DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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

June 13, 1995

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

Dear Secretary O'Leary:

The Department of Energy (DOE) is committed to a standards-based safety management program. The importance of standards that capture the essence of good safety practice was recognized by Congress in establishing the functions of the Defense Nuclear Facilities Safety Board (Board).

The Board has been engaged, for a number of years, in interaction with the DOE on this subject matter. It has been the subject of a number of Board recommendations, including our Recommendation 94-5, issued December 29, 1994.

Dialogue between our respective agencies, at times, gets caught up in the lexicon of special terms, at times causing confusion and miscommunication. Basic words and acronyms, such as Standard/Requirements Identification Documents (S/RIDs), Orders, standards, and regulations have different meanings for different people. Even the concept of standards-based safety management is not adequately understood. This situation, in part, led to our Recommendation 94-5.

The Board, on May 31, 1995, initiated a set of public meetings whereby we plan to address matters germane to safety standards and their use by DOE and its contractors in establishing safety management programs. The enclosed paper, entitled "Fundamentals for Understanding Standards-Based Safety Management of Defense Nuclear Facilities" was presented by Board Member, Joseph DiNunno, to the Board during the May 31, 1995, public meeting. This paper includes definitions of a number of key words and terms and describes simply and

succinctly, a framework for structuring a standards-based safety management program using DOE Orders and Rules. The Board believes this document could be of considerable benefit to the DOE as it proceeds with its standards development and implementation efforts and with the DOE's actions in developing an acceptable Implementation Plan for Board Recommendation 94-5.

Sincerely,

John T. Conway
Chairman

Enclosure

c: The Honorable Charles B. Curtis
The Honorable Thomas P. Grumbly
The Honorable Tara O'Toole
The Honorable Victor H. Reis
Mr. Mark Whitaker

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.

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 II 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.

I. 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, disassembly 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 consistently 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 incorporated 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 allegedly 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 to 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 in-depth 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**

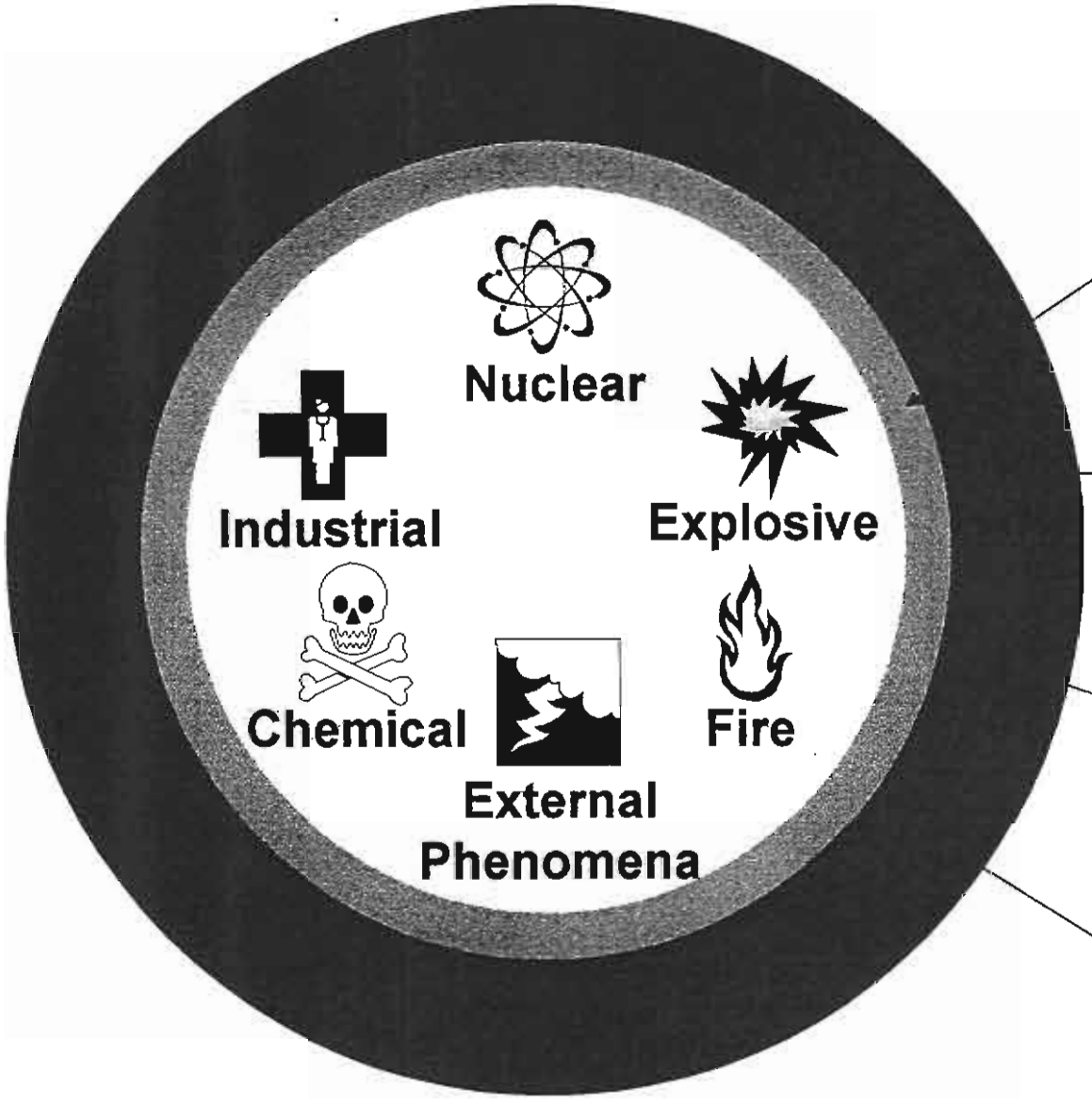
  Those requirements that reflect possibilities for operational mishaps, man or nature caused, and the emergency response capabilities needed to regain control and mitigate consequences of dispersion of radioactive materials should they be released beyond designed confinement barriers.

- **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



PREVENTION:

Functions specific to preventing exposure to certain hazards (e.g., fire, criticality, radiation). These functions include both design and analysis functions.

PRESERVATION:

Functions for preservation of SSCs (e.g., configuration management, training, and maintenance)

MITIGATION:

Functions for mitigating any release of hazardous or radiological material (e.g., emergency management)

INTEGRATION:

High level integration and management functions (e.g., standards, quality assurance, and independent review)

FIGURE 1

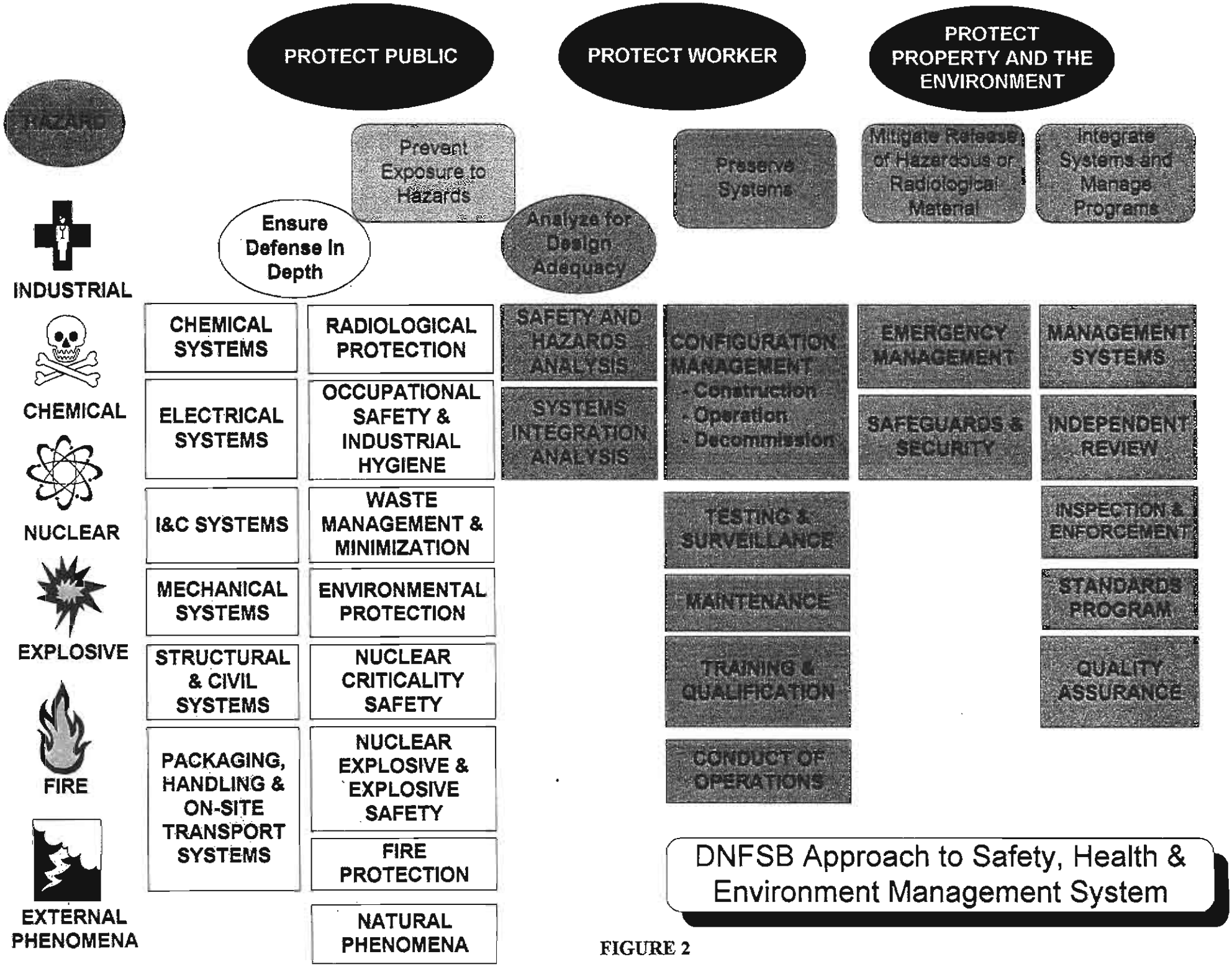

PROTECT PUBLIC
PROTECT WORKER
PROTECT PROPERTY AND THE ENVIRONMENT
HAZARD
Prevent Exposure to Hazards
Preserve Systems
Mitigate Release of Hazardous or Radiological Material
Integrate Systems and Manage Programs
Ensure Defense In Depth
Analyze for Design Adequacy
INDUSTRIAL
CHEMICAL
NUCLEAR
EXPLOSIVE
FIRE
EXTERNAL PHENOMENA
CHEMICAL SYSTEMS
ELECTRICAL SYSTEMS
I&C SYSTEMS
MECHANICAL SYSTEMS
STRUCTURAL & CIVIL SYSTEMS
PACKAGING, HANDLING & ON-SITE TRANSPORT SYSTEMS
RADIOLOGICAL PROTECTION
OCCUPATIONAL SAFETY & INDUSTRIAL HYGIENE
WASTE MANAGEMENT & MINIMIZATION
ENVIRONMENTAL PROTECTION
NUCLEAR CRITICALITY SAFETY
NUCLEAR EXPLOSIVE & EXPLOSIVE SAFETY
FIRE PROTECTION
NATURAL PHENOMENA
SAFETY AND HAZARDS ANALYSIS
SYSTEMS INTEGRATION ANALYSIS
CONFIGURATION MANAGEMENT
- Construction
- Operation
- Decommission
TESTING & SURVEILLANCE
MAINTENANCE
TRAINING & QUALIFICATION
CONDUCT OF OPERATIONS
EMERGENCY MANAGEMENT
SAFEGUARDS & SECURITY
MANAGEMENT SYSTEMS
INDEPENDENT REVIEW
INSPECTION & ENFORCEMENT
STANDARDS PROGRAM
QUALITY ASSURANCE
DNFSB Approach to Safety, Health & Environment Management System

FIGURE 2

Orders and Rules associated with specific functional areas are shown in Table 1, this does not imply that all requirements in those Orders are applicable to all sites, facilities or activities, nor do they necessarily represent a sufficient set for tailoring facility or activity specific safety management programs.

The wide variety of DOE nuclear facilities and activities make it necessary to tailor safety management programs individually to a large extent. None-the-less, there is built into generally applicable requirements the approach that is common to all nuclear activities. Requirements in effect prescribe a process, including basic ingredients, that begins with the analysis of the hazards and leads to the design of ways of (1) preventing exposures to radioactive sources, (2) preserving and properly using the safety features so designed (3) preparing in advance for handling and mitigating effects of potential mishaps and off-normal situations, and (4) providing the organizational resources and structure to effectively manage and execute the safety program. (Although the requirements that are the focus of oversight by the DNFSB are limited by statute to nuclear safety, one should note that the process is equally applicable to the regulation of other hazardous materials.)

There are several major elements which are used to define safety management programs for defense nuclear sites and facilities. These elements include: (1) the Standards/Requirements Identification Document (S/RID), (2) the Authorization Basis (3) the Authorization Agreement, and (4) Readiness Certification. If the conditions and practices as described in these documents are implemented and maintained at the site and facilities as the work is performed, then DOE and its contractors have reason to expect that workers, the public, and the environment will be adequately protected. The relationship of the S/RID's, Authorization Basis, Authorization Agreement and Certification of Readiness is shown in Figure 3 and is discussed in more detail in the sections that follow.

A. STANDARDS/REQUIREMENTS IDENTIFICATION DOCUMENT

The Board has advocated, and the Secretary of Energy has endorsed, standards-based safety management programs. DOE has committed (Board Recommendation 90-2) to the identification of applicable site-wide and facility-specific standards/requirements in Standards/Requirements Identification Documents (S/RIDs). Within the site S/RID one would expect to find the identification of safety standards/requirements which generally apply to a wide variety of activities conducted at a site. Theoretically, the site S/RID may be sufficient to describe the safety requirements for major facilities or projects; however, it may be preferable to develop a tailored set of safety requirements from the site S/RID that are more facility-specific (i.e, a facility S/RID).

During the drafting stage of an S/RID, the contractor at a facility or site, in cooperation with DOE, is expected to identify those safety requirements that have

Relationship of Major Elements of a Safety Management Program

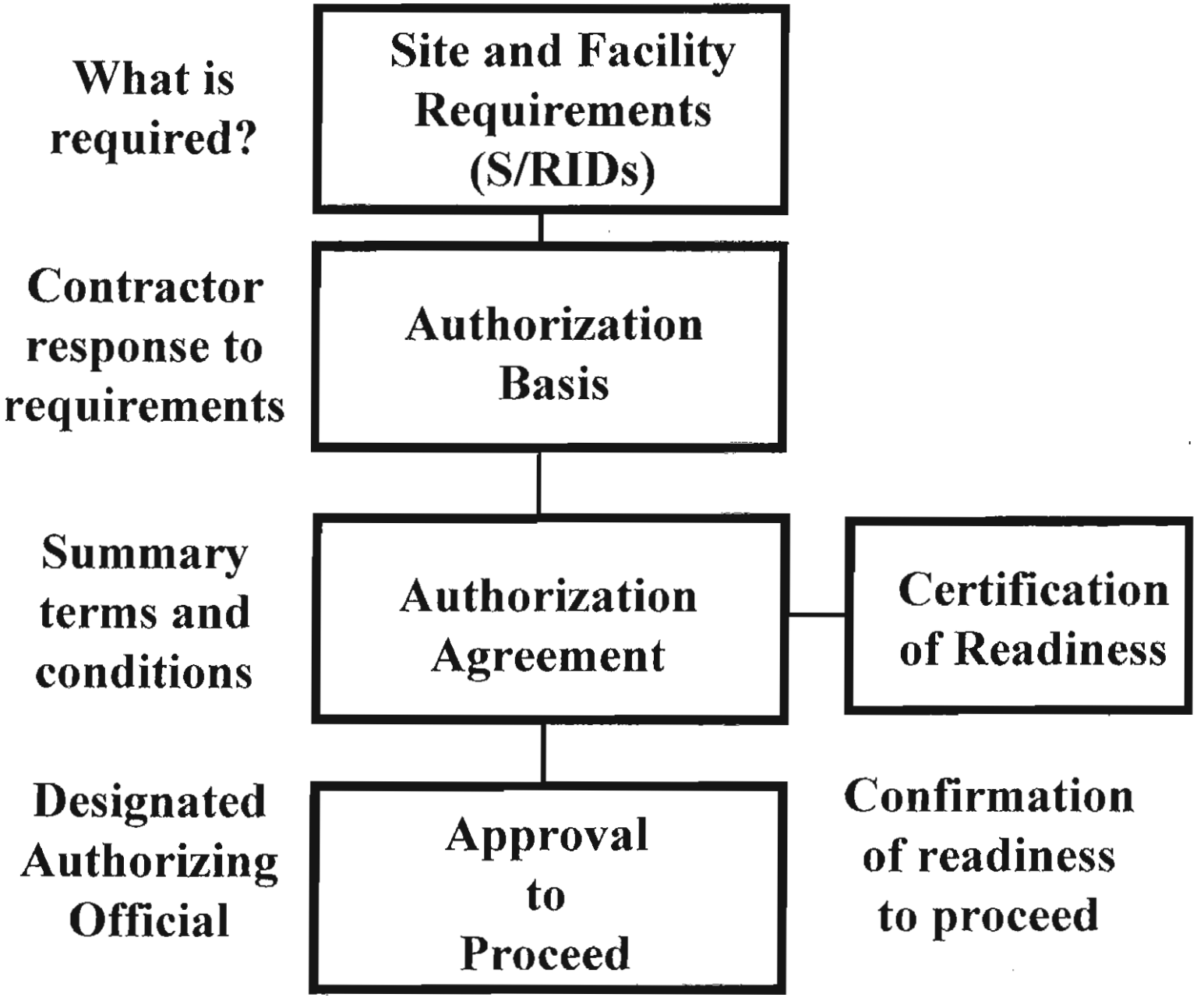


FIGURE 3

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 S/RID). 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:

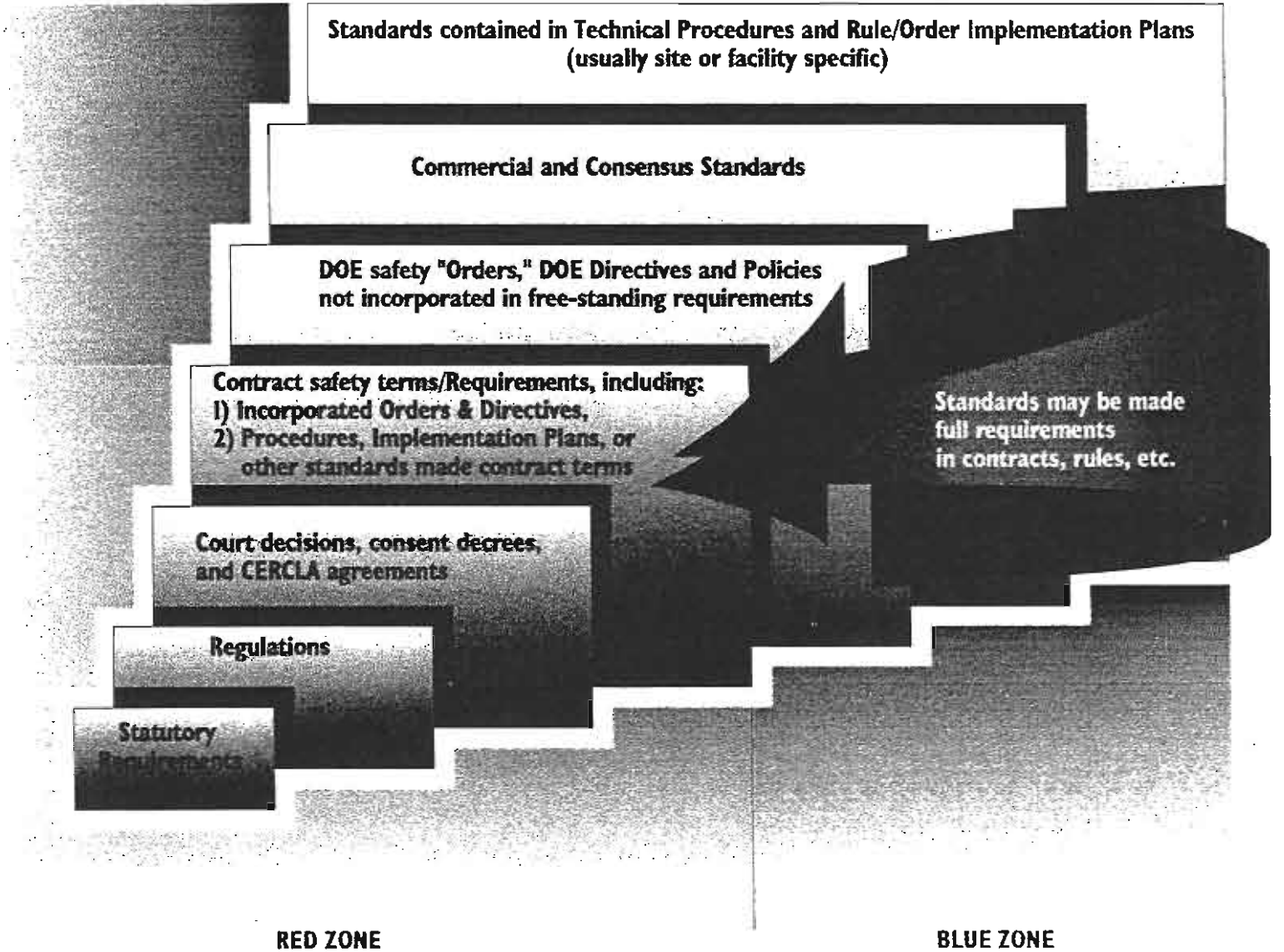
> Those aspects of facility design basis and operational requirements relied upon by DOE to authorize operation. These aspects are considered to be important to the safety of facility operations. The authorization basis is described in documents such as the facility Safety Analysis Report and other safety 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.

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



RED 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

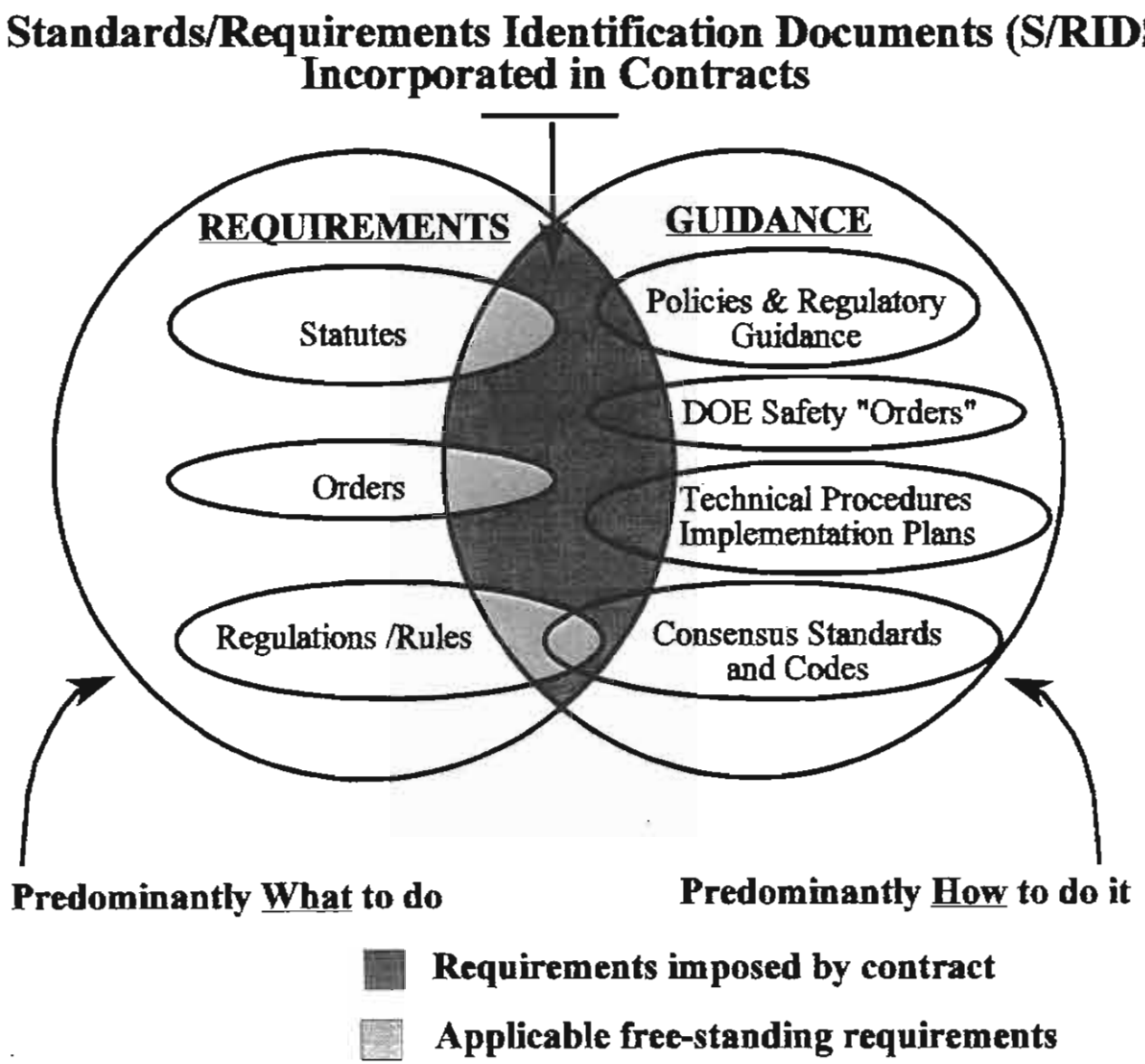

Standards/Requirements Identification Documents (S/RIDS)
Incorporated in Contracts
REQUIREMENTS
GUIDANCE
Statutes
Orders
Regulations /Rules
Policies & Regulatory Guidance
DOE Safety "Orders"
Technical Procedures Implementation Plans
Consensus Standards and Codes
Predominantly What to do
Predominantly How to do it
Requirements imposed by contract
Applicable free-standing requirements

FIGURE 5

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 S/RIDs 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

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 II. 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 forth 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. *6430.1A 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. **Fire 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 Waste Management*
   b. *5400.1 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*

II. 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. *5400.2A Environmental Compliance Issue Coordination*
   b. *5400.4 CERCLA Requirements*
   c. *5440.1E NEPA Compliance Program*

3. **Safeguards and Security**
   a. *5632.1C 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 committed 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, implemented, 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

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

A. The application for a license filed by Texas Utilities Electric Company (TU 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 25, 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.D 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 50 "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 50, "Domestic Licensing of Production and Utilization Facilities", Texas Municipal Power Agency 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 material without 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.

D. 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 are 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)(1), 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 rights, 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 (1), 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 mineral 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 shall fully 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.

AUTHORIZATION 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-3011-94, *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 IP 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.