DEPARTMENT IMPLEMENTATION PLAN

Department of Energy Plan
for the Development and Implementation of

Integrated Safety Management

(Implementation Plan for Board Recommendation 95-2)

Washington, D.C. 20585

April 18, 1996

CONTENTS

DEPARTMENT IMPLEMENTATION PLAN
DNFSB RECOMMENDATION 95-2

TAB A

Implementation Plan forwarding
Secretary of Energy letter to Mr. John T. Conway,
Chairman of the DNFSB dated April 18, 1996

The Secretary of Energy
Washington, DC 20585

April 18, 1996

The Honorable John T. Conway
Chairman.
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, NW
Suite 700
Washington, DC 20004

Dear Mr. Chairman:

This letter forwards the Department's Implementation Plan for addressing the Safety Management issues raised in the Defense Nuclear Facilities Safety Board's Recommendation 95-2.

The Department acknowledges the concerns raised by the Board. in Recommendation 95-2. "This Implementation Plan fulfills my commitment to you in my letter of January 17, 1996, to develop an implementation plan which recognizes that effective work planning must be integrated into management at all levels. The activities described in this plan will help ensure that the Department effectively accomplishes its mission while ensuring the safety of the public., workers and the environment. The Department believes that this Implementation Plan meets the intent of Recommendation 95-2.

The Implementation Plan describe '-an aggressive program of actions. Field and-Area offices will proceed without delay with initiatives to institutionalize' the Safety Management System as described in this Implementation Plan. To ensure its success, I have tasked the Acting Under Secretary, Mr. Thomas. P. Grumbly, to establish a Safety Management Implementation Team to institutionalize the Safety Management System in the Department. This Implementation Team will be composed of safety and management professionals from the field and headquarters who will be, charged with pulling this program together and coordinating with other ongoing complementary activities..

We appreciate Mr. DiNunno's and Dr. Kouts' advice and support in the Department's development of this plan. If you have any questions, please feel free to contact me or Mr. Grumbly.

Sincerely,

Hazel R. O'Leary

TAB B

Integrated Safety Management
Implementation Plan for Board Recommendation
95-2 dated April 18, 1996

DEPARTMENT IMPLEMENTATION PLAN

Department of Energy Plan
for the Development and Implementation of

Integrated Safety Management

(Implementation Plan for Board Recommendation 95-2)

Washington, D.C. 20585

April 18, 1996

Executive Summary

The Department is committed to conducting work efficiently and in a manner that ensures protection of workers, the public and the environment. Over the past three years, the Department has developed and implemented a number of systems that are designed to achieve an acceptable level of safety throughout Departmental operations. These systems are designed to achieve the following results:

- enhance our ability to plan and execute work, identify the hazards associated with specific operations and activities, and control or eliminate such hazards in an appropriate and cost-effective manner;

- clarify our expectations for the work to be accomplished and the level of environment, safety and health protection to be established and to do so in a manner that is not overly prescriptive but allows contractors to exercise the best means of meeting these expectations;

- establish clear roles and responsibilities for protection of environment, safety and health throughout the Department and our mntractor corps;

- shift the focus of attention from "paper requirements" and documentation to a disciplined, analytical and collaborative focus on work planning, hazards analysis and hazards control; and

- establish analytical bases for setting risk-based management and project priorities.

The objective of integrated safety management (referred to as safety management in this document) is for the Department and contractors to systematically integrate safety into management and work practices at all levels so that missions are accomplished while protecting the public, the worker, and the environment.

Objective of Integrated Safety Management

The Department and Contractors must systematically integrate safety into management and w ork practices at all levels so that missions are accomplished while protecting the public, the w orker, and the environm ent.

Stated simply, the objective is to: ***DO WORK SAFELY***.

The objective, guiding principles, and core functions of safety management have been defined in this Implementation Plan and should be used consistently in implementing safety management throughout the Department complex. Throughout this plan, the term safety is used synonymously with environment, safety and health (ES&H) to encompass protection of the public, the workers, and the environment. The guiding principles for safety management are the fundamental policies that guide Department and contractor actions, from developing safety directives to performing work. The safety management guiding principles include: line management responsibility for safety, competence commensurate with responsibilities, and establishment of an appropriate set of safety requirements. The guiding principles were developed by a group of safety and management professionals following a review of safety guiding principles in other Department documents and industry safety standards.

Safety management activities can be grouped into five core safety management functions:

1) define scope of work,
2) identify and analyze hazards associated with the work,
3) develop and implement hazard controls,
4) perform work within controls, and
5) provide feedback on adequacy of controls and continuous improvement in defining and planning work.

These five core safety management functions provide the necessary structure for any work activity that could potentially affect the public, the workers, and the environment. The degree of rigor needed to address these functions will vary based on the type of work activity and the hazards involved.

The key elements of this plan include:

- Institutionalizing through Department directives the Safety Management System, including establishment of the Department-wide safety management objective, guiding principles, and functions; establishment of guidance for tailoring the level of rigor based on the work involved, the hazard and potential for environmental impact; and direction on authorization basis and authorization agreements.

- Identifying existing directives and ongoing Department initiatives involving safety management that need to be reconciled and integrated.

- Upgrading the Functions, Assignments, and Responsibilities Manual, consistent with the direction provided by the Safety Management System.

- Implementing a variety of activities to share, recruit/acquire and develop/train

Department technical expertise for effectively implementing the Safety Management " System.

- Developing contractual mechanisms to implement the Department's Safety Management System into existing and future contracts.

- Implementing the integrated safety management system at a priority list of Department sites and facilities.

A Safety Management Implementation Team will be established to oversee the commitments and internal management actions outlined in this Implementation Plan. The Implementation Team will track and reconciliate other relevant Department programs and initiatives for consistency with the safety management approach outlined in this plan. This dedicated Implementation Team will report directly to the Under Secretary. Further changes in Departmental organization may also be warranted once it becomes clear how effectively the recommendation is being implemented through this process.

Table of Contents

1. Background

The Department is committed to conducting its work efficiently and in a manner that ensures protection of the workers, the public and the environment Initiatives underway within the Department are designed to provide an effective system for managing safety, consistent with its missions, budgets, and risk acceptance objectives. Line managers are being given the authority and being held accountable for implementing health, safety, and environmental requirements. These requirements will be clearly defined and commensurate with the hazards and risks associated with the work

> ***DOE Critical Success Factor***
>
> *"Ensuring the safety and health of workers and the public and the protection and restoration of the environment are fundamental responsibilities of the Department of Energy."*
>
> *- DOE Strategic Plan, 1994*

Recommendation 95-2, submitted to the Department on October 11, 1996, seeks to combine and modify previous Board recommendations concerning the use of standards for conducting operations. The recommendation calls for: 1) an institutionalized process for ensuring environment, safety, and health requirements are met, 2) safety management plans for conduct of operations, tailored based upon risk, 3) a prioritized list of facilities/activities based on hazards and importance, 4) direction and guidance for the integrated safety management system, and 5) measures to ensure the Department has or will acquire the necessary technical expertise to effectively implement the process.

The Department's acceptance of Recommendation 95-2, as discussed in the Secretary's letter of January 17, 1996, is based on the premise that safety management must be integrated into management and work practices at all levels so that missions are accomplished and the public, the workers, and the environment are protected. Stated simply, the objective is to: ***DO WORK SAFELY***. The Department has implemented or is developing many of the necessary elements of an improved safety management system. This Plan describes the actions for completing that development effort and institutionalizing a safety management system effectively Department-wide. Throughout this plan, the term safety is used synonymously with environment, safety and health to encompass protection of the public, the workers, and the environment.

2. Underlying Issues

The Department has thoroughly evaluated its past performance in managing safety of Department facilities and activities. This evaluation provides an understanding from which positive change can be made. Some of these changes include:

- Ensuring that overall management of safety functions and activities become an integral part of the Department's business process.

- Developing an approach for tailoring safety requirements appropriate for the work and the hazards.

- Recognizing that many existing programs and initiatives related to safety management must be reconciled and brought into a coherent, appropriate, integrated system.

- Establishing a corporate safety management system which will readily facilitate establishment of balanced priorities; allocation of resources based on work and associated hazards; and translation of lessons learned from managing one hazard type for the benefit of managing other hazard types.

- Establishing clear roles and responsibilities for safety management that provide for ownership and assurance of safety.

- Ensuring that assigned responsibilities and personnel competence are properly aligned for effectively implementing safety management systems.

These underlying issues form the basis of the Implementation Plan and these are discussed in more detail below.

Integrating Safety Management into the Business Process. The Department's missions include assuring nuclear deterrence, conducting research, energy security, dismantling surplus facilities, and cleaning-up legacy waste. The Department must meet its responsibilities to protect the public, the workers, and the environment, while accomplishing these missions. The Department's business processes for defining mission objectives, assuring that work objectives are compatible with mission objectives, establishing and modifying contracts, obtaining and allocating resources, and managing execution and monitoring performance should consider all aspects of Department operations, including safety management. To be efficient and cost-effective, safety management must become part of each work activity, rather than something "in addition to" or "on top of." Expectations for contractor safety performance are an integral part of expectations for contractor overall performance and mission accomplishment.

Tailored Approach. A key challenge in institutionalizing a safety management system that can be used uniformly for all hazard types and levels is to allow for flexibility in the performance of the work. The Department's efforts to identify and apply standards throughout the complex have proven that a "one-size-fits-all" approach is not appropriate and cannot succeed. When lower hazard facilities apply standards that are appropriate for higher hazard facilities, this often results in minimum value-added, excessive costs, and encumbered work activities. While core safety functions are similar for all facilities and activities, the implementing mechanisms and approval authorities need to be allowed to differ, based on the hazards and work being performed. For example, Nuclear Safety Analysis Reports and Department-conducted Operational Readiness Reviews are appropriate for higher hazard activities but not for all activities.

Coherent, Integrated System. With the formation of the Department Standards Committee in 1994, the Department recognized that existing safety management efforts across the various program offices needed to become more effective, better coordinated, and cost-effective. For the most part, the necessary elements and initiatives for assuring safety are in place (see Appendix C). The existing Department safety management system can be transformed from the current patchwork of overlapping elements and initiatives into a coherent, integrated safety management system. The guiding principles, functions, mechanisms, and responsibilities necessary to effectively implement safety management can be identified and connected in a systematic way. A common understanding of fundamental components of the safety management system need to be attained and communicated throughout the Department complex.

Corporate System. This plan describes a safety management system which will readily facilitate establishment of balanced priorities; allocation of resources based on work and associated hazards; and translation of lessons learned from managing one hazard type for the benefit of managing other hazard types.

Clear Roles and Responsibilities. A clear assignment of safety management functions and responsibilities is essential. The Department has the ultimate responsibility for ensuring that the management of risk is effectively conducted at all Department facilities and activities. Likewise, Department contractors have responsibilities for managing and performing work safely. The Department needs to make decisions about which functions should be contractor responsibilities and to assure that contractor performance is adequate.

Competence Commensurate with Responsibility. It is critical that personnel possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities. The Department has a considerable amount of technical talent and an experience base which is uniquely suited to the Department's work. But the Department can do a better job in recruiting, managing and leveraging this expertise and focusing it on the

most important priorities and challenges in order to effectively implement safety managements systems. In addition, the Department must identify weaknesses in technical competence which may hinder institutionalization or sustenance of effective safety management systems.

3. Assumptions

The Department makes the following assumptions in developing this Implementation Plan:

- The Department has already in place the majority of elements necessary for safety management (see Appendix C), but these may be integrated and rationalized to ensure performance.

- Sufficient flexibility must be provided to field operations and contractors to accomplish their missions effectively. This must be balanced with the need for the Department's Headquarters program managers to be responsive and accountable for mission completion and for establishing environment, safety and health policies and management expectations

- Department safety management systems must ensure that the Department is attending to its most significant risks to environment, safety and health in a cost-effective manner.

- The Department can assign safety management functions and responsibilities to the contractor and achieve the expected level of safety performance when the assigned functions are appropriately defined and monitored.

- The features of a facility or operation that may be a basis for tailoring of safety requirements include: the risk, as determined by hazards/safety analysis; the experience and competence of the operating management and staff; and the expected duration of the operation or use of the facility.

- The Department has the responsibility to reduce the risks to an acceptable level and authorize the conduct of all activities performed at Department sites and facilities. The form and content of the Department's authorization to proceed will vary based on the work to be performed and the hazards and risks associated with the work. -

- Primary safety responsibility belongs to line management. Day-to-day ES&H oversight by line management is a key element in effective safety management, Recent steps to streamline and enhance line oversight activities, including the use of facility representatives at facilities to ensure that managers and workers: understand their assigned duties; are cognizant of and responsive to site hazards; have comprehensive and adequate safety standards in place; execute work knowing that they are accountable for environment, safety, and health performance; and ensure that contractors abide by their safety commitments.

- The Department will maintain a vigorous and comprehensive, independent oversight program that evaluates the effectiveness of safety management at Departmental sites and operations. This information will be used by the line organizations to improve the performance of environment, safety, and health and thereby, support the management of risks.

- This plan does not apply to Naval Reactors (Naval Nuclear Propulsion Program) which is not subject to Board oversight. Naval Reactors achieves a high degree of safety through strict technical discipline, high standards, close headquarters control and oversight throughout Program activities. The joint DOE/Navy nature of the Program assures uniform application of Program requirements to all Program activities.

4. Summary of Completed and Ongoing Activities

Over the past three years, the Department has undertaken a number of initiatives that were designed to improve safety management throughout Departmental operations. These initiatives are identified in Appendix C.

Key among these policy initiatives and programs that have significant impact on safety management are directives reform, including the promulgation and implementation of nuclear safety rules; the requirements identification approaches such as Standards/Requirements Identification Documents (S/RIDs) and the Necessary and Sufficient Closure Process; contract reform, including performance-based contracting; and the R&D Laboratory activities related to safety management; Operational Readiness Reviews (ORR) to confirm readiness; Nuclear Explosive Safety and Surety Program devoted to the safety of nuclear explosives and weapons; line and independent oversight, and the enforcement program under the Price Anderson Amendments Act of 1988.

5. Implementation of Integrated Safety Management

5.1 Safety Management System and Implementation Approach

The Safety Management System. The Department's safety management system establishes a hierarchy of components that facilitates the orderly development and implementation of safety management throughout the Department complex. The safety management system, provided in Figure 1, consists of six components: 1) the objective, 2) guiding principles, 3) functions, 4) mechanisms, 5) responsibilities, and 6) implementation. The first three components (i.e, objectives, guiding principles, and functions) needs to be defined and used consistently Department-wide. The second three components (i.e., mechanisms, responsibilities, and implementation) are established for all work being performed and will vary based on the specific nature and hazard of the work being performed. These three components establish the how, who, where, and the when of safety management implementation. Past efforts at defining a Department-wide safety management system have often experienced difficulty by not clearly differentiating these necessary system components and not appreciating the order in which they must be defined and put into place to achieve

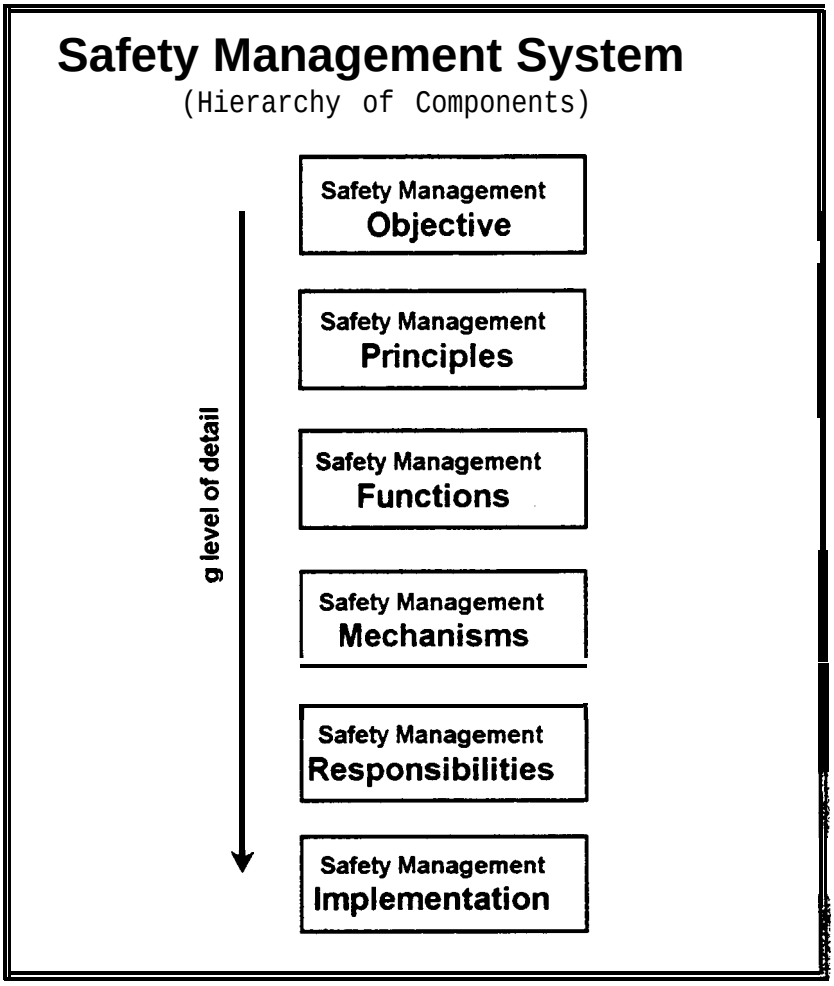

Figure 1: Safety Management System

consistency and allow flexibility.

The objective of integrated safety management is for the Department and contractors to systematically integrate safety into management and work practices at all levels so that missions are accomplished while protecting the public, the worker, and the environment. Stated simply, the objective is to: ***DO WORK SAFELY.***

> ***Objective of Integrated Safety Management***
>
> ***The Department and Contractors must systematically integrate safety into management and work practices at all levels so that missions are accomplished while protecting the public, the worker, and the environment.***

The guiding principles for safety management are the fundamental policies that guide Department and contractor actions, from developing safety directives to performing work. The safety management guiding principles include: line management responsibility for safety, competence commensurate with responsibilities, and establishment of an appropriate set of safety requirements. The guiding principles were developed by a group of safety and management professionals following a review of safety guiding principles in other Department documents and industry safety "standards. The Department's guiding principles for safety management are provided in Figure 2.

