

Regulatory Challenges and Plans for the Year Ahead

by

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I appreciate the opportunity to speak to the EFCOG Executive Council today. I was asked to address *Regulatory Challenges and Plans for the Year Ahead*. In order to discuss challenges to the DOE regulatory framework and plans for the year ahead, it is important to discuss the DOE directives program, the Board's role, where the program was when the Board was established, how it has evolved, and where the Board believes it should go.

When Congress established the Board, objectives for the Board included: *to assist DOE's development and implementation of appropriate and operationally meaningful safety standards (including orders, regulations and requirements) at defense nuclear facilities*. Congress challenged the Board and DOE to achieve the safety goal of comparability between DOE standards and those applied to commercial facilities.

Congress highlighted the importance of this function by listing it first among the Board's duties in the Board's enabling legislation. This amendment to the Atomic Energy Act provides that the Board shall perform the following functions:

The Board shall review and evaluate the content and implementation of the standards relating to the design, construction, operation, and decommissioning of defense nuclear facilities of the Department of Energy (including all applicable Department of Energy orders, regulations, and requirements) at each Department of Energy defense nuclear facility. The Board shall recommend to the Secretary of Energy those specific measures that should be adopted to ensure that public health and safety are adequately protected. The Board

shall include in its recommendations necessary changes in the content and implementation of such standards, as well as matters on which additional data or additional research is needed.

The basis for the Board's standards function, and the priority given to it by Congress, arose from the common understanding that DOE's defense nuclear facilities lacked an effective standards-based program for safety assurance. In the 1940s and 1950s, during the infancy of both commercial and defense applications of atomic energy work proceeded using safety measures and programs developed on an ad hoc basis for specific projects.

During the 1960s, operators of commercial atomic energy plants followed the lead of the Naval Nuclear Propulsion Program and began a strong move toward use of written standards. This move may also have been dictated in part by the realization that licensing of commercial facilities imposes a burden of proof which is difficult to satisfy without a solid reference base of written safety standards.

By the time of the Board's creation in 1988, the lack of an effective standards-based safety program within DOE had been made known to Congress through a variety of studies and assessments. At that time, the Department had an assemblage of "orders," many of which were out-of-date, poorly drafted, and haphazardly imposed upon operating contractors. In its first annual report to Congress, the Board noted the root causes for these deficiencies:

The reasons . . . include: lack of understanding among DOE managers of the importance of standards to safety; resistance

by national laboratories and contractors to the use of standards; and lack of authority over DOE field offices by appropriate DOE officers in Headquarters.

This situation, and the emphasis of the Board's enabling legislation on standards development and implementation, led to the issuance of Recommendation 90-2 shortly after the Board commenced operations. This was followed by Recommendation 91-1 and 94-5, also relating to standards.

Standards development requires a technically competent, dedicated headquarters organization, while standards implementation requires similarly competent organization at headquarters, the field offices, and the contractors, plus an aggressive oversight, inspection and enforcement program. These tasks cannot be completed absent continued commitment by DOE management at the top level.

The Board and DOE have expended a tremendous number of resources working through the standard challenges and have made significant progress establishing a standards-based directives program for assuring safety as envisioned by Congress when they established the Board. True, the program is not perfect, but at least in the area of nuclear safety the directives set is acceptable, with one exception – standards on integrating safety into the design process. This is an area that continues to demand Board attention.

As stated above, the Board's enabling legislation requires that it review the design of new DOE defense nuclear facilities before construction begins and recommend to the Secretary of Energy, within a reasonable time, any modifications of the design the Board considers necessary to ensure adequate protection of the public

health and safety. The Board has worked with DOE to carry out this legislative mandate since 1989, and in so doing has reviewed a large number of DOE design and construction projects .

The Board has consistently stressed the need for a conservative hierarchy of safety controls to prevent and mitigate the hazards in defense nuclear facilities—prevention of accidents and their consequences rather than mitigating the consequences; and passive controls rather than active controls. Integrated safety management (ISM) principles have been key to this effort. However, methods and protocols to implement ISM into design of hazardous facilities are not addressed as a DOE policy and have not been well defined in DOE directives.

As the total project costs increased and schedules slipped for many DOE projects—in particular the Waste Treatment Plant at the Hanford Site and the Salt Waste Processing Facility at Savannah River Site, there was a perception held by many, including members of Congress, that slow resolution of safety-related issues was the primary cause. In considering this criticism, the Board believed that further consideration of integration of safety into the design process was appropriate.

The Board has held three public meetings focusing on the integration of safety into the design process. On December 7, 2005, the Board held its initial public meeting, during which the Deputy Secretary committed to address fundamental concerns with the integration of safety into the design process. These expectations were summarized in the Deputy Secