

TESTIMONY OF
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A. J. EGGENBERGER, VICE CHAIRMAN
JOHN W. CRAWFORD, Jr., MEMBER
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DEFENSE NUCLEAR FACILITIES SAFETY BOARD

FY 1997 DEFENSE AUTHORIZATION HEARING

SUBCOMMITTEE ON STRATEGIC FORCES
COMMITTEE ON ARMED SERVICES
UNITED STATES SENATE

MARCH 6, 1996

MR. CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE:

We appreciate the opportunity to appear before you to discuss the Board's role in ensuring that the health and safety of the public and the workers are adequately protected throughout the Department of Energy's (DOE) defense nuclear complex. The February 23, 1996, letter from Senators Lott and Exon inviting us to testify today advised that:

"The subject of the hearing will be the major recommendations of the Defense Nuclear Facilities Safety Board (DNFSB) over the past several years and whether they have been effective in promoting the safe accomplishment of the nuclear weapons and environmental missions of the U.S. Department of Energy. In particular, you should be prepared to comment on the Ahearne Report's recommendations on external regulation of DOE nuclear activities, and on the efficacy of all legislated DNFSB functions, including DNFSB Recommendation 94-1."

In our testimony today, we will first attempt to summarize the Board's progress in fulfilling its public health and safety oversight responsibility for the nuclear weapons and environmental missions of the DOE.

STATUTORY MISSION OF THE BOARD

The Board's enabling statute, 42 U.S.C. § 2286, requires the Board to review and evaluate the content and implementation of health and safety

standards, including DOE's Orders, rules, and other safety requirements, relating to the design, construction, operation, and decommissioning of DOE's defense nuclear facilities. The Board must then recommend to the Secretary of Energy any specific measures, such as changes in the content and implementation of those standards, that the Board believes should be adopted to ensure that the public health and safety are adequately protected. The Board is required to review the design of new defense nuclear facilities before construction begins, as well as modifications to older facilities, and to recommend changes necessary to protect health and safety. Board review and advisory responsibilities continue throughout the full life cycle of facilities, including shutdown and decommissioning phases. The Board is also required to investigate any event or practice at a DOE defense nuclear facility which it determines has adversely affected or may adversely affect public health and safety.

The Board has also undertaken the added responsibilities mandated by the National Defense Authorization Act for Fiscal Years 1992 and 1993 (Public Law 102-190) which amended the original law. These amendments, which added the assembly, disassembly, and testing of nuclear weapons to the scope of the Board's oversight responsibilities, increased the Board's workload substantially.

The Board has been in operation for 6 ½ years. The Board has assembled a talented staff with extensive experience in nuclear-chemical processing, conduct of operations, nuclear safety analysis, conventional and nuclear explosive technology and safety, nuclear weapons safety, storage of nuclear materials, nuclear criticality safety, and waste management and environmental restoration. Two full-time site representatives are stationed at the Pantex site to oversee

the safe assembly and disassembly of nuclear weapons. Two site representatives are assigned to the Hanford Site to monitor waste characterization and stabilization and two full-time site representatives are stationed at the Rocky Flats Environmental Technology Site to monitor DOE's stabilization and storage of the large plutonium inventory at the site.

The terms of the statute setting up the Defense Nuclear Facilities Safety Board (Board) gave clear guidance of what Congress had in mind for the Board to do, and the way it was to operate. Oversight with action-forcing powers was chosen instead of making the Board a regulator. Congress expected the Board's oversight to have many of the same positive results as regulation; that is, assure that the Department of Energy was implementing a program for the safe management of the production and use of defense nuclear materials, a program that provides reasonable assurance of no undue risk to the workers and the public, and protects the environment. Congress was well aware that DOE had issued safety policies and standards of good practices. However, Congress was also aware that they needed upgrading and that DOE and contractor operations in the past had left a residual of much contamination in buildings and the surrounding environment. DOE's problem appeared to be more one of failure to establish clear expectations by DOE of its contractors and to build safety compliance into the fabric of work planning and execution.

The Board's efforts in the past six years have been focused upon the examination of the standards identified by DOE as codes of good practices, the manner in which DOE defines for its contractor's what is expected of them in the performance of DOE's mission, and how such expectations once established as

requirements are enforced. These elements are basic to any safety management program whether internally or externally driven. The most significant deficiencies noted by the Board in these basic elements have been communicated to DOE via the recommendation process set forth in our authorizing legislation. These recommendations not only describe the perceived deficiency, but also provide guidance as to what the Board believes is advisable for a solution. Details of plans for addressing the issues identified through the recommendation process are then submitted by the Secretary for Board approval. The Board follows the progress of the required action program until the planned action has been completed. To date the Board has issued 33 sets of recommendations containing 147 specific recommendations. These will be discussed in more detail later.

Not all Board action-forcing activities lead to formal recommendations. The Board's assigned functions also include the review of design, construction, operation, and decommissioning of defense nuclear facilities. For such activities the Board's charter allows it to satisfy a real need for DOE to get on with its work with a minimum of delay due to external oversight. The Board through assignment of our staff to monitor and review work, whether it is design, construction or readiness preparations for operations, has been able to keep its reviews in sync with DOE activities. Technical concerns that arise are frequently resolved by the technical staffs of DOE, the Board, and contractors without the need for action-forcing measures by the Board. If the Board determines there are unresolved safety issues that require resolution before proceeding, the Board can define the issue for the Secretary and recommend resolution before proceeding. In the case of operations at Rocky Flats, Congress

specifically required the Board to certify readiness before resumption of operations could begin.

In addition to our reviews of the basic elements and structure of DOE's safety management program, the Board has given priority attention to facilities and activities believed to represent the greatest safety risks -- mainly those that now comprise the residual of the nuclear weapons complex devoted to stewardship, maintenance and surveillance of nuclear weapons, the storage of strategic and highly radioactive materials and the stabilization of hazardous residuals of weapons production. For those facilities and operations representing significant hazards (e.g., those classified as hazard classes 1 and 2), the Board is pressing DOE to develop safety management programs that result in clearly defined systems and components important to safety, the technical specifications that define limiting conditions for operation, and the infrastructure needed to support maintenance and safety in operation. This has already been done in a number of cases. The extension of this effort to all high-risk facilities is the thrust of the Board's latest Recommendation 95-2. The end goal is to have safety management programs that are well defined but tailored to the diverse operations that make up the DOE complex, the hazards-specific nature of the activities involved and the aged nature of the facilities in which such operations must be conducted.

With respect to decommissioning of defense nuclear facilities, the Board has tended to focus its activities on those facilities in transition to cleanups or environmental restoration under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Resource Conservation and Recovery

Act (RCRA). A substantial number of such facilities require considerable effort to remove radioactive materials, or otherwise deactivate them, before they can be considered safe for non-time critical remedial action. CERCLA and RCRA statutes are administered by the Environmental Protection Agency (EPA) and the States. The Board is working cooperatively with EPA and the States to smoothly effect this transition. The Board has recently signed a cooperative agreement with the State of Colorado, EPA and DOE with respect to activities at the Rocky Flats Environmental Technology Site.

ADDITIONAL REGULATION OF DOE'S DEFENSE NUCLEAR FACILITIES

The Ahearne Report is a Report of The Advisory Committee on External Regulation of Department of Energy Nuclear Safety generally referred to as the Ahearne Committee, after one of the co-chairmen. The title of the report is "Improving the Regulation of Safety at DOE Nuclear Facilities." As the title implies, the Department of Energy already is regulated in most all of its activities by State and Federal Environmental Protection Agencies and by the Department of Transportation. By law it must comply with OSHA requirements and the nuclear safety of its weapon mission activities are under the external oversight and action-forcing powers of the Defense Nuclear Facilities Safety Board.

What advantages will accrue from adding another level of regulatory authority over DOE's activities? Justification for additional regulation is based on two suppositions, both of which we believe to be wrong.

1. That it will enhance DOE credibility with the public, and

2. That it will improve safety.

We suggest the public's trust in DOE will not increase by setting up another federal government agency here in Washington, DC to regulate its activities, whether the agency be the Defense Nuclear Facilities Safety Board or the U.S. Nuclear Regulatory Commission (NRC) or some combination of the two operating in a formal regulatory manner. Rather than by having more external regulation imposed upon it, DOE's credibility will improve by performing its responsibilities in an efficient and creditable manner. We believe DOE has made notable progress as regards cooperation and openness particularly in the formation and utilization of local citizen advisory boards. Trust and credibility are developed at the local levels, not by layering government agencies.

Will more regulation improve safety? If so, at what additional cost? The Ahearne Report acknowledges that regulation would require additional start up costs, but asserts that savings will result from having fewer DOE employees assigned to environmental safety and health issues. The NRC has advised that if it is to assume regulatory responsibility for DOE, the Commission would need an additional 1,100 to 1,600 full-time employees and an increase of \$150 million to \$200 million per year in its budget. How much of that addition in personnel and dollars cost would DOE save? We know of no organization, in government or in private industry, that reduces personnel or response costs when additional regulatory authorities are imposed on it. The opposite occurs. The Ahearne Report does not set forth how savings will accrue from its recommendation, nor does it specify what safety improvements will occur and how.

The Ahearne Report, in the interest of improving safety, would have OSHA formally regulate DOE, requiring many more full-time inspectors to cover thousands of DOE facilities. OSHA complains that it doesn't have sufficient inspectors to adequately meet its current responsibilities. In DOE nuclear defense activities, the actual work is done by employees of commercial organizations such as Westinghouse, Kaiser, Bechtel, etc. The managements of those companies are fully knowledgeable of OSHA requirements through their commercial activities. DOE owns the facilities and its line management should be alert to their obligations and make certain the contractors meet them. In some cases--such as at Rocky Flats--DOE doesn't directly manage the working contractors, but uses another commercial contractor to manage or "to integrate" those contractors who do the actual work. Thus, to implement the Ahearne Recommendation, the Federal government could end up with an OSHA government agency worker enforcing safety rules at a federally owned work place through a DOE employee who then turns to the integrator contractor company to force the contractor doing the actual work to correct safety deficiencies or violations. The practical solution to the problem is to have DOE site personnel trained in OSHA safety regulations and then enforce those safety requirements on their contractors, who are required to comply with these requirements in their normal commercial work.

The Ahearne Report makes a very pertinent and important observation when it notes that "No outside authority or authorities could or should be considered a substitute for an effective internal safety management structure and program." Regulation by itself cannot assure safety is a maxim long known by those experienced in hazardous occupations.

A number of individual recommendations in the Ahearne Report, in our opinion, are directed toward the ability of intervenors to delay the construction or operation of needed facilities and other activities through use of the court of law and extended appellate reviews and if implemented would increase this ability. The Ahearne Report recommended legislative changes to the Atomic Energy Act that would provide greater intervention rights than that which exists in the civilian nuclear field to those opposed to DOE's production and uses of special nuclear materials for defense purposes.

Another recommendation of the report is to grant authority to the States to set more stringent facility safety standards providing those standards "do not unduly hinder DOE in performance of its missions." Who is to determine what is unduly? Lawyers will have a "field day" with that one in the courts up to and including the Supreme Court before a resolution is reached. States will be competing with each other as to which one is more conservative in nuclear safety issues at DOE nuclear defense facilities.

The Report barely acknowledges the existence of the national security elements of the Atomic Energy Act, and it does not explain how national security will be impacted by the actions of an independent regulatory agency.

When Secretary O'Leary, in January 1995, created the Advisory Committee on External Regulation of Department of Energy Nuclear Safety and appointed Dr. Ahearne to be co-chairman, she requested the Defense Nuclear Facilities Safety Board to participate in the work of the Committee. Mr. Joseph DiNunno, a member of our Board and a recognized nuclear safety expert knowledgeable in

environmental regulatory matters, volunteered. Throughout the past year Mr. DiNunno devoted a great deal of time and effort to the undertaking. Mr. DiNunno and a number of others who participated in the study did not concur in many of the recommendations set forth in the report.

We have attached a copy of Mr. DiNunno's separate views as Attachment III. Also in view of his special insight as to the workings of the Committee under the chairmanship of Dr. Ahearne, we have attached a copy of a presentation Mr. DiNunno recently made to the local section of the American Nuclear Society, which we believe you will find to be both thoughtful and informative (Attachment IV). Mr. DiNunno's basic conclusion after one year of intense involvement and careful consideration of the issues examined by the Committee is that ". . . taken as a whole the recommendations represent a regulatory model that will exacerbate DOE's problems, not help solve them."

RECOMMENDATIONS TO THE SECRETARY OF ENERGY

During the past six years of operation, the Board has advised the Secretary of Energy and other senior DOE officials on a wide variety of specific health and safety matters within the DOE weapons complex. In general, the Board's Recommendations have emphasized:

- identifying, assessing the adequacy of, and applying appropriate design and operating standards;
- selecting, training, qualifying, and retaining technically competent operations, maintenance, and technical support personnel;

- applying the principles of systems engineering in evaluating the design of new facilities and in upgrading existing facilities;
- conducting timely and comprehensive Operational Readiness Reviews (ORR's);
- improving the Department's radiation protection program, including measures for control of radioactive sources and contamination;
- assigning well-qualified DOE Facility Representatives at defense nuclear facilities;
- resolving expeditiously many pressing issues surrounding the stabilization and safe storage of fissionable materials and production residues; and
- integrating various modalities for binding requirements, such as Rules, Orders and Contract provisions.
- establishing well-defined safety management programs, tailored to the specific hazards of the work, as a requisite for authorization to conduct such work.

Sixteen sets of recommendations have been fully closed or subsumed by later recommendations. The remaining seventeen are in various stages of implementation. Attachment I lists key milestones associated with the Board's

Recommendations.

The Board's Recommendations result from: (1) site visits by the Board, staff, and outside technical experts; (2) review of documentation concerning particular problems at the site; (3) review of staff or Board contractor reports in appropriate cases; (4) briefings by DOE officials and DOE contractors; and (5) deliberation and technical review by the Board. In 1995 alone, the Board Members, its staff, or its contractor experts made 173 site visits to DOE's defense nuclear facilities. These visits focused primarily on selected facilities that both the Board and DOE consider to be most important to DOE's mission, primarily those the Savannah River Site, the Pantex Plant, the Hanford Site, the Rocky Flats Plant, the Idaho National Engineering Laboratory, the Oak Ridge Y-12 Complex, the Los Alamos National Laboratory, and the Nevada Test Site.

In addition, since its formation the Board has held a total of 49 public meetings/briefings, the majority of which were held in the vicinity of selected DOE defense nuclear facilities, to listen to DOE managers, their contractors, and the public, and discuss the status of ongoing health and safety reviews.

HEALTH AND SAFETY IMPROVEMENTS RESULTING FROM BOARD ACTIONS

During 1995, a number of Board initiatives, some undertaken in previous years, were completed or advanced significantly. A representative sample of these accomplishments is summarized below.

- The Board issued a landmark recommendation urging DOE to improve the process used in development, review, and approval of authorization

bases for facility operation or conduct of potentially hazardous activities, based on two pivotal technical reports prepared by the Board (Recommendation 95-2).

- Based on the guidance contained in the technical reports supporting Recommendation 95-2, the Board's staff completed assessments of authorization bases for a representative sample of high priority defense nuclear facilities and activities, demonstrating the soundness and adaptability of the concepts included in the reports and setting the groundwork for future reviews of authorization bases prepared by DOE and its contractors.
- In response to Recommendation 94-1, plutonium residues remaining from metal casting at RFETS have been successfully stabilized during the summer of 1995, and by mid-November 1995, all plutonium in contact with plastic had been repackaged.
- Also in response to Recommendation 94-1 and a Board technical report, DOE modified its previous plans for dry storage of deteriorating reactor fuel in storage basins at the Savannah River Site and is now planning to stabilize the fuel by processing it in F-Canyon.
- Largely as a result of the Board's attention to the problems associated with deteriorating fuel at the Hanford Site, DOE officials responsible for the K Basins are now focused on

expeditiously stabilizing this fuel and removing it from wet storage. In addition, the K Basins now have in place most of the elements of an adequate authorization basis, including an updated Safety Analysis Report, revised Operational Safety Requirements, a corresponding Safety Evaluation Report prepared by DOE, a Standards/Requirements Identification Document, and revised facility procedures.

- As a result of Board emphasis on the need for comprehensive readiness reviews, substantial improvements were made in systems and practices at the F-Canyon and FB-Line at the Savannah River Site, leading to the timely availability of these facilities for stabilization of plutonium solutions.
- In early 1995, the Board issued Recommendation 95-1 after its staff found that many cylinders containing depleted uranium hexafluoride in outdoor storage at the three gaseous diffusion plants were handled and stored under conditions that could lead to high deterioration rates. As a result, DOE initiated a program for repairing the affected cylinders and for improving storage conditions.
- Due in large part to the Board's intensive review, agreements between DOE and the FAA have been reached that will eventually eliminate most aircraft flights over the Pantex Plant, thereby significantly reducing the risk of an airplane crash into the Plant.

- Board attention to technical staffing of DOE's Amarillo Area Office and the Y-12 Site Office at Oak Ridge led to hiring of a number of technically competent engineering professionals in Amarillo and of eight new technical staff members in the Y-12 Site Office, yielding substantial improvements in operations at both locations.
- In response to Recommendation 94-4, DOE took immediate steps to correct safety deficiencies at the Y-12 Plant at Oak Ridge and then validated the corrections through a formal restart process.
- The Board's staff played a substantial role in helping prepare a needed standard for storing highly enriched uranium at the Y-12 Plant at Oak Ridge. None had existed prior to the summer of 1995.
- In response to an earlier Recommendation (92-6), which called for improved guidance for timing, staffing and content of operational readiness reviews, DOE had developed a new order and a new DOE standard. Both were revised in 1995 to respond to a number of Board comments suggesting improvements in both documents.
- The Board reviewed the safety of the Replacement Tritium Facility at the Savannah River Site, and in discussions with DOE established a basis for operating limits providing an acceptable level of safety. This process was followed in direct discharge of the Board's statutory responsibilities. A similar process is under way for the facilities being started up at Savannah River for processing high

level nuclear waste to disposable forms.

- Responding to the Board's Recommendation 93-6, DOE has instituted a program to recover and preserve information vital to safety of nuclear weapons, their surveillance, and their future dismantlement. This information is, for instance, that possessed by weapons designers who have recently retired or who will retire in the near future.

SAFETY ASPECTS OF NUCLEAR WEAPONS STOCKPILE STEWARDSHIP AND MANAGEMENT

The continuing national commitment to dismantle approximately 2,000 nuclear weapons per year has challenged and will continue to challenge the DOE weapons complex, which is experiencing a concurrent erosion of technical capability and limitation in physical plant capacity. The Board must continue to pay close attention to the safety of assembly and dismantlement activities, and to those activities needed to meet the requirements of the enduring stockpile, so as to ensure that an appropriate risk management strategy is applied while meeting national security commitments.

DOE's "Stockpile Stewardship" efforts will involve nuclear research and experimental activities at the weapons laboratories and at Nevada Test Site (NTS). The Board is working with DOE and the weapons laboratories to tailor integrated safety management strategies for these types of activities. The initiation of "sub-critical experiments" at NTS in FY 1996, to continue throughout FY 1997 and beyond, will require additional Board oversight resources.

In addition, full implementation of integrated safety management systems for research activities at the weapons laboratories is proceeding slowly, and is anticipated to require continuing Board attention.

SAFELY MANAGING SURPLUS NUCLEAR MATERIAL AND WASTE

The halt in production of nuclear weapons and materials to be used in nuclear weapons froze the DOE manufacturing pipeline in a state that, for safety reasons, should not be allowed to persist unremediated. The Board concluded in early 1994 from observation and technical discussions with others experienced in plutonium handling that imminent hazards could arise within two to three years unless certain problems are corrected. The Board was especially concerned about specific liquids and solids containing fissile materials and other radioactive substances in spent fuel storage pools, reactor basins, reprocessing canyons, processing lines, and various buildings once used for processing and weapons manufacture.

Early in 1994, the Board issued Recommendation 94-1, calling for an improved schedule for remediation of such materials throughout the complex, and specifically recommending that DOE take specific actions at several DOE sites on a high priority basis. Attachment II presents the complete text of Recommendation 94-1 to the Secretary of Energy. DOE's progress in implementing this recommendation is summarized as follows:

Stabilization of Fissionable Residues at the Rocky Flats Environmental Technology Site -- In Recommendation 94-1, the Board recommended that DOE expedite its efforts to characterize and stabilize a wide variety of production

residues remaining in process lines and storage containers which were continuing to degrade, creating an increasing hazard. Although the problem exists at several facilities in the defense nuclear complex, it is especially acute at the Rocky Flats Environmental Technology Site (RFETS).

During the summer of 1995, impure material remaining from metal casting, which constituted one of the highest risk sources of plutonium-bearing residues at RFETS, was successfully stabilized. In addition, by mid-November 1995, plutonium metal in contact with plastic at RFETS had been repackaged in accordance with DOE's implementation plan. Moreover, processing and safe interim storage of other plutonium residues and oxides are proceeding, albeit not on the schedule set forth in DOE's implementation plan.

DOE completed the venting of 2,696 solid residue drums in December 1995, nine months ahead of schedule. These residue drums were vented as a safeguard to prevent pressurization and flammable gas accumulation and ensure worker safety.

Nuclear Material Stabilization at the Savannah River Site -- At the Savannah River Site, Recommendation 94-1 applies to stabilization of solutions containing plutonium and trans-plutonium elements in F-Canyon, plutonium metal in storage, and irradiated fuel and target assemblies in basins. In accordance with its implementation plan, DOE has expedited processing of plutonium solutions in F-Canyon and FB-Line, in addition to reassessing its earlier plans for deteriorating fuel and target material.

As part of the material stabilization effort, the Board has insisted that each facility to be used for stabilization undergo a thorough operational readiness review, including reviews of operator training and procedures, verification of equipment operability, and definition and control of the facility's authorization basis. This process has resulted in: (1) augmented steps to protect against radioactive material release, including the isolation of an F-Canyon tank that contains highly radioactive americium and curium; (2) modifications to the FB-Line ventilation system to provide exhaust filtration through a sand filter; (3) additional controls in F-Canyon and H-Canyon to prevent an explosion similar to the accident at the Tomsk facility in the former USSR; and (4) reductions in the size and number of contaminated areas in both F-Canyon and the FB-line.

Spent Nuclear Fuel at the Savannah River Site -- In Recommendation 94-1, the Board also urged DOE to expedite processing of deteriorating reactor fuel stored in basins at the Savannah River Site. In its implementation plan, DOE committed to begin stabilizing this aluminum-clad highly-enriched fuel by November 1996. Only weeks after these revised plans were issued, one of the storage containers began to leak, demonstrating anew the lack of stability of the fuel under the prevailing conditions of chemical corrosion and attack.

The Board identified problems with pursuing dry storage plans for aluminum-clad highly-enriched uranium fuel, and pointed out certain rapidly corroding nondefense fuel that had been previously predicted by DOE to remain stable for another ten years. In a subsequent technical report, DNFSB/TECH 7, *Stabilization of Deteriorating Mark 16 and Mark 22 Aluminum-Alloy Spent Nuclear Fuel at the*

Savannah River Site, the Board's staff established the technical basis for concluding that stabilization of this fuel by chemical separation is the better alternative.

The Board's attention to this matter caused DOE to refocus its previous dry storage plans, and, as a consequence, DOE now is examining means to expedite conversion of the fuel into more manageable components (i.e., feed for the Defense Waste Processing Facility and low-enriched uranium).

Had the Board not alerted DOE to the rapidly corroding but incorrectly categorized fuel, it is likely that DOE would have continued wet storage for at least the next decade, based on its assumption of stability.

Spent Nuclear Fuel Stored in the K Basins at the Hanford Site -- At the beginning of 1994, DOE pursued a vaguely defined course of action to resolve recognized safety issues with severely deteriorated spent fuel stored in leaking basins located next to the Columbia River. A Tri-Party Agreement involving DOE, the Environmental Protection Agency, and the State of Washington had been reached to remove the fuel from the basins by the end of the year 2002. DOE-HQ expressed reservations about the feasibility of meeting the agreed-upon completion date. Meanwhile, the contractor expended considerable resources, but made little progress, on an interim effort to encapsulate (in the basin water) all of the fuel in the K-East Basin.

In early 1994, the Board pointed out the lack of a technical basis for DOE's planned course of action and urged DOE to identify engineering

alternatives, the criteria for selecting an alternative, and the anticipated radiological consequences of proposed actions. In May 1994, the Board issued Recommendation 94-1, specifically recommending that the program be accelerated to place the deteriorating reactor fuel in a stable configuration for interim storage until an option for ultimate disposition is chosen.

As a result of intense interactions between DOE and the Board's staff, DOE's implementation plan committed DOE to begin fuel removal by the end of 1997, and to complete fuel removal by December 1999. In addition, this implementation plan reflected results of recently performed engineering studies identifying stabilized dry storage as the best interim storage for the type of fuel stored in the K-Basin.

The Board's involvement with these issues resulted in a technically sound path forward and an expedited schedule for resolving the safety and environmental vulnerabilities associated with the leaking fuel. The Board was instrumental in steering both the contractor and DOE toward a system where all activities associated with the stabilization of the fuel in the K-Basins are conducted on a separate project basis.

Spent Nuclear Fuel Stored at the Idaho National Engineering Laboratory --
During 1993, the Board highlighted the weaknesses in actions by DOE to develop a systems engineering plan to address the spent fuel problems, and noted that actions at Idaho to address problems with severely corroding fuel were neither timely nor in accordance with proper procedures. DOE responded by preparing a systems engineering plan for the spent fuel program and taking corrective actions

at INEL. This progress at Idaho was acknowledged in the Recommendation 94-1.

Operational Readiness Reviews at the Idaho National Engineering Laboratory

-- Late in 1992, questions from the Board's staff prompted DOE to conduct a more comprehensive operational readiness review for the New Waste Calcining Facility, and led to improvements in the safety of calciner operations. Similar scrutiny was given to preparations to restart the denitrator process at Idaho, where preparation by line management and conduct of the operational readiness review adequately demonstrated readiness to restart operations. The Board believes that INEL needs to continue to make improvements in the operational readiness review process and the staff will continue to monitor their efforts.