Integrated Safety Management - Guiding Principles

1. Line Management Responsibility for Safety. Line management is responsible for the protection of the public, the workers, and the environment.

2. Clear Roles and Responsibilities. Clear and unambiguous lines of authority and responsibility for ensuring safety are established and maintained at all organizational levels within the Department and its contractors.

3. Competence Commensurate with Responsibilities. Personnel possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.

4. Balanced Priorities. Resources are effectively allocated to address safety, programmatic, and operational considerations. Protecting the public, the workers, and the environment is a priority whenever activities are planned and performed.

5. Identification of Safety Standards and Requirements. Before work is performed, the associated hazards are evaluated and an agreed-upon set of safety standards and requirements are established which, if properly implemented, provide adequate assurance that the public, the workers, and the environment are protected from adverse consequences.

6. Hazard Controls Tailored to Work Being Performed. Administrative and engineering controls to prevent and mitigate hazards are tailored to the work and associated hazards being performed.

7. Operations Authorization. The conditions and requirements to be satisfied for operations to be initiated and conducted are clearly established and agreed-upon.

Figure 2: Integrated Safety Management Guiding Principles

Safety management activities can be grouped into five core safety management functions:

1) define scope of work,
2) identify and analyze hazards associated with the work,
3) develop and implement hazard controls,
4) perform work within controls, and
5) provide feedback on adequacy of controls and continuous improvement in defining and planning work.

These five core safety management functions provide the necessary structure for any work activity that could potentially affect the safety of the public, the workers, and the environment. The degree of rigor in addressing these functions will vary based on the type of work activity and the 'hazards involved. The core functions are illustrated in figure 3.

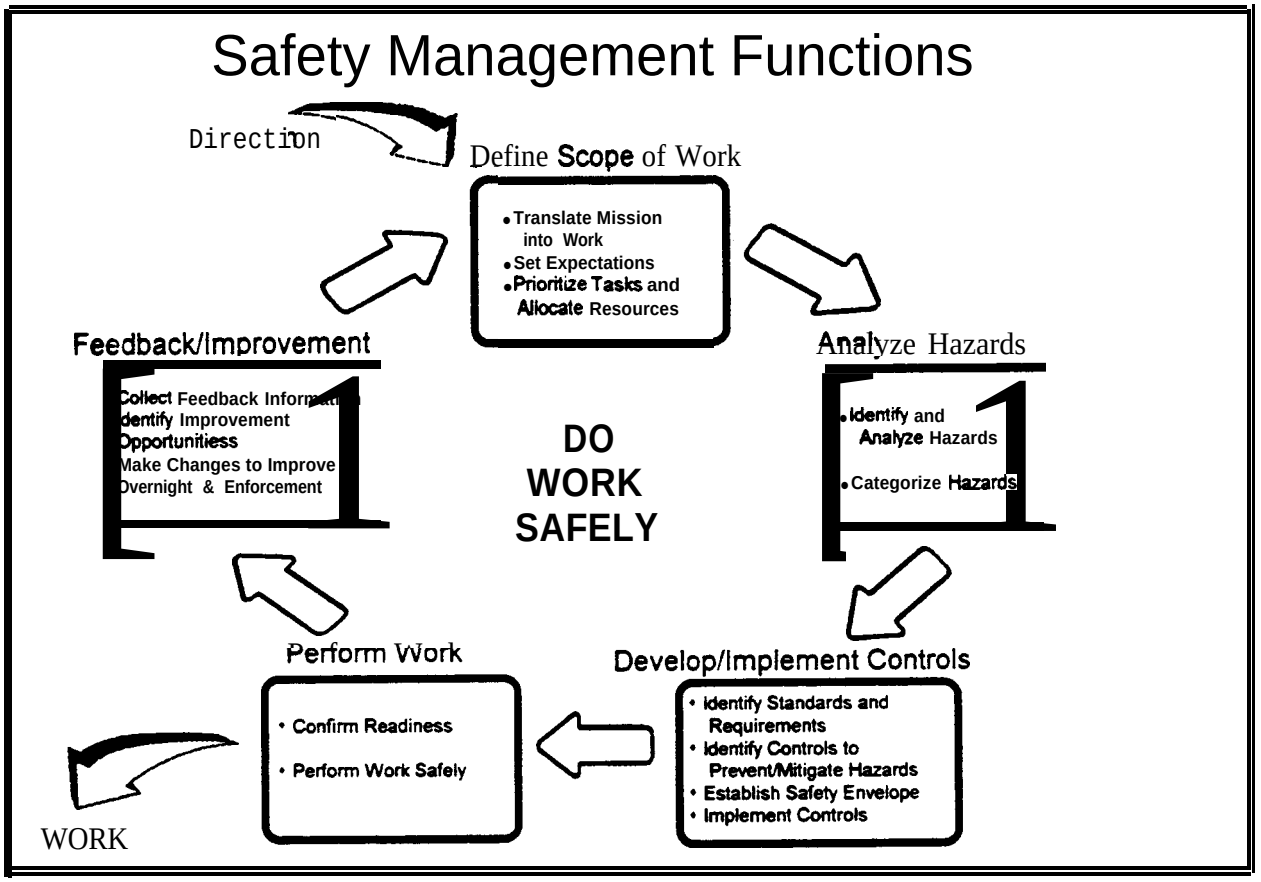

Figure 3: Safety Management Functions

These core safety management functions comprise several constituent functions. **Defining scope** of **work** includes: translating mission into work, setting expectations, **identifying** and prioritizing tasks, and allocating resources. **Analyzing hazards** includes identifying, analyzing and categorizing hazards. **Developing/implementing hazard controls** includes: identifying applicable standards and agreed-upon sets of requirements, identifying controls to prevent/mitigate hazards, establishing a safety envelope, and implementing controls. As can be seen clearly from figure 3, defining scope of work, analyzing hazards, and developing/implementing hazard controls are the core functions which make up work planning.

Performing work includes confirming readiness and performing work safely. Finally, the **feedback and improvement** function includes collecting feedback information, identifying improvement opportunities, making changes to improve, line and independent oversight, and enforcement.

The feedback and improvement function obtains inputs from various sources. The first is from the line organization through a variety of self-assessment, continuous improvement, and contractually-based review activities. The second is from line and independent oversight programs through their inspection, assessment, and surveillance activities designed to improve implementation of safety management.

The next level in the safety management system is the mechanisms which define how the safety management functions are performed While core safety management functions are similar for all facilities and activities, the safety management mechanisms could differ from facility to facility and activity to activity, based on the hazards and work being performed. The primary safety management mechanisms promulgated by headquarters are Department directives (policy, rules, orders, notices, standards, and guidance), and contract clauses (DEAR clauses) for safely managing contracted work. These mechanisms include the Department rules, orders, and standards on identifying and analyzing hazards and performing safety analyses The headquarters mechanism also includes Department directives which establish the acceptable processes to be used in setting safety standards. Examples include Standards/Requirements Identification Documents (S/IUD) Development Process and the Necessary and Sufficient Closure Process (DOE M 450.3-1). The safety management mechanisms need to be integrated to ensure that protection of the public, workers, and the environment is achieved effectively and efficiently. While these are mechanisms to implement safety management from the Department's perspective, they constitute direction from the contractor's perspective. Directives and contract clauses provide **input** to the core function of **defining scope of work**.

At the contractor level, safety management mechanisms are often a specific application of a Department-level directive or contract provision. For example, a Nuclear Safety Analysis Report is a mechanism for analyzing hazards associated with certain specific facilities and activities involving specific hazards. At other facilities and activities, a Health and Safety Plan is the appropriate mechanism for analyzing hazards and defining hazard controls. Contractor safety management mechanisms also include those specific implementing policies and procedures established by the contractor to implement safety management objectives, guiding principles, functions, and fulfill commitments made to the Department.

Clearly defining responsibilities for implementing these mechanisms to accomplish the safety management functions is the next level in the safety management system. For each safety management mechanism employed to satisfy a safety management principle or function, the

associated approval authority needs to be established. This is consistent with the guiding principle that roles and responsibilities need to be established. The review and approval levels may vary based on the commensurate type of work and hazards involved. For example, Department independent review and approval of operational readiness is appropriate for higher hazard facilities but not necessary for all facilities and activities. While the Department retains ultimate responsibility for safe operation of all facilities and activities, the Department may allow the contractor to authorize operations at low hazard facilities. Before allowing the contractor to authorize such operations, the Department would typically review a description of the contractor's methods and capabilities, and a demonstration of the contractor's performance.

The final level of the safety management system is implementation. This involves specific instances of work definition and planning, hazards identification and analysis, definition or implementation of specific hazard controls, developing and implementing operating procedures, performance of work, monitoring and assessing performance for improvement.

Implementing the Department's Integrated Safety Management System

Successful implementation of the Safety Management System will involve reconciling and integrating to many ongoing programs and initiatives, including the following:

- Department Standards Program (integrating standards-based safety management)
- Directives Reform (streamlining unnecessary and redundant orders and standards)
- Promulgating Nuclear Safety Rules (including administration and exemption processes)
- Necessary and Sufficient Process Roll-out (for tailoring requirements and standards)
- Contract Reform (using performance expectations and incentives)
- Oversight Reform (reducing the layers of Department oversight on contractors)
- Manual on Functions, Assignments, and Responsibilities (updating/revising)
- Training and Qualification Program for Department technical personnel
- Strategic Alignment Initiatives establishing responsibilities and qualifications
- Enhanced Work Planning
- Identification of budget priorities (annual ES&H Management Plan)
- Independent oversight and enforcement programs
- ES&H oversight by line management

The Safety Management System guiding principles and functions provide the central criteria for assessing the value and contribution of these various programs and initiatives. By reconciling and integrating these various efforts, Department and contractor personnel will gain a more coherent understanding of safety expectations.

Likewise, implementation of the Safety Management System at the site, facility or activity level will lead to integration of various contractor programs and initiatives affecting safety. The contractor must understand and reconcile all the various safety management expectations provided by the Department (through various directives, contract clauses, guidance, and oversight) and formulate a coherent, integrated approach to govern safe accomplishment of work activities. The Safety Management System provides a consistent framework for the Department and its contractors to develop and agree on the contractor's approach to safety management. It provides flexibility to define the safety management mechanisms and approval levels, tailored to the work activities and hazards.

This Implementation Plan includes Department commitments to the Board and internal management actions. The Department will provide the Board deliverables defined by the commitments in this plan. Descriptive material contained in this plan provides the context for these commitments and illuminates the overall direction the Department intends to pursue. Although the Department will use the approaches described in this plan for all Department activities and facilities, the commitments to the Board relate only to those activities and facilities subject to the Board's jurisdiction. The internal management actions are identified in Appendix D; Summary of Department Internal Management Actions.

A Safety Management Implementation Team will be established to oversee the commitments and internal management actions outlined in this Implementation Plan. The Implementation Team will also track and reconcile other relevant Department programs and initiatives for consistency with the safety management approach outlined in this plan. This dedicated Implementation Team will report to the Under Secretary. Further changes in Departmental organization may be warranted once it becomes clear how effectively these actions are being implemented.

A lead office is designated for each commitment and internal management action. Each lead office is expected to carry out its functions using a team approach, thereby including participation from the line program and field offices, as appropriate. There will be Safety Management Implementation Team participation in all deliverables. To ensure continuity and adequacy, all deliverables and correspondence relative to the implementation of this plan will be reviewed and approved by the Under Secretary.

The key elements of this plan include:

- Institutionalizing through Department directives the Safety Management System, including establishment of the Department-wide safety management objective, guiding principles, and functions; establishment of guidance for tailoring the level of rigor based on the work involved, the hazard and potential for environmental impact; and direction on authorization basis and authorization agreements.

- Identifying existing directives and ongoing Department initiatives involving safety management that need to be reconciled and integrated.

- Upgrading the Functions, Assignments, and Responsibilities Manual, consistent with the direction provided by the Safety Management System.

- Implementing a variety of activities to share, recruit/acquire, develop/train Department technical expertise for effectively implementing the Safety Management System.

- Developing contractual mechanisms to implement the Department's Safety Management System into existing and future contracts.

- Implementing the integrated safety management system at a priority list of Department sites and facilities.

5.2 Safety Issue Resolution

The following sections of the plan describe the Department's approach (and associated deliverables and milestones) for implementing an integrated, coherent safety management system throughout the Department:

- Institutionalizing an integrated safety management system
- Tailoring safety management according to work and associated hazards
- Prioritizing implementation of the safety management system
- Establishing direction and guidance for system implementation
- Ensuring necessary technical expertise to accomplish implementation

5.2.1 Institutionalizing an Integrated Safety Management System

Board Issue Description

The Department needs to develop and institutionalize a system of integrated safety management using sound management guiding principles which systematically integrate safety assurance into management and work practices at all levels so that missions are accomplished while protecting the public, the worker, and the environment.

Department Commitment

1. *Institutionalize the process of incorporating* ***into the planning and execution*** *of every* ***major defense nuclear activity involving hazardous materials those controls necessary to ensure that environment, safety and health objectives are achieved.***

Resolution Approach

The Department will promulgate its safety management expectations through a policy, notice, and manual, which institutionalize the following:

- safety management objective,
- safety management guiding principles,
- safety management functions,
- process for defining safety management mechanisms and approval levels,
- guidance for tailoring safety management,
- criteria and guidance for prioritizing implementation of the safety management system

Pending the September 1996 promulgation of the draft manual, initiatives underway and actions ongoing to institutionalize the safety management system should proceed ahead without delay.

Concurrent with development of Department directives on the safety management system, a review will be conducted to identify Department directives and ongoing initiatives involving safety management that need to be reconciled and integrated with the Safety Management System. Each ongoing Department directive and ongoing initiative related to safety management will be evaluated to determine whether it is consistent with the Safety Management System, and whether it meshes appropriately with other directives and initiatives. If this evaluation concludes that an existing directive or ongoing initiative is not consistent, a process will be undertaken to reconcile and integrate the directive or program in line with the Department's integrated safety management system, As part of this effort, Department directives will be reviewed and revised, as necessary, to define authorization basis and authorization agreement consistently with the safety management system outlined in this plan.

The role of the following three key elements in implementing the safety management system must be understood: 1) the contract, 2) the authorization basis, and 3) the authorization agreement. The contractual understanding between the Department and the contractor provides the foundation requirements for safety management at a specific site, facility, or activity. The authorization basis is the information, prepared by the contractor, that establishes the safety envelope for a facility operation or activity. The authorization agreement defines the binding requirements on the contractor approved by the Department for conducting the activity or operating the facility. Each is discussed further below.

The Department will manage safety through a contractually binding process that identifies and incorporates the requirements which provide for safe operation of facilities and activities. The contract is an umbrella document which identifies appropriate requirements for managing safety, tailoring controls for assuring safety of the specific facility or activity based on the

associated hazards, and establishing approval levels for safety documents. The Department will manage safety by including the following elements in the basic contract: 1) the requirement to manage work safely consistent with the objective, guiding principles and core safety functions of the safety management system that the Department has defined; 2) an agreed-upon list of applicable requirements derived from relevant laws, regulations, Department directives, and industry standards; and 3) clear safety management expectations, including site-specific safety performance objectives and measures. The contract defines the Department's requirements for contractor development of authorization basis documentation and for associated Department review and approval of such documentation, when required.

The authorization basis establishes the safety envelope for a facility operation or activity and defines what will have to be done to control safety of the operation. The authorization basis includes the hazards analysis, the definition of administrative and engineering controls to prevent and mitigate hazards, and the associated technical and operational limits. The type of safety documents that will constitute the authorization basis will vary with the hazard and complexity of the operation or activity. Subsequent to establishing the safety envelope, the contractor prepares for operation by implementing the controls, such as testing, procedures, and training, as described in the authorization basis.

The authorization agreement consists of those contractually binding requirements governing the conduct of the activity or operation of the facility. For lower hazard facilities and activities, the basic contract would serve as the authorization agreement unless the Department specifically directs otherwise for a particular facility or activity. For higher hazard facilities, the authorization agreement would require the contractor to perform in accordance with established operating limits and administrative/operational commitments. Operating limits would include those defined by Technical Safety Requirements, Operational Safety Requirements, the Hazard and Operability Analysis, Safety Analysis Documents, or Health and Safety Plans. Administrative and operational commitments would include change control processes. Authorization agreements, which must be approved by the Department, will specify which of these commitments require Department approval so that the Department may satisfy itself as to the adequacy of those requirements.

Defense Programs promulgated implementation guidance for authorization basis in August 1995 which describes the authorization basis components for nuclear and non-nuclear facilities with long lifetimes. The Department will review existing guidance and formalize its direction on the content of authorization basis and authorization agreements.

Deliverables/Milestones

The Department will complete the following:

Commitment 1.1:	Issue Department policy and notice to define and institutionalize the Department's Safety Management System, including the safety management objectives, guiding principles, and functions defined by this Implementation Plan.
Lead Responsibility:	Environment, Safety, and Health
Applicability:	Department-wide
Deliverable:	Secretarial Policy Statement and Departmental Notice
Due Date:	July 11, 1996 (Draft) September 11, 1996 (Final)

Commitment 1.2:	Issue draft Safety Management System Manual and/or guidance to implement the system described in the policy and notice (Commitment 1.1). The completion date for the final manual will be provided with the draft.
Lead Responsibility:	Environment, Safety, and Health
Applicability:	Department-wide
Deliverable:	Draft Manual and completion date for the final manual
Due Date:	September 11, 1996

5.2.2 Tailoring Safety Management **According** to **Work** and Associated **Hazards**.

Board Issue Description

Performance of work activities within the defense nuclear complex or the former defense nuclear complex that involve radioactive and other substantially hazardous materials needs to be subject to a safety management system that can be tailored according to the risk associated with the activity. The safety management mechanisms and approval levels for implementing the safety management functions must be tailored in accordance with the type of activity and the level of hazard.

Department Commitment

2. ***The conduct of all operations and activities within the defense nuclear complex or the former defense nuclear complex that involve radioactive and other substantially hazardous materials shall be subject to management plans that are [tailored] according to the risk associated with the activity.***

Resolution Approach

The intensity and formality of safety management mechanisms should be commensurate with the work and associated hazards. The following should be considered, among other factors, as part of the framework to be used as guidance regarding the comprehensiveness of the hazard analysis and means of control: 1) the facility/activity's potential to cause an accident which could have an adverse affect on the workers or the surrounding public or environment; 2) whether the principal activities at the facility are of a repetitive nature (such as production or waste management) performed by technician-level personnel under supervision, versus non-repetitive activities (such as experimentation or deactivation) performed by scientists/engineers; and 3) whether the activities in question or similar ones are expected to be continued for a number of years.

The Department has concluded that the Necessary and Sufficient Process provides an acceptable method for selecting and producing a tailored set of requirements, which would in turn define the appropriate contractor mechanisms and approval levels, The Necessary and Sufficient Process considers Department guidance and requirements for defined hazard levels in reaching agreement on a tailored list of requirements for a given site or facility.

Deliverables/Milestones

In order to resolve this issue, the Department will complete the following actions:

Commitment 2.1:	Develop guidance for tailoring the level of rigor necessary for performance of work for facilities and activities.
Lead Responsibility:	Chairperson, Department Standards Committee (DSC)
Applicability:	Department-wide
Deliverable:	Tailoring guidance to be developed and reviewed by the DSC and included in Safety Management System Manual (Commitment 1.2)

Due Date: September 11, 1996

5.2.3 Prioritizing Implementation of the Safety Management System

Board Issue Description

The Department needs to prioritize its facilities and activities according to their hazard and importance. For both safety and good management reasons, the Department will always need a comprehensive understanding of its priorities. To be useful, any such new list of prioritized facilities and activities must also reflect other current initiatives underway in the Department and should not be carried out exclusively for the purpose of focusing the transition from implementation programs related to Board Recommendations 90-2 and 92-5.

Department Commitment

3. *Prioritize the Department's facilities and activities according to their hazard and their importance to defense and cleanup programs.*

Resolution Approach

Given resource limitations (expertise, funding, equipment) and external drivers, the Department must establish a prioritization for implementing the safety management system. The following factors are considered relevant in establishing priorities: 1) hazard, 2) importance to long-term Department missions, and 3) existence of mature elements of an integrated safety management system (i e., approved safety analysis reports, technical safety requirements, and other safety documentation). Facilities and activities that need to be addressed first are those which involve moderate to high hazards and impact the Department's mission. Based on these considerations, the Department has selected the following sites and facilities, having equal priority, for initial implementation of the safety management system as described in this plan:

- Hanford/K-Basins and Tank Farms
- Lawrence Livermore National Laboratory /Superblock
- Los Alamos National Laboratory/TA-55 and CMR
- PantedCells and Bays
- Savannah River Site/Canyons
- Rocky Flats/Buildings 371 and 771
- Oak Ridge/Y-12

Specific plans and schedules for implementation at these sites/facilities will be established by the local Department/contractor management. For prioritizing implementation beyond this initial group, the Department will define specific criteria, such as: remaining facility lifetime; whether the facility/site is new or has had its mission "redefined or its safety basis changed; and any specific coordination issues with the application of the Necessary and Sufficient process. The Department intends to develop guidance for prioritizing Department facilities and activities and will include this in the Department Safety Management System Manual. The responsible Secretarial Officers and Field Office Managers will use this guidance to identify priorities (facilities and activities) so that personnel resources can be allocated and budget resources can be provided.

Deliverables/Milestones

Commitment 3.1:	For each site designated above, provide a status briefing on the approach and schedule for implementation of the Safety Management system.
Lead Responsibility:	Manager, Albuquerque Operations Office (Los Alamos National Laboratory, Pantex) Manager, Richland Operations Office (Hanford) Manager, Savannah River Operations Office (Savannah River) Manager, Rocky Flats Operations Office (Rocky Flats) Manager, Oak Ridge Operations Office (Oak Ridge) Manager, Oakland Operations Office (Lawrence Livermore National Laboratory)
Applicability:	Initial Implementation Facilities
Deliverable:	Status Briefing
Due Date:	July 18, 1996

5.2.4 **Establishing Direction and Guidance for System Implementation**

Board Issue Description

The Department needs to promulgate requirements and associated direction and guidance for implementing the safety management system. This includes defining roles and responsibilities for carrying it out, and use of ES&H contract clauses.

Department Commitment

4. *Promulgate requirements and associated instructions (Orders/Standards) which provide direction and guidance for the safety management process, including responsibility for carrying it out. These requirements and associated instructions shall be made a contract term.*

Resolution Approach

The Department has recently revised and developed a conceptual-level document to the Manual of Functions, Assignments, and Responsibilities Manual for Nuclear Safety (FAR Manual) which identifies the responsibilities of the Department elements, including the Cognizant Secretarial Officers and Field Element Managers, for carrying out its general functions to ensure environment, safety and health protection, This document does not define the way in which the Department elements assign, delegate, and implement their functions and responsibilities. Much work still needs to be done on this document to roll down the conceptual level document, to ensure linkage with field documents and procedures, and to ensure consistency with recent strategic alignment initiatives that have established Department roles and responsibilities. The Department will update the Department headquarters and field roles and responsibilities in the FAR Manual to ensure assignment of environment, safety and health responsibility and authority to line management.

The Department will review existing contract clauses for assuring safety, health, and environmental protection and recommend any changes necessary to ensure that they support this approach to safety management. The Department will develop contract language requiring the contractor to implement the Department's Safety Management System, including the safety management objective, guiding" principles, and functions.

Deliverables/Milestones

Commitment 4.1:	Issue updated amendment to the Department roles and responsibilities in the FAR Manual to be consistent with changes in the safety management organization instituted pursuant to this Implementation Plan.
Lead Responsibility:	Environment, Safety, and Health
Applicability:	Department-wide
Deliverable:	Updated FAR Manual

Due Date:	September 18, 1996
Commitment 4.2:	Develop and issue for use, contract clauses requiring contractors to follow the safety management objectives, guiding principles, and functions that are defined in the policy and notice (Commitment 1.1) and to describe the contractor's approach to implementing and tailoring the safety management system to their sites/facilities/activities.
Lead Responsibility:	Procurement/Environment, Safety, and Health
Applicability:	Department-wide
Deliverable:	Proposed amendment on DEAR (Department of Energy Acquisition Regulation) Clause
Due Date:	September 25, 1996

5.2.5 Ensuring necessary Technical Expertise to accomplish Implementation

Board Issue Description

The Department needs to continue to take measures to ensure that we have or will acquire the technical expertise to effectively implement our integrated safety management system.

Department Commitment

5. ***Continue to take m easures to ensure that we have*** *or w* ***ill*** *acquire the technical expertise to effectively implement our* ***integrated*** *safety management [system].*

Resolution Approach

The Department has a considerable amount of **technical** talent and an experience base which is uniquely suited to the Department's work. Some of this expertise is at Headquarters, and some of it is distributed among the various Department field elements. The Department can do a better job of recruiting, managing and leveraging Department expertise so that it is effectively focused on the most important Department priorities and challenges, such as implementing an integrated safety management system. The Department must develop overall direction to underscore the need for technical and managerial expertise to effectively

implement the safety management systems. This direction will describe how to utilize the tools available by the Department for sharing, recruiting/acquiring and developing/training technical expertise, including (the first five being used to the maximum extent possible):

Using a core technical group database to identify and share expertise
- Sending personnel on Operational Readiness Reviews to develop expertise
- Training and qualification programs to develop expertise
- Using the Laboratories and Universities to acquire and develop expertise

Using Excepted Service Authority to supplement areas of technical deficiencies
As appropriate, use contracted consultants to acquire expertise

The Defense Programs core technical group model identifies critical skills, documents unique knowledge, and defines programs to maintain the Department's access to personnel having these skills and knowledge. The Defense Programs core technical group database will be expanded to include Environmental Management technical experts. The goal is to identify technical subject matter experts in safety functions which can then be focused on problems where the help is needed. Examples of these technical areas would include seismic, fire protection, and emergency planning.

The Department must identify weaknesses in technical competence which may hinder institutionalization and/or sustenance of effective safety management systems. These areas of weaknesses will be filled through aggressive recruitment and the use of Excepted Semite Authority.

Two training initiatives will be undertaken to promulgate information related to developing and maintaining safety management systems. An awareness briefing will be developed and provided to the Department and contractor management at the priority facilities and activities In addition, a Department course will be developed and made available for complex-wide training on integrated safety management.

The Department continues to take steps (outlined in the Department's Implementation Plan for Recommendation 93-3, Improved Technical Competence) to increase the depth and breadth of technical talent of Department personnel. The efforts undertaken in this Implementation Plan are not intended to encompass or replace the actions taken by the Implementation Plan responding to Recommendation 93-3. However, the Department will revise, as necessary, the qualification standards for the Department qualification program in order to further develop the technical and management competencies required to effectively implement the safety management systems.

Deliverables/Milestones

Commitment 5.1:	Outline a Department approach for improving the technical expertise/competence necessary to implement the Safety Management System. Aspects till include: identification of areas of deficiencies; use Excepted Service Authority to supplement areas of technical deficiencies; training and qualification programs to develop expertise; and revisions, as necessary, to the qualification standards for the Department qualification program.
Lead Responsibility:	Implementation Team/Human Resources
Applicability:	Department-wide
Deliverable:	Department Approach included in the Secretarial Policy Statement and Departmental Notice on Safety Management System (see Commitment 1.1)
Due Date:	July 11, 1996 (Draft) September 11, 1996 (Final)
Commitment 5.2:	Establish a Department of Energy core technical group database to ensure effective identification and utilization of the Department's technical expertise.
Lead Responsibility:	Human Resources/Defense Programs/Environmental Management
Applicability:	Defense Programs/Environmental Management
Deliverable:	Action Plan for establishing Core Technical Group
Due Date:	December 4, 1996

6. Organization and Management

The Department recognizes that implementation and integration of the Safety Management System described in this plan occurs at many organizational levels, including Department Headquarters/Cognizant Secretarial Officer level, at the Department field office level, and at the contractor site/facility/activity level This effort will require an integrated, systems

approach. Given the magnitude of the implementation challenges, the Department will need to clearly and consistently communicate its vision of safety management. Further, the Department must actively solicit feedback and sharing of lessons learned to ensure the Department's safety management system achieves its objectives of consistency, flexibility, and effectiveness.

To oversee commitments and internal management actions outlined in this plan, a dedicated Implementation Team will be established. The Implementation Team, called the Safety Management Implementation Team, will be led by a senior Department official to be named by the Under Secretary. It will be staffed with safety and management professionals from throughout the Department, including the major program offices and field offices. This dedicated Implementation Team will report to the Under Secretary. This team will consult with the Department Standards Committee and other Department committees and organizations with safety management responsibilities; Designated representatives from the priority facilities and respective sites will be identified by site managers to assist and advise the Safety Management Implementation Team and will have direct authority, reporting through their field managers, to implement changes at the priority projects. The Safety Management Implementation Team will take action using the established line management channels. The Implementation Team will also track and reconciliate relevant Department programs and initiatives for consistency with the safety management approach outlined in this plan.

Change Control. Complex, long-range plans require sufficient flexibility to accommodate changes in commitments, actions, and completion dates that may be necessary due to additional information, improvements, or changes in baseline assumptions. The Department's policy is to (1) bring to the Board's attention any substantive changes to this implementation plan as soon as identified and prior to passing milestone dates, (2) have the Secretary approve all revisions to the scope and schedule of plan commitments, and (3) clearly identify and describe the revisions and their bases. Fundamental changes in strategy, scope, or schedule will be provided to the Board through formal revision of the implementation plan. Other changes to planned actions will be reported in appropriate correspondence, along with the basis for the changes and appropriate corrective actions. Further organizational changes may be warranted once it is clear how effectively the program is being implemented.

Reporting. In order to ensure that the various Department implementing elements and the Board remain informed of the status of the progress of plan implementation, the Department will provide a quarterly briefing to the Board. The first briefing will be scheduled for August 1996 to cover the activities through July 1996.

Appendix A

Acronyms and Abbreviations

CSO	Cognizant Secretarial Officer
DEAR	Department of Energy Acquisition Regulation
DOE	Department of Energy
ES&H	Environment, Safety, and Health
FAR	Functions, Assignments, and Responsibilities
ORR	Operational Readiness Review
NOPR	Notice of Proposed Rulemaking
N&S	Necessary and Sufficient
R&D	Research and Development
SAR	Safety Analysis Report
S/RIDs	Standards/Requirements Identification Documents

Appendix B

References

1. Defense Nuclear Facilities Safety Board Recommendation 95-2, "Safety Management," Conway to O'Leary, October 11, 1995.

2. Department of Energy Response to Board Recommendation 95-2, O'Leary to Conway, January 17, 1996.

3. Department Standard DOE/EH/0416, "Criteria for the Department's Standards Program," August 1994.

4. Department Policy Statement DOE P 450.3, "Authorizing Use of the Necessary and Sufficient Process for Standards-Based Environment, Safety and Health Management," January 1996.

5. Department Standard DOE-STD-1027-92, "Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23 Nuclear Safety Analysis Reports," December 1992.

6. Department Standard DOE-STD-3009-94, "Preparation Guide for U.S. DOE Nonreactor Nuclear Facility Safety Analysis Reports," July 1994.

7. Department Standard DOE-STD-3011 -94, "Guidance for Preparation of DOE 5480.22 (TSR) and DOE 5480.23 (SAR) Implementation Plans," November 1994.

8. Department Order 420.1, "Facility Safety," October 1995.

9. Department Standard DOE-STD-3006, "Planning and Conduct of Operational Readiness Reviews (ORR)," November 1995.

10. Department Standard DOE-EM-STD-5502 -94, "Hazard Baseline Documentation," August 1994.

11. Defense Programs Implementation Guidance for Authorization Basis, Revision 1, August 21, 1995.

12. Department report, "Managing the Safety of Defense Nuclear Research and Development Activities," August 1995.

Appendix C

Completed and Ongoing Safety Management Activities

Standards and Requirements Identification

- The Department issued Department standard DOE/EH/0416, "Criteria for the Department's Standards Program," in August 1994.

- The Department promulgated Policy Statement DOE P 450.3, "Authorizing Use of the Necessary and Sufficient Process for Standards-Based Environment, Safety and Health Management," in January 1996. This policy statement establishes the Closure Process for Necessary and Sufficient Sets of Standards described in the associated guidance manual as one means of addressing the selection of appropriate standards.

- The Department promulgated a Manual DOE M 450.3-1, "The Department of Energy Closure Process for Necessary and Sufficient Sets of Standards," in January 1996. The Manual describes the Necessary and Sufficient Closure Process and details the steps which must be followed to produce a necessary and sufficient set of standards.

- The Department promulgated a Notice DOE N450.3 in January 1996 which provides requirements and guidance for near-term use of the Necessary and Sufficient process including management requirements and criteria which should be applied to decide where and how to use the process.

- Pilots have been conducted at several facilities and activities to validate the Necessary and Sufficient Closure process. Many lessons have been learned, and these are being incorporated to improve the process.

- Standards/Requirements Identification Document Development and Approval Instruction of August 1994.

Laboratory R&D Safety Initiative

- In response to the Board's letter of April 28, 1995, the Department prepared a summary report, "Managing the Safety of Defense Nuclear Research and Development Activities," in August 1995 which describes how the Department and the Weapons Laboratories will proceed in developing an integrated safety management system. The Department and Laboratories have since developed guiding principles and essential functions for integrated safety management.

Contract Reform

- The Department is requiring its contractors to begin working in ways that better reflect expectations for ES&H. DOE is moving toward performance-based contracting, where the Department establishes ES&H expectations, and holds contractors accountable and responsible for conducting operations consistent with those expectations. Financial incentives (and penalties, including a clause that puts a contractor's entire fee at risk for serious failures to meet the Department's ES&H expectations) have been put in place in new contracts, as have requirements for integrating ES&H into overall m, ssion planning and execution, evidenced in the contractor's ES&H Management Plan.

- The Department has supported the use of risk-based approaches for identifying and prioritizing ES&H needs. A draft standard "Environment, Safety and Health (ES&H) Management Planning Process and the ES&H Management Plan" has been developed that reflects the consensus of good practice in this area, and that provides a path forward for developing an ES&H Management Plan that is consistent with the to be proposed ES&H contract clause, and that is appropriate to the types of hazards to be encountered in the work by each contractor.

- The contract reform Notice of Proposed Rulemaking to be issued includes a clause which requires contractors to comply with all applicable federal, state, and local laws and regulations. This would include rule Implementation Plans under the Department's nuclear safety rules. The clause also requires contractors to comply with a list of Department directives attached to the contract or alternate standards developed through the Necessary and Sufficient Closure Process or similar processes.

Orders

- In an effort to clarify and streamline safety requirements, and in concert with the President's National Performance Review, the Department revised and consolidated many of its nuclear safety directives during 1995. Identifying and clarifying the essential safety requirements allows the department and contractors to better focus attention and resources on safety performance. The Board has addressed several issues with the order revision process which the Department is working to resolve.

- The Department issued Interim Policy Statement DOE P 450.2, "Identification, Implementation and Compliance with Environment, Safety and Health Requirements," and is now resolving comments with the Board.

- Department issued Order 251.1, "Directives System," in October 1995 to better explain the relationship between policy, requirements, guidance, technical standards, and implementation processes and expectations. The associated Directives System Manual, DOE 251.1, which fully describes the Directives System structure and the hierarchy of related documents, was issued in October 1995 and is being discussed with the Board. This manual also describes the Department's Order exemption process.

Rules

- The Department is in the process of promulgating rules using notice and comment rulemaking under the Administrative Procedure Act, Eight new safety rules are scheduled to be issued in 1996 and are now being discussed with the Board. They include the following topics: Safety Analysis Reports, Unreviewed Safety Questions, Conduct of Operations, Technical Safety Requirements, Training and Qualification, Maintenance Management, Operational Occurrence Reporting, and Radiation Protection for the Public and the Environment. Benefits include Price-Anderson Amendments Act (PAAA) enforcement and public participation.

- The following safety rules have been issued: Enforcement and Adjudication Procedures (10CFR820), Occupational Radiation Protection (1 0CFR835), Quality Assurance (10CFR830. 120), and Contractor Employee Protection Regulations (1 OCFR7O8).

- The Department plans to amend the rule for granting exemptions to the nuclear safety rules to provide that the determination of adequate protection of workers, the public, and the environment made in the Necessary and Sufficient Closure Process can be used as a documented basis for seeking an exemption from the rules.

- The Department has issued Interim Policy Statement DOE P 410.1, "Promulgating Nuclear Safety Requirements," and is resolving comments with the Board.

Hazard Analysis

- The Department issued a Department-wide standard, "Preparation Guide for U.S. DOE Nonreactor Nuclear Facility Safety Analysis Reports," (DOE-STD-3009-94) in July 1994. This standard describes a SAR preparation method for hazard category 2 and 3 nuclear facilities.

- The Department issued a Department-wide standard, "Guidance for Preparation of DOE 5480.22 (TSR) and DOE 5480.23 (SAR) Implementation Plans," (DOE-STD-301 1-94) in November 1994.

- Department Order 420.1, "Facility Safety," was issued in October 1995 to establish facility safety requirements related to nuclear safety design, criticality safety, fire protection and natural hazards mitigation. .

- The Department issued a Department-wide standard, "Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23 Nuclear Safety Analysis Reports," (DOE-STD-1 027-92) in December 1992 that establishes guidance for the preparation and review of hazard categorization and accident analysis techniques.

Confirming Readiness

- The Department issued a Department-wide standard, "Planning and Conduct of Operational Readiness Reviews (ORR)," (DOE-STD-3006) in November 1995. This standard provides guidance on approaches and methods approved as acceptable for implementing the requirements of Order DOE O 425.1 which establishes the requirement to conduct Operations Readiness Reviews or Readiness Assessments prior to restart of an existing nuclear facility or startup of a new nuclear facility.

Functions and Responsibilities

- The Department established the Functions Assignments and Responsibilities (FAR) Manual in October 1994 to identify the responsibilities of the Department elements for carrying out its safety responsibilities. The document has been revised in March 1996 and efforts are underway to, link this document with the documents, policies and procedures used by the field.

Technical Management Plans

- The Department has developed a generic technical management plan identifying the roles, responsibilities, and technical competencies required for the management of environmental restoration contracts.

Nuclear Explosive Safety

- Nuclear explosive operations are considered by the Department to be a special class of activity due to their potential risk, unique nature, and important national security implications. These operations comprise a limited range of Department activities, and include assembly, transportation, maintenance, storage, testing, and disassembly of a nuclear explosive. A safety management system that addresses nuclear explosive safety has been specified in DOE Order" 5610.11 and its predecessors. In response to

Recommendation 93-1, a complete set of safety requirements for nuclear explosive operations is being institutionalized in the 5610-series of Orders and associated guide and standards. The 5610-series of orders was converted from a specification of the nuclear explosive safety program to a specification of a comprehensive, integrated surety management system (safety, security, and control) for nuclear explosive operations.

Independent Oversight

- The Department's independent oversight program was consolidated in December 1994 under the Office of Environment, Safety and Health into the Office of the Deputy Assistant Secretary for Oversight. The major objective of the Office of Oversight is to provide the Secretary of Energy; DOE program, field, and contractor managers; Assistant Secretary for Environment, Safety and Health; Congress; and the public with accurate and comprehensive information on and analysis of the effectiveness of the Department's ES&H programs.

Appendix D

Summary of Department Internal Management Actions

The following actions are included in the Implementation Plan as internal management actions which describe the overall direction the Department intends to pursue.

Action 1.a: Establish a Safety Management Implementation Team to oversee commitments and internal management actions outlined in this Implementation Plan. The Implementation Team will also follow other relevant Department programs and initiatives for consistency with the Recommendation 95-2 Implementation Plan approach.

Lead Responsibility: Under Secretary

Applicability: Department-wide

Deliverable: Safety Management Implementation Team and Charter

Due Date: May 22, 1996

Action lb: Identify and then establish a Department-wide process for reconciling and integrating existing directives and ongoing initiatives with the Safety Management System.

Lead Responsibility Under Secretary/Implementation Team

Applicability: Department-wide

Deliverable: Process description

Due Date: September 25, 1996

Action 3.a: Prepare guidance and criteria on prioritizing implementation of the Safety Management System at Department facilities and activities.

Lead Responsibility: Defense Programs/Environmental Management

Applicability: Department-wide.

Deliverable: Guidance and criteria on prioritization to be included in Safety Management System Manual (Commitment 1.2).

Due Date: September 11, 1996

Action 3.b: Prepare Under Secretary guidance to be promulgated to the Heads of Department Program Elements for establishing" out year budget priorities for implementing the Safety Management System (using the criteria developed in Action 3.1).

Lead Responsibility: Implementation Team

Applicability: Department-wide.

Deliverable: Under Secretary memorandum regarding prioritization.

Due Date: November 1, 1996

Action 5a: Develop and present an awareness briefing for the Department and contractor management at the priority facilities and activities regarding implementation of safety management systems.

Lead Responsibility: Safety Management Implementation Team

Applicability: Department-wide

Deliverable: Training course conducted

Due Date: June 13, 1996

Action 5.b: Develop a training course to be made available for complex-wide training on integrated safety management.

Responsibility: Human Resources/Environment, Safety, and Health

Applicability:	Department-wide
Deliverable	Life-cycle training course on safety management and revisions to other courses as appropriate
Due Date:	December 11, 1996

TAB C

Recommendation Letter from Mr. John T. Conway Chairman of the DNFSB dated October 11, 1995, forwarding Recommendation 95-2

DEFENSE NUCLEAR FACILITIES
SAFETY BOARD

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

October 11, 1995

The Honorable Hazel R. O'Leary
Secretary of Energy
Washington, DC 20585

Dear Secretary O'Leary:

On October 11, 1995, the Defense Nuclear Facilities Safety Board, in accordance with 42 U.S.C. § 2286a(a)(5), unanimously approved Recommendation 95-2 which is enclosed for your consideration. Recommendation 95-2 deals with Safety Management.

p] *42* U.S.C. § 2286d(a) requires the Board, after receipt by you, to promptly make this recommendation available to the public in the Department of Energy's regional public reading rooms. The Board believes the recommendation contains no information which is classified or otherwise restricted. To the extent this recommendation does not include information restricted by DOE under the Atomic Energy Act of 1954, 42 U.S.C. §§ 2161-68, as amended, please arrange to have this recommendation promptly placed on file in your regional public reading rooms.

The Board will publish this recommendation in the Federal Register.

Sincerely,

John T. Conway
Chairman

Enclosure

c: Mark Whitaker, EH-9

cc

DEFENSE NUCLEAR FACILITIES SAFETY **BOARD**
RECOMMENDATION 95-2 TO THE SECRETARY OF ENERGY
pursuant to 42 U.S.C. § 2286a(a)(5)
Atomic Energy Act of 1954, as amended.

Dated: October 11, 1995

The Defense Nuclear Facilities Safety Board (Board) has issued and the Secretary of Energy has accepted three sets of recommendations (90-2, 92-5, and 94-5) concerning the use of standards by contractors at the Department of Energy's (DOE) defense nuclear facilities, and the level of conduct of operations to be maintained at these facilities. These recommendations intersect in many of their implications. The Board now wishes to combine and modify these recommendations into a form that (1) reflects what it has learned from DOE's response to the recommendations, (2) more sharply focuses continued activity on the objectives DOE and the Board seek to achieve, and (3) is more clearly consonant with the actions. nich DOE has under way to modify DOE's system of Orde .s

On March 8, 1990, the Board forwarded to the Secretary of Energy Recommendation 90-2. Briefly paraphrased, it recommended that (I) DOE identify the particular standards that it considered should apply to certain designated defense nuclear facilities of DOE, (2) DOE provide its views of the adequacy of these standards, and (3) DOE establish the extent to which the standards *were* being applied to the facilities. The Secretary accepted this Recommendation on June 11, 1990, and provided the Board with an acceptable Implementation Plan on November 9, 1994.

The principal product of implementation was to be a set of facility-specific documents that set forth the applicable standards and requirements for a selected set of DOE's defense nuclear facilities. These were termed Standards/Requirements Implementation Documents (S/RIDs). The S/R.Ill was to contain those requirements considered necessary and sufficient for ensuring safety in the particular application. These were to be principally extracted from DOE Orders, appropriate standards, NRC guides, and similar sources. The S/RID was envisioned as the basis upon which work controls would be developed and implemented.

This concept has been maturing in the course of its application to several DOE defense nuclear facilities. Subsequently, in connection with its internal plans to restructure its system of Orders, DOE has developed the concept of the "necessary and sufficient" set of requirements at a site or a facility or for an activity. As applied to safety requirements, we recognize the "necessary and sufficient" and S/RID concepts to be identical. In the following, the identity of the two will be implicitly understood, although we shall continue to use S/R.Ill as the preferred term for the documented set of applicable standards and requirements in agreements between DOE and its defense contractors. This is the nomenclature found in implementation plans submitted by DOE to the Board. To avoid confusion, we suggest that DOE continue uniform use of the term SAUD in this connection.

DOE is to determine the extent to which standards are implemented through a process of Order Compliance Self-Assessment. This has generally been accomplished through review of detailed compliance with the DOE safety Orders of interest to the Board. The practice is to be followed until S/RIDs are in place, after which time, the issue becomes compliance with requirements in S/RIDS.

The Board has viewed the Order Compliance Self-Assessment Program of DOE as an initial activity in the formulation of the S/RIDs. As part of this compliance self-assessment, DOE required the contractors to justify in documented form the rationale for judging requirements to be non-applicable. This procedural requirement has been reported to have caused the expenditure of more effort than merited to achieve the end result the Board sought, which was the establishment of the particular subset of requirements upon which the safety management programs at a site would be structured. In the recommendations below, the Board seeks to streamline the process of arriving at an Authorization Basis and Authorization Agreements with respect to DOE's safety management of its sites, facilities, and activities. The review and acceptance by DOE of(1) the hazards assessment of the work contracted, *(2)* the standards/requirements identified as appropriate, and (3) safety management controls committed by the contractor for conduct of the work would in effect constitute, in the view of the Board, a DOE determination of adequacy relative to sufficiency of the requirements base.

In another action, on August 17, 1992, th Board forwarded its Recommendation 92-5, which called for establishing certain safety policies at defense nuclear facilities faced with missions that were changing in response to the shifting world situation. The principal features of Recommendation 92-5 can be paraphrased as follows: (1) that facilities to be used in the longer term in nuclear defense missions or in cleanup from previous nuclear defense activities should be operated according to a superior level of conduct of operations, (2) that certain safety practices be followed at nuclear defense facilities being restarted after a long period of idleness, and (3) that defense nuclear facilities designated for various other kinds of use (such as standby) should be subject to a graded approach of safety criteria and requirements to be developed. The Board requested that it be informed on a timely basis of changes in the intended use of DOE's defense nuclear facilities.

Implicit in the Recommendation was a broader view of conduct of operations than adherence to written procedures and related activities directly in support of operations. It encompassed the entire set of practices used to ensure safety in a facility, and in the operations conducted therein, extending to coverage implied by the term "safety culture."

On December 16, 1992, the Secretary of Energy accepted Recommendation 92-5, and forwarded to the Board an Implementation Plan which the Board accepted on January 8, 1993.

Circumstances affecting DOES defense programs have continued to evolve since then, and the view of the future of the defense nuclear establishment is now different from that in late 1992. Many facilities then scheduled for restart or standby are now slated for deactivation and decommissioning. Though the future form of the establishment continues to be uncertain, the Board believes that the extent of the changes and other intervening events makes it necessary to bring major features of its Recommendation 92-5 up to date and in line with the updating of Recommendation 90-2.

Another important development has been the elaboration of the S/RID concept into a system view of a standards-based safety management system.[1] This has shed further light on such important matters as permissible variability of safety management at facilities of different kinds and different levels of risk, and the formal means whereby an Authorization Agreement related to environment, safety and health objectives is incorporated into contractual terms.

Principles that should guide the structure and use of safety management, the framework for conduct of operations appropriate to different cases, the basis for grading of safety management and conduct of operations, and the application to the important defense nuclear laboratories of the Department of Energy, are outlined in another document in the DNFSB/TECH sequence.[2] The points laid out in DNFSB/TECH-6 are consistent with those in DNFSB/TECH-5. Although the concepts and processes discussed in these documents are couched in terms of radiological hazards, they are more general, and apply as well to hazards of other kinds. In addition, they offer an appropriate match to requirements established elsewhere for safety in decommissioning of facilities, and would serve as a bridge to such operations.

The Board agrees with the view adopted by DOE in certain pilot tests presently under way, that the contractor for a site, facility, or activity should originate the drafting of the Safety Management Plan and the S/RID with assistance and input as appropriate by DOE. DOE has the responsibility for determining that the proposed S/RID will ensure an adequate level of safety, and finally approving it when it is found to be satisfactory. In the Board's view, an S/IUD should be the central component of the Authorization Agreement which should have contractual status as part of the agreement with the contractor relevant to performance of the work authorized for the site, facility, or activity.

In accordance with its statutory directive to review DOES safety standards and their implementation, the Board plans to track selected S/RIDs and the associated Safety Management Programs as they are developed. The Board will formally review them after their completion and will provide its comments to DOE in letters to the Secretary or in the statutory form of recommendations. The Board would normally expect DOE to have performed its own review with documentation of the results before being formally provided with the Board's comments.

We recognize that the various DOE organizational units which maybe delegated review and approval authority for S/RIDs and associated Safety Management Programs may not have enough individuals with qualifications in the technical specialties required to carry out effectively the streamlined process being recommended. This means that technical assistance may need to be retained from elsewhere to compensate for such personnel deficiencies where they exist. It also means that DOE may need

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[1] *Fundamentals for Understanding Standards-Based Safety Management,* Joseph J. DiNunno, DNFSB/TECH-5.

[2] *Safety Management and Conduct of Operations at the Department of Energy's Defense Nuclear Facilities,* DNFSB/TECH-6.

to augment its own technical expertise so as not to be obliged to continue indefinitely to rely on technical assistance from outside DOE.

The Board renews its request that it be informed on a timely basis of changes in planned use of defense nuclear facilities. In addition, the Board now wishes to replace Recommendations 90-2 and 92-5. The schedule agreed to by DOE and the Board for S/RID development and implementation pursuant to Recommendation 90-2 will be revised and carried forward as a part of Recommendation 94-5, which is not being otherwise modified at this time.

Therefore, the Board recommends, that DOE:

1. Institution* the process of incorporating into the planning and execution of every major defense nuclear activity involving hazardous materials those controls necessary to ensure that environment, safety and health objectives are achieved.

2. Require the conduct of all operations and activities within the defense nuclear complex or the former defense nuclear complex that involve radioactive and other substantially hazardous materials to be subject to Safety Management Pians that are graded according to the risk associated with the activity. The Safety Management Plans and the operations should be structured on the lines discussed in the referenced documents DNFSB/TECH-5 and DNFSB/TECH-6.

3. Establish anew list of facilities and activities prioritized on limes of hazard and importance to defense and cleanup programs, to focus the transition from implementation programs related to 90-2 and 92-5 to this revised development of S/RIDs and associated Safety Management Plans, following the process of Section I of DNFSB/TECH-6.

4. Promulgate requirements and associated instructions (Orders/standards) which provide direction and guidance for this process including responsibilities for carrying it out. The manner of establishing responsibilities and authorities as currently set forth in DOE Order 5480.31 (425.1) for Operational Readiness Reviews should serve as a model for preparing, reviewing, and approving the. Safety Management Programs. The requirement for conformance should be made a contract term.

5. Take such measures as are required to ensure that DOE itself has or acquires the technical expertise to effectively implement the streamlined process recommended.

John T. Conway, Chairman

TAB D

DNFSB/TECH-5
Fundamentals for Understanding Standards-Breed Safety Management of DOE's Defense Nuclear Facilities

Fundamentals for Understanding Standards-Based Safety Management of Department of Energy Defense Nuclear Facilities

Paper Prepared for the
Defense Nuclear Facilities Safety Board
Public Meeting, May 31, 1995
on
Standards-Based Safety Management

Joseph J. DiNunno

Note: This paper was developed by the author with assistance of Board staff for consideration by the Board as a whole, as a part of the hearing record.

Fundamentals for Undemanding Standards-Based Safety Management

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DOE Defense Nuclear Facilities

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Acknowledgement

This paper was developed with the assistance of a number of the staff of the Defense Nuclear Facilities Safety Board. The author wishes to acknowledge a core group that included Robert Andersen, Lester Ettlinger, Robert Warther, Daniel Burnfield, and Farid Bamdad. In addition, our attempts to better define terms benefited by informal exchanges with Margaret Sturdivant of DOE/EH and Frank Arsenault, a DOE support contractor.

Fundamentals for Understanding
Standards-Based Safety Management of
DOE Defense Nuclear Facilities

One of the problems encountered in the Defense Nuclear Facilities Safety Board (Board) and the Department of Energy (DOE) efforts to achieve an adequate set of safety requirements and a standards-based safety program is a lack of consistent understanding of such fundamental terms as 'standards," "requirements," and "enforcement. " Individuals with different academic backgrounds (scientific, engineering, legal) and professional experiences (operators, regulators, enforcement officers) may interpret these terms in disparate ways. To avoid misunderstanding, it is necessary to establish commonly understood definitions and to agree conceptually on how these terms fit into a standards-based safety management program that both reduce confusion and form a basis for dialogue. This paper is an attempt to define key safety terms and apply them, for illustrative purposes, to the structure of an integrated safety management program. Among the most critical terms essential to a common dialogue on DOE safety programs are the following: safety standard. safety requirement, DOE safety "Orders," safety regulations, and enforcement.

Section I of this document presents a brief background discussion of the statutory basis for these key safety terms. Section 11 introduces the technical and legal perspective brought to the use of the terms over several decades of experience. Section III of this document defines these terms, differentiates "standards" from "standards imposed as requirements, " and then discusses how standards and requirements can be incorporated in DOE contracts and ultimately enforced. The final Section (IV) explains one structure for an integrated safety management program, including the concepts of a Standards/Requirement Identification Document (S/RID), a facility and/or activity Authorization Basis, an activity/facility Authorization Agreement, and a Certification of Readiness to Proceed for defense nuclear facilities.

L BACKGROUND

Most of the terms used to describe safety programs for defense nuclear facilities have evolved from nuclear practices and statutory provisions governing DOE, beginning with the Atomic Energy Act. The Atomic Energy Act of 1954 provided that the Atomic Energy Commission, and later its successor agencies, Nuclear Regulatory Commission (NRC) and DOE, would "establish by rule, regulation, or order, such standards and instructions . . . necessary or desirable . . . to protect health or to minimize danger to life or property. " 42 U.S.C. § 2201(b). This was the first Congressional directive to DOE's predecessor's organization to establish a standards-based safety program.

Prior to the Price-Anderson Act Amendments to the Atomic Energy Act in 1988, DOE partially met its statutory obligations by issuing DOE Safety Orders which were sometimes incorporated into the terms of management and operations (M&O) contracts

for defense nuclear facilities. Of interest to the Board are 51 DOE Safety Orders which apply to DOE nuclear facilities and nine DOE Safety Orders which apply specifically to weapons assembly, disassemble y and testing facilities. As will be explained in detail later, DOE safety "Orders" are not automatically mandatory on the date of issuance, as the use of the word "Order" would imply. Some of these Orders were implemented by DOE at various sites by issuance and use of detailed technical procedures and other guidance which spelled out how safe operations are to be achieved. DOE has not consistent y invoked these Orders, contract terms, and procedures to define for their contractors what was expected to assure adequate protection of public health and safety at defense nuclear facilities.

The Price-Anderson Act Amendments of 1988 authorized DOE to impose civil and criminal penalties upon its indemnified M&O contractors for violations of nuclear safety rules, regulations, or orders. These regulations and orders must, among other things, be promulgated or issued in accordance with Section 501 of the DOE Organization Act of 1977 and the Administrative Procedure Act. To date, DOE has issued two substantive nuclear safety regulations (radiation protection and quality assurance), but has not used its enforcement powers. Some two dozen more regulations are in various states of completion.

The Board's first statutory duty is to "review and evaluate 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. " 42 U.S.C.§ 2286a (emphasis added). Recognizing that DOE did not have a well-developed set of requirements or a fully functional standards-based nuclear safety program, the Board issued a number of recommendations designed to prompt DOE to correct the situation. The first was Recommendation 90-2. In response, DOE in 1990 accepted the recommendation and began to identify, evaluate for adequacy, and determine the status of implementation of DOE safety standards. This effort continued but has lagged behind the pace the Board expected and DOE had committed in its implementation plan, This DOE effort has been marked by attempts (1) to improve and re-issue some safety-related "Orders," (2) to transition from the Order system to rules in defining requirements, and (3) to separate guidance from requirements. This effort has not been free of confusion that has slowed the complex-wide implementation of a standards-based program. Recently, in Recommendation 94-5, the Board recommended that DOE integrate applicable safety requirements contained in rules, DOE Safety Orders, and elsewhere into a clear, coherent, and consistent standards-based nuclear safety program.

DOE's slow pace in establishing a standards-based nuclear safety program throughout the complex after five years of Board prompting involves a number factors. One of the most persistent, yet curable, factors is that individuals do not have a common understanding of "standards, " "requirements," and other fundamental terms. This results in mis-

communication and unrealistic expectations. After discussions, parties often leave the table believing that agreement has been reached when in fact consensus has not been achieved. Having a set of mutually-acceptable definitions for key terms is essential to achieving shared safety goals for standards-based safety programs at defense nuclear facilities.

II. INTRODUCTION

Safety standards, which are defined more rigorously in the following discussion, are accepted levels or measures of performance, or in the case of many consensus standards, accepted methods for safe performance of specific functions. Standards can be suggested as guidance or imposed as requirements. If imposed as requirements, standards are legally enforceable. That is, legal action can be taken if the responsible person, organization or agency fails to follow the standards. If suggested as guidelines, the responsible entity is encouraged to follow the standards, or some alternative that achieves the same purpose, but cannot be subjected to legal action for failure to do so.

When standards are incorporated into statutes (i.e., laws), regulations (synonymous with rules), or judicial or agency orders (not to be confused with DOE Safety Orders), or if they are agreed to as mandatory' terms of contracts, they become legally enforceable requirements. For example, "adequate protection of the health and safety of the public" is a standard for measuring safety that is incorporated in the Board's enabling statute, the Atomic Energy Act; an annual dose equivalent of 25 millirems per year is a safety standard and limit incorporate in a regulation (40 C.F.R. § 190.10).

Standards that are not imposed as requirements are guidelines, and could be adopted for use by means of corporate policy or procedure. For example, an M&O contractor could specify to its employees that equipment be designed to a particular Institute of Electrical and Electronics Engineers (IEEE) consensus standard or to the American Society of Mechanical Engineers (ASME) code. The M&O contractor would not be subject to legal action for failing to follow this policy. However, employees could be disciplined for failure to follow the standards. Moreover, if the purpose of the corporate policy is to provide a preferred process for meeting an underlying safety requirement, the M&O contractor would need to implement an equivalent process or risk liability for failing to meet the underlying requirement. The liability stems from failing to meet the requirement, not from failing to implement the recommended IEEE or ASME standard. Similarly, if a regulated entity fails to follow one of its own procedures, no liability would result if the procedure was not imposed by requirement (e.g., regulation or contract). However, if the procedural error results in failure to meet a safety requirement (e.g., adequate fire protection), the regulated entity could be liable for that failure. The picture changes if a specific industry consensus or other standard is made mandatory by regulation or other process. For example, a regulation could require that equipment be designed and tested according to a named consensus standard. In this case, the regulated entity must use this standard or face legal action.

III. DEFINITIONS

Nuclear safety experts and drafters of the relevant Atomic Energy Act provisions recognized that safety standards are a broader category than safety requirements. Therefore, we begin by defining standards.

A. ***SAFETY STANDARDS: Documented measures for the safe performance of work. Standards may be expressed in at least two ways, namely as: (1) criteria for measuring whether or not a condition indicative of safety has been met; and (2) prescriptions for how a certain safe result is to be achieved, including specified methods, procedures, materials, and actions. Safety standards are not necessarily requirements.***

This definition acknowledges that the term "standards" can be used in two ways. First, a standard can be a criterion for measuring whether or not a certain status or condition has been achieved; the standard states what is to be achieved. These standards are sometimes called "substantive" or "outcome" standards, and are often expressed as measurable limits. As an example, radiation protection standards have been characterized in these terms: "standards mean limits on radiation exposures or levels, or concentrations or quantities of radioactive material, in the general environment outside the boundaries of locations under the control of persons possessing or using radioactive material." Reorganization Plan No. 3 of 1970, 5 U.S.C. Appendix I. Standards of this type are often found in statutes and agency regulations.

The second type of standard is a prescription for achieving a certain status or condition. A standard of this type may specify methods, materials, procedures, and actions on how a certain result is 'to be achieved. These types of standards are often called procedural, but may also address what is to be achieved. Such standards are often developed by technical specialists, first as guidance, often using a consensus process. The National Fire Protection Association Codes are examples of consensus standards developed by technical experts. The Radiological Protection Control Manual issued by the DOE or NRC Regulatory Guides are examples of procedural standards issued by the government.

As mentioned earlier, individuals with different backgrounds and experiences may view and interpret definitions or concepts from different perspectives or, in a metaphoric sense, through different lenses - one lens may bring a sharp focus to an image, while another lens may obscure or blur the very same image. In this document, we will try to bridge those differences to view the image through the same, clear, focused lens.

Scientists and engineers often view the second type of safety standard as a set of prescriptions by which the success and failure of a technology can be recorded and

communicated to a broad segment of the professional community. As a historical record, these standards are documented and codified sound engineering practices. The professional organizations that publish and communicate these types of safety standards expect that, if those standards are followed, the equipment or processes to which the standards are applied can be built and used safely.

Safety standards, as a prescription for how certain conditions are to be achieved, are usually based upon the best technical information available to the scientific and engineering community. Often they emerge from a consensus process and/or formal attempts to develop the standard. The process usually involves the most experienced professionals in a particular field. The larger professional community generally supports their adoption and use in applicable and appropriate situations.

These safety standards are often viewed as information by which the more experienced professional can help guide those with less experience through a body of accepted industry practice. Scientific and engineering standards also distill the experience and responses to administrative and technical challenges to a system, or technology. As a result, many safety standards in use today contain lessons which the engineering and scientific community have learned the hard way - through accidents and through years of examination of methods practiced by the national and international community. Viewed through this lens, safety standards provide the professional scientific and engineering basis for the conduct of work.

When a particular safety standard is applicable and is adopted for use by the scientific and engineering community and the standard is imposed as an enforceable requirement by one of the processes discussed below, regulators, compliance officers, and members of the legal community view the safety standard through another lens. That lens reveals that any "standard" made a "requirement" converts it into a mandate which must be followed; noncompliance will subject the violator to various sanctions. The converse of this is, of course, that a standard which is not imposed as a requirement cannot be enforced. As a consequence, the adoption of a particular standard as a requirement for an application, in whole or in part, becomes a challenging intellectual exercise for the scientific, engineering, and legal community.

Any standard may be made a fully enforceable requirement if imposed by statute, rule, or contract term (by Congress and the President, in the case of statutes; by DOE, in the case of regulations, and by the contractor/operator in agreement with DOE, in the case of contract terms) as discussed below. If the standard is not made into a fully-enforceable requirement, it remains only a standard. See Figure 4.

B. SAFETY REQUIREMENTS: Enforceable mandates governing public health and safety.

The Atomic Energy Act and the Board's enabling statute anticipate that certain safety standards will be made legal requirements, ultimately enforceable in court. A general definition of a requirement which is well-suited to the Atomic Energy Act and the Board's enabling statute is "an enforceable mandate governing public health and safety." Broadly, a requirement is a mandate which can ultimately be enforced by a court or other authority having jurisdiction, and which the person or entity to whom the mandate is addressed is bound under law to obey. One of the most important features distinguishing a safety standard which is a requirement from a safety standard which is not a requirement is that the former is fully enforceable against an organization or individual in noncompliance with the requirements. See the definition of enforcement below. Most requirements are also enforceable, without resort to courts, through other administrative or contractual mechanisms. For example, it is expected that DOE would administratively enforce DOE regulatory and contractual requirements in the first instance. Requirements can be subdivided into the following categories based on the sources of requirements and by their interpretation in law.

1. Statutory Requirements

Statutes, both state and federal, mandate compliance by individuals, government bodies, and corporations with certain health, safety, and environmental standards specified in the statute. Statutory requirements can be enforced by empowered state and federal officials using legal sanctions such as administrative orders and fines. These sanctions if resisted can ultimately be enforced by the courts. Moreover, enforcement officials often may seek to enforce against statutory noncompliance by going to court in the first instance.

2. Judicially-Imposed Requirements

Federal and state courts can issue orders in the form of injunctions or other mandates that certain actions be taken (or desisted from) by individuals, government bodies, and corporations, to adequately protect public health and safety. Court orders and other mandates can be grounded in statutes, regulations, or contracts, or can be based on principles of common law and equity. Tri-Party agreements under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), endorsed by federal courts, are examples of such court-imposed safety, environmental, and health requirements. Safety standards incorporated into court orders would be legally-enforceable requirements to the affected parties.

3. **Regulatory Requirements**

Regulations are the products of rule making and the word is synonymous with the word rule when it is used in the formal sense described in the Administrative Procedure Act. Federal and state statutes have created agencies with the power to issue and enforce safety regulations, pursuant to statutes, which are designed to protect public health and safety. Regulations elaborate upon and expand the statutory safety requirements by using the agency's special expertise (usually scientific or technical) to promulgate detailed, generally applicable, regulations. Federal law dictates that safety requirements imposed by regulation must first be subjected to notice and comment from the regulated entity and the interested public. Safety standards imposed by regulations issued by such agencies have the force and effect of law and are enforceable against persons under the agency's authorized jurisdiction.

4. **Order Requirements**

Federal and state agencies are also empowered to issue orders to specific persons or corporations to protect public health and safety. Orders, which carry certain procedural rights under the Administrative Procedure Act and parallel state statutes, can be of several types: (1) compliance orders, which demand that the ordered party comply with existing statutory and regulatory requirements, (2) penalty orders, which initiate an enforcement proceeding when a statutory or regulatory requirement has been alleged y violated, and (3) adjudicatory orders to a regulated entity, which are final agency actions in formal proceedings. All of these orders should be distinguished from typical DOE Safety Orders, which are not legally enforceable until made a term of the contract. Because DOE safety "Orders" have not been promulgated according to Administrative Procedure Act requirements, and are thus not self-executing, they are not orders of the type described in this paragraph. Labelling something a DOE safety Order does not make it an enforceable order requirement in the sense just described. "Order" as used by DOE in this context is a misnomer and the "requirements" imposed by contracts.

5. Contractual Requirements

Two or more parties to a contract can impose on each other the obligation to take or desist from certain actions. Properly drafted contracts specify (1) the criteria by which performance by each party will be measured, and (2) the remedies that each party has in the event of nonperformance by the other. DOE safety "Orders" can be made mandatory and become contract terms when incorporated as such into contracts between DOE and its operating contractors. Contractual requirements are enforceable administratively under the terms and remedies provided in the contract, and ultimately in court.

6. Management Imposed Restrictions

Safety standards, such as technical procedures, which are unilaterally adopted by M&O contractors, can become "requirements" in a limited sense for contractor employees. Corporations and government bodies have the authority to reasonably direct the actions of their employees and sanction misconduct that threatens safe operations. This authority is circumscribed by Constitutional constraints (e.g., discriminatory conduct) and statutory requirements (e.g., Occupational Safety and Health Administration (OSHA) regulations). However, in the area of compliance with safety requirements, employers are typically given a great deal of latitude in specifying which procedures must be followed. These standards become fully enforceable by DOE against the contractor when they are promulgated in rules, agreed to as contract terms, or otherwise imposed as legal requirements. See Arrow in Figure 4.

C. ENFORCEMENT OF REQUIREMENTS: ***Any action taken by an authorized entity to remedy or penalize (sanction) noncompliance with safety requirements; the ultimate goal of enforcement is to bring the entity violating the requirement back into compliance and 10 discourage noncompliance in the future.***

In most cases, DOE would initiate the enforcement action against the noncomplying contractor or its personnel. However, third parties with "standing" (some injury suffered as a result of the noncompliance) may also institute some forms of enforcement actions. Different levels of enforceability are associated with the forums that decide whether a noncompliance has occurred and what remedy is appropriate. Requirements based on contract terms can be enforced by either party. Thus, a contractor could enforce the contract against DOE.

1. Judicial Enforcement

Federal and state courts can mandate by judicial order that the requirements in statutes, agency regulations, and contracts be carried out by persons, government bodies, and corporations. The specific instrument used by the court to remedy, or to penalize, noncompliance may be an injunction, a writ of mandamus, a decision upholding of a fine or other administrative sanction, or in criminal cases, conviction and sentencing of guilty parties.

2. **Administrative Enforcement**

Federal and state regulatory agencies are granted enforcement powers which may include the power to issue compliance orders, impose fines and other civil penalties, and to investigate and refer for prosecution potential criminal violations. See the definition of Orders. Agency sanctions may ultimately be enforced by judicial order.

3. **Contract Enforcement**

   Parties to a complex contract normally specify a range of remedies for violations of contract terms. Contractual remedies may include mandatory compliance (specific performance), reduction of payments, mandatory dispute resolution procedures such as arbitration, and in extreme cases, contract termination.

4. Managed Compliance

   Management officials of government bodies and corporations can impose internal policies and procedures upon employees using written standards of conduct, employment contracts, and internal directives. Sanctions to enforce compliance or punish violations range from informal reprimands to job termination.

IV. INTEGRATED SAFETY MANAGEMENT PROGRAM

The inherent hazardous nature of radioactive materials has long been recognized. Practices that have evolved over the years to protect workers, the public, and the environment have been based upon a number of basic concepts. These include the following:

- Defense In-Depth

  Facilities wherein nuclear materials are processed, fabricated, stored or used must be designed to provide multiple levels of defense against undue exposure of workers and the public to radiation. Combinations of inherent design characteristics and engineered features are used to prevent release of radioactive materials into the work place or off site.

- Minimizing **Radioactive Exposures**

  Keeping radioactive exposures to "as low as reasonably achievable" (ALARA) is internationally accepted as a fundamental principle of radiation protection. This conservative approach is directed at preventing workers from being exposed to any more radiation than is absolutely necessary to achieve the intended uses of the nuclear materials or intended results of work in a radiation environment.

- **Hazards/Safety Analysis**

  A Hazards/Safety Analysis is the companion piece to the defense indepth concept. This is a planning exercise done to define the hazardous aspects of the nuclear activity and the features needed to render the probability of inadvertent exposure of workers and the public extremely low.

- **Clear Delineation of Safety Responsibility**

  Congress has made quite clear that with the privilege of using radioactive materials comes responsibility for assuring nuclear safety of workers and the public and for protecting the environment.

Regulatory bodies of nations with acknowledged nuclear programs have widely adopted these concepts in structuring requirements imposed on users of nuclear materials. These concepts undergird the regulatory programs of both the NRC and the DOE.

Safety practices, or functions, that embody these four basic concepts can be grouped by the safety functions they are designed to serve, namely:

- **Prevention**

  Those requirements pertaining to hazards analysis and design of structures, systems or components to prevent undue exposures, whether from normal or abnormal conditions attendant the work activity or from unusual but credible disruptive events.

- **Preservation**

  Those requirements to preserve the designed-in capability of structures, systems and components important to nuclear safety and protection of the environment.

- **Mitigation**

  Those requirements that reflect possibilities for operational mishaps, man or nature caused, and the emergency response capabilities needed to regain control and mitigate consequences of dispersion of radioactive materials should they be released beyond designed confinement barriers.

- **Management**

  Those requirements that address the need for detailed procedures and trained and qualified personnel to integrate, manage and execute the safety functions.

Groupings of safety functions, and the individual functional areas within the groupings are illustrated by Figures 1 and 2.

Together, the functional areas provide a framework for implementing the safety requirements applicable to any facility at any site, or for major work activities at any site involving hazardous or radioactive materials. Currently DOE nuclear safety-related orders grouped by functional areas are shown in detail in Table 1. While existing DOE

been established by statutes and rules and any additional safety standards which are necessary to achieve adequate protection of public health and safety. Thus, the S/RID process provides an opportunity for the contractor and DOE to identify and mutually agree upon those requirements and other standards, such as DOE Safety Orders, and selected industry standards which are to apply to a site and/or facility. Safety requirements imposed by regulation, or other legal mechanisms are applicable and enforceable even before they are referred to, or incorporated in, an S/RID. See Red Zone, Figure 4 and the yellow area in Figure 5.

A completed S/RID, which is envisioned to be incorporated into the contract between DOE and contractor(s), should contain the explicit safety requirements applicable to a particular site or facility (site S/RID or facility MUD). See yellow and blue areas of Figure 5. It is expected that as activities performed at a site or facility change, the S/RID will be modified and updated in an orderly process. The set of safety requirements contained in the site S/RID should be organized such that they can be changed and applied in seamless fashion as DOE's defense nuclear facilities progress through life cycle phases of design, construction, operation, maintenance, and decommissioning.

B. AUTHORIZATION BASIS

While the development and incorporation into contract agreement of a DOE/Contractor mutually agreed-upon set of requirements is absolutely essential for effective compliance/enforcement activities, such definition is not sufficient. Agreements must similarly be reached as to how the applicable requirements are to be satisfied.

DOE Order 5480.21, ***Unreviewed Safety Questions, defines "Authorization Basis"*** as:

> Those aspects of facility design basis and operational requirements relied upon by DOE to authorize operation. These aspects are considered to be important to the safety of facility operations. The authorization basis is described in documents such as the facility Safety Analysis Report and other safety analysis; Hazards Classification Documents, the Technical Safety Requirements, DOE safety evaluation reports and facility-specific commitments made in order to comply with DOE Orders or policies.

A similar definition has been proposed as part of 10 C.F.R. $830.3. The above definition captures the essence of an important sub-set of the health and safety requirements but may not always be inclusive. In the larger context, "authorization basis" must be viewed as the composite of information a contractor must provide in response to all ES&H requirements applicable to a facility.

Many of the facilities in the defense nuclear complex were designed and constructed to requirements that are not current today. The result is that much of the authorization basis that is required of new facilities is not available or would be highly costly to reconstruct at best. Further, missions have dramatically changed and functions that many facilities were originally designed to serve are no longer needed. These conditions notwithstanding, all facilities that continue to use or contain substantive quantities of radioactive materials require some program for safety management commensurate with the potential risk to the worker, the public and the environment. The challenge is to structure a safety management program for each such facility, considering its existing mission, its anticipated future use and the best knowledge of its radioactive inventory and design that can reasonably be gathered and analyzed.

The basic process prescribed for developing these programs can be, and should be, conducted even though the data base may be less than an ideal. For the old facilities in particular, the difficulty of DOE's review of such programs for adequacy will rival the challenge the Department faces in determining the "necessity and sufficiency" of facility-specific MUDS proposed by their contractors.

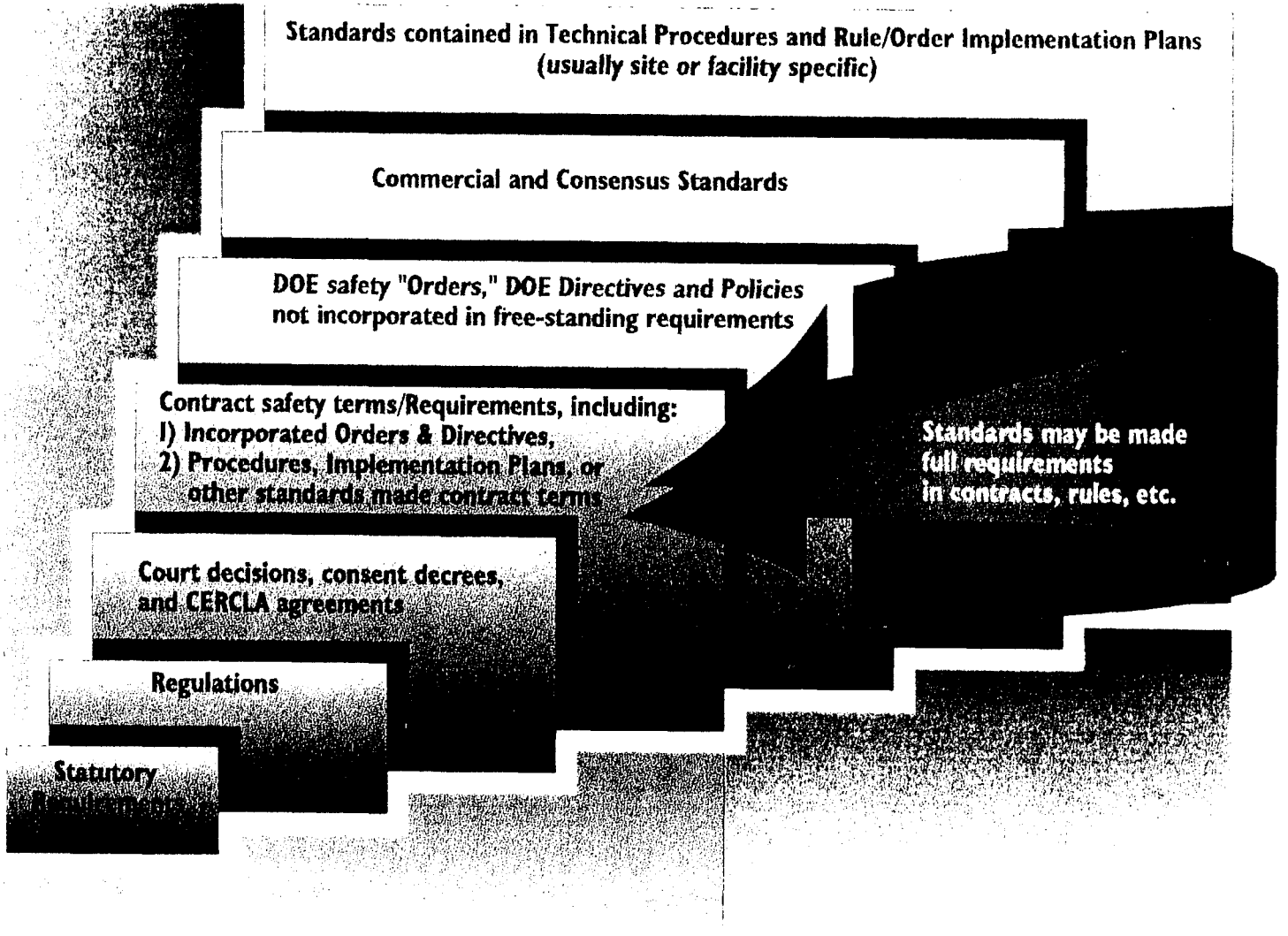
C. AUTHORIZATION AGREEMENT

When authorizing operation of a commercial nuclear facility, the NRC extracts an explicit set of terms and conditions from information provided as part of the license application (e.g., technical specifications, SARs, safety programs). These terms and conditions, along with other information such as applicable regulatory requirements, are made part of the license to conduct the activities authorized. An example of such terms and conditions for the Comanche Peak Unit 2 operating license is shown in Appendix I. By analogy, it is possible for DOE to develop an authorization agreement which distills terms and conditions from the authorization basis information submitted by the contractor (e.g., the SAR, S/RIDs). This authorization agreement would set forth the basis on which DOE approves operation of the facility. While the analogy to an NRC license is helpful, it is important to note that an NRC license and a DOE contract are fundamentally different legal documents. DOE is the owner of the facilities operated by contractors and is not in the same position as the NRC, which has no ownership interest in the facilities it licenses.

The terms and conditions of an NRC license identify the programs and activities to be conducted by a licensee to ensure compliance with regulatory requirements, which are also identified in the license. Similarly, the terms and conditions in a DOE authorization for operation should contain the contractor's commitments to programs and activities that will be conducted to ensure performance of obligations stated in the

PROCESS FOR IDENTIFYING SAFETY REQUIREMENTS FROM THE SET OF APPLICABLE STANDARDS

Predominantly HOW adequate protection is achieved



Predominantly WHAT must be done for adequate protection

IRED ZONE
Realm of free-standing legal requirements, mandatory and enforceable against organizations and individuals (e.g., DOE, M&O contractor)

BLUE ZONE
DOE and contractors may require employees to comply. Violations may subject employee to discipline

FIGURE 4

Standards/Requirements Identification Documents (S/RIDS) Incorporated in Contracts

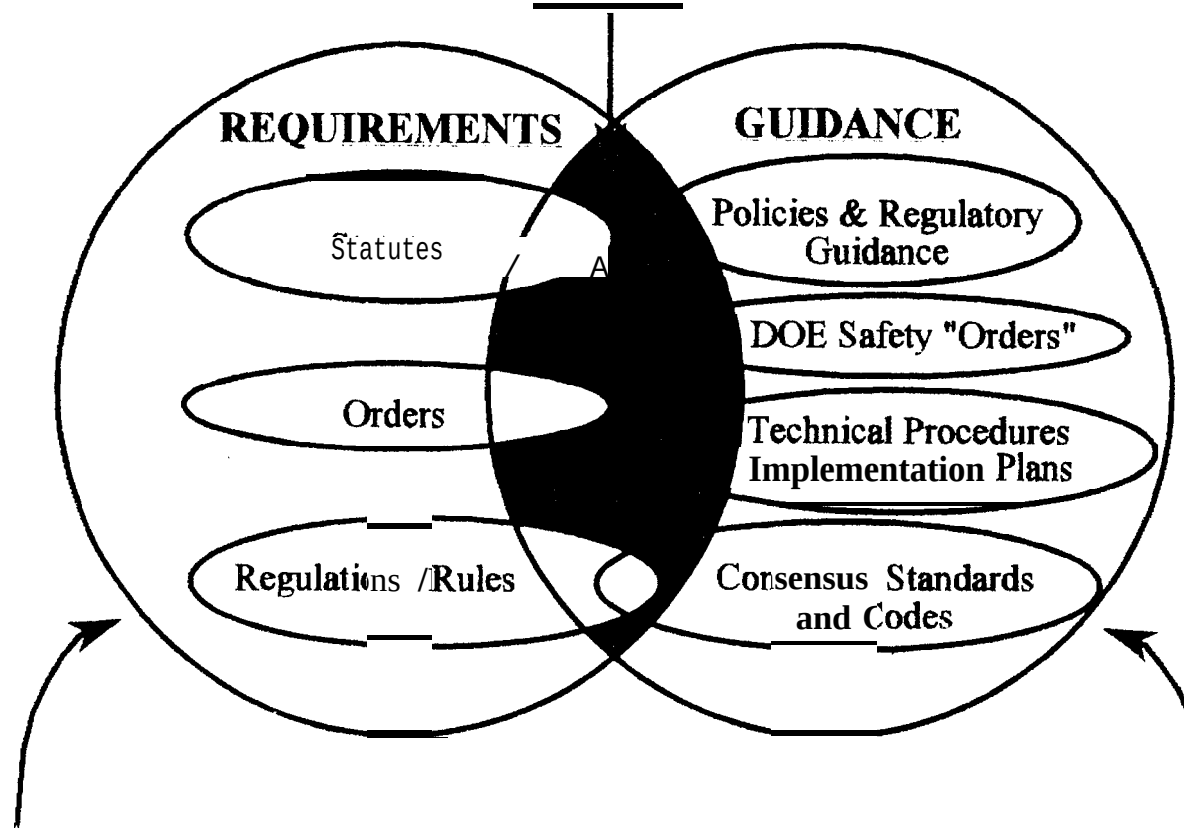


FIGURE 5

contract in the form of S/RIDs. Such commitments provide a concise set of clearly-defined expectations of contractor performance which form a basis for compliance and enforcement actions by DOE and/or independent external oversight organizations.

Historically, DOE has not used Authorization Agreements to explicitly define and control terms and conditions governing contractor operations. However, several DOE Safety Orders address the desired content of documentation that in effect would constitute such contractor activities, authorization agreement, if so defined. Particularly pertinent existing DOE guidance from DOE Orders is summarized in Appendix H. The marked similarity of the content of Technical Safety Requirements (TSRs) that would result from implementing DOE Orders compared to commercial practice is illustrated in Table *2,* using Comanche Peak, Unit 2 License conditions as the commercial reference. One can note that the basic elements of authorization agreements are expected to include:

1. Identification of those systems, structures, and components important to safety and the commitment to maintain them operational,

2. The technical safety requirements (TSR's), including limiting conditions of operations (LCO's),

3. The commitments to programs to preserve the designed-in capability of structures, systems, and components important to nuclear safety and environmental protection; e.g:

   - Configuration Management,

   - Maintenance.

   . Selection and Qualification of Operating Personnel, and

   . Procedures Development and Implementation.

4. The commitments to programs for emergency preparedness and response, and

5. The commitments to administrative controls necessary to successfully execute the activity being authorized.

Whereas, this generalized approach to establishing clear authorization agreements can be adapted to every nuclear facility or major activity involving radioactive and other hazardous materials, different types of facilities or environmental restoration activities may well have different terms and conditions. Some sites with a multiplicity of activities of different nature may also find that site-wide programs, such as

emergency preparedness and response, may be the most effective means of satisfying safety functions common to a number of facilities or activities.

The point to be emphasized is the importance of establishing clearly the terms and conditions that form the agreement between DOE and its contractor(s) as to safe management of the authorized work and which, if implemented, well satisfy contractual objectives set** fonh in the **S/RIDs.

D. CERTIFICATION OF READINESS

Before the start-up of new facilities or the re-start after shutdown of old facilities, the DOE has, in response to Board recommendations, instituted a process of readiness review and certification both by the operating contractor and the responsible DOE authorities. The Board provides oversight. This process, set forth in DOE safety Order 5480.31, is intended to insure that a safety management program responsive to DOE imposed applicable requirements, is demonstrably in place and functioning effectively. Responsible contractors and DOE management must certify to that effect and designate the authorizing DOE official.

The basic concepts described above are generic and can be adapted to the wide range of facilities and activities that make up the defense nuclear complex. A good example of a safety management program for new facilities structured in this integrated way are Savannah River's (SR's) Defense Waste Processing Facility (DWPF) and the In-Tank Precipitation Facility (ITP). For DWPF and ITP, the contractor and DOE/SR have well developed a standards-based safety management plan that is currently undergoing the demonstration of readiness to operate.

SUMMARY

In summary:

1. The model presented herein is structured upon the framework of existing DOE Rules and Orders. While the requirements and guidance set forth therein might well benefit from reorganization, consolidation and improvement, it is important to retain the essence of good safety practices that is embodied in the existing framework.

2. Requirements in effect prescribe a process that begins with hazards analysis and leads to the definition of ways to:

   (1) prevent exposures to radioactive sources
   (2) preserve and properly use the safety features so designed
   (3) prepare for emergencies and mitigate effects of mishaps
   (4) manage the authorized activity safely

3. Standards-based safety management programs of DOE and its operating contractors, compared to commercial practice, is closely approached in some of the newer DOE facilities but existing DOE requirements and guidance are not consistently or uniformly applied across the complex.

4. It will require competent, consistent, centralized direction to achieve uniformity and consistency in standards-based management of DOE nuclear facilities and activities.

TABLE -1

Functional Areas and Associated Current DOE Safety Orders

I. Prevention

A. System and Program Functional Areas to Ensure Defense in Depth

1. **Chemical Systems**
   a. *6430.1A General* ***Design Criteria***

2. **Electrical Systems**
   a. 4430.1A ***General Design Criteria***

3. **Instrumentation and Control Systems**
   a. 6430.1A *General Design Criteria*

4. **Mechanical Systems**
   a. *6430.1A General Design Criteria*

5. **Structural Systems**
   a. 6430.1A *General Design Criteria*

6. **Nuclear Criticality**
   a. 5480.24 *Nuclear Criticality Safety*

7. *Fiie* **Protection**
   a. 5480. 7A *Fire Protection*

8. **Radiological Protection**
   a. ***5400.*** *5 Radiation Protection* ***of*** *the public and the* ***Environment***
   b. *5480.11 Radiation Protection for Occupational Workers*
   c. 5480.15 DOE Laboratory Accreditation Program for Personnel ***Dosimetry***

9. **Waste Management and Minimization**
   a. *5820.2A Radioactive Wrote Management*
   b. ***5400.*** *I General Environmental Protection Program*

10. Occupational Safety and Industrial Hygiene
- a. *5480. 1B Environment, Safety and Health Program*
- b. *5480.4 Environmental Protection, Safety and Health Protection Standards*
- c. *5480. 8A Contractor Occupational Medical Program*
- d. *5480. 9A Construction Safety and Health Program*
- e. *5480.10 Contractor Industrial Hygiene Program*
- f. *5483. 1A Occupational Safety and Health Program for DOE Contractor Employees at Government-Owned Contractor-Operated Facilities*

11. Nuclear Explosives Safety
- a. *5600. 1 Management of DOE Weapon Program and Weapon Complex*
- b. *5610.10 Nuclear Explosive and Weapon Safety Program*
- *c. 5610.11 Nuclear Explosive Safety*
- d. *5610.12 Packaging of Offsite Transportation of Nuclear Components, and Special Assemblies Associated with the Nuclear Explosive and Weapon Safety Program*

12. External Hazards
- a. 5480.28 *Natural Phenomena Hazards Mitigation*

B. Functional Areas to Analyze for Defense in Depth

1. Safety and **Hazards** Analysis
- a. 5480.6 *Safety of DOE-Owned Reactors*
- b. *5480.21 Unreviewed Safety Questions*
- *c. 5480.22 Technical Safety Requirements*
- d. *5480.23 Nuclear Safety Analysis Reports*
- *e. 5480.25 Safety of Accelerator Facilities*
- f. *5480.30 Nuclear Reactor Safety Design Criteria*
- g. *5481. 1B Safety Analysis and Review System*

2. **Systems Integration Analysis (e.g.,** reliability, maintainability, supportability)

3. Packaging, Handling, and On-Site Transportation
- a. 1540.2 *Hazardous Material Packaging for Transport - Administrative Procedures*
- b. *1540.3A Base Technology for Radioactive Material Transportation Packaging Systems*

- *c. 5480.3 Safety Requirements for the Packaging and Transportation of Hazardous Substances and Hazardous Wastes*
- d. *5632.11 Physical Protection of Unclassified Irradiated Reactor Fuel in Transit*

IL Preservation

A. Functional Areas

1. **Conduct of Operations**
   a. 5480.19 *Conduct* ***of Operations Requirements for DOE Facilities***

2. **Configuration Management**

3. **Maintenance**
   a. 4330. 4B *Maintenance Management Program*

4. **Testing and Surveillance**

5. **Training and Qualification**
   a. **5480.** ***18B*** *Training Accreditation*
   b. *5480.20 Personnel Selection, Qualification, Training and* ***Staffing*** *Requirements at DOE Reactor and Non-reactor Nuclear Facilities*

III. Mitigation

A. Functional Areas

1. **Emergency Management**
   a. ***5500. 1B Emergency*** *Management System*
   b. ***5500.*** **2B** ***Emergency Categories, Classes, and Notification*** *and* ***Reporting*** *Requirements*
   c. ***5500.*** *3A Planning and Preparedness for Operational Emergencies*
   d. ***5500.*** *4A Public* ***Affairs*** *Policy and Planning Requirements*
   e. ***5500. 7B*** *Emergency Operating Records Program*
   f. *5500.10 Emergency Readiness Assurance Program*
   g. *5530.* ***1A*** *Accident Response Group*
   h. *5530.2 Nuclear Emergency Search Team*
   i. *5530.3 Radiological Assistance Program*
   j. *5530.4 Aerial Measuring System*

2. **Environmental Protection**
   a. **54(W. 2A** *Environmental Compliance* ***Issue*** *Coordination*
   b. ***5400.*** **4** ***CERCLA Requirements***
   c. 5440. 1E NEPA Compliance Program

3. Safeguards and Security

a. *5632.1 C Protection and Control of Safeguards and Security Interests*

b. *5610.13 Joint DOE/DOD Nuclear Weapons System Safety, Security, and Control Activities*

Iv. Integration

A. Functional Areas

1. Management Systems

a. *1360. 2B Unclassified Computer Security Program*

b. *4700. 1 Project Management System*

c. *5000. 3B Occurrence Reporting and Processing of Operations Information*

d. *5480.26 Trending and Analysis of Operations Information Using Performance Indicators*

e. *5480.29 Employee Concerns Management System*

f. *5480.31 Startup and Restart of Nuclear Facilities*

g. *5482. 1B Environment, Safety, and Health Appraisal Program*

h. *5484.1 Environmental Protection, Safety and Health Protection Information Reporting Requirements*

2. **Independent Review**

a. *5480.17 Site Safety Representatives*

3. **Inspection and Enforcement**

4. **Standards Program**

a. *1300.2A Department of Energy Technical Standards Program*

5. Quality Assurance

a. *5700.* 6C *Quality Assurance*

Section	Title	Note (*)
1	Use and Application	1
2	Safety Limits	2
3/4	Operational Limits and Surveillance Requirements	3/4
5	Administrative Controls:	6
5.a	Contractor Responsibility	6.1
5.b	Contractor Organization	6.2.1
5.c	Procedures	6.8
5.d	Programs	6.8
5.e	Minimum Operations Shift Complement	
5.f	Operating support	6.2.2
5.g	Facility Staff Qualifications and Training	6.4
5.h	Operability Definition of Implementation Principles	1
5.i	TSR Basis Control	6.8
5.j	Review and Audit	6.5
5.k	Reporting Requirements	6.9
Appendix A	TSR Bases	Attach. to 3/4
Appendix B	Design Features	5

(*) Note: These are corresponding Sections from Table 1, Technical Specifications, Operating License, Comanche Peak, Unit #2

Table -2
Technical Specifications Table of Contents
for DOE upgraded Safety Analysis Program
(DOE Order 5480.22)

EXAMPLE TERMS & CONDITIONS FOR AN OPERATING LICENSE (OL) FOR A COMMERCIAL NUCLEAR POWER PLANT

As an example of the conditions *imposed* on operation of commercial nuclear power plants the operating License of Comanche Peak Unit No. 2 was studied. The OL No. NPF-89 is basically a five page letter (copy attached). The following is a brief digest.

The Operating License first discusses how Texas Utilities Electric meets or satisfies the NRC requirements specified in the Code of Federal Regulations. Several of these requirement are specifically identified in the OL such as 10 CFR chapter 1; 10 CFR 140; 10 CFR 51; 10 CFR parts 30, 40, and 70; 10 CFR 50; and 10 CFR 70. The NRC then states that the license is subject to the additional conditions specified in three Attachments, Appendices A, B and C outlined below and some exemptions identified in the OL. The license also lists three specific programs: fire protection, physical security, and financial protection, and clarifies the contents of those programs.

Appendix A:	Technical Specifications (NUREG-1468)
Appendix B:	Environmental Protection Plan (non radiological)
Appendix C:	Antitrust Conditions

Appendix A - Technical Specifications:

This appendix consists of six (6) sections as shown in Table-1. Section 6, Administrative Controls, identifies some committal Safety Programs as individual subsections e.g. Responsibility, Organization, Training and Qualification, Radiation Protection program, and Review and Audit. Some other committed safety programs are described under procedures and programs in subsection 6.8. Whereas is stated that "written procedures shall be established, implemented, and maintained" covering the following activities:

a. Applicable procedures recommended in Appendix A to Reg. Guide 1.33 (These procedures define the quality assurance program related to operations, such as operating procedures, startup and shutdown procedures, procedures for combating emergencies, etc.),
b. Emergency Operating Procedures,
c. Security Plan implementation,
d. Emergency Plan implementation,
e. Process Control Program implementation,
f. Offsite Dose Calculation Manual implementation,
g. Quality Assurance for effluent and environmental monitoring,
h. Fire Protection program implementation, and
i. Technical Requirements Manual implementation.

In addition, Section 6.8.3 to Appendix A identifies some programs that "shall be established, implemental, and maintained", and are related to environmental monitoring such as:

a) Primary Coolant sources outside containment,
b) In-plant Radiation Monitoring (airborne concentrations),
c) Secondary water chemistry,
d) Post-Accident sampling,
e) Radioactive Effluent controls program, and
f) Radiological Environmental Monitoring program.

Section	Title
1	Definitions
2	Safety Limits and Limiting Safety System Settings
3/4	Limiting Conditions of Operations and Surveillance Requirements
5	Design Features
6	Administrative Controls:
6.1	Responsibility
6.2	Organization
6.3	Staff Qualification
6.4	Training
6.5	Review and Audit
6.6	Reportable Event Action
6.7	Safety Limit violation
6.8	Procedures and programs
6.9	Reporting Requirements
6.10	Record Retention
6.11	Radiation Protection Program
6.12	High Radiation Area
6.13	Process Control Program
6.14	Offsite Dose Calculation Manual

Table -1, Appendix I
Technical Specifications Table of Contents
for Commercial Nuclear Power Plants

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

TEXAS UTILITIES ELECTRIC COMPANY, ET AL.*

DOCKET NO. 50-446

COMANCHE PEAK STEAM ELECTRIC STATION, UNIT NO. 2

FACILITY OPERATING LICENSE

License No. NPF-89

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for a license filed by Texas Utilities Electric Company (TLJ Electric) acting for itself and as agent for Texas Municipal Power Agency, (licensees), complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's regulations set forth *in* 10 CFR Chapter I, and all required notifications to other agencies or bodies have been duly made;

   B. Construction of the Comanche Peak Steam Electric Station, Unit No. 2 (the facility), has been substantially completed in conformity with Construction Permit No. CPPR-127 and the application, as amended, the provisions of the Act, and the regulations of the Commission;

   C. The facility will operate in conformity with the application, as amended, the provisions of the Act, and the regulations of the Commission (except as exempted from compliance in Section 2.D below);

   D. There is reasonable assurance: (i) that the activities authorized by this operating license can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I, except as exempted from compliance in Section 2.D. below;

   E. TU Electric is technically qualified to engage in the activities authorized by this operating license in accordance with the Commission's regulations set forth in 10 CFR Chapter I;

*The current owners of the Comanche Peak Steam Electric Station are: Texas Utilities Electric Company and Texas Municipal Power Agency. Transfer of ownership from Texas Municipal Power Agency to Texas Utilities Electric Company was previously authorized by Amendment No. 8 to Construction Permit CPPR-127 on August 2S, 1988 to take place in 10 installments *as* set forth in the Agreement attached to the application for Amendment dated March 4, 1988. At the completion thereof, Texas Municipal Power Agency will no longer retain any ownership interest.

F. The licensees have satisfied the applicable provisions of 10 CFR 140, "Financial Protection Requirements and Indemnity Agreements," of the Commission's regulations;

G. The issuance of this license will not be inimical to the common defense and security or to the health and safety of the public;

H. After weighing the environmental, economic, technical, and other benefits of the facility against environmental and other costs and considering available alternatives, the issuance of Facility Operating License No. NPF-89 subject to the conditions for protection of the environment set forth herein, is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied; and

I. The receipt, possession, and use of source, byproduct, and special nuclear material as authorized by this license will be in accordance with the Commission's regulations in 10 CFR Parts 30, 40, and 70, except that an exemption to the provisions of 70.24 is granted as described in paragraph 2.0 below.

2. Pursuant to approval by the Nuclear Regulatory Commission at a meeting on April 6, 1993, the License for Fuel Loading and Low Power Testing, License No. NPF-88, issued on February 2, 1993, is superseded by Facility Operating License No. NPF-89 hereby issued to the licensees, to read as follows:

A. This license applies to the Comanche Peak Steam Electric Station, Unit No. 2, a pressurized water nuclear reactor and associated equipment (the facility), owned by the licensees. The facility is located on Squaw Creek Reservoir in Somervell County, Texas about 5 miles north-northwest of Glen Rose, Texas, and about 40 miles southwest of Fort Worth in north-central Texas and is described in the licensee's Final Safety Analysis Report, as supplemented and amended, and the licensee's Environmental Report, as supplemented and amended.

B. Subject to the conditions and requirements incorporated herein, the Commission hereby licenses:

(1) Pursuant to Section 103 of the Act and 10 CFR Part SO 'Domestic Licensing of Production and Utilization Facilities", TU Electric to possess, use, and operate the facility at the designated location in Somervell County, Texas in accordance with the procedures and limitations set forth in this license;

(2) Pursuant to Section" 103 of the Act and 10 CFR Part SO, 'Domestic Licensing of Production and Utilization Facilities', Texas Municipal"P owerAgency to possess the facility at the designated location in Somervell County, Texas in accordance with the procedures and limitations set forth in this license;

(3) TU Electric, pursuant to the Act and 10 CFR Part 70, to receive, possess and use at any time, special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, and described in the Final Safety Analysis Report, as supplemented and amended;

(4) TU Electric. pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use, at any time, any byproduct, source, and special nuclear material as sealed neutron sources for reactor startup, sealed *sources* for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;

(5) TU Electric, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use in amounts as required, any byproduct, source or special nuclear materialwithout restriction to chemical *or* physical form, for sample analysis or instrument calibration *or* associated with radioactive apparatus *or* components; and

(6) TU Electric, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.

C. This license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

TU Electric is authorized to operate the facility at reactor core power levels not in excess of 3411 megawatts thermal in" accordance with the conditions specified herein.

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into this license. TU Electric shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

(3) Antitrust Conditions

Applicants as defined in Appendix C shall comply with the antitrust conditions delineated *in* Appendix C to this license; Appendix C is hereby incorporated into this *license.*

0. The following exemptions are authorized by law and will not endanger life *or* property *or* the common defense and security. Certain special circumstances are present and these exemptions are otherwise in the public interest. Therefore, these exemptions arc hereby granted:

(1) The facility requires a technical exemption from the requirements of 10 CFR Part 50, Appendix J, Section III.D.2(b)(ii). The justification for this exemption is contained in Section 6.2.5.1 of Supplement 26 to the Safety Evaluation Report dated February 1993. The staff's environmental assessment was published on January 19, 1993 (58 FR 5036). Therefore, pursuant to 10 CFR 50.12(a)(l), 10 CFR 50.12(a)(2)(ii) and (iii), the Comanche Peak Steam Electric Station, Unit 2 is hereby granted an exemption from the cited requirement and instead, is required to perform the overall air lock leak test at pressure P_a prior to establishing containment integrity if air lock maintenance has been performed that could affect the air lock sealing capability.

(2) The facility was previously granted exemption from the criticality monitoring requirements of 10 CFR 70.24 (see Materials License No. SNM-1986 dated April 24, 1989 and Section 9.1.1 of SSER 26 dated February 1993.) The staff's environmental assessment was published on January 19, 1993 (58 FR 5035). The Comanche Peak Steam Electric Station, Unit 2 is hereby exempted from the criticality monitoring provisions of 10 CFR 70.24 as applied to fuel assemblies held under this license.

E. With the exception of 2.C(2) and 2.C(3), TU Electric shall report any violations of the requirements contained in Section 2.C of this license within 24 hours. Initial notification shall be made in accordance with the provisions of 10 CFR 50.72 with written followup in accordance with the procedures described in 10 CFR 50.73(b), (c), and (e).

F. In order to ensure that TU Electric will exercise the authority as the surface landowner in a timely manner and that the requirements of 10 CFR 100.3(a) are satisfied, this license is subject to the additional conditions specified below: (Section 2.1, SER)

(1) For that portion of the exclusion area which is within 2250 ft of any seismic Category I building or within 2800 ft of either reactor containment building, TU Electric must prohibit the exploration and/or exercise of subsurface mineral tights, and if the subsurface mineral rights owners attempt to exercise their rights within this area, TU Electric must immediately institute immediately effective condemnation proceedings to obtain the mineral rights in this area.

(2) For the unowned subsurface mineral rights within the exclusion area not covered in item (l), TU Electric will prohibit the exploration and/or exercise of mineral rights until and unless the licensee and the owners of the mineral rights enter into an agreement which gives TU Electric absolute authority to determine all activities--including times of arrival and locations of personnel and the authority to remove personnel and equipment--in event of emergency. If the mineral rights owners attempt to exercise their rights within this area without first entering into such an agreement, TU Electric must immediately institute immediately effective condemnation proceedings to obtain the mineral rights in this area.

(3) TU Electric shall promptly notify the NRC of any attempts by subsurface mineral rights owners to exercise mineral rights, including any legal proceeding initiated by miners? rights owners against TU Electric.

G. TU Electric shall implement and maintain in effect all provisions of the approved fire protection program as described in the Final Safety Analysis Report through Amendment 87-and as approved in the SER (NUREG-0797) and its supplements through SSER 27, subject to the following provision:

TU Electric may make changes to the approved fire protection program without prior approval of the Commission only if those changes would not adversely affect the ability to achieve and maintain safe shutdown *in* the event of a fire.

H. TU Electric shallfully implement and maintain in effect all provisions of the physical security, guard training and qualification, and safeguards contingency plans, previously approved by the. Commission, and all amendments made pursuant to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The plans, which contain safeguards information protected under 10 CFR 73.21, are entitled: 'Comanche Peak Steam Electric Station Physical Security Plan" with revisions submitted through January 14, 1993; "Comanche Peak Steam Electric Station Security Training and Qualification Plan" with revisions submitted through June 10, 1991; and 'Comanche Peak Steam Electric Station Safeguards Contingency Plan' with revisions submitted through December 1988.

I. The licensees shall have and maintain financial protection of such type and in such amounts as the Commission shall require in accordance with Section 170 of the Atomic Energy Act of 1954, as amended, to cover public liability claims.

J. Amendment No. 8 to Construction Permit CPPR-127, issued August 25, 19$8, authorized the transfer of 6.2% ownership interest in the facility from Texas Municipal Power Agency to TU Electric, such transfer to take place in 10 installments as set forth in the Agreement attached to the application for amendment dated March 4, 1988. At the completion of such transfer of interest, Texas Municipal Power Agency shall no longer be a licensee under this license and all references to "licensees" shall exclude Texas Municipal Power Agency.

K. This license is effective as of the date of issuance and shall expire at Midnight on February 2, 2033.

FOR THE NUCLEAR REGULATORY COMMISSION

Thomas E. Murley, Director
Office of Nuclear Reactor Regulation

Attachments/Appendices:
1. Appendix A - Technical Specifications (NUREG-1468)
2. Appendix B - Environmental Protection Plan
3. Appendix C - Antitrust Conditions

Date of Issuance: April 6, 1993

AUIT-IONIZATION AGREEMENTS
DOE ORDERS GUIDANCE

Much of what might be expected as summary terms and conditions for safety management of a nuclear facility or activity is set forth in DOE Order 5480.23, Safety Analysis Report and DOE Order 5480.22, Technical Safety Requirements. The guidance differs somewhat depending upon whether the facilities structure a safety management program based upon a fully completed upgraded safety analysis or an interim preliminary analysis.

DOE Order 5480.23, Nuclear Safety Analysis Reports, requires all existing facilities and operations to submit a plan and schedule for implementing the requirements of this order within 180 days of its effective date (April 30, 1992). The objective was an upgrading and updating of the authorization basis for facilities with continued operational missions. In the interim, a Basis for Interim Operation (BIO) based upon a preliminary assessment of facility hazards was to be established.

With respect to existing facilities undergoing SAR upgrades, pertinent guidance relative to the development of a BIO includes the following:

a. DOE Standard STD-301 1-94, *Guidance for preparation of DOE 5480.22 (TSR) and DOE 5480.23 (SAR) Implementation Plans (IP), was* issued in November 1994 to clarify some of the elements of the 1P for submittal to DOE. Appendix A to this standard discusses safety assurance via BIO. It states that "The BIO establishes the interim safety basis for the facility; i.e., the information upon which DOE depends for its conclusion that operations at a facility can be conducted safely on an interim basis until SAR and TSR documents complying with the requirements of DOE 5480.22 and DOE 5480.23 have been approved. "

b. DOE Standard 3011-94 states that the acceptability of the BIO depends on the (1) Safety Management Programs, (2) Safety and Hazards Analysis, and (3) Identification of Operational Controls. Examples of safety management programs given in this standard include: Radioactive and hazardous material waste management; criticality protection; radiation protection; hazardous material protection; training; testing; surveillance; maintenance; conduct of operations; configuration management; quality assurance (including document control); experimental review; provisions for decontamination and decommissioning (D&D); emergency preparedness, and human factors.

c. The Operational Controls are defined in DOE Standard 3011-94 as Operational Safety Requirements (OSRS), operating limits, surveillance requirements, and administrative controls needed to maintain the operations within the bounds of the SAR. The Standard explains that "Administrative controls implement safety programs that also bound the limits of normal operation. Surveillance requirements ensure that the necessary operability and quality of Structures, Systems, and Components (SSCs) and their support systems required for safe operations of the facility are maintained. "

For facilities with SARS that are compliant with requirements of DOE-Order 5480.23:

a. Attachment 1 to DOE Order 5480.22, Technical Safety Requirements, defines format and content of a TSR.

b. Section 5.C of DOE Order 5480.22 states that "procedures should be established, implemented, and maintained for all activities in support of the TSR. This should include:

- Emergency operating procedures,
- Operating procedures for all phases of operation,
- Procedures for all surveillance required by the TSR,
- Security plan implementation,
- Emergency plan implementation,
- Fire protection,
- Programs to ensure safety and healthful operation (examples detailed in section 5d of DOE Order 5480.22). and
- Administrative Procedures.

TAB E

DNFSB/TECH-6
Safety Management and Conduct of Operations at the DOE's Defense Nuclear Facilities

Safety Management and Conduct of Operations

at the

Department of Energy's Defense Nuclear Facilities

Paper Prepared for the
Defense Nuclear Facilities Safety Board
October 6,1995

by
Dr. Herbert J.C. Kouts .
and
Mr. Joseph J. DiNunno

We wish to acknowledge input from Steven Krahn and Wayne Andrews. The concepts were also assisted in formulation through discussions at DOE's laboratories by a team of DNFSB staff consisting of Steven Krahn, Jan Preston, Albert Jordan, and Donald Owen, along with Dr. Gerald Tape, Dr. Duane Sewell, and Admiral John Drain.

REMARKS ON SAFETY MANAGEMENT AND CONDUCT OF OPERATIONS AT THE DEPARTMENT OF ENERGY'S DEFENSE NUCLEAR FACILITIES

INTRODUCTION

In issuance of the document "Fundamentals for Understanding Standards-Based Safety Management" (DNFSB/TECH-5), by Joseph J. DiNunno, the Defense Nuclear Facilities Safety Board (Board) discussed the nature of safety management of defense nuclear sites, facilities, and activities of the Department of Energy (DOE), managed for the Department by contractors. In this relationship, a contractor ensures safety of the site, facilities, and activities entrusted to him through operation in accordance with Safety Management Plans devised in the first instance by the contractor, and then finalized between the parties. The Safety Management Plan is part of the overall Plan of the contractor for the conduct of specified work covered by the contract. DOE expresses its concurrence in the Plan by its acceding to an Authorization Agreement. The Safety Management Plan and the Authorization Agreement accepting the Plan rest on an Authorization Basis that includes as safety documentation a Safety Analysis Report, a Standards/Requirements Identification Document (S/RID), Technical Safety Requirements (TSRs), and additional requirements that the Department may specify.

In 1992 the Board issued its Recommendation 92-5, calling for observance of a high level of conduct of operations at the Department's active defense nuclear facilities. In this Recommendation the Board took a broad view of the meaning of the term "conduct of operations," in effect equating it to the range of operational practices followed to ensure safety. The Safety Management System as described in DNFSB/TECH-5 and the scope of "conduct of operations" are therefore complementary subjects. Broadly speaking, a Safety Management System in the context of the Board's present discussion includes the formal relationship between the Department of Energy and its defense nuclear contractors to ensure safety in operations, including objectives, plans, and commitments. Conduct of operations refers to the body of practice that implements the system.

The Board now deems it advisable to elaborate on the concepts of safety management and conduct of operations as outlined in DNFSB/TECH-5, to avoid misunderstanding of the Board% views in these matters.

I

ESTABLISHING A NUCLEAR SAFETY MANAGEMENT SYSTEM

The important features of the Safety Management System as they reflect on conduct of operations are the same in application to all defense nuclear facilities, though their appearance maybe highly variable because of the great differences in activities at different DOE facilities. All safety management, however, is based on defense in depth, which in this usage is the practice of using systems of equipment and systems of procedures in a structure of mutual reinforcement to avoid exposure of individuals and the environment to undesired nuclear radiation.

The process of safety management is discussed in DNFSB/TECH-5. It is shown as a flow diagram on page 8. It begins logically with definition by DOE of the mission to be accomplished by the contractor in operation of a site or facility, or conduct of an activity (BOX 1). In other actions by the Department of Energy, requirements are formulated to ensure safety of operations. They are issued in various forms: statements of policy, safety rules, Orders, standards, and nonmandatory guidance. Some of these are appropriate to all activities sponsored by the Department (Box 2). Some might apply only to the specific site or type of site (BOX 3).

The mission statement and the requirements are provided to the contractor. In order to make complex missions tractable, the contractor breaks the work into work packages (Box 4). The set of work packages may range from a formal work breakdown structure, appropriate to activities of a production type, to a structure by projects or disciplines, as may be more suited to a research or development mission.

Once the work is structured in smaller pieces, it is possible to plan how to do each piece and to apply the available resources in facilities, equipment, and manpower. A single mission or activity may require use of several facilities at the site. On the other hand, a large facility maybe used in more than one of several unrelated missions or activities.

Part of work planning is development of the basis for ensuring safety of what is to be done. Not only must the contractor satisfy the Department as to his plan for achieving the mission, he also must provide assurance that the work will meet the stated safety objectives. The first step toward the latter objective is preparation of a Safety Analysis Report or a set of Safety Analysis Reports, covering the proposed work. The safety analysis becomes a basis for identifying the hazards to workers and the public and the proposed means for avoiding the hazards. The Safety Analysis Reports and material based on their results become part of an Authorization Basis provision of which is the subject of Box 5.

The central component of the Authorization Basis is the Standards/Requirements Identification Document which states the standards and requirements that are to be used for safety reasons.

Some standards and requirements are of such a general nature that it is appropriate to include them in an S/RID for an entire site. Others may be applicable only to individual facilities or activities, and would therefore be included in corresponding S/RIDs having that *coverage.* All standards and requirements to be used in ensuring safety somewhere at a site should be included in the appropriate S/RIDs. The contractor, in consultation with DOE, must establish a suitable structure of S/RIDs to cover the site. Then there will bean S/RID for the site, and other S/RIDs for facilities and, possibly, activities.

The Authorization Basis also includes other material that is to be relied on to ensure safety. Examples are standards and guides incorporated by reference and Technical Safety Requirements.

S/RIDs are first prepared by the contractor, with assistance and input as appropriate by DOE. The cooperation of DOE at this stage is advisable to ensure that the S/RIDs will be found satisfactory by DOE in its approval of the finished product.

S/RIDs are the central components of the Safety Management Plan for sites, for facilities to be used in discharge of the mission, or for activities to be conducted for this purpose. The other components of a Safety Management Plan are any commitments in the Safety Analysis Report for the facility or activity; the Technical Safety Requirements (TSRS) that will be applied; referenced material such as DOE Orders and guides, industry standards, or NRC guides and standards; and any other material relied on in developing the S/RIDs.

The contractor forwards the proposed work plan and Safety Management Plan to DOE for review and approval (Box 6). A period of discussion and revision may follow, during which modifications may be agreed on in reaching agreement as to acceptability. The end product is agreement on final versions as an Authorization Basis for conduct of the work (Box 7). The agreement is made material in an Authorization Agreement formally endorsed by DOE and the contractor, which is made a contract term along with the S/RIDs.

The contractor then proceeds to do the work, subject to the conditions of the Authorization Agreement (Box 8). Conduct of operations then comes into play.

Experience (Box 9) may lead to improvement in the work plan and the conditions to be imposed on the work.

Though the above is presented in terms of radiological safety, the concepts and their application are completely general, applying just as well to hazards of all other kinds.

II

NORMAL COMPONENTS OF FORMALIN IN AN INTENSIVE PROGR4M OF CONDUCT OF OPERATIONS

It is important to understand what is meant by the Board in its use of the term "conduct of operations, " since that term is not explicitly defined in DOE's Order 5480.19, Conduct of Operations for DOE Facilities.

The Board includes under conduct of operations all those attitudes, processes, and precautions taken in the interest of safety. Though features of a system of conduct of operations maybe different at different facilities, the common feature is a formality of operations which will vary in form and degree depending on conditions discussed in the next section, The most intensive application of the concept would be found at the more hazardous facilities subject to the more repetitive types of activities.

Operational formality is a structured and systematic way of performing work. It is not simply a listing of fictional areas, but rather a mind set, a way of doing business. A comprehensive program of operational formality should provide detailed guidance for performing essential elements of operations, such as: maintaining facility status within the Authorization Basis, formal communications, independent safety reviews, review of operating experience, and preparing, reviewing, approving, and using operating procedures. The Board has in mind issuance of a detailed set of guidelines to ensure that hazardous facilities and activities meriting intensive safety treatment are competently operated with full knowledge of their condition and the effect of operations, in a manner providing proper assurance of worker and equipment safety. In the present document, however, we wish simply to indicate the range and coverage of an intensive system.

Such a program would normally include the following:

- Line management of operations including a clear chain of safety responsibility, .
- Detailed procedures for operation and maintenance, including emergency procedures,
- For more hazardous operations, line-by-line adherence to the procedures with check off after each step,
- A formal process for review and approval of changes to the procedures,
- Supervision by highly competent personnel who are knowledgeable as to the results of the safety analysis and operating limits for the facility or activity,

. A highly trained and formally qualified staff of operators and maintenance personnel,

. An effective radiation protection program,

. Adherence to a safety envelope comprised of TSRS and SIRIDS,

. A formal process for review and approval of structures, systems, and components important to safety and environmental protection,

- A maintenance program that includes regularly scheduled preventive and predictive maintenance and timely corrective maintenance, conducted in accordance with approved procedures,

- An orderly workplace,

- A process which converts mistakes to lessons learned and uses these as a basis for improvement, and

. A process of independent safety review that includes close attention of top management.

In application, the scope of operational formality must be reviewed to ensure that each element is appropriate to the operation under consideration. Those elements that are deemed applicable should be tailored in depth and rigor to match the hazards that may be present.

III

THE BASIS FOR GRADED SAFETY MANAGEMENT

It is clear that the level of conduct of operations necessary to meet safety objectives maybe different in various activities at defense nuclear facilities of the Department of Energy.

1. The most intensive Safety Management System should be found at a facility where the principal activities are of a repetitive nature (such as production or cleanup) performed by technician-]evel personnel under supervision, where there is some potential for a large accident which could affect the workers or the surrounding public, and the activities in question or similar ones are expected to be continued for a number of years.

2. The features of a facility or operation that maybe a basis for grading of safety management are:

- The risk as indicated by safety analysis,
- The competence and technical sophistication of the operating staff and the technical supervision, and
- The expected duration of the operation or use of the facility.

3. Safety management can be graded in a number of ways, principally:

. Depth and detail of safety analysis,

- Redundancy and assured reliability of safety structures, systems, and components,

. Number of TSRS and extent of defense in depth they provide,

- Depth and detail of the S/RID,
- Detail of written operating and maintenance procedures,

. Training and qualification of workers, and

. Other forms of formality of conduct of operations.

4. A low level of risk can be the basis for reduced intensity of safety management. However, the system must always include measures that may be needed to ensure a safe workplace, meaning

measures that ensure an acceptably low likelihood of unintentional release of radioactive material or nuclear radiation and as low as reasonably achievable (ALARA) practices for normal operations.

5. If a facility is to be active for only a relatively short period of time, so that the benefit of following a normal system of safety management would be questionable when compared to the cost in time and money, it maybe justifiable to use alternative procedures that are demonstrably effective. For instance, some training of technician-level personnel can be replaced by assignment of highly qualified individuals on shift, available on a real-time basis as backup to operators.

6. Operations at some facilities consist of research conducted by individuals well conversant with the subject matter underlying the work, such as those having advanced academic degrees in the topics and having demonstrated competence. In such cases, step-by-step procedures where they otherwise would have been needed can be replaced by such documents as those conventionally used for planning of experiments or operations, containing the objective of the work. the plan of operations, and precautions and limits placed on operations for safety reasons.

I v

FORMALITY OF OPERATIONS AT DOE's DEFENSE RESEARCH LABORATORIES

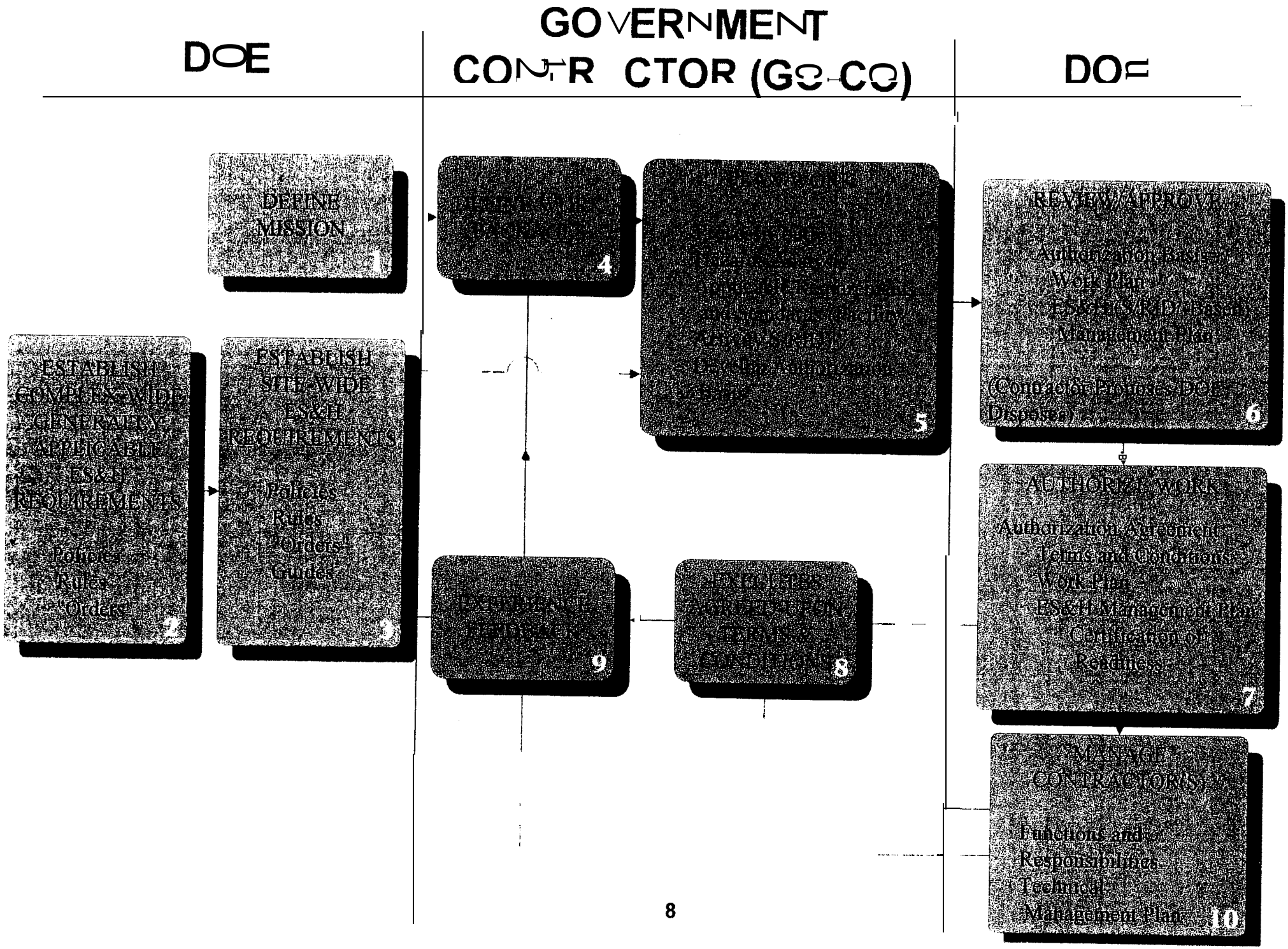
The Board considers it appropriate that among the family of defense nuclear facilities operated for DOE, the style of conduct of operations may depart most from the detailed features in Section II at the defense research laboratories. A possible format for the research activities at these laboratories is found in the following. Note that it would be expected that production type activities at these laboratories would appropriately fall under the conventional form of Section II.

1. S/RIDs should be a domain of managers whose functions should include seeing that the S/RIDs are complied with. In this context, examples of managers are laboratory directors and their staff; directors of supporting activities such as fire protection, engineering, maintenance, and waste disposal; directors of projects of substantial size; building managers; and managers of production type activities.

2. Research scientists, heads of small projects, and operating staff should be familiar with the main features and results of the safety analysis, the TSRs, other operating limits, and the planning documents as the conditions permitting them to conduct their activities, and they should be bound by these conditions. It is not necessary that they be fully conversant with the contents of S/RIDs, which are to be enforced by the managers.

3. Activities with associated hazards should be conducted in accordance with written procedures that are based on an appropriate safety analysis and are appropriately reviewed and approved. These procedures can range from detailed, step-by-step actions to be followed in relatively routine processes, conducted by technician or production personnel, to more generalized analysis and guidance in the general form of laboratory experiment plans where research projects entail minor hazard. A process of ensuring adequacy of the procedures should be followed, including the process commonly known as walkdown.

4. The S/RIDs, the TSRS, any other operating limits imposed as a result of safety analysis, and the existence of the procedures and the safety analyses (but not their detailed contents) constitute a compact on which agreement to proceed with operations is to be based.


DOE
GOVERNMENT CONTRACTOR (GOCO)
DOE
DEFINE MISSION 1
ESTABLISH COMPLEX-WIDE GENERALLY APPLICABLE ES&H REQUIREMENTS
Policies
Rules
Orders 2
ESTABLISH SITE-WIDE ES&H REQUIREMENTS
Policies
Rules
Orders
Guides 3
4
5
REVIEW/APPROVE
Authorization Basis
Work Plan
ES&H/QA/RAD Protection Management Plan
(Contractor Proposes/DOE Disposes) 6
AUTHORIZE WORK
Authorization Agreement
Terms and Conditions
Work Plan
ES&H Management Plan
Certification of Readiness 7
8
9
MANAGE CONTRACTOR(S)
Functions and Responsibilities
Technical Management Plan 10