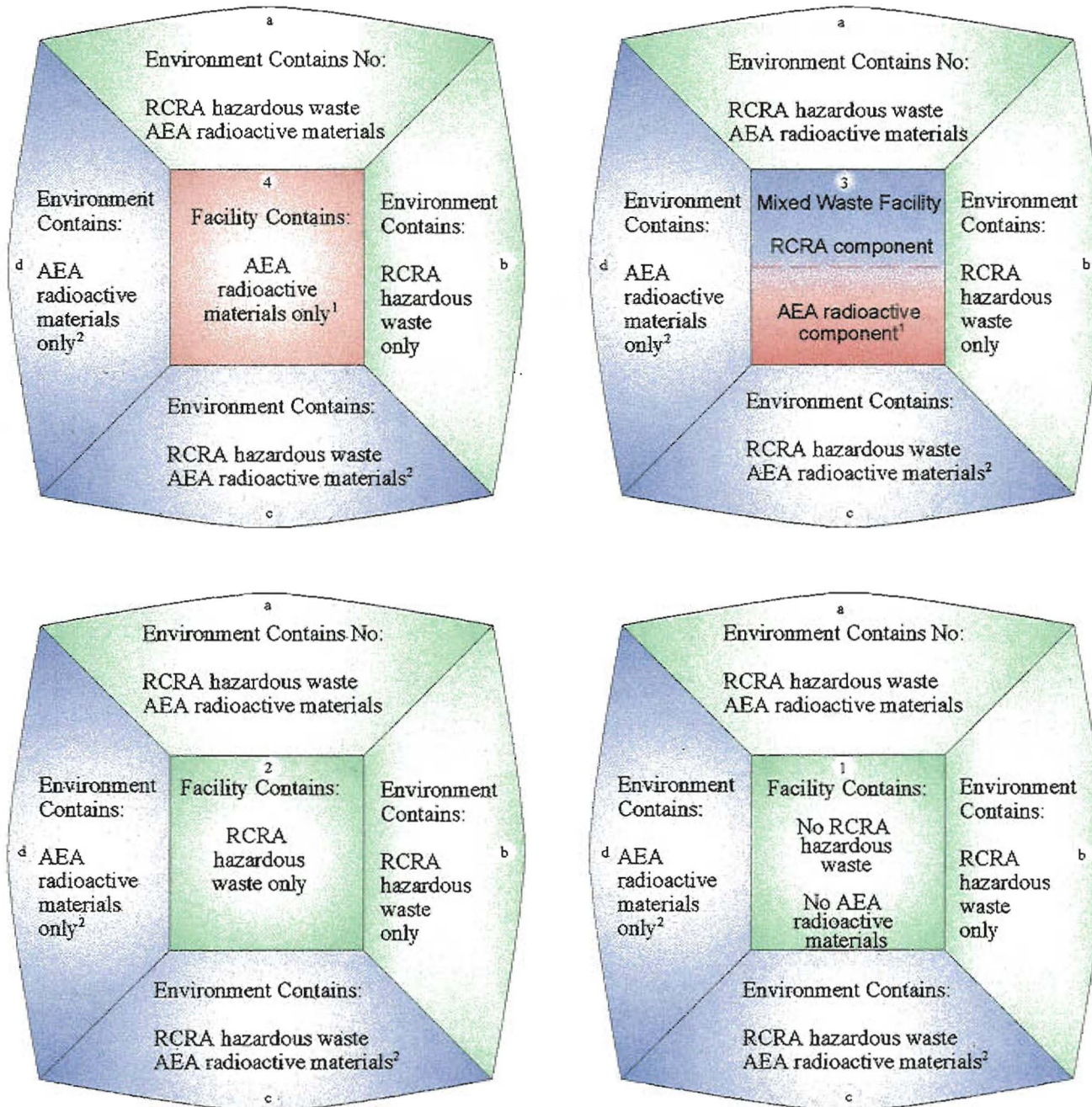





Figure 3

# DNFSB INTEREST IN POTENTIAL DOE D&D SCENARIOS



**Legend:**

-  Board has primary interest
-  Board shares interest
-  Board has minor or no interest

**Notes:**

1. Contains AEA radioactive material as stored material, contamination, or as a constituent of mixed waste, in sufficient quantity to constitute a hazard to worker or public health and safety if not properly controlled.
2. Contains AEA radioactive material as contamination or as a constituent of mixed waste, in sufficient quantity to constitute a hazard to worker or public health and safety if not properly disposed of.