Development of Required Standards -- At the Y-12 Plant, the nation's repository for highly enriched uranium (HEU), DOE plans to consolidate much of the HEU from other sites in the complex. This will involve receipt, processing, and storage of uranium in many different forms. Historically, no standard existed for uranium storage. This past summer, DOE approved a standard for storing HEU at the Y-12 Plant. The Board's staff played a key role in the creation of this standard through on-site reviews and detailed technical comments on the initial drafts.

The Board has also actively promoted the development of two standards for safe storage of plutonium. Subsequent to issuance of Recommendation 94-1, two such DOE standards have been issued, one applying to 50-year storage of plutonium metal and oxide, and another covering 20-year storage of plutonium-bearing scraps and residues. DOE is procuring a new system of equipment for stabilization and

packaging of plutonium metal and oxide to meet the 50-year storage standard. Initial installation of prototype equipment at Rocky Flats is scheduled for 1996, with probable future deployment at Hanford and Savannah River.

Thank you for the opportunity to report to you on the Board's progress in meeting the challenges before us. We will be happy to answer any questions you may have.

ATTACHMENTS:

ATTACHMENT I -- Recommendations Tracking Calendar

ATTACHMENT II -- Board Recommendation 94-1

ATTACHMENT III -- Additional Views of Joseph J. DiNunno Relative to The Report
of the Advisory Committee on External Regulation

ATTACHMENT IV -- External Regulation of DOE Nuclear Safety.
A Different Point of View, Joseph DiNunno, February 27, 1996

SEPARATION

PAGE

DEFENSE NUCLEAR FACILITIES SAFETY BOARD
1990 RECOMMENDATIONS CALENDAR

2/22/96 Update

DNFSB Recommendation Number, DOE Site Involved And Subject In Brief	Date Delivered To Sec'y Of DOE	Date Recomme. Appears In Fed. Register	Public Comments To Rec. Deadline Date	Sec'y Of DOE Response Due Date	Date Response Appears In Fed. Register	Deadline For Public Comments To SOE Response	Implementation Plan Due Date	Date Implementation Plan Is Received	Public Hearing Date
90-1 <u>Savannah River</u> , Reactor Operator Trng.	02/22/90	03/01/90	03/31/90	04/15/90	04/13/90	05/14/90	07/12/90	3/ 07/13/90	06/28/90 CLOSED 10/27/92
90-2 <u>All Sites Standards</u>	03/08/90	03/14/90	04/13/90	06/12/90	06/12/90	07/12/90	09/10/90	6/ 11/09/94	CLOSED 9/ 08/30/90
90-3 <u>Hanford Future Tank Monitoring</u>	03/27/90	03/30/90	04/30/90	05/14/90	05/23/90	06/22/90	08/13/90	2/ 08/13/90	CLOSED 05/01/92
90-4 <u>Rocky Flats Operational Readiness Review</u>	05/04/90	05/10/90	06/11/90	06/25/90	06/25/90	07/25/90	09/24/90	4/ 11/30/90	08/30/90
90-5 <u>Rocky Flats Systematic Evaluation Program</u>	05/18/90	05/24/90	06/25/90	07/09/90	06/20/90	07/20/90	09/18/90	7/ 05/04/94	10/ 08/30/90 CLOSED
90-6 <u>Rocky Flats Plutonium In The Ducts</u>	06/05/90	06/11/90	07/11/90	07/26/90	07/26/90	08/27/90	10/24/90	11/30/90	11/ 08/30/90 CLOSED
90-7 <u>Hanford Modif. To Imple. Plan For 90-3</u>	10/12/90	10/18/90	11/19/90	12/03/90	12/11/90	01/10/91	03/04/91	5/ 10/00/94	8/

Secretary's response originally due 4/15/90; Board granted 45-day extension to 6/12/90.

Implementation Plan due date figured from 5/14/90.

Original Implementation Plan received 7/13/90; supplemental received 2/7/91 to rectify deficiencies.

Original Implementation Plan received 11/30/90; modification received 2/15/91 to incorporate revisions and changes cited by Board.

Implementation Plan due date figured from 12/3/90.

Original Implementation Plan received 9/17/90; due to deficiencies, DOE has submitted revisions on 11/14/91, 6/15/92, 12/24/92, 7/20/93, and 11/9/94.

5/27/93 letter to SOE requesting revised IP; 6/25/93 SOE responded, will provide rev. by 10/15/93; rev. 1 IP received 10/15/93; 12/20/93 letter to SOE requesting IP be Rev.; 5/4/94 received Rev. 2 IP.

Original Implementation Plan received 3/7/91; Revision 1, dated 12/92, received 9/2/93; 5/10/94 received WMC-EP-0721 Program Plan as a replacement to IP; 12/2/94 received DCE/PL-94-110 as updated IP.

Recommendation closed per 10/24/95 letter to SOE.

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Recommendation closed per 10/24/95 letter to SOE.

Recommendation closed per 10/24/95 letter to SOE.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD
1991 RECOMMENDATIONS CALENDAR

2/22/96 Update

DNFSB Recommendation Number, DOE Site Involved And Subject In Brief	Date Delivered To Sec'y Of DOE	Date Recomme. Appears In Fed. Register	Public Comments To Rec. Deadline Date	Sec'y Of DOE Response Due Date	Date Response Appears In Fed. Register	Deadline For Public Comments To SOE Response	Implementation Plan Due Date	Date Implementation Plan Is Received	Public Hearing Date
91-1 <u>All Sites</u> Safety Standards	03/08/91	03/13/91	04/12/91	05/13/91 ^{1/}	05/17/91	06/17/91	08/15/91	08/16/91	CLOSED 10/27/92
91-2 <u>Savannah River</u> , Narrative For Closure Pkg.	03/27/91	04/03/91	05/03/91	05/20/91 ^{2/}	05/28/91	06/27/91	08/26/91	08/07/91	CLOSED 10/27/92
91-3 <u>WIPP</u> Readiness Review	04/25/91	05/01/91	05/31/91	06/17/91 ^{3/}	07/24/91 ^{3/}	08/23/91	09/03/91 ^{3/}	08/07/91	CLOSED 05/01/92
91-4 <u>Rocky Flats</u> Operational Readiness Review	09/30/91	10/08/91	11/07/91	11/22/91 ^{4/}	12/10/91	01/09/92	02/20/92	11/08/91	<u>01/16/92</u> CLOSED 05/01/92
91-5 <u>Savannah River</u> , Power Limits/K-Reactor	12/19/91	12/27/91	01/27/92	02/10/92 ^{5/}	03/10/92	04/09/92	06/08/92	01/31/92 ^{5/}	CLOSED 02/94 ANN. RPT.
91-6 <u>All Sites</u> Radiation Protection	12/19/91	12/27/91	01/27/92	02/10/92 ^{6/}	03/10/92	04/09/92	06/08/92	06/23/93 ^{7/}	

Originally DOE response due 4/29/91; Deputy SOE requested an extension to 5/13/91. Board approved 4/29/91.

SOE response letter dated 5/14/91 and received 5/24/91.

SOE response letter dated and received 6/3/91; Implementation Plan due date determined from date response was received.

SOE response letter dated 11/4/91 and received 11/9/91.

SOE response letter dated and received 1/31/92; response includes Implementation Plan.

SOE response letter dated 2/7/92 and received 2/11/92.

Per 8/3/92 letter to SOE, Implementation Plan not accepted; 1/15/93 DOE submitted revised Plan; 6/23/93 received Revision 2 Implementation Plan, dated 6/21/93; 7/2/93 letter to SOE stating Revision 2 IP was acceptable if implementation dates were revised; 5/10/94 received letter from SOE stating implementation dates were adjusted.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD
1992 RECOMMENDATIONS CALENDAR

2/22/96 Update

DNFSB Recommendation Number, DOE Site Involved And Subject In Brief	Date Delivered To Sec'y Of DOE	Date Recomme. Appears In Fed. Register	Public Comments To Rec. Deadline Date	Sec'y Of DOE Response Due Date	Date Sec'y Of DOE Response Received	Date Response Appears In Fed. Register	Deadline For Public Comments To SOE Response	Implementation Plan Due Date	Date Implementation Plan Received
92-1 <u>Savannah River</u> , HB-Line Oper. Readiness	05/21/92	05/29/92	06/29/92	10/14/92	10/20/92	11/06/92	12/07/92	CLOSED 10/27/92	SUPER-SEDED BY REC. 92-3
92-2 <u>All Sites</u> , DOE Facility Rep. Program	05/28/92	06/04/92	07/06/92	07/20/92	07/21/92	07/31/92	08/31/92	10/29/92	11/05/92
92-3 <u>Savannah River</u> , HB-Line Op. Read. Review	05/29/92	06/04/92	07/06/92	09/03/92	09/21/92	10/16/92	11/16/92	11/30/92	09/21/92 CLOSED
92-4 <u>Hanford</u> , Multi-Function Waste Tank Fac.	07/06/92	07/14/92	08/13/92	08/28/92	08/28/92	09/23/92	10/23/92	02/05/93	11/07/94
92-5 <u>All Sites</u> , Discipline of Operation	08/17/92	08/28/92	09/28/92	11/27/92	12/18/92	01/08/93	02/08/93	04/08/93	12/18/92 CLOSED
92-6 <u>All Sites</u> , Operational Readiness Review	08/26/92	09/02/92	10/02/92	10/19/92	10/20/92	11/06/92	12/07/92	02/04/93	04/04/94 CLOSED
92-7 <u>All Sites</u> , Training and Qualification	09/22/92	09/28/92	10/28/92	12/28/92	01/21/93	01/28/93	03/01/93	06/14/93	11/04/93

- 1/ 45-day extension requested. Board approved on 7/17/92; DOE response to be sent within 30 days of receipt of DNFSB HB-Line report, which was delivered 9/14/92.
2/ 45-day extension requested for response. Board approved 7/17/92; DOE response dated 9/15/92 and received 9/21/92. Implementation Plan was included; Recommendation closed per 2/94 Annual Report.
3/ 45-day extension requested for response. Board approved 10/23/92; DOE response and Implementation Plan received together; recommendation closed per 10/24/95 letter to SOE.
4/ 45-day extension requested for response. Board approved 12/2/92; 4/28/93 received DOE notice of 45-day extension for submitting Implementation Plan.
5/ Received DOE notice of 45-day extension for submitting Implementation Plan.
6/ 1/15/93 Board letter to SOE stating Implementation Plan be revised.
7/ Original Implementation Plan received 2/4/93; Due to deficiencies, DOE has submitted revisions on 3/18/94 and 11/7/94.
8/ Original Implementation Plan received 1/19/93; Received revised IP 9/17/93; Received revised IP 4/4/94, dated 4/1/94; recommendation closed per 10/24/95 letter to SOE.
9/ Original Implementation Plan received 6/14/93; Received revised IP 11/4/93 that also covered IP for Recommendation 92-3; Recommendation closed per 2/94 Annual Report.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD
1993 RECOMMENDATIONS CALENDAR

2/22/96 Update

DNFSB Recommendation Number, DOE Site Involved And Subject In Brief	Date Delivered To Sec'y Of DOE	Date Recomme. Appears In Fed. Register	Public Comments To Rec. Deadline Date	Sec'y Of DOE Response Due Date	Date Sec'y Of DOE Response Received	Date Response Appears In Fed. Register	Deadline For Public Comments To SOE Response	Implementation Plan Due Date	Date Implementation Plan Received
93-1 <u>All Sites</u> , Standards Utilization	01/21/93	01/28/93	03/01/93	04/28/93 ^{1/}	04/27/93	05/10/93	06/09/93	08/09/93	08/25/93 ^{2/}
93-2 <u>All Sites</u> , Critical Experiment Capability	03/23/93	03/30/93	04/29/93	05/14/93	05/13/93	06/04/93	07/06/93	09/02/93	08/10/93
93-3 <u>All Sites</u> , Tech. Capability in DNF Programs	06/01/93	06/08/93	07/08/93	07/23/93	07/23/93	08/06/93	09/06/93	11/04/93	11/04/93 ^{3/}
93-4 <u>All Sites</u> , Env. Restoration Mgmt. Contracts	06/16/93	06/24/93	07/26/93	08/09/93	08/09/93	08/12/93	09/13/93	11/10/93	11/09/93 ^{5/}
93-5 <u>Hanford</u> , Waste Tanks Char. Studies	07/19/93	07/28/93	08/27/93	09/13/93	08/31/93	09/09/93	10/11/93	01/24/94 ^{4/}	01/25/94
93-6 <u>All Sites</u> , Maintaining Acc. to Nuc.Wea.Exp.	12/10/93	12/23/93	01/24/94	02/07/94	02/04/94	02/17/94	03/22/94	07/05/94 ^{6/}	07/08/94

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45-day extension requested by DOE; Board approved 3/23/93.
Original Implementation Plan received 7/19/93; received amended IP that includes requested Board additions on 8/25/93.
Implementation Plan also covered revised IP for Recommendation 92-7.
Implementation Plan originally due 12/8/93, 12/14/93 received letter (dated 12/9/93) notifying that DOE needed a 45-day extension.
5/16/94 DOE notified Board that Item 4 of Recommendation is closed; 10/4/95 Board issued report requirement for revised IP.
Implementation Plan originally due 5/18/94, 5/19/94 received letter from SOE notifying Board that DOE needed 45-day extension.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD
1994 RECOMMENDATIONS CALENDAR

2/22/96 Update

DNFSB Recommendation Number, DOE Site Involved And Subject In Brief	Date Delivered To Sec'y Of DOE	Date Recomme. Appears In Fed. Register	Public Comments To Rec. Deadline Date	Sec'y Of DOE Response Due Date	Date Sec'y Of DOE Response Received	Date Response Appears In Fed. Register	Deadline For Public Comments To SOE Response	Implementation Plan Due Date	Date Implementation Plan Received
94-1 <u>All Sites</u> Improved Sched. for Remediation	05/26/94	06/03/94	07/05/94	09/01/94	08/31/94	09/06/94	10/06/94	02/28/95	03/01/95
94-2 <u>All Sites</u> Low-Level Waste Disposal	09/08/94	09/15/94	10/17/94	10/31/94	11/08/94	11/16/94	12/16/94	03/31/95	04/10/95
94-3 <u>Rocky Flats</u> Seismic and Safety Systems	09/26/94	10/04/94	11/03/94	11/18/94	11/21/94	11/28/94	12/28/94	04/12/95	07/03/95
94-4 <u>Oak Ridge</u> Deficiencies in Criticality Saf.	09/27/94	10/05/94	11/04/94	11/21/94	11/18/94	11/28/94	12/28/94	02/27/95	02/27/95
94-5 <u>All Sites</u> Integ. of Safety Rules, Orders	12/29/94	01/06/95	02/06/95	02/21/95	02/23/95	03/07/95	04/06/95	07/20/95	07/25/95

- 1/ Response originally due 7/18/94, SOE requested 45-day extension.
2/ IP initially due 12/5/94, rec'd 12/6/94; orig. IP withdrawn 1/26/95, will be resubmitted by 2/28/95; 2/28/95 IP is acceptable with three conditions.
3/ Implementation Plan originally due 2/14/94, SOE notified Board that DOE needed an additional 45 days.
4/ Implementation Plan originally due 2/27/95, SOE notified Board that DOE needed an additional 45 days.
5/ Implementation Plan originally due 6/5/95, SOE notified Board that DOE needed an additional 45 days.
6/ 10/3/95 letter to SOE stating Board accepts IP with revised schedule for Phase I.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD
1995 RECOMMENDATIONS CALENDAR

2/22/96 Update

DNFSB Recommendation Number, DOE Site Involved And Subject In Brief	Date Delivered To Sec'y Of DOE	Date Recomme. Appears In Fed. Register	Public Comments To Rec. Deadline Date	Sec'y Of DOE Response Due Date	Date Sec'y Of DOE Response Received	Date Response Appears In Fed. Register	Deadline For Public Comments To SOE Response	Implementation Plan Due Date	Date Implementation Plan Received
95-1 <u>All Sites</u> Safety of Cylin. w/ Depl. Uranium	05/05/95	05/15/95	06/14/95	06/29/95	07/05/95	07/18/95	08/17/95	10/16/95	10/17/95 ^{1/}
95-2 <u>All Sites</u> Safety Management	10/11/95	10/19/95	10/20/95	01/17/96 ^{2/}	01/18/96	01/23/96	02/22/96	04/22/96	

^{1/} 11/1/95 Board sent letter to SOE accepting Implementation Plan.
^{2/} 12/1/95 SOE requested a 45-day extension for response, Board approved 12/5/95.

SEPARATION

PAGE

RECOMMENDATION 94-1 TO THE SECRETARY OF ENERGY
pursuant to 42 U.S.C. § 2286a(5)
Atomic Energy Act of 1954, as amended.

Dated: May 26, 1994

The halt in production of nuclear weapons and materials to be used in nuclear weapons froze the manufacturing pipeline in a state that, for safety reasons, should not be allowed to persist unremediated. The Board has concluded from observations and discussions with others that imminent hazards could arise within two to three years unless certain problems are corrected.

We are especially concerned about specific liquids and solids containing fissile materials and other radioactive substances in spent fuel storage pools, reactor basins, reprocessing canyons, processing lines, and various buildings once used for processing and weapons manufacture.

It is not clear at this juncture how fissile materials produced for defense purposes will eventually be dealt with long term. What is clear is that the extant fissile materials and related materials require treatment on an accelerated basis to convert them to forms more suitable for safe interim storage.

The Board is especially concerned about the following situations:

- Several large tanks in the F-Canyon at the Savannah River Site contain tens of thousands of gallons of solutions of plutonium and trans-plutonium isotopes. The trans-plutonium solutions remain from californium-252 production; they include highly radioactive isotopes of americium and curium. These tanks, their appendages, and vital support systems are old, subject to deterioration, prone to leakage, and are not seismically qualified. If an earthquake or other accident were to breach the tanks, F-Canyon would become so contaminated that cleanup would be practically impossible. Containment of the radioactive material under such circumstances would be highly uncertain.
- The K-East Basin at the Hanford Site contains hundreds of tons of deteriorating irradiated nuclear fuel from the N-Reactor. This fuel has been heavily corroded during its long period of storage under water, and the bottom of the basin is now covered by a thick deposit of sludge containing actinide compounds and fission products. The basin is near the Columbia River. It has leaked on several occasions, is likely to leak again, and has design and construction defects that make it seismically unsafe.
- The 603 Basin at the Idaho National Engineering Laboratory (INEL) contains deteriorating irradiated reactor fuel from a number of sources. This basin

also contains sludge from corrosion of the reactor fuel. The seismic competence of the 603 Basin is not established.

- Processing canyons and reactor basins at the Savannah River Site contain large amounts of deteriorating irradiated reactor fuel stored under conditions similar to those at the 603 Basin at INEL.
- There are thousands of containers of plutonium-bearing liquids and solids at the Rocky Flats Plant, the Hanford Site, the Savannah River Site, and the Los Alamos National Laboratory. These materials were in the nuclear-weapons-manufacturing pipeline when manufacturing ended. Large quantities of plutonium solutions are stored in deteriorating tanks, piping, and plastic bottles. Thousands of containers at the Rocky Flats Plant hold miscellaneous plutonium-bearing materials classed as "residuals", some of which are chemically unstable. Many of the containers of plutonium metal also contain plastic and, in some at the Rocky Flats Plant, the plastic is believed to be in intimate contact with the plutonium. It is well known that plutonium in contact with plastic can cause formation of hydrogen gas and pyrophoric plutonium compounds leading to a high probability of plutonium fires.

We note that removal of fissile materials from the 603 Basin at INEL has begun. We are also following the plans for remedying several of the other situations listed. In general, these plans are at an early stage. In addition, we are aware of steps DOE has taken to assess spent fuel inventories and vulnerabilities. We also note that a number of environmental assessments are being conducted in relation to the situations we have listed above. Finally, we note that a draft DOE Standard has been prepared for methods to be used in safe storage of plutonium metal and plutonium oxide.

These actions notwithstanding, the Board is concerned about the slow pace of remediation. The Board believes that additional delays in stabilizing these materials will be accompanied by further deterioration of safety and unnecessary increased risks to workers and the public.

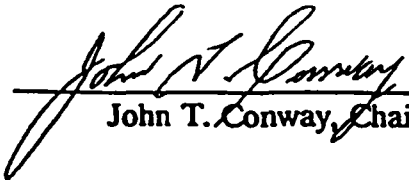
Therefore the Board recommends:

- (1) That an integrated program plan be formulated on a high priority basis, to convert within two to three years the materials addressed in the specific recommendations below, to forms or conditions suitable for safe interim storage. This plan should recognize that remediation will require a systems engineering approach, involving integration of facilities and capabilities at a number of sites, and will require attention to limiting worker exposure and minimizing generation of additional waste and emission of effluents to the environment. The plan should include a provision that, within a reasonable period of time (such as eight years), all storage of plutonium metal and oxide

should be in conformance with the draft DOE Standard on storage of plutonium now being made final.

- (2) That a research program be established to fill any gaps in the information base needed for choosing among the alternate processes to be used in safe conversion of various types of fissile materials to optimal forms for safe interim storage and the longer term disposition. Development of this research program should be addressed in the program plan called for by (1) above.
- (3) That preparations be expedited to process the dissolved plutonium and trans-plutonium isotopes in tanks in the F-Canyon at the Savannah River Site into forms safer for interim storage. The Board considers this problem to be especially urgent.
- (4) That preparations be expedited to repackage the plutonium metal that is in contact with, or in proximity to, plastic or to eliminate the associated existing hazard in any other way that is feasible and reliable. Storage of plutonium materials generated through this remediation process should be such that containers need not be opened again for additional treatment for a reasonably long time.
- (5) That preparations be expedited to process the containers of possibly unstable residues at the Rocky Flats Plant and to convert constituent plutonium to a form suitable for safe interim storage.
- (6) That preparations be expedited to process the deteriorating irradiated reactor fuel stored in basins at the Savannah River Site into a form suitable for safe interim storage until an option for ultimate disposition is selected.
- (7) That the program be accelerated to place the deteriorating reactor fuel in the K-East Basin at the Hanford Site in a stable configuration for interim storage until an option for ultimate disposition is chosen. This program needs to be directed toward storage methods that will minimize further deterioration.
- (8) That those facilities that may be needed for future handling and treatment of the materials in question be maintained in a usable state. Candidate facilities include, among others, the F- and H-Canyons and the FB- and HB-Lines at the Savannah River Site, some plutonium-handling glove box lines among those at the Rocky Flats Plant, the Los Alamos National Laboratory, and the Hanford Site, and certain facilities necessary to support a uranium handling capability at the Y-12 Plant at the Oak Ridge Site.

- (9) Expedited preparations to accomplish actions in items (3) through (7) above should take into account the need to meet the requirements for operational readiness in accordance with DOE Order 5480.31.



John T. Conway, Chairman

SEPARATION

PAGE

John T. Conway, Chairman
A.J. Eggenberger, Vice Chairman
John W. Crawford, Jr.
Joseph J. DiNunno
Herbert John Cecil Kouts

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

625 Indiana Avenue, NW, Suite 700, Washington, D.C. 20004
(202) 208-6400



December 12, 1995

Dr. John F. Ahearne (Co-Chair)
Mr. Gerald F. Scannell (Co-Chair)
Advisory Committee on External Regulation
Of Department of Energy Nuclear Safety
1726 M Street, NW
Washington, DC 20036

Gentlemen:

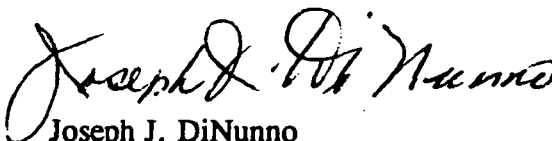
I appreciated the opportunity to be a part of this study and to contribute to the lively and thought-provoking exchanges that took place. The subject matter is certainly one that merits attention by our lawmakers, either to confirm that the status quo suffices or to make changes in the national interest.

In highlighting issues, the Committee's report reveals the complexity of the existing regulatory framework relative to the Department of Energy's nuclear programs. Our deliberations on these issues showed considerable diversity of ideas as to fixes, general agreement on some broad concepts, and lack of unanimity on any number of the detailed recommendations.

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.

My views with respect to the report are summarized in the enclosure. I request these views be included as a part of the report submitted to the Secretary of Energy.

Respectfully,


Joseph J. DiNunno
Board Member

Enclosure

**STATEMENT BY 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.

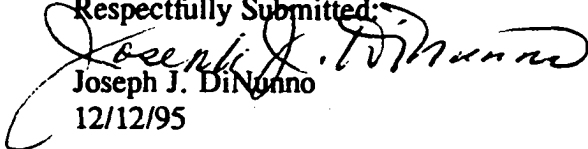
However: The fulfillment of this objective could be significantly affected by report recommendations for specific language changes to existing provisions of both the AEA and the RCRA. I do not endorse such recommendations. The implications of such changes deserve much more scrutiny than the Committee 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 28*);
- Permitting state regulation of nuclear facility safety, using standards inconsistent with Federal standards (page 30*); and
- Provision for citizen suits directly against DOE and its contractors in addition to new layers of Federal regulation of DOE (Page 37*).

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)

Respectfully Submitted:


Joseph J. DiNonno
12/12/95

- * Page numbers refer to report draft dated December 7, 1995. These may be different for the final report

SEPARATION

PAGE

**EXTERNAL REGULATION OF DOE NUCLEAR SAFETY
A DIFFERENT POINT OF VIEW**

**PAPER PREPARED FOR PRESENTATION TO
LOCAL SECTION-AMERICAN NUCLEAR SOCIETY
WASHINGTON, D.C.**

**JOSEPH DiNUNNO
MEMBER: DEFENSE NUCLEAR FACILITIES SAFETY BOARD
FEBRUARY 27, 1996**

NOTE: The views expressed here are those of the author and do not necessarily represent the views of the Board as a whole.

EXTERNAL REGULATION OF DOE NUCLEAR SAFETY ANOTHER POINT OF VIEW

As a part of my confirmation consideration by the Senate Armed Services Committee in 1992, I was asked the question, "Should you be confirmed as a member of the Defense Nuclear Facilities Safety Board (Board), what would you view as your principal responsibilities to the Secretary of Energy . . . ?"

My reply was as follows: My responsibilities to the Secretary of Energy will be to provide independent oversight of defense nuclear facilities with respect to nuclear safety without, in any way, assuming or unduly intruding upon programmatic responsibilities that are his (Watkins). As a Board Member, I will owe to the Secretary, independent, forthright, soundly-based advisories that hopefully will contribute in a positive way to achievement of added margins of safety for both workers on site and the public at large.

As a member of the Advisory Committee on External Regulation, I found myself one of a diverse group of individuals with different agendas, different interests, and different backgrounds. It was an experience in participatory democracy with all the benefits of increased understanding and enlightenment that derives from lively exchanges among individuals with different points of view. The process is great for airing views. It is not so great for coming up with detailed solutions on complex issues. My lifetime experience has made me wary of solutions developed by committees. They generally include something for everyone. I am ever reminded of the old Aesop fable that ended with the observation that "he who tries to please everyone pleases no one."

I am not here to quarrel with the Committee structure. The Secretary of Energy chose to explore this issue for her. That was her call. However, in the context of my pledge to give her forthright and soundly-based advisories, I was not able to do so as one contributor among many. Hence, I felt compelled to include, as additional comments, my advice to look much more carefully than the Committee did at the implications of the detailed recommendations before moving forward. There is an apt expression that captures the situation; namely:

THE DEVIL IS IN THE DETAILS

I will be more explicit later, but I would like to say that one of my criticisms of the report is that it implies a greater unanimity by the Committee with respect to the recommendations that can be rightfully asserted. The Committee never really reached full accord on much of anything except that:

- 1) The historic past provided little cause to believe the Department of Energy (DOE) could ever self-police itself with credibility without some outside external forcing authority.
- 2) No outside authority or authorities could or should be considered a substitute for an effective internal safety management structure and program, and

- 3) **Practicality considerations made enlarged roles for existing government entities preferable over new creations.**

Virtually all other more detailed recommendations had constituencies, but support was anything but unanimous on most of them. This is not surprising, given the diversity of the Committee, nor cause for castigation of those with different views. However, it should give cause for DOE to review the report with caution because controversy within the Committee surely signals difficulties for DOE if it chooses to endorse the report as a whole I understand that DOE has established a group under Thomas Grumbly, Acting Under Secretary, to study the report and to develop a response plan. I have been invited to meet with the group and have indicated my willingness to do so.

In my formal comments on the report, I indicated there were parts of the report I felt to be informative and a number of the recommendations I did support. However, I believe, taken as a whole the recommendations represent a regulatory model that will exacerbate DOE's problems, not help solve them. The safety problems of DOE require technical solutions--stabilization of residual wastes, clean up of contaminated buildings and sites, safe dismantlement of nuclear weapons, and safe stewardship of strategic materials. The solution offered is a cumbersome, complex, legal structure with dramatically increased potential for litigious proceedings that could impede DOE's mission and add unneeded cost to the taxpayer.

These observations are not post report reactions. I made the same or equivalent points during the Committee's deliberations. I also offered the concept I like to think of as incrementalism, if additives to external action-forcing authority are to be sought. This approach might be characterized as an engineer's approach to the problem in contrast to the legal one advocated. It is driven by a different set of premises and principles than formed the Committee's approach; e.g., the Committee established increased credibility of DOE as a main driver for a reformed regulatory structure. I believe DOE should seek greater confidence and acceptability through more solid performance rather than a spinoff of responsibilities assigned to it by Congress. Further, the public sectors to be better served are those most directly affected; namely, those living in the proximity to the activities that put them at risk and those called upon to foot the bill for added safety assurance measures. In keeping with this view, I would commend to DOE a different set of principles than set forth in the report to guide DOE's path forward. These are as follows:

- **Attack today's regulatory problems, not those of yesteryear,**
- **Regulate only to the degree necessary to force the behavior sought,**
- **Facilitate technical solutions not construct needless process impediments,**
- **Allow flexibility in establishment of requirements, tailored to work hazards,**
- **Structure to encourage good solid safety practices, not to fear penalties,**

- Minimize costs and maximize benefits,
- Minimize regulatory overlaps and duplication, and
- Encourage intra government cooperation.

The concept of establishing an added external regulatory program for the DOE nuclear complex is far more complicated than it might appear on the surface. This results both from the sheer number and diversity of facilities and activities involved, the condition and age of many of them, the national security functions some of them serve, and the changing missions to which a safety management program must adjust. The Committee rightly recognized that no one regulatory concept would fit all and that neither the Board nor the Nuclear Regulatory Commission (NRC) had programs that were suitable without modification and adaptation.

Having so observed, the matter was not pursued far enough to develop more than generalities. It deserves much closer scrutiny by DOE. One way to do this is to divide the DOE nuclear complex into component parts such as shown in Figure 1 (Viewgraph) and then examine each part relative to the merits and demerits of added external regulation. Before doing so, however, it is important to understand that the often expressed statement that DOE regulates itself is misleading. DOE self-regulates today only in a limited area of nuclear materials. Regulation of the hazardous and toxic materials, control of some releases of radioactivity to the environment and disposal of mixed and radioactive wastes are externally regulated. (See Figure 2.) DOE today is not free to operate in the way that historically caused the contamination of sites now requiring major cleanup and environmental restoration. An examination of Figure 1 helps focus on key points at issue.

Facilities in Part I include the residual of the weapons program still required to fulfill DOE's nuclear weapons mission. Those under Part IIA are high hazard facilities (radioactivity) required for safe stabilization of residuals of weapons production, waste processing and safe storage. Parts IIB, III, and IV are the major targets for cleanup and environmental restoration. Part V includes nuclear facilities that are part of the non-defense nuclear activities of DOE. Added regulation by any external agency has different implications for each of these groupings. It has been estimated that facilities total on the order of 3500 operable units targeted for cleanup under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) on the order of 300, and facilities required to support the weapons program on the order of 100.

Facilities in Part I are the residual components of DOE nuclear weapons complex still required to support the weapons program. Facilities in Part IIA (left portion) are facilities required to process and stabilize hazardous residuals of the weapon's program. They are the main targets for those who most strongly advocate external regulation. External regulation is seen by some as a vehicle for greater access to information heretofore withheld and by others as a way to gain greater intervention rights in decisions relative to the production and uses of nuclear materials by the weapons establishment. Such is the thrust of any number of the detailed recommendations

pertaining to changes to the Atomic Energy Act, Resource Conservation and Recovery Act (RCRA), and the Clean Water Act.

Facilities in Parts I and Parts IIA are high hazard facilities and operations that Congress targeted for special external oversight when it established the Board in 1988. The Board was given action-forcing powers rather than regulating authority because that was deemed sufficient to achieve the behavior sought. National security considerations strongly influenced Congressional action. The Board, in its 5th Annual Report, found that no additional authority was needed to induce DOE to move forward in its safety upgrade program, although that movement was not progressing as fast as the Board sought. In response to Board recommendations and in part on its own initiative, DOE this year has undertaken a number of initiatives to move toward a flexible safety management concept that embodies safety practices comparable to the commercial industry, but more adaptable to the changing missions and needs of DOE. However, the Board is not totally satisfied with the results of DOE's efforts to date to revise its safety requirements and to institutionalize its safety management programs. The Board and DOE are working together to resolve the issues. The question of whether the Board has enough statutory authority to move DOE forward in a timely fashion is certainly appropriate. The Board on its own is assessing this matter as a part of its annual review and report to Congress due in early March. The Board has also been contacted by staffs of several of the Congressional Committees and is expected to address this issue of external regulation during hearings scheduled in early March.

Facilities and activities in Parts IIB, II, and IV are either to be deactivated for non-time critical cleanup or remediation under CERCLA or RCRA. These activities hardly need another regulator on the scene. DOE is not suffering from lack of external regulation. If anything it is just the opposite--too much. The Board has been cooperating with both EPA and State authorities in establishing effective working relationships. The objective is to facilitate DOE's work. (See Figure 3.)

In the case of facilities in Part V, to my knowledge there are no public pressures being brought to bear on DOE to change the self-regulatory programs that cover these. Why then change? If the Secretary so wished, DOE could seek the independent review and affirmation by NRC of its safety management programs for these facilities. DOE in the past had a "parallel review" of its developmental power reactors that possibly could be re-instituted.

In summary:

The report, in my view, does not make a convincing case for proceeding as recommended. Draconian measures are offered when simpler actions are likely to suffice.

REFERENCES

1. Improving Regulation of Safety at DOE Nuclear Facilities, December 1996, Report of the Advisory Committee on External Regulation of the Department of Energy
2. Compendium: Federal Environmental Laws, West Publishing Company
3. Fifth Annual Report to Congress, February 1995, Defense Nuclear Facilities Safety Board

DOE Defense Nuclear Complex

F A C I L I T I E S	LABORATORIES WEAPONS ASSEMBLY & DISASSEMBLY TESTING SURVEILLANCE & READINESS SPECIAL NUCLEAR MATERIALS	SPENT FUEL & PRODUCTION RESIDUALS EXCESS SPECIAL NUCLEAR MATERIAL	TREATMENT & STABILIZATION FACILITIES WASTE PROCESSING & STORAGE RADIOACTIVE WASTE	EXCESS FACILITIES . CUSTODIAL . DECONTAMINATION (D) . DECONTAMINATION & DECOMMISSION (D&D) . (D&D PLUS ENV. RES.)	OPERABLE UNITS RCRA & CERCLA . (D&D PLUS ENV. RES.)	REPOSITORIES . HL-W . LL-W . MIXED . TRU
F U N C T I O N S	STEWARDSHIP/NATIONAL SECURITY & DEFENSE		TREATMENT & STABILIZATION SAFE STORAGE	CUSTODIAL & D&D	ENVIRON- MENTAL RESTORATION	WASTE DISPOSAL
PART I			PART II		PART III	PART IV

FIGURE 1

DOE Non-Defense Nuclear Complex

F A C I L I T I E S	RESEARCH/ TEST REACTORS NATIONAL LABORATORIES UNIVERSITY LABORATORIES
F U N C T I O N S	ENERGY RESEARCH ENVIRONMENTAL RESTORATION RESEARCH
	PART V

FIGURE 1-A

ENVIRONMENT

DEFENSE NUCLEAR FACILITY

DISPOSAL

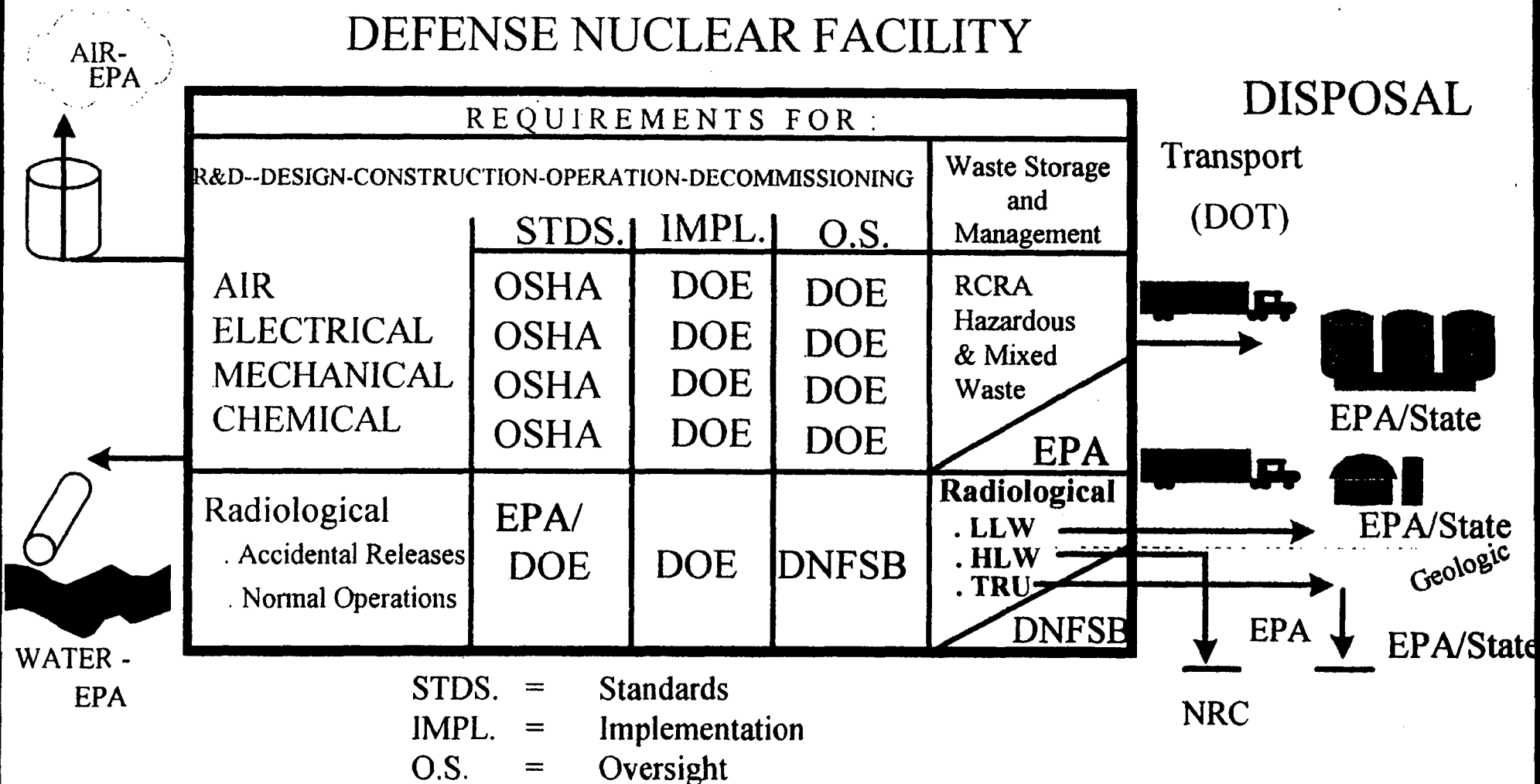


FIGURE 2

DUE TO THE COMPLEXITY OF THE ISSUES SUMMARIZED IN THIS FIGURE, IT MUST BE READ IN CONJUNCTION WITH THE FULL TEXT IN PART II, SECTION IV.D.1.

DEPARTMENTAL AND AGENCY ROLES AND RESPONSIBILITIES FOR ACTIVITIES IN THE INDUSTRIAL AREA AT RFETS

DOE DIRECTS AND MANAGES ALL ACTIVITIES AT RFETS

MATERIAL/ WASTE ACTIVITY	RADIOACTIVE MATERIALS SNM, TRU, Byproduct	LOW LEVEL RADIOACTIVE WASTE	SOLID/LIQUID MIXED TRU WASTE (RCRA Waste)	LOW LEVEL MIXED WASTE (RCRA waste)	HAZARDOUS AND SOLID WASTE	†CERCLA/RCRA MATERIALS IN ENVIRONMENT
Operations and Processing	DNFSB Primary CDPHE Review and Comment	DNFSB Primary CDPHE Review and Concur	CDPHE Primary DNFSB Review and Concur	CDPHE Primary DNFSB Review and Concur	CDPHE Primary	CDPHE Primary
Storage, On-Site Transport , and Decontamination (unassociated with decommissioning)	DNFSB Primary CDPHE Review and Comment	DNFSB Primary CDPHE Review and Concur	CDPHE Primary DNFSB Review and Concur ‡	CDPHE Primary DNFSB Review and Concur	CDPHE Primary	CDPHE Primary
Deactivation including removal of SNM stored and contained materials and waste	DNFSB Primary CDPHE Review and Comment	DNFSB Primary CDPHE Review and Concur	CDPHE Primary DNFSB Review and Concur	CDPHE Primary DNFSB Review and Concur	CDPHE Primary	CDPHE Primary
Final disposition, or disposal within Colorado	DNFSB Primary CDPHE Review and Comment ††	CDPHE Primary DNFSB Review and Concur	CDPHE Primary DNFSB Review and Concur	CDPHE Primary DNFSB Review and Concur	CDPHE Primary	CDPHE Primary
Decontamination of residual contamination of fixed structures	CDPHE Primary EPA Review and Comment	CDPHE Primary EPA Review and Comment	CDPHE Primary EPA Review and Comment	CDPHE Primary EPA Review and Comment	CDPHE Primary EPA Review and Comment	CDPHE EPA Review and Comment
	DNFSB Review and Comment	DNFSB Review and Comment	DNFSB Review and Comment	DNFSB Review and Comment	DNFSB Review and Comment	DNFSB Review and Comment
Dismantlement and Demolition	CDPHE Primary EPA Review and Comment	CDPHE Primary EPA Review and Comment	CDPHE Primary EPA Review and Comment	CDPHE Primary EPA Review and Comment	CDPHE Primary EPA Review and Comment	CDPHE EPA Review and Comment
	DNFSB Review and Comment	DNFSB Review and Comment	DNFSB Review and Comment	DNFSB Review and Comment	DNFSB Review and Comment	DNFSB Review and Comment

Decommissioning
(DOE/EPA Policy)

† EPA retains final signature authority on the "record of decision" for final selection of remedial alternative, and DNFSB provides comment in areas of expertise upon request.
 †† Review and Concur if final disposition or disposal is in the State of Colorado.
 ‡ DNFSB has statutory oversight responsibility for nuclear waste storage. 42 U.S.C. § 2286g(2).

Legend:

CDPHE Primary EPA Secondary DNFSB Secondary	CDPHE Primary DNFSB Secondary	DNFSB Primary CDPHE Secondary
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Figure 3