91:1054

The Secretary of Energy
Washington, DC 20585

May 13, 1991

The Honorable John T. Conway
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, N.W.
Suite 700
Washington, D.C. 20004

Dear Mr. Conway:

Your letter of March 7, 1991, forwarded the Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 91-1 expressing the Board's concern for the rate of progress at which nuclear safety standards are being issued within the Department. The DOE response to each of the issues raised by that Recommendation is enclosed.

The Department has concluded that assessment of penalties under the Price-Anderson Amendments Act of 1988 can best be accomplished using standards that have been subject to the notice-and-comment rulemaking procedures of the Administrative Procedure Act. However, as you know, rulemaking is a lengthy process. Therefore, in order to ensure DOE contractors have up-to-date guidance concerning the operation of DOE facilities in the interim, I have directed that updated DOE Orders be issued without delay. In previous correspondence, I provided a plan for developing nuclear safety rules, safety guides, and DOE Orders. An implementation plan will be forwarded to the Board describing the application of standards throughout the Department.

In accordance with section 315(d) of the Atomic Energy Act of 1954, as amended, this response will be published in the Federal Register.

Sincerely,

James D. Watkins
Admiral, U.S. Navy (Retired)

Enclosure

RESPONSE TO DNFSB LETTER OF MARCH 7, 1991,
RECOMMENDATIONS OF DNFSB REGARDING STANDARDS DEVELOPMENT

On March 7, 1991, the Defense Nuclear Facilities Safety Board (DNFSB) issued Recommendation 91-1. The DNFSB recommendations and DOE's response are as follows:

1. that the Department expeditiously issue a formal statement of its overall Nuclear Safety Policy.

The Department accepts this recommendation. A formal statement of the Department's overall Nuclear Safety Policy was prepared and submitted for internal review on April 15, 1991, and is expected to be issued by July 15, 1991.

2. that increased attention be given to the qualifications and background of managers and technical staff assigned to the development and implementation of standards and that the numbers of personnel suited to this activity be increased commensurate with its importance.

The Department accepts this recommendation. On January 31, 1990, the responsibility for the development and coordination of Departmental policy for nuclear facility safety, including standards development, was centralized under the Assistant Secretary for Nuclear Energy (ASNE). An Office of Nuclear Safety Policy and Standards (ONSPS) was established, reporting directly to the ASNE, with the primary mission to develop, coordinate, and maintain DOE standards on nuclear facility safety. Starting at 10 professionals, the ONSPS staff increased to its FY 90 ceiling of 20. The FY 91 ceiling is 25 professionals, and recruiting has resulted in filling 4 of the 5 new positions to date. The FY 92 ceiling is 36. Almost half of the professional staff have NRC experience, with the remainder having backgrounds divided between industry and the Department. The Department will continue to review the staffing status and needs of the organizations at Headquarters that are developing standards and will revise them as necessary. The Department recognizes the Board's concern with respect to implementing an effective standards program through the entire Department complex of field and contractor operations. The Department will submit an implementation plan to the Board describing its overall approach to develop and implement standards throughout the DOE complex.

3. that standards program officials be given direct access to the highest levels of DOE management.

The Headquarters standards program officials have direct access to the highest levels of DOE management. The Secretary has assigned responsibility for the development of nuclear safety and radiological protection standards to the Assistant Secretaries for Nuclear Energy and for Environment, Safety and Health, respectively. The Department's standards program officials for nuclear safety and radiological protection report directly to these senior officials. Furthermore, the Secretary has established the Senior Nuclear Managers group consisting of the Department's highest level of managers responsible for nuclear activities. The Senior Nuclear Managers have been charged with coordinating and overseeing the upgrading of the Department's nuclear safety directives. In this and in other matters, the Senior Nuclear Managers Group

has been particularly effective in resolving differences in the Department and reaching a uniform consensus. The Department believes that this recommendation has been fulfilled.

4. that the Department critically reexamine its existing infrastructure for standards development and implementation at Headquarters to determine if organizational or managerial changes are needed to (1) emphasize the priority and importance of standards to assuring public health and safety; (2) expand the program to facilitate the rapid development and implementation of standards; and (3) streamline the DOE approval process for standards.

The Department accepts this recommendation. The Department has been critically examining its infrastructure for standards development and implementation at Headquarters. The Department has emphasized the priority and importance of standards for assuring public health and safety by assigning to the Senior Nuclear Managers group the responsibility to oversee and coordinate the upgrading of the Department's nuclear safety directives.

Secretary of Energy Notice (SEN-6-series) assigns to line management full responsibility for environmental protection, radiation and reactor safety, and worker and public health and safety. The Secretary also established nuclear safety self-assessment offices for the line managers involved in nuclear safety matters and a separate Office of Nuclear Safety which advises the Secretary on whether line management and its self-assessment functions are adequately assuring nuclear safety.

The DOE process for approval of standards has been streamlined as discussed in 3. above.

The implementation plan will provide additional information relative to this recommendation.

5. that the Department reexamine the corresponding organizational units at DOE's principal Operations and Field Offices and DOE contractor organizations to determine if those organizations' standards infrastructure, responsibilities and resources would also benefit from changes to reflect improvements at Headquarters which strengthen and expedite standards development and implementation.

The Department accepts this recommendation. The implementation plan will specify the Department's actions for assessing the Operations Offices, Field Offices, and contractor organizations to determine if changes should be made to reflect improvements at Headquarters.

6. that DOE review all the findings and conclusions of both the Executive Summary and Volume 2 of the MITRE report, identify which findings and conclusions it considers valid and appropriate in DOE's Response to this set of Recommendations, and subsequently address those findings and conclusions in the Implementation Plan.

The Department accepts the findings and conclusions of the MITRE Executive Summary. These conclusions reemphasize the deficiencies identified in earlier reviews. The MITRE report notes that it considered active DOE Orders as of February 1990, and that DOE had taken various initiatives to upgrade and revise its safety requirements, but that the revised requirements were brought to its attention after MITRE had essentially completed its review. Nevertheless, although the Department believes that the new safety directives prepared and issued subsequent to the MITRE review rectify the concerns identified by MITRE, the conclusions reached by MITRE in the Executive Summary are still valid for those safety directives remaining to be revised or implemented.

The approach and scope of Volume 2 of the MITRE report focused on characterizing the differences between DOE and NRC requirements and summarizing insights gained from those comparisons. Thus, the findings and conclusions of Volume 2 are not as clearly defined as those in the Executive Summary. Attachment A, presents the findings and conclusions by MITRE and provides comments on these to identify to the Board the Department's understanding of these MITRE insights.

The implementation plan will describe the program to revise the safety directives.

7. that DOE expedite the issuance of revised safety orders, directives, or other requirements as a means of addressing the need for substantive guidance on the wide variety of safety requirements, while DOE is promulgating rules.

The recommendation is accepted. The Department has concluded that the implementation of the Price-Anderson Amendments Act of 1988 can best be accomplished using the rulemaking procedures of the Administrative Procedure Act. However, rulemaking is a lengthy process. In order to ensure DOE contractors have up-to-date guidance concerning the operation of DOE facilities, the Secretary has directed that updated DOE Orders be issued without delay.

In May 1990, the Secretary's Task Force on Nuclear Safety Directives identified ten subjects that should receive priority attention with respect to upgrading the safety directives. These ten subjects were subsequently chosen for rule development. Six of these ten subjects are now covered by DOE Orders, and the remaining four Orders are, or will be, in the last stage of formal DOE review by May 15, 1991. The status of the corresponding Nuclear Safety Orders is shown on the following page.

Nuclear Safety Orders Being Developed in Parallel with Rules

Title	December Schedule	Current Status	Final Issuance
Radiation Protection	Issued	Issued	Issued
Accreditation of Performance-Based Training	Issued	Issued	Issued
Conduct of Operations	Issued	Issued	Issued
Occurrence Reporting and Processing of Operations Information	Issued	Issued	Issued
Personnel Training	February 1991	Issued	Issued
Maintenance Management	February 1991	Issued	Issued
Quality Assurance for DOE Nuclear Activities	June 1991	March 21, 1991*	September 1991
Unreviewed Safety Questions	June 1991	April 5, 1991*	September 1991
Technical Safety Requirements	June 1991	May 15, 1991*	October 1991
Safety Analysis Reports	September 1991	May 15, 1991*	October 1991

*Issued for Formal Coordination.

The wide diversity of DOE facilities limits the detail that is practical for insertion into DOE rules and/or Orders. However, where necessary, detailed implementation plans will be developed by contractors based on direction from DOE, and these implementation plans will be reviewed and approved by DOE line management.

2.B. Organizational responsibilities assigned in the DOE Orders have not been revised to reflect significant recent changes.

The revised responsibilities of Departmental elements are, however, being included in the DOE Orders as they are being prepared or modified.

The Department has recognized that internal DOE organizational responsibilities should not be provided in Rules. As part of the rulemaking effort, the Department is preparing a DOE Manual of Responsibilities in which the responsibilities of all Departmental elements for a given technical topic are defined. This is similar to the NRC practice of providing such information in the NRC Manual.

3. Certain DOE Orders that address topics important to facility safety do not focus on safety. This may be evidence of improperly defined objectives and lack of due attention to the safety functions of the facilities.

The specific DNFSB concerns highlighted in their discussion of this conclusion are with two technical areas, Fire Protection and Quality Assurance. To avoid duplication, the DOE response to these concerns are provided later under each specific technical topic.

4.A. The DOE Orders do not provide criteria and guidelines for accomplishing their stated objective to apply "uniform standards, guides, and codes which are consistent with those applied to comparable licensed nuclear facilities."

In the discussion of this conclusion, MITRE points out that the basic requirement to apply applicable NRC design and siting criteria is limited to new construction, during major modifications to an existing facility, or when it is determined that safety can be significantly improved. In the past these basic requirements were generally implemented for new facilities such as the Fast Flux Test Facility, the upgrade to the Annular Core Research Reactor and similar new or modified facilities. This was primarily accomplished through preparation of Safety Analysis Reports that followed the NRC Regulatory Guide for Standard Format and Content of Safety Analysis Reports. By following the standard format and content, Regulatory criteria and standards were addressed in the Safety Analysis Reports, and the review of these reports provided a means to judge the adequacy of application of NRC criteria.

This general approach, however, has not worked with older DOE facilities that were designed and built prior to the existence of Standard Format and Content guidelines. In addition, the application of new standards to existing facilities during modifications has not always been successfully accomplished.

their cognizance. DOE is also in the process of preparing a similar document for nonreactor nuclear facilities which should be available in September 1991. The standards selected will be identified in the design or safety documentation such as System Design Descriptions or Safety Analysis Reports that will be approved by DOE.

The efforts discussed above, in conjunction with the development of the DOE Backfit Policy will significantly improve the use of standards throughout the Department's operations.

DOE RESPONSE TO THE SPECIFIC CONCLUSIONS OF THE MITRE REPORT

SPECIFIC CONCLUSIONS

Design Standards

1. The DOE Orders do not require existing reactors to meet any mandatory design standards, and existing nonreactor facilities are required to comply with only a very small set of design standards. The Orders require that new construction of reactors and nonreactor facilities conform with a much larger body of standards, but these standards are applied at existing facilities only when modifications are made or when DOE determines that safety can be significantly improved. Moreover, the Orders do not provide procedures or criteria for making the determination that safety can be significantly improved.

See response to General Conclusion #5.

2. The DOE Orders are not clear about the criteria for selecting the structures, systems, and components that must satisfy mandatory standards. One Order introduces the term "safety or safety-related" equipment, but does not include a definition of safety-related, and the other Orders do not provide additional guidance for identifying this type of equipment in reactors. For nonreactor facilities, the term "safety class items" is defined, but the relationship between safety class items and safety-related items is unclear. This is of particular concern because of potential confusion about how consensus standards are to be applied.

As part of the Department's decision to improve the DOE Order system and the requirements therein, one of the major objectives will be to assure consistent use of terminology. DOE Orders 5480.5, 5480.6, and 6430.1A will be revised as improvements are made to the technical areas highlighted in the MITRE report to ensure that the specific terminology, in question here, will be consistent.

See also response to General Conclusion #4.B.

3. In some DOE Orders, mandatory design standards are applied only to a subset of all plant equipment, and there are no requirements for the remaining plant equipment. For modifications to existing facilities,

one DOE Order requires compliance with mandatory standards only when "safety or safety-related structures, systems, or components" are involved. Another DOE Order that applies exclusively to new construction and modifications of nonreactor facilities restricts the scope of the equipment covered by its requirements to those identified as "safety class items."

See response to the MITRE Specific Conclusions #1 and #2 above.

4. The DOE Orders do not provide specific requirements or review criteria to implement general guidelines relating to the design of structures, systems, and components for either reactors or nonreactor facilities.

The recent effort undertaken by the Department to prepare Rules and new DOE Orders as well as to revise existing DOE Orders in the technical areas discussed in the MITRE report will provide specific requirements and review criteria for the Department to use in the implementation of improved guidelines relating to the design, construction, and operation of the Department's facilities. Many of the new Rules and Orders, in addition, require the contractors to prepare implementation plans based on a required format which are then approved by the Department's line program organizations. These approved plans then provide the bases for compliance enforcement.

5. Several specific DOE references to mandatory and reference standards need to be revised to reflect the current versions of those standards. For civilian nuclear facilities, the NRC regulations and regulatory guidance documents provide extensive references to consensus standards, and the regulations provide the mechanism for maintaining the currency of endorsements of principal consensus standards.

As part of the Department's continuing effort to improve the DOE Order system and the requirements therein, the existing DOE Orders will be revised to reflect the current version of consensus standards, as appropriate. It should be recognized, however, that some older standards, e.g., in the training area, are referenced because they contain more appropriate or more stringent requirements than newer versions of the standards.

Quality Assurance

6. While both the DOE and NRC refer to the same principal consensus standard on quality assurance, DOE's quality assurance program requirements lack the systematic organization and strength of language evident in NRC's requirements. For example, NRC's detailed regulations on this subject are supplemented by Regulatory Guides that address additions or modifications to the consensus standards. Also, NRC has specified formal procedures for reviewing and approving changes to the licensee's quality assurance program.

DOE's Quality Assurance (QA) requirements established in DOE Order 5700.6B are being revised. The revised Draft Order 5700.6C was sent to all Departmental elements for formal coordination in March 1991. The revision is consistent with the latest version of NRC's Standard Review Plan, Chapter 17.3, on QA. This revised Order parallels a proposed QA Rule (10 CFR 830.120), which is expected to be published for comment in the Summer of 1991, and its accompanying Safety Guide. The International Atomic Energy Agency (IAEA) is also making revisions to its QA standards similar to the revised Draft Order 5700.6C.

7. DOE's safety objective is not well integrated into the stated purpose of its quality assurance program. While the principal DOE objective is operational success, the principal objective of NRC's mandated requirements is integrity of safety-related equipment, although as discussed earlier, the focus of NRC's requirements on safety-related functions of licensed facilities is also a limitation.

DOE's safety objective will be integrated into the stated purpose of its QA program in the revised DOE Order 5700.6C, the proposed Rule 830.120, and the Rule's companion Safety Guide.

8. The DOE General Design Criteria, that apply to new construction or modification of nonreactor facilities provide guidance on safety classification for equipment; however, they do not specify the gradation in quality assurance standards that is applied.

As noted in the resolution to MITRE conclusion #6, the Department's revised Order 5700.6C, the proposed Rule 830.120, and the Rule's companion Safety Guide are consistent with the latest version of NRC's Standard Review Plan. In addition, the proposed rule will require a graded approach to items and processes depending upon the risk associated with those items and processes.

Safety Analysis and Review

9. DOE requirements on this subject are scattered among and within the applicable Orders. The SR Orders introduce new terms and definitions. For example, although DOE Orders define the terms "significant modification" and "unreviewed safety question," SR Orders introduce different definitions and language to describe the use of these concepts. This adds confusion to the interpretation of the DOE Orders.

In his memo to the Operations Office Managers dated February 25, 1991, the Under Secretary directed them to discontinue the practice of writing supplements and indicated that DOE Orders should be the only documents specifying requirements to the contractor.

10. Both DOE and NRC require that plant changes involving unreviewed safety questions be accompanied by safety analyses; however, DOE's definition of an unreviewed safety question differs from the NRC definition and would result in fewer safety analyses.

The Department is issuing rules for many of the technical topics discussed in the MITRE report, including Unreviewed Safety Questions. In addition, a DOE Order on Unreviewed Safety Questions has been transmitted for formal coordination Departmentwide. The definition of Unreviewed Safety Question in both the Rule and the Order has been revised to reflect the NRC definition.

11. The most significant difference between the DOE and NRC requirements for existing facilities is that DOE Orders provide virtually no guidance concerning the content, evaluation methodologies, and review criteria for Safety Analysis Reports. NRC has very extensive and substantive guidance on the subject. Furthermore, DOE does not require periodic updates to keep the Safety Analysis Report current with facility configuration and operation; NRC requires updates on an annual basis.

DOE has drafted a proposed rule, 10 CFR 830.110, which relates to DOE contractor requirements for preparing Safety Analysis Reports for nuclear facilities (reactors and nonreactor nuclear facilities). Because the rulemaking process is lengthy in nature, DOE will also issue an Order which parallels the proposed Rule.

The draft Rule and its guidance document will provide substantive guidance on Safety Analysis Report content. DOE does not intend to provide a "Standard Review Plan" for the evaluation and review of Safety Analysis Reports which would be similar to that utilized by the NRC for evaluating and reviewing components or systems of nuclear powerplants, since the Safety Guides that will be issued with the new Rules will provide sufficient information to serve the purpose of the NRC Standard Review Plan.

With regard to Safety Analysis Report updating, the proposed Rule and Order will require that contractors annually review the changes or modifications made to nuclear facilities to determine if the Safety Analysis Reports need to be updated rather than requiring annual updates. The Department considers this requirement to review and update as necessary to be prudent from both a safety and resource standpoint.

12. The draft DOE Order on this subject would specify the methodologies for safety evaluation much more precisely than do the existing Orders; however, it would not significantly supplement the safety review and acceptance criteria.

See response to MITRE conclusion #11.

Operations

13. A major weakness in the existing Orders is the absence of detailed guidelines on the scope, content, and format of the technical specifications for reactor facilities and operational safety requirements for nonreactor nuclear facilities. Operational safety requirements are required to be concise and commensurate with the potential risks involved. While DOE Order 5480.6 states that the NRC Technical

Specifications requirements given in 10 CFR 50.36 shall apply for DOE-owned reactors, it does not provide guidelines on how these requirements are to be met. Furthermore, DOE has no Order or generic document similar to NRC's Standard Technical Specifications that licensees use for formulating and documenting plant-specific technical specifications, as required in 10 CFR 50.36. It is also significant that technical specifications on effluents to the environment are not explicitly covered in DOE's general requirements, NRC, on the other hand, provides detailed format and other guidance on the standard technical specifications for each major reactor type. Its regulations provide numerical guidelines for design objectives and limiting conditions for operation with respect to reactor effluents. Also, violations of technical specifications at civilian nuclear facilities can result in civil penalties, depending on the safety significance involved.

The draft DOE Rule, 10 CFR 830.320, covers the requirements for the development of Technical Safety Requirements (terminology which replaces Technical Specifications and Operational Safety Requirements) for DOE nuclear facilities. The proposed Rule is similar to 10 CFR 50.36 and builds on NRC's experience with its implementation as well as the NRC's Technical Specification Improvement Program (TSIP). The Department's proposed Rule and Order are modeled after the NRC TSIP.

The Safety Guide which accompanies the draft Rule provides extensive guidance on the format and content of Technical Safety Requirements documents and, similar to the NRC philosophy, emphasizes keeping the content of the Technical Safety Requirements to a minimum to make the document user-friendly.

A draft Rule, 10 CFR 820, has also been prepared by DOE to articulate the Department's enforcement process which could result in civil penalties for contractor violations of Technical Safety Requirements depending on the safety significance involved. Violations of Technical Safety Requirements will subject contractors to potential civil penalties.

14. DOE requirements for operator selection, qualification, and training as stated in the Orders are not as detailed as those of NRC. For production reactors, the applicable Order selectively applies consensus standards. DOE recognizes the use of partial or full-scope simulators for training; however, the latter are not mandatory for production reactors. Also, there is nothing in the existing Orders that parallels the detailed NRC criteria for examining the competency of reactor operators. Operators are certified by DOE's contractors, whereas operators of civilian reactors are licensed by NRC. Furthermore, DOE staffing requirements for reactor control rooms are different from those for civilian power reactors. For nonreactor facilities, qualification requirements are not explicit; verification, rather than certification, of personnel qualification and training is required.

The Department has recently issued DOE Order 5480.20, "Personnel Selection, Qualification, Training, and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear Facilities." This Order contains detailed requirements for Category A and B reactors and nonreactor nuclear facilities that are more detailed than the NRC requirements contained in 10 CFR 55. In addition, the requirements for DOE's production, test and research reactors are equivalent to the guidance contained in NRC Regulatory Guide 1.8. The Department's requirements for nonreactor nuclear facilities are also more specific and detailed than NRC rules or Regulatory Guides.

The Department has also established a formal training accreditation program that is modeled after the commercial nuclear power industry's program. Although the industry program is only applicable to power reactors, the Department has implemented this program at our larger nonreactor nuclear facilities as well. The accreditation program is required through DOE Order 5480.18, "Accreditation of Performance-Based Training for Category A Reactors and Nuclear Facilities."

These two DOE Orders on training provide a basis in policy and requirements that will provide assurance of the content and quality of training programs as well as the competency of operators, maintenance, and technical support personnel. The Department has also developed a DOE rule and associated Safety Guide that incorporate the basic requirements for performance-based training contained in DOE 5480.18 and the prescriptive requirements contained in DOE 5480.20.

The MITRE report indicates that the DOE Orders do not contain a requirement for a simulator for the production reactors. It should be noted by the DNFSB that the NRC rules also do not require a simulator for commercial power reactors. DOE 5480.20 continues to require a facility specific evaluation for the need for a full-scope simulator. Based on such evaluations conducted in 1981, the DOE production reactors have installed full-scope simulators. In addition, the DOE rule currently incorporates an explicit requirement for a full-scope simulator for production reactors and continues the requirement for a facility-specific evaluation for other Category A test and research reactors.

The MITRE report also indicates that the Department's requirements for control room staffing are different from those for civilian power reactors. DOE's control room staffing requirements for Category A and B reactors are the same as those for commercial power reactors and research reactors, respectively. In addition, the MITRE report states that verification rather than certification of operators is required at nonreactor nuclear facilities. It should be noted that verification was in fact defined in a manner identical to certification in previous Orders. The current DOE Orders have been revised to use the same terminology (i.e., certification). Finally, the MITRE report notes that DOE contractors, rather than DOE personnel certify operators. DOE Order 5480.20 provides for a much more direct role of oversight by DOE including co-evaluation of operators in a manner similar to NRC's current requalification program practices. Through the Department's training accreditation program, individual training programs for maintenance personnel, radiation protection technicians, and technical staff, as well as operator programs will be individually accredited. This program will provide the necessary assurance of the content and quality of training programs and the competency of personnel completing the programs.

Fire Protection

15. DOE and NRC differ in their fundamental approaches to fire protection. The DOE emphasis is on minimizing risk to the public and workers, on preventing the disruption of vital DOE programs, and on keeping the monetary cost of a fire to manageable proportions. NRC's fire protection program requirements are directed at protecting safety systems and preventing radioactive releases to the environment. Thus, DOE Orders do not explicitly address nuclear safety systems and safe shutdown.

Fire protection is the sum of all activities to provide for the control and/or extinguishment of all aspects of fire. Fire prevention, referring primarily to measures directed towards avoiding the inception of fire, is a subset of fire protection. Fire protection engineering establishes the appropriate mix of construction, protection, and occupancy requirements which sets adequate suppression mechanisms in place, mitigates the consequences of fire and minimizes the need for detection.

There are basic differences between the approach to fire protection taken by DOE and NRC because there is a fundamental difference between the role of DOE and NRC. DOE is the Owner/Operator/Regulator of facilities and NRC is only the Regulator of facilities. The NRC licensee employs an insurance company, usually the nuclear fire insurance arm of either the Factory Mutuals (FM) or the Improved Risk Insurers (IRI), the major Highly Protected Risk (HPR) insurers in the world, to protect its investors' interests by securing the best fire protection engineering, loss prevention advice and insurance coverage available against catastrophic fire loss. DOE must also do this as owner of the facilities.

NRC is primarily concerned with the safe operation/shutdown of reactors. DOE also shares this concern. However, in addition to this responsibility, DOE also has broader regulatory concerns that parallel those of other Government regulatory agencies, e.g., EPA, DOL/OSHA, etc. Consequently, DOE fire protection includes and emphasizes other codes/standards such as the Life Safety Code. Thus, the Department's actions for assuring full scope responsibility for fire protection is supportive of MITRE's implied recommendation that DOE not follow the limitations of NRC requirements that focus only on safety-related functions (MITRE conclusion #7 above).

16. DOE Orders are written in a general manner, reflecting the fact that they apply to all types of facilities. Orders applying to existing facilities make limited reference to consensus standards. NRC requirements include detailed consideration of such aspects as electrical cable tray design, remote safety-related shutdown control panels, and fire barriers. Also, fire prevention plays a prominent role in NRC's defense-in-depth principle for safety.

The DOE fire protection program is based upon the Highly Protected Risk (HPR) concept. The essential elements of the program are given in Section 10, "Essential Elements of an Improved Risk (the terms HPR and Improved Risk are synonymous) Facility," in DOE Order 5480.7. DOE Order 5480.7 was intended to

provide direction to a professional fire protection engineer with HPR experience. This provides too much latitude for use as a regulatory document since stringent requirements are implicit rather than explicit.

The DOE fire protection program requires qualified professional fire protection engineers to review, for fire protection content and adequacy, all plans prior to construction to require regular self-inspections, periodic audits by independent HPR authorities, physically adequate enclosures, separations and protection of special hazard operations among other concerns.

DOE Order 5480.7 under the Section "Compliance With Improved Risk Objectives" states: "To ensure --- no threats to the public --- will result from fire." DOE fire protection personnel have interpreted this to mean that a fire will not be the cause of harm to the public either through the flames of a fire or through release of toxic or hazardous materials through a breach of the structural integrity of the process under fire attack. The other three objectives are equally broad. More specific language will be incorporated in future revisions to this Order.

Maintenance

17. The existing maintenance requirements for operating DOE facilities are extremely limited in their scope and structure, and weak in their level of detail. In fact, they are virtually nonexistent for production reactor facilities. Explicit evaluations of maintainability are based on optimizing life-cycle cost analyses. On the NRC side, the existing maintenance requirements are scattered through some 30 Regulatory Guides and chapters of the Inspection Manual. Appropriate sections of consensus standards on quality assurance that deal with maintenance also apply. Maintenance requirements are a concern for the non-safety- related or "balance-of-plant" equipment, which is not as strictly regulated as the safety-related portion of the licensed facilities. Thus, NRC's maintenance requirements are not well integrated into its regulations.

DOE issued DOE Order 4330.4A, "Maintenance Management Program," for use by all Department elements in April 1991. The Order consolidates DOE's maintenance program requirements and requires the contractor program to be documented in Maintenance Implementation Plans which will be approved by the Department. The Order covers maintenance requirements, modeled after the Institute of Nuclear Power Operations guidelines for all equipment and systems in both nuclear and nonnuclear facilities.

The DOE's maintenance requirements are also provided in the first set of proposed DOE Rules that is scheduled to be published in the Federal Register in July 1991. The Rule for maintenance contains the same basic requirements that are provided in DOE Order 4330.4A and is supplemented by a Safety Guide to provide additional information to DOE contractors relating to implementation. DOE's inspection and enforcement will be based on the new Order and proposed Rule.

18. As a result of the need for improved maintenance, both DOE and NRC have drafted and proposed additional requirements. DOE's planned adoption of Institute of Nuclear Power Operation's (INPO's) maintenance requirements reflects DOE's current philosophy of incorporating accepted industry programs into its key maintenance activities. Finalization of DOE's proposed maintenance program would result in a more comprehensive and detailed approach to maintenance. NRC has published its policy on maintenance and intends to proceed with the issuance of a proposed rule. It already has implemented an inspection and enforcement measure that will increase civil penalties for licensee violations that involve a maintenance-related failure.

See response to MITRE conclusion #17 above.

Radiation Protection

19. There are several differences between DOE and NRC with respect to their radiation protection programs, related, for example, to the implementation of the as-low-as-is-reasonably-achievable (ALARA) process, and requirements for personnel monitoring and training. However, the radiation standards adopted by the two organizations are generally consistent.

Occupational radiation protection standards and limits within the DOE have typically been proactive and conservative. As an example, DOE modified their existing occupational radiation protection standards in 1988 to reflect the 1987 Environmental Protection Agency (EPA) Radiation Protection Guidance to Federal Agencies for Occupational Exposure. DOE was the first Federal agency to adopt these recommendations, which basically incorporated the recommendations contained in the International Commission on Radiological Protection (ICRP) Report 26. Current NRC regulations do not reflect the 1987 EPA guidance, and consequently generally allow higher radiation exposures to the occupational worker. DOE has been advised that NRC is planning to issue revised regulations in 1991, to be effective in 1993, that will bring them into consistency with current DOE and EPA requirements.

Current DOE occupational radiation protection regulations require monitoring of worker external and internal exposures at thresholds more conservative than current and proposed NRC regulations. The DOE Laboratory Accreditation Program (LAP) for accrediting external dosimetry programs contains more stringent requirements than the corresponding LAP required by NRC. The DOE Order describing radiation protection requirements for occupational workers (DOE Order 5480.11) provides more detailed requirements in the areas of training, instrumentation, area posting and access control, and ALARA design requirements than the corresponding NRC regulation (10 CFR 20).

In 1990, DOE formed the Office of Health, with authority to develop policy and guidance in the occupational radiation protection and industrial hygiene areas. The Office of Health is continually reviewing the adequacy of current DOE radiation protection policy and is currently developing additional guidance in a number of radiation protection program areas to ensure a high level of performance within the DOE complex.

20. NRC has provided more structured and detailed guidelines than DOE on meeting its regulatory requirements. Guidelines on effluent monitoring and estimation of potential radiation doses are examples.

The requirements for effluent monitoring and radiation dose estimation are more specific in DOE Order 5400.1 and 5400.5 than those provided by NRC in 10 CFR 20. The DOE Orders not only require the collection of data but also the submittal of the data to a central database. Since DOE's guidance for monitoring were in draft at the time of publication of the MITRE report, it is easy to understand the basis for the conclusion that NRC's guidance was more detailed. However, since that time the DOE guidance has been published and is now being distributed under the title "DOE Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance." It should also be noted that the reporting requirements in the DOE Orders are more specific and comprehensive than the environmental related requirements in the NRC Rules. Based on this current guidance, the Department does not believe that the NRC guidance in this area is anymore comprehensive or detailed.

With regard to dose estimation, DOE guidance to the field for conducting dose estimates using the ICRP-26/30 recommended methodology has existed since 1985. These requirements were formalized for environment and public protection in DOE Order 5400.5 in February 1990. NRC is just now issuing similar requirements in a revision to 10 CFR 20. NRC has prepared some Regulatory Guides for estimating dose, however, this material is necessary because many of its licensees do not have specific models, staff, or programs for conducting such estimates. All DOE facilities have programs and staff assigned to these functions and issue annual reports containing the results of these efforts. DOE continues to conduct audits/internal reviews and provide additional guidance to ensure the quality, accuracy, and consistency of these procedures. The Department believes this oversight to be equal to or exceeding that of NRC, and that, on average, DOE has more monitoring data on its contractor sites and releases than NRC has on its Licensees.

In summary, considering the DOE Orders and guidance that have been issued since MITRE performed their review, the Department believes that the concerns raised in the report have been resolved.

Radioactive Waste Management

21. The DOE Order on this subject is detailed and often more specific than the NRC regulations on certain topics. The Order references pertinent requirements of NRC and other agencies.

No response needed.

22. DOE does not provide a time restriction on liquid high-level waste before it is converted to solid form. The NRC regulations provide a time limit of five years. However, DOE provides requirements for the management of liquid high-level waste, while NRC does not.

It is true that DOE does not provide a time requirement for converting liquid high-level waste to solid form. However, the Department does require

provisions for the control of chemistry of liquid high-level waste to minimize corrosion of the storage vessel and requirements for monitoring, surveillance, and leak detection (DOE Order 5820.2A, Radioactive Waste Management, 9-26-88, Chapter I). NRC does provide some requirements for the management of high-level waste in Title 10 CFR Part 60, 2-25-81, Disposal of High-Level Wastes in Geologic Repositories and in Title 10 CFR Part 72, 8-19-88, Licensing Requirements for the Independent Storage of Spent Nuclear Fuel and High-Level Radioactive Waste.

23. DOE's disposal of high-level waste is subject to NRC regulations.

No response needed.

24. DOE requirements for the disposal of low-level waste are similar to NRC's regulations. However, the NRC regulations are more specific in terms of waste classification.

Both NRC and DOE requirements for low-level waste disposal provide for similar protection from the disposed waste. The performance objectives for the two organizations are similar. For NRC regulated disposal facilities, the annual dose must not exceed an equivalent of 25 mrem to the whole body, 75 mrem to the thyroid, and 25 mrem to any other organ for any member of the public. DOE limits the annual effective dose equivalent to 25 mrem to any member of the public.

Both organizations require the preparation of an all pathways analysis (performance assessment) to provide reasonable assurance that the above performance objectives are met.

NRC has developed a waste classification system which imposes additional requirements, such as waste form stability and depth of disposal, which are dependent on the level of radioactivity in the waste. The waste classification system was developed based on the types of wastes regulated by NRC and for an intruder scenario only. Additional restrictions may be put on certain waste types or classes if the performance assessment indicates that they are necessary. DOE decided against developing or adopting a waste classification system. Instead, the criteria for waste form, depth of disposal, types of waste allowed, etc., are determined on a site-specific basis and must be justified by the performance assessment.

Emergency Planning and Preparedness

25. DOE Orders call for developing, with the Federal Emergency Management Agency (FEMA), scenarios for use by DOE facility operators and state and local governments in exercising radiological emergency plans. NRC requires formal concurrence with FEMA that emergency plans are adequate and capable of being implemented. NRC also requires an independent periodic review of the emergency plans; a similar requirement is not provided in the DOE Orders.

The DOE requirement cited was excerpted from a July 1990 draft DOE Order which has since been changed to have the Heads of Field Elements assist state,

tribal, and local governments in the development of emergency plans when the Emergency Planning Zone extends beyond DOE site boundaries. This assistance is to be provided in coordination with appropriate Federal agencies, such as FEMA. The need to ensure coordinated planning and response activities is recognized explicitly in the current drafts of DOE Order 5500.1B, 5500.2B, 5500.3A, and 5500.10, which all contain provisions for coordination of emergency plans with Federal, state, tribal, and local emergency response organizations. These Orders also contain provisions for requesting and accommodating participation by other organizations in emergency exercises. The current drafts of the DOE Orders, cited above, also require annual updates of emergency plans, with corresponding coordination and approval, and the preparation of 5-year emergency readiness assurance plans, which describe activities, accomplishments, plans, schedules, and budgets.

DOE emergency plans are comprehensive relative to radiological and non-radiological hazards expected at each facility. Emergency plans within the Department are subject to approval by each level of line management, culminating in approval by the Program Secretarial Officer. In addition, independent oversight of emergency plans is provided by the Office of Nuclear Safety and the Office of the Assistant Secretary for Environment, Safety, and Health. These two offices were established by the Secretary to independently overview the nuclear and nonnuclear aspects of all DOE operations. They report directly to the Secretary and have no programmatic responsibility.

With the implementation of the requirements contained in the new and revised DOE 5500 series Orders identified above, and the continued involvement of the independent oversight organizations within the Department in the review of emergency plans and other emergency management activities, the Department has no need for entering into a special arrangement with FEMA to provide concurrence on emergency plans.

26. The DOE Orders do not contain an integrated, full-scale exercise requirement describing the scope and frequency of emergency drills and exercises at DOE facilities. The NRC requirements are as follows: one full-participation exercise prior to full-power license issuance; and annual onsite exercises, in which state and local authorities must fully participate biennially, and local authorities from all states within the potentially affected area must participate every seven years.

Draft DOE Order 5500.3A, "Planning and Preparedness for Operational Emergencies," which is currently being finalized, contains specific requirements for a coordinated drill and exercise program as an integral part of the Department's overall emergency management program. One of the requirements in this Order calls for each DOE facility to conduct a full-participation exercise annually. Federal, state, tribal, and local regulatory and/or emergency response organizations must be offered the opportunity to participate in these exercises, and participation must be accommodated when requested.

Safety Issue Identification, Notification, and Resolution

27. DOE requirements in this area are generally comparable to NRC.

No response needed.

28. The DOE program for identifying, prioritizing, and resolving generic safety issues does not appear to be as structured and formal as that of NRC.

The response to this conclusion will be in two parts, the first dealing with the Department's Safety Concern Management System and the second dealing with occurrence reporting. The diversity of the Department's facilities normally mitigates against the development of a large number of generic safety issues.

In regard to the Department's Safety Concern Management System, the Department prepared a draft DOE Order in CY 1989 which has undergone extensive review. In addition the Department has prepared a Notice for Proposed Rulemaking on "whistle-blower" protection which was published in the Federal Register on March 13, 1990. The Department expects to issue a DOE Order on the Safety Concern Management System in CY 1991. This Order details the Department's process in identifying, prioritizing, and resolving safety issues which are discovered anywhere in the DOE complex. As noted in the MITRE report, this program is extensive. Improvements in more recent drafts of the Order provide a more structured and formal approach to how the Department processes and resolves these safety concerns.

In terms of occurrence reporting, the Department issued DOE Order 5000.3A, "Occurrence Reporting and Processing of Operations Information," on May 30, 1990. This Order documents the Department's requirements for occurrence categorization, notification, reporting, and follow-up (root cause identification and corrective actions). The process requires line program management involvement in the follow-up of the occurrences in terms of root cause identification and in assuring that corrective actions are appropriately identified, resources applied, and actions completed. Monthly status reports of outstanding corrective actions are required to help assure tracking of all actions to completion.

29. DOE does not explicitly define an unusual occurrence of major significance that requires "prompt reporting" to the appropriate Program Secretarial Officer.

DOE Order 5000.3A and the proposed Rule and Safety Guide on occurrence reporting now indicate that Program Secretarial Officers or their designees (program managers) must be notified of all unusual occurrences verbally within 2 hours of categorization of an event/condition and formally notified, in writing, within 24 hours.

30. DOE does not provide a mechanism, such as NRC's process for "Differing Professional Opinion," for the consideration of dissenting views on decisions or responses to safety issues.

In regard to safety issues identified through the occurrence reporting system, both the DOE Order and proposed Rule/Safety Guide on occurrence reporting explicitly provide for input by Department personnel which may differ from the

action/direction that the Department/contractor proposes for a particular event/condition.

The Department is developing a Safety Concern Management System program that will consider the need for a separate "Differing Professional Opinion" process.

91:1054

The Secretary of Energy
Washington, DC 20585

May 13, 1991

The Honorable John T. Conway
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, N.W.
Suite 700
Washington, D.C. 20004

Dear Mr. Conway:

Your letter of March 7, 1991, forwarded the Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 91-1 expressing the Board's concern for the rate of progress at which nuclear safety standards are being issued within the Department. The DOE response to each of the issues raised by that Recommendation is enclosed.

The Department has concluded that assessment of penalties under the Price-Anderson Amendments Act of 1988 can best be accomplished using standards that have been subject to the notice-and-comment rulemaking procedures of the Administrative Procedure Act. However, as you know, rulemaking is a lengthy process. Therefore, in order to ensure DOE contractors have up-to-date guidance concerning the operation of DOE facilities in the interim, I have directed that updated DOE Orders be issued without delay. In previous correspondence, I provided a plan for developing nuclear safety rules, safety guides, and DOE Orders. An implementation plan will be forwarded to the Board describing the application of standards throughout the Department.

In accordance with section 315(d) of the Atomic Energy Act of 1954, as amended, this response will be published in the Federal Register.

Sincerely,

James D. Watkins
Admiral, U.S. Navy (Retired)

Enclosure

RESPONSE TO DNFSB LETTER OF MARCH 7, 1991,
RECOMMENDATIONS OF DNFSB REGARDING STANDARDS DEVELOPMENT

On March 7, 1991, the Defense Nuclear Facilities Safety Board (DNFSB) issued Recommendation 91-1. The DNFSB recommendations and DOE's response are as follows:

1. that the Department expeditiously issue a formal statement of its overall Nuclear Safety Policy.

The Department accepts this recommendation. A formal statement of the Department's overall Nuclear Safety Policy was prepared and submitted for internal review on April 15, 1991, and is expected to be issued by July 15, 1991.

2. that increased attention be given to the qualifications and background of managers and technical staff assigned to the development and implementation of standards and that the numbers of personnel suited to this activity be increased commensurate with its importance.

The Department accepts this recommendation. On January 31, 1990, the responsibility for the development and coordination of Departmental policy for nuclear facility safety, including standards development, was centralized under the Assistant Secretary for Nuclear Energy (ASNE). An Office of Nuclear Safety Policy and Standards (ONSPS) was established, reporting directly to the ASNE, with the primary mission to develop, coordinate, and maintain DOE standards on nuclear facility safety. Starting at 10 professionals, the ONSPS staff increased to its FY 90 ceiling of 20. The FY 91 ceiling is 25 professionals, and recruiting has resulted in filling 4 of the 5 new positions to date. The FY 92 ceiling is 36. Almost half of the professional staff have NRC experience, with the remainder having backgrounds divided between industry and the Department. The Department will continue to review the staffing status and needs of the organizations at Headquarters that are developing standards and will revise them as necessary. The Department recognizes the Board's concern with respect to implementing an effective standards program through the entire Department complex of field and contractor operations. The Department will submit an implementation plan to the Board describing its overall approach to develop and implement standards throughout the DOE complex.

3. that standards program officials be given direct access to the highest levels of DOE management.

The Headquarters standards program officials have direct access to the highest levels of DOE management. The Secretary has assigned responsibility for the development of nuclear safety and radiological protection standards to the Assistant Secretaries for Nuclear Energy and for Environment, Safety and Health, respectively. The Department's standards program officials for nuclear safety and radiological protection report directly to these senior officials. Furthermore, the Secretary has established the Senior Nuclear Managers group consisting of the Department's highest level of managers responsible for nuclear activities. The Senior Nuclear Managers have been charged with coordinating and overseeing the upgrading of the Department's nuclear safety directives. In this and in other matters, the Senior Nuclear Managers Group

has been particularly effective in resolving differences in the Department and reaching a uniform consensus. The Department believes that this recommendation has been fulfilled.

4. that the Department critically reexamine its existing infrastructure for standards development and implementation at Headquarters to determine if organizational or managerial changes are needed to (1) emphasize the priority and importance of standards to assuring public health and safety; (2) expand the program to facilitate the rapid development and implementation of standards; and (3) streamline the DOE approval process for standards.

The Department accepts this recommendation. The Department has been critically examining its infrastructure for standards development and implementation at Headquarters. The Department has emphasized the priority and importance of standards for assuring public health and safety by assigning to the Senior Nuclear Managers group the responsibility to oversee and coordinate the upgrading of the Department's nuclear safety directives.

Secretary of Energy Notice (SEN-6-series) assigns to line management full responsibility for environmental protection, radiation and reactor safety, and worker and public health and safety. The Secretary also established nuclear safety self-assessment offices for the line managers involved in nuclear safety matters and a separate Office of Nuclear Safety which advises the Secretary on whether line management and its self-assessment functions are adequately assuring nuclear safety.

The DOE process for approval of standards has been streamlined as discussed in 3. above.

The implementation plan will provide additional information relative to this recommendation.

5. that the Department reexamine the corresponding organizational units at DOE's principal Operations and Field Offices and DOE contractor organizations to determine if those organizations' standards infrastructure, responsibilities and resources would also benefit from changes to reflect improvements at Headquarters which strengthen and expedite standards development and implementation.

The Department accepts this recommendation. The implementation plan will specify the Department's actions for assessing the Operations Offices, Field Offices, and contractor organizations to determine if changes should be made to reflect improvements at Headquarters.

6. that DOE review all the findings and conclusions of both the Executive Summary and Volume 2 of the MITRE report, identify which findings and conclusions it considers valid and appropriate in DOE's Response to this set of Recommendations, and subsequently address those findings and conclusions in the Implementation Plan.

The Department accepts the findings and conclusions of the MITRE Executive Summary. These conclusions reemphasize the deficiencies identified in earlier reviews. The MITRE report notes that it considered active DOE Orders as of February 1990, and that DOE had taken various initiatives to upgrade and revise its safety requirements, but that the revised requirements were brought to its attention after MITRE had essentially completed its review. Nevertheless, although the Department believes that the new safety directives prepared and issued subsequent to the MITRE review rectify the concerns identified by MITRE, the conclusions reached by MITRE in the Executive Summary are still valid for those safety directives remaining to be revised or implemented.

The approach and scope of Volume 2 of the MITRE report focused on characterizing the differences between DOE and NRC requirements and summarizing insights gained from those comparisons. Thus, the findings and conclusions of Volume 2 are not as clearly defined as those in the Executive Summary. Attachment A, presents the findings and conclusions by MITRE and provides comments on these to identify to the Board the Department's understanding of these MITRE insights.

The implementation plan will describe the program to revise the safety directives.

7. that DOE expedite the issuance of revised safety orders, directives, or other requirements as a means of addressing the need for substantive guidance on the wide variety of safety requirements, while DOE is promulgating rules.

The recommendation is accepted. The Department has concluded that the implementation of the Price-Anderson Amendments Act of 1988 can best be accomplished using the rulemaking procedures of the Administrative Procedure Act. However, rulemaking is a lengthy process. In order to ensure DOE contractors have up-to-date guidance concerning the operation of DOE facilities, the Secretary has directed that updated DOE Orders be issued without delay.

In May 1990, the Secretary's Task Force on Nuclear Safety Directives identified ten subjects that should receive priority attention with respect to upgrading the safety directives. These ten subjects were subsequently chosen for rule development. Six of these ten subjects are now covered by DOE Orders, and the remaining four Orders are, or will be, in the last stage of formal DOE review by May 15, 1991. The status of the corresponding Nuclear Safety Orders is shown on the following page.

Nuclear Safety Orders Being Developed in Parallel with Rules

Title	December Schedule	Current Status	Final Issuance
Radiation Protection	Issued	Issued	Issued
Accreditation of Performance-Based Training	Issued	Issued	Issued
Conduct of Operations	Issued	Issued	Issued
Occurrence Reporting and Processing of Operations Information	Issued	Issued	Issued
Personnel Training	February 1991	Issued	Issued
Maintenance Management	February 1991	Issued	Issued
Quality Assurance for DOE Nuclear Activities	June 1991	March 21, 1991*	September 1991
Unreviewed Safety Questions	June 1991	April 5, 1991*	September 1991
Technical Safety Requirements	June 1991	May 15, 1991*	October 1991
Safety Analysis Reports	September 1991	May 15, 1991*	October 1991

*Issued for Formal Coordination.

Attachment A

DOE RESPONSE TO THE GENERAL CONCLUSIONS OF THE MITRE REPORT

GENERAL CONCLUSIONS

1. The DOE Orders, which are the principal means for establishing safety requirements for defense nuclear facilities, lack the systematic approach and coherence necessary for understanding DOE's safety management philosophy.

A methodology for establishing a coherent and systematic approach to assuring safe operation of DOE facilities was described to the Board on December 10, 1990, subsequent to the MITRE report. Upper-tier requirements establish broad objectives which are then incorporated with increasing detail in lower-level documents. A Nuclear Safety Policy, DOE Nuclear Safety Orders, and consensus and DOE standards provide an appropriate progression in the level of detail. The above methodology is also being used for the Nuclear Safety Rules and accompanying Safety Guides which are being prepared in parallel with DOE Nuclear Safety Orders.

2.A. In many areas pertinent to safety, the DOE Orders do not provide specific requirements and supporting guidelines for implementing DOE's safety objectives. SR Orders specifically applicable to defense nuclear facilities at the Savannah River Plant do not add significantly to the substance or specificity of DOE safety requirements; a great deal is left to be defined and interpreted by the DOE contractor operating the facilities.

The Department has undertaken the task of preparing new DOE Orders and revising existing Orders to improve the specificity of its safety directives. Since January 1990, four new DOE Orders were issued, one existing Order was significantly revised, and two new Orders were issued for formal coordination. In addition, four new Orders will be issued for Department coordination before the end of May 1991.

The priority for determining the Orders that have to be prepared or revised is based on the need for new or improved requirements as recommended by external reviews such as those undertaken by the National Academies of Science and Engineering (NAS/NAE) and the MITRE report prepared for the DNFSB. The priorities established by DOE for the Rules and Orders have been provided to the DNFSB in meetings with NE staff and in separate correspondence.

In regard to the issuance of Operations Office Order Supplements, the Department agrees with the DNFSB that the supplements do not add significantly to the substance or specificity of the DOE Orders. In his memo to the Operations Office Managers dated February 25, 1991, the Under Secretary directed them not to issue supplementary DOE Orders and indicated that DOE Orders should be the only documents specifying requirements on the contractor.

The wide diversity of DOE facilities limits the detail that is practical for insertion into DOE rules and/or Orders. However, where necessary, detailed implementation plans will be developed by contractors based on direction from DOE, and these implementation plans will be reviewed and approved by DOE line management.

2.B. Organizational responsibilities assigned in the DOE Orders have not been revised to reflect significant recent changes.

The revised responsibilities of Departmental elements are, however, being included in the DOE Orders as they are being prepared or modified.

The Department has recognized that internal DOE organizational responsibilities should not be provided in Rules. As part of the rulemaking effort, the Department is preparing a DOE Manual of Responsibilities in which the responsibilities of all Departmental elements for a given technical topic are defined. This is similar to the NRC practice of providing such information in the NRC Manual.

3. Certain DOE Orders that address topics important to facility safety do not focus on safety. This may be evidence of improperly defined objectives and lack of due attention to the safety functions of the facilities.

The specific DNFSB concerns highlighted in their discussion of this conclusion are with two technical areas, Fire Protection and Quality Assurance. To avoid duplication, the DOE response to these concerns are provided later under each specific technical topic.

4.A. The DOE Orders do not provide criteria and guidelines for accomplishing their stated objective to apply "uniform standards, guides, and codes which are consistent with those applied to comparable licensed nuclear facilities."

In the discussion of this conclusion, MITRE points out that the basic requirement to apply applicable NRC design and siting criteria is limited to new construction, during major modifications to an existing facility, or when it is determined that safety can be significantly improved. In the past these basic requirements were generally implemented for new facilities such as the Fast Flux Test Facility, the upgrade to the Annular Core Research Reactor and similar new or modified facilities. This was primarily accomplished through preparation of Safety Analysis Reports that followed the NRC Regulatory Guide for Standard Format and Content of Safety Analysis Reports. By following the standard format and content, Regulatory criteria and standards were addressed in the Safety Analysis Reports, and the review of these reports provided a means to judge the adequacy of application of NRC criteria.

This general approach, however, has not worked with older DOE facilities that were designed and built prior to the existence of Standard Format and Content guidelines. In addition, the application of new standards to existing facilities during modifications has not always been successfully accomplished.

To provide a logical and systematic method for applying new standards and criteria to existing facilities, the recently developed Backfit Policy establishes a process for arriving at backfit decisions. In addition, both a new rule and a new DOE Order on Safety Analysis Reports are being prepared. The new rule and Order will require Updated Safety Analysis Reports to be prepared for existing facilities which will permit judging the application of current criteria and standards to existing as well as new facilities.

4.B. There is no DOE guidance to suggest that its requirements overcome the deficiencies or inconsistencies that may be present in the requirements for licensed nuclear facilities, especially when referencing those requirements.

The discussion of this conclusion in the MITRE report expresses concern that the application of NRC requirements would result in application of standards that apply only to "safety-related and other important-to-safety" systems and thereby neglect non-safety-related equipment such as balance of plant equipment. The report also concludes that NRC's requirements for nonreactor nuclear facilities are not as comprehensive as those for the power reactors. The report suggests that DOE adopt "a total systems approach that would recognize and overcome any weaknesses in NRC's requirements."

In the Department's development of new rules and Orders it is the intent that safety analyses for new and existing facilities take a balanced approach to the application of standards and requirements to all plant systems and equipment. Recognizing the importance of formal conduct of operations and maintenance to the safe and efficient operation of DOE's nuclear facilities, both rules and DOE Orders have been developed to address the operation and maintenance of all plant systems and equipment. In addition, DOE has recognized the importance of standards and the fact that NRC's requirements for nonreactor nuclear facilities are not as comprehensive as those for power reactors. Accordingly, the Department is reestablishing a standards program to address the need for additional guidance in areas beyond those traditionally applied to only safety-related equipment.

5. The DOE Orders require compliance with very few mandatory nuclear safety standards for existing reactors or nonreactor facilities.

DOE has prepared draft DOE Order 1300.2A, Department of Energy Standards Program, which was transmitted to Departmental elements on March 26, 1991, for informal coordination. This draft Order emphasizes the Department's proposed policy in regard to the use of national and international consensus standards in the design, construction, and operation of all its facilities, projects, and programs. The draft Order requires that line management ensure and document the use of standards in the design, construction, and operation of all DOE facilities.

In addition, in an effort to improve the use of national and international consensus standards throughout the Department, DOE will issue in June 1991, a document which lists the codes, regulations, and consensus standards applied to commercially licensed reactors which have potential applicability to the Department's reactors. It is DOE's intent that this document be used as a resource by DOE line program management in evaluating and determining specific standards applicable to the design and/or modification of facilities under

their cognizance. DOE is also in the process of preparing a similar document for nonreactor nuclear facilities which should be available in September 1991. The standards selected will be identified in the design or safety documentation such as System Design Descriptions or Safety Analysis Reports that will be approved by DOE.

The efforts discussed above, in conjunction with the development of the DOE Backfit Policy will significantly improve the use of standards throughout the Department's operations.

DOE RESPONSE TO THE SPECIFIC CONCLUSIONS OF THE MITRE REPORT

SPECIFIC CONCLUSIONS

Design Standards

1. The DOE Orders do not require existing reactors to meet any mandatory design standards, and existing nonreactor facilities are required to comply with only a very small set of design standards. The Orders require that new construction of reactors and nonreactor facilities conform with a much larger body of standards, but these standards are applied at existing facilities only when modifications are made or when DOE determines that safety can be significantly improved. Moreover, the Orders do not provide procedures or criteria for making the determination that safety can be significantly improved.

See response to General Conclusion #5.

2. The DOE Orders are not clear about the criteria for selecting the structures, systems, and components that must satisfy mandatory standards. One Order introduces the term "safety or safety-related" equipment, but does not include a definition of safety-related, and the other Orders do not provide additional guidance for identifying this type of equipment in reactors. For nonreactor facilities, the term "safety class items" is defined, but the relationship between safety class items and safety-related items is unclear. This is of particular concern because of potential confusion about how consensus standards are to be applied.

As part of the Department's decision to improve the DOE Order system and the requirements therein, one of the major objectives will be to assure consistent use of terminology. DOE Orders 5480.5, 5480.6, and 6430.1A will be revised as improvements are made to the technical areas highlighted in the MITRE report to ensure that the specific terminology, in question here, will be consistent.

See also response to General Conclusion #4.B.

3. In some DOE Orders, mandatory design standards are applied only to a subset of all plant equipment, and there are no requirements for the remaining plant equipment. For modifications to existing facilities,

one DOE Order requires compliance with mandatory standards only when "safety or safety-related structures, systems, or components" are involved. Another DOE Order that applies exclusively to new construction and modifications of nonreactor facilities restricts the scope of the equipment covered by its requirements to those identified as "safety class items."

See response to the MITRE Specific Conclusions #1 and #2 above.

4. The DOE Orders do not provide specific requirements or review criteria to implement general guidelines relating to the design of structures, systems, and components for either reactors or nonreactor facilities.

The recent effort undertaken by the Department to prepare Rules and new DOE Orders as well as to revise existing DOE Orders in the technical areas discussed in the MITRE report will provide specific requirements and review criteria for the Department to use in the implementation of improved guidelines relating to the design, construction, and operation of the Department's facilities. Many of the new Rules and Orders, in addition, require the contractors to prepare implementation plans based on a required format which are then approved by the Department's line program organizations. These approved plans then provide the bases for compliance enforcement.

5. Several specific DOE references to mandatory and reference standards need to be revised to reflect the current versions of those standards. For civilian nuclear facilities, the NRC regulations and regulatory guidance documents provide extensive references to consensus standards, and the regulations provide the mechanism for maintaining the currency of endorsements of principal consensus standards.

As part of the Department's continuing effort to improve the DOE Order system and the requirements therein, the existing DOE Orders will be revised to reflect the current version of consensus standards, as appropriate. It should be recognized, however, that some older standards, e.g., in the training area, are referenced because they contain more appropriate or more stringent requirements than newer versions of the standards.

Quality Assurance

6. While both the DOE and NRC refer to the same principal consensus standard on quality assurance, DOE's quality assurance program requirements lack the systematic organization and strength of language evident in NRC's requirements. For example, NRC's detailed regulations on this subject are supplemented by Regulatory Guides that address additions or modifications to the consensus standards. Also, NRC has specified formal procedures for reviewing and approving changes to the licensee's quality assurance program.

DOE's Quality Assurance (QA) requirements established in DOE Order 5700.6B are being revised. The revised Draft Order 5700.6C was sent to all Departmental elements for formal coordination in March 1991. The revision is consistent with the latest version of NRC's Standard Review Plan, Chapter 17.3, on QA. This revised Order parallels a proposed QA Rule (10 CFR 830.120), which is expected to be published for comment in the Summer of 1991, and its accompanying Safety Guide. The International Atomic Energy Agency (IAEA) is also making revisions to its QA standards similar to the revised Draft Order 5700.6C.

7. DOE's safety objective is not well integrated into the stated purpose of its quality assurance program. While the principal DOE objective is operational success, the principal objective of NRC's mandated requirements is integrity of safety-related equipment, although as discussed earlier, the focus of NRC's requirements on safety-related functions of licensed facilities is also a limitation.

DOE's safety objective will be integrated into the stated purpose of its QA program in the revised DOE Order 5700.6C, the proposed Rule 830.120, and the Rule's companion Safety Guide.

8. The DOE General Design Criteria, that apply to new construction or modification of nonreactor facilities provide guidance on safety classification for equipment; however, they do not specify the gradation in quality assurance standards that is applied.

As noted in the resolution to MITRE conclusion #6, the Department's revised Order 5700.6C, the proposed Rule 830.120, and the Rule's companion Safety Guide are consistent with the latest version of NRC's Standard Review Plan. In addition, the proposed rule will require a graded approach to items and processes depending upon the risk associated with those items and processes.

Safety Analysis and Review

9. DOE requirements on this subject are scattered among and within the applicable Orders. The SR Orders introduce new terms and definitions. For example, although DOE Orders define the terms "significant modification" and "unreviewed safety question," SR Orders introduce different definitions and language to describe the use of these concepts. This adds confusion to the interpretation of the DOE Orders.

In his memo to the Operations Office Managers dated February 25, 1991, the Under Secretary directed them to discontinue the practice of writing supplements and indicated that DOE Orders should be the only documents specifying requirements to the contractor.

10. Both DOE and NRC require that plant changes involving unreviewed safety questions be accompanied by safety analyses; however, DOE's definition of an unreviewed safety question differs from the NRC definition and would result in fewer safety analyses.

The Department is issuing rules for many of the technical topics discussed in the MITRE report, including Unreviewed Safety Questions. In addition, a DOE Order on Unreviewed Safety Questions has been transmitted for formal coordination Departmentwide. The definition of Unreviewed Safety Question in both the Rule and the Order has been revised to reflect the NRC definition.

11. The most significant difference between the DOE and NRC requirements for existing facilities is that DOE Orders provide virtually no guidance concerning the content, evaluation methodologies, and review criteria for Safety Analysis Reports. NRC has very extensive and substantive guidance on the subject. Furthermore, DOE does not require periodic updates to keep the Safety Analysis Report current with facility configuration and operation; NRC requires updates on an annual basis.

DOE has drafted a proposed rule, 10 CFR 830.110, which relates to DOE contractor requirements for preparing Safety Analysis Reports for nuclear facilities (reactors and nonreactor nuclear facilities). Because the rulemaking process is lengthy in nature, DOE will also issue an Order which parallels the proposed Rule.

The draft Rule and its guidance document will provide substantive guidance on Safety Analysis Report content. DOE does not intend to provide a "Standard Review Plan" for the evaluation and review of Safety Analysis Reports which would be similar to that utilized by the NRC for evaluating and reviewing components or systems of nuclear powerplants, since the Safety Guides that will be issued with the new Rules will provide sufficient information to serve the purpose of the NRC Standard Review Plan.

With regard to Safety Analysis Report updating, the proposed Rule and Order will require that contractors annually review the changes or modifications made to nuclear facilities to determine if the Safety Analysis Reports need to be updated rather than requiring annual updates. The Department considers this requirement to review and update as necessary to be prudent from both a safety and resource standpoint.

12. The draft DOE Order on this subject would specify the methodologies for safety evaluation much more precisely than do the existing Orders; however, it would not significantly supplement the safety review and acceptance criteria.

See response to MITRE conclusion #11.

Operations

13. A major weakness in the existing Orders is the absence of detailed guidelines on the scope, content, and format of the technical specifications for reactor facilities and operational safety requirements for nonreactor nuclear facilities. Operational safety requirements are required to be concise and commensurate with the potential risks involved. While DOE Order 5480.6 states that the NRC Technical

Specifications requirements given in 10 CFR 50.36 shall apply for DOE-owned reactors, it does not provide guidelines on how these requirements are to be met. Furthermore, DOE has no Order or generic document similar to NRC's Standard Technical Specifications that licensees use for formulating and documenting plant-specific technical specifications, as required in 10 CFR 50.36. It is also significant that technical specifications on effluents to the environment are not explicitly covered in DOE's general requirements, NRC, on the other hand, provides detailed format and other guidance on the standard technical specifications for each major reactor type. Its regulations provide numerical guidelines for design objectives and limiting conditions for operation with respect to reactor effluents. Also, violations of technical specifications at civilian nuclear facilities can result in civil penalties, depending on the safety significance involved.

The draft DOE Rule, 10 CFR 830.320, covers the requirements for the development of Technical Safety Requirements (terminology which replaces Technical Specifications and Operational Safety Requirements) for DOE nuclear facilities. The proposed Rule is similar to 10 CFR 50.36 and builds on NRC's experience with its implementation as well as the NRC's Technical Specification Improvement Program (TSIP). The Department's proposed Rule and Order are modeled after the NRC TSIP.

The Safety Guide which accompanies the draft Rule provides extensive guidance on the format and content of Technical Safety Requirements documents and, similar to the NRC philosophy, emphasizes keeping the content of the Technical Safety Requirements to a minimum to make the document user-friendly.

A draft Rule, 10 CFR 820, has also been prepared by DOE to articulate the Department's enforcement process which could result in civil penalties for contractor violations of Technical Safety Requirements depending on the safety significance involved. Violations of Technical Safety Requirements will subject contractors to potential civil penalties.

14. DOE requirements for operator selection, qualification, and training as stated in the Orders are not as detailed as those of NRC. For production reactors, the applicable Order selectively applies consensus standards. DOE recognizes the use of partial or full-scope simulators for training; however, the latter are not mandatory for production reactors. Also, there is nothing in the existing Orders that parallels the detailed NRC criteria for examining the competency of reactor operators. Operators are certified by DOE's contractors, whereas operators of civilian reactors are licensed by NRC. Furthermore, DOE staffing requirements for reactor control rooms are different from those for civilian power reactors. For nonreactor facilities, qualification requirements are not explicit; verification, rather than certification, of personnel qualification and training is required.

The Department has recently issued DOE Order 5480.20, "Personnel Selection, Qualification, Training, and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear Facilities." This Order contains detailed requirements for Category A and B reactors and nonreactor nuclear facilities that are more detailed than the NRC requirements contained in 10 CFR 55. In addition, the requirements for DOE's production, test and research reactors are equivalent to the guidance contained in NRC Regulatory Guide 1.8. The Department's requirements for nonreactor nuclear facilities are also more specific and detailed than NRC rules or Regulatory Guides.

The Department has also established a formal training accreditation program that is modeled after the commercial nuclear power industry's program. Although the industry program is only applicable to power reactors, the Department has implemented this program at our larger nonreactor nuclear facilities as well. The accreditation program is required through DOE Order 5480.18, "Accreditation of Performance-Based Training for Category A Reactors and Nuclear Facilities."

These two DOE Orders on training provide a basis in policy and requirements that will provide assurance of the content and quality of training programs as well as the competency of operators, maintenance, and technical support personnel. The Department has also developed a DOE rule and associated Safety Guide that incorporate the basic requirements for performance-based training contained in DOE 5480.18 and the prescriptive requirements contained in DOE 5480.20.

The MITRE report indicates that the DOE Orders do not contain a requirement for a simulator for the production reactors. It should be noted by the DNFSB that the NRC rules also do not require a simulator for commercial power reactors. DOE 5480.20 continues to require a facility specific evaluation for the need for a full-scope simulator. Based on such evaluations conducted in 1981, the DOE production reactors have installed full-scope simulators. In addition, the DOE rule currently incorporates an explicit requirement for a full-scope simulator for production reactors and continues the requirement for a facility-specific evaluation for other Category A test and research reactors.

The MITRE report also indicates that the Department's requirements for control room staffing are different from those for civilian power reactors. DOE's control room staffing requirements for Category A and B reactors are the same as those for commercial power reactors and research reactors, respectively. In addition, the MITRE report states that verification rather than certification of operators is required at nonreactor nuclear facilities. It should be noted that verification was in fact defined in a manner identical to certification in previous Orders. The current DOE Orders have been revised to use the same terminology (i.e., certification). Finally, the MITRE report notes that DOE contractors, rather than DOE personnel certify operators. DOE Order 5480.20 provides for a much more direct role of oversight by DOE including co-evaluation of operators in a manner similar to NRC's current requalification program practices. Through the Department's training accreditation program, individual training programs for maintenance personnel, radiation protection technicians, and technical staff, as well as operator programs will be individually accredited. This program will provide the necessary assurance of the content and quality of training programs and the competency of personnel completing the programs.

Fire Protection

15. DOE and NRC differ in their fundamental approaches to fire protection. The DOE emphasis is on minimizing risk to the public and workers, on preventing the disruption of vital DOE programs, and on keeping the monetary cost of a fire to manageable proportions. NRC's fire protection program requirements are directed at protecting safety systems and preventing radioactive releases to the environment. Thus, DOE Orders do not explicitly address nuclear safety systems and safe shutdown.

Fire protection is the sum of all activities to provide for the control and/or extinguishment of all aspects of fire. Fire prevention, referring primarily to measures directed towards avoiding the inception of fire, is a subset of fire protection. Fire protection engineering establishes the appropriate mix of construction, protection, and occupancy requirements which sets adequate suppression mechanisms in place, mitigates the consequences of fire and minimizes the need for detection.

There are basic differences between the approach to fire protection taken by DOE and NRC because there is a fundamental difference between the role of DOE and NRC. DOE is the Owner/Operator/Regulator of facilities and NRC is only the Regulator of facilities. The NRC licensee employs an insurance company, usually the nuclear fire insurance arm of either the Factory Mutuals (FM) or the Improved Risk Insurers (IRI), the major Highly Protected Risk (HPR) insurers in the world, to protect its investors' interests by securing the best fire protection engineering, loss prevention advice and insurance coverage available against catastrophic fire loss. DOE must also do this as owner of the facilities.

NRC is primarily concerned with the safe operation/shutdown of reactors. DOE also shares this concern. However, in addition to this responsibility, DOE also has broader regulatory concerns that parallel those of other Government regulatory agencies, e.g., EPA, DOL/OSHA, etc. Consequently, DOE fire protection includes and emphasizes other codes/standards such as the Life Safety Code. Thus, the Department's actions for assuring full scope responsibility for fire protection is supportive of MITRE's implied recommendation that DOE not follow the limitations of NRC requirements that focus only on safety-related functions (MITRE conclusion #7 above).

16. DOE Orders are written in a general manner, reflecting the fact that they apply to all types of facilities. Orders applying to existing facilities make limited reference to consensus standards. NRC requirements include detailed consideration of such aspects as electrical cable tray design, remote safety-related shutdown control panels, and fire barriers. Also, fire prevention plays a prominent role in NRC's defense-in-depth principle for safety.

The DOE fire protection program is based upon the Highly Protected Risk (HPR) concept. The essential elements of the program are given in Section 10, "Essential Elements of an Improved Risk (the terms HPR and Improved Risk are synonymous) Facility," in DOE Order 5480.7. DOE Order 5480.7 was intended to

provide direction to a professional fire protection engineer with HPR experience. This provides too much latitude for use as a regulatory document since stringent requirements are implicit rather than explicit.

The DOE fire protection program requires qualified professional fire protection engineers to review, for fire protection content and adequacy, all plans prior to construction to require regular self-inspections, periodic audits by independent HPR authorities, physically adequate enclosures, separations and protection of special hazard operations among other concerns.

DOE Order 5480.7 under the Section "Compliance With Improved Risk Objectives" states: "To ensure --- no threats to the public --- will result from fire." DOE fire protection personnel have interpreted this to mean that a fire will not be the cause of harm to the public either through the flames of a fire or through release of toxic or hazardous materials through a breach of the structural integrity of the process under fire attack. The other three objectives are equally broad. More specific language will be incorporated in future revisions to this Order.

Maintenance

17. The existing maintenance requirements for operating DOE facilities are extremely limited in their scope and structure, and weak in their level of detail. In fact, they are virtually nonexistent for production reactor facilities. Explicit evaluations of maintainability are based on optimizing life-cycle cost analyses. On the NRC side, the existing maintenance requirements are scattered through some 30 Regulatory Guides and chapters of the Inspection Manual. Appropriate sections of consensus standards on quality assurance that deal with maintenance also apply. Maintenance requirements are a concern for the non-safety- related or "balance-of-plant" equipment, which is not as strictly regulated as the safety-related portion of the licensed facilities. Thus, NRC's maintenance requirements are not well integrated into its regulations.

DOE issued DOE Order 4330.4A, "Maintenance Management Program," for use by all Department elements in April 1991. The Order consolidates DOE's maintenance program requirements and requires the contractor program to be documented in Maintenance Implementation Plans which will be approved by the Department. The Order covers maintenance requirements, modeled after the Institute of Nuclear Power Operations guidelines for all equipment and systems in both nuclear and nonnuclear facilities.

The DOE's maintenance requirements are also provided in the first set of proposed DOE Rules that is scheduled to be published in the Federal Register in July 1991. The Rule for maintenance contains the same basic requirements that are provided in DOE Order 4330.4A and is supplemented by a Safety Guide to provide additional information to DOE contractors relating to implementation. DOE's inspection and enforcement will be based on the new Order and proposed Rule.

18. As a result of the need for improved maintenance, both DOE and NRC have drafted and proposed additional requirements. DOE's planned adoption of Institute of Nuclear Power Operation's (INPO's) maintenance requirements reflects DOE's current philosophy of incorporating accepted industry programs into its key maintenance activities. Finalization of DOE's proposed maintenance program would result in a more comprehensive and detailed approach to maintenance. NRC has published its policy on maintenance and intends to proceed with the issuance of a proposed rule. It already has implemented an inspection and enforcement measure that will increase civil penalties for licensee violations that involve a maintenance-related failure.

See response to MITRE conclusion #17 above.

Radiation Protection

19. There are several differences between DOE and NRC with respect to their radiation protection programs, related, for example, to the implementation of the as-low-as-is-reasonably-achievable (ALARA) process, and requirements for personnel monitoring and training. However, the radiation standards adopted by the two organizations are generally consistent.

Occupational radiation protection standards and limits within the DOE have typically been proactive and conservative. As an example, DOE modified their existing occupational radiation protection standards in 1988 to reflect the 1987 Environmental Protection Agency (EPA) Radiation Protection Guidance to Federal Agencies for Occupational Exposure. DOE was the first Federal agency to adopt these recommendations, which basically incorporated the recommendations contained in the International Commission on Radiological Protection (ICRP) Report 26. Current NRC regulations do not reflect the 1987 EPA guidance, and consequently generally allow higher radiation exposures to the occupational worker. DOE has been advised that NRC is planning to issue revised regulations in 1991, to be effective in 1993, that will bring them into consistency with current DOE and EPA requirements.

Current DOE occupational radiation protection regulations require monitoring of worker external and internal exposures at thresholds more conservative than current and proposed NRC regulations. The DOE Laboratory Accreditation Program (LAP) for accrediting external dosimetry programs contains more stringent requirements than the corresponding LAP required by NRC. The DOE Order describing radiation protection requirements for occupational workers (DOE Order 5480.11) provides more detailed requirements in the areas of training, instrumentation, area posting and access control, and ALARA design requirements than the corresponding NRC regulation (10 CFR 20).

In 1990, DOE formed the Office of Health, with authority to develop policy and guidance in the occupational radiation protection and industrial hygiene areas. The Office of Health is continually reviewing the adequacy of current DOE radiation protection policy and is currently developing additional guidance in a number of radiation protection program areas to ensure a high level of performance within the DOE complex.

20. NRC has provided more structured and detailed guidelines than DOE on meeting its regulatory requirements. Guidelines on effluent monitoring and estimation of potential radiation doses are examples.

The requirements for effluent monitoring and radiation dose estimation are more specific in DOE Order 5400.1 and 5400.5 than those provided by NRC in 10 CFR 20. The DOE Orders not only require the collection of data but also the submittal of the data to a central database. Since DOE's guidance for monitoring were in draft at the time of publication of the MITRE report, it is easy to understand the basis for the conclusion that NRC's guidance was more detailed. However, since that time the DOE guidance has been published and is now being distributed under the title "DOE Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance." It should also be noted that the reporting requirements in the DOE Orders are more specific and comprehensive than the environmental related requirements in the NRC Rules. Based on this current guidance, the Department does not believe that the NRC guidance in this area is anymore comprehensive or detailed.

With regard to dose estimation, DOE guidance to the field for conducting dose estimates using the ICRP-26/30 recommended methodology has existed since 1985. These requirements were formalized for environment and public protection in DOE Order 5400.5 in February 1990. NRC is just now issuing similar requirements in a revision to 10 CFR 20. NRC has prepared some Regulatory Guides for estimating dose, however, this material is necessary because many of its licensees do not have specific models, staff, or programs for conducting such estimates. All DOE facilities have programs and staff assigned to these functions and issue annual reports containing the results of these efforts. DOE continues to conduct audits/internal reviews and provide additional guidance to ensure the quality, accuracy, and consistency of these procedures. The Department believes this oversight to be equal to or exceeding that of NRC, and that, on average, DOE has more monitoring data on its contractor sites and releases than NRC has on its Licensees.

In summary, considering the DOE Orders and guidance that have been issued since MITRE performed their review, the Department believes that the concerns raised in the report have been resolved.

Radioactive Waste Management

21. The DOE Order on this subject is detailed and often more specific than the NRC regulations on certain topics. The Order references pertinent requirements of NRC and other agencies.

No response needed.

22. DOE does not provide a time restriction on liquid high-level waste before it is converted to solid form. The NRC regulations provide a time limit of five years. However, DOE provides requirements for the management of liquid high-level waste, while NRC does not.

It is true that DOE does not provide a time requirement for converting liquid high-level waste to solid form. However, the Department does require

provisions for the control of chemistry of liquid high-level waste to minimize corrosion of the storage vessel and requirements for monitoring, surveillance, and leak detection (DOE Order 5820.2A, Radioactive Waste Management, 9-26-88, Chapter I). NRC does provide some requirements for the management of high-level waste in Title 10 CFR Part 60, 2-25-81, Disposal of High-Level Wastes in Geologic Repositories and in Title 10 CFR Part 72, 8-19-88, Licensing Requirements for the Independent Storage of Spent Nuclear Fuel and High-Level Radioactive Waste.

23. DOE's disposal of high-level waste is subject to NRC regulations.

No response needed.

24. DOE requirements for the disposal of low-level waste are similar to NRC's regulations. However, the NRC regulations are more specific in terms of waste classification.

Both NRC and DOE requirements for low-level waste disposal provide for similar protection from the disposed waste. The performance objectives for the two organizations are similar. For NRC regulated disposal facilities, the annual dose must not exceed an equivalent of 25 mrem to the whole body, 75 mrem to the thyroid, and 25 mrem to any other organ for any member of the public. DOE limits the annual effective dose equivalent to 25 mrem to any member of the public.

Both organizations require the preparation of an all pathways analysis (performance assessment) to provide reasonable assurance that the above performance objectives are met.

NRC has developed a waste classification system which imposes additional requirements, such as waste form stability and depth of disposal, which are dependent on the level of radioactivity in the waste. The waste classification system was developed based on the types of wastes regulated by NRC and for an intruder scenario only. Additional restrictions may be put on certain waste types or classes if the performance assessment indicates that they are necessary. DOE decided against developing or adopting a waste classification system. Instead, the criteria for waste form, depth of disposal, types of waste allowed, etc., are determined on a site-specific basis and must be justified by the performance assessment.

Emergency Planning and Preparedness

25. DOE Orders call for developing, with the Federal Emergency Management Agency (FEMA), scenarios for use by DOE facility operators and state and local governments in exercising radiological emergency plans. NRC requires formal concurrence with FEMA that emergency plans are adequate and capable of being implemented. NRC also requires an independent periodic review of the emergency plans; a similar requirement is not provided in the DOE Orders.

The DOE requirement cited was excerpted from a July 1990 draft DOE Order which has since been changed to have the Heads of Field Elements assist state,

tribal, and local governments in the development of emergency plans when the Emergency Planning Zone extends beyond DOE site boundaries. This assistance is to be provided in coordination with appropriate Federal agencies, such as FEMA. The need to ensure coordinated planning and response activities is recognized explicitly in the current drafts of DOE Order 5500.1B, 5500.2B, 5500.3A, and 5500.10, which all contain provisions for coordination of emergency plans with Federal, state, tribal, and local emergency response organizations. These Orders also contain provisions for requesting and accommodating participation by other organizations in emergency exercises. The current drafts of the DOE Orders, cited above, also require annual updates of emergency plans, with corresponding coordination and approval, and the preparation of 5-year emergency readiness assurance plans, which describe activities, accomplishments, plans, schedules, and budgets.

DOE emergency plans are comprehensive relative to radiological and non-radiological hazards expected at each facility. Emergency plans within the Department are subject to approval by each level of line management, culminating in approval by the Program Secretarial Officer. In addition, independent oversight of emergency plans is provided by the Office of Nuclear Safety and the Office of the Assistant Secretary for Environment, Safety, and Health. These two offices were established by the Secretary to independently overview the nuclear and nonnuclear aspects of all DOE operations. They report directly to the Secretary and have no programmatic responsibility.

With the implementation of the requirements contained in the new and revised DOE 5500 series Orders identified above, and the continued involvement of the independent oversight organizations within the Department in the review of emergency plans and other emergency management activities, the Department has no need for entering into a special arrangement with FEMA to provide concurrence on emergency plans.

26. The DOE Orders do not contain an integrated, full-scale exercise requirement describing the scope and frequency of emergency drills and exercises at DOE facilities. The NRC requirements are as follows: one full-participation exercise prior to full-power license issuance; and annual onsite exercises, in which state and local authorities must fully participate biennially, and local authorities from all states within the potentially affected area must participate every seven years.

Draft DOE Order 5500.3A, "Planning and Preparedness for Operational Emergencies," which is currently being finalized, contains specific requirements for a coordinated drill and exercise program as an integral part of the Department's overall emergency management program. One of the requirements in this Order calls for each DOE facility to conduct a full-participation exercise annually. Federal, state, tribal, and local regulatory and/or emergency response organizations must be offered the opportunity to participate in these exercises, and participation must be accommodated when requested.

Safety Issue Identification, Notification, and Resolution

27. DOE requirements in this area are generally comparable to NRC.

No response needed.

28. The DOE program for identifying, prioritizing, and resolving generic safety issues does not appear to be as structured and formal as that of NRC.

The response to this conclusion will be in two parts, the first dealing with the Department's Safety Concern Management System and the second dealing with occurrence reporting. The diversity of the Department's facilities normally mitigates against the development of a large number of generic safety issues.

In regard to the Department's Safety Concern Management System, the Department prepared a draft DOE Order in CY 1989 which has undergone extensive review. In addition the Department has prepared a Notice for Proposed Rulemaking on "whistle-blower" protection which was published in the Federal Register on March 13, 1990. The Department expects to issue a DOE Order on the Safety Concern Management System in CY 1991. This Order details the Department's process in identifying, prioritizing, and resolving safety issues which are discovered anywhere in the DOE complex. As noted in the MITRE report, this program is extensive. Improvements in more recent drafts of the Order provide a more structured and formal approach to how the Department processes and resolves these safety concerns.

In terms of occurrence reporting, the Department issued DOE Order 5000.3A, "Occurrence Reporting and Processing of Operations Information," on May 30, 1990. This Order documents the Department's requirements for occurrence categorization, notification, reporting, and follow-up (root cause identification and corrective actions). The process requires line program management involvement in the follow-up of the occurrences in terms of root cause identification and in assuring that corrective actions are appropriately identified, resources applied, and actions completed. Monthly status reports of outstanding corrective actions are required to help assure tracking of all actions to completion.

29. DOE does not explicitly define an unusual occurrence of major significance that requires "prompt reporting" to the appropriate Program Secretarial Officer.

DOE Order 5000.3A and the proposed Rule and Safety Guide on occurrence reporting now indicate that Program Secretarial Officers or their designees (program managers) must be notified of all unusual occurrences verbally within 2 hours of categorization of an event/condition and formally notified, in writing, within 24 hours.

30. DOE does not provide a mechanism, such as NRC's process for "Differing Professional Opinion," for the consideration of dissenting views on decisions or responses to safety issues.

In regard to safety issues identified through the occurrence reporting system, both the DOE Order and proposed Rule/Safety Guide on occurrence reporting explicitly provide for input by Department personnel which may differ from the

action/direction that the Department/contractor proposes for a particular event/condition.

The Department is developing a Safety Concern Management System program that will consider the need for a separate "Differing Professional Opinion" process.