**DEPARTMENTAL AND AGENCY ROLES AND RESPONSIBILITIES FOR DEACTIVATION AND DECOMMISSIONING ACTIVITIES AT DEPARTMENT OF ENERGY DEFENSE NUCLEAR FACILITIES** Figure 4

DOE DIRECTS AND MANAGES ALL ACTIVITIES AT DEFENSE NUCLEAR FACILITIES

ACTIVITY	MATERIAL/ WASTE	RADIOACTIVE MATERIALS: (SNM, TRU, Byproduct)	RADIOACTIVE WASTE (HLW, LLW, TRU)	*SOLID/LIQUID HIGH LEVEL MIXED WASTE (RCRA Waste)	*LOW LEVEL MIXED WASTE (RCRA waste)	*CERCLA/RCRA MATERIALS IN ENVIRONMENT	*HAZARDOUS AND SOLID WASTE (non-radioactive)
<b>Operations and Processing</b>		Primary: DNFSB	Primary: DNFSB	EPA/State jurisdiction over hazardous component  DNFSB jurisdiction over radioactive component	EPA/State jurisdiction over hazardous component  DNFSB jurisdiction over radioactive component	Primary: As Identified in EPA/State Agreements	Primary: As Identified in EPA/State Agreements
<b>Storage, On-Site Transport, and Decontamination (unassociated with decommissioning)</b>		Primary: DNFSB	Primary: DNFSB	EPA/State jurisdiction over hazardous component  DNFSB jurisdiction over radioactive component	EPA/State jurisdiction over hazardous component  DNFSB jurisdiction over radioactive component	Primary: As Identified in EPA/State Agreements	Primary: As Identified in EPA/State Agreements
<b>Deactivation including removal of stored SNM and contained materials and waste</b>		Primary: DNFSB	Primary: DNFSB	EPA/State jurisdiction over hazardous component  DNFSB jurisdiction over radioactive component	EPA/State jurisdiction over hazardous component  DNFSB jurisdiction over radioactive component	Primary: As Identified in EPA/State Agreements	Primary: As Identified in EPA/State Agreements
<b>Final Disposition</b>		Primary: DNFSB	Primary: DNFSB ♦	EPA/State jurisdiction over hazardous component  DNFSB jurisdiction over radioactive component	EPA/State jurisdiction over hazardous component  DNFSB jurisdiction over radioactive component	Primary: As Identified in EPA/State Agreements	Primary: As Identified in EPA/State Agreements
<b>Decontamination of residual contamination of fixed structures</b>		Primary: Federal Interest- DOE EPA DNFSB †	Primary: As Identified in EPA/State Agreements  Review & Comment: DNFSB	Primary: As Identified in EPA/State Agreements  Review & Comment: DNFSB	Primary: As Identified in EPA/State Agreements  Review & Comment: DNFSB	Primary: As Identified in EPA/State Agreements	Primary: As Identified in EPA/State Agreements
		Primary: As Identified in EPA/State Agreements  Review & Comment: DNFSB	Primary: As Identified in EPA/State Agreements  Review & Comment: DNFSB	Primary: As Identified in EPA/State Agreements  Review & Comment: DNFSB	Primary: As Identified in EPA/State Agreements  Review & Comment: DNFSB	Primary: As Identified in EPA/State Agreements	Primary: As Identified in EPA/State Agreements
<b>Dismantlement, Demolition, Reuse</b>		Primary: As Identified in EPA/State Agreements  Review & Comment: DNFSB	Primary: As Identified in EPA/State Agreements  Review & Comment: DNFSB	Primary: As Identified in EPA/State Agreements  Review & Comment: DNFSB	Primary: As Identified in EPA/State Agreements  Review & Comment: DNFSB	Primary: As Identified in EPA/State Agreements	Primary: As Identified in EPA/State Agreements

Decommissioning (DOE/EPA Policy)

\* EPA and State authority depends on RCRA and CERCLA agreements and authorizations.

♦ Final disposition in a public or private, licensed facility, would fall under State or licensing agency jurisdiction pursuant to applicable statutes and agreements.

† DOE retains responsibility under 42 U.S.C. § 2011 et seq. and Executive Order 12580. DNFSB and EPA may assert jurisdiction pursuant to 42 U.S.C. § 2286 or CERCLA.

Legend:

DNFSB Primary	Concurrent jurisdiction to be addressed by MOU	State or EPA Primary DNFSB Secondary	State or EPA Primary DNFSB comment discretionary
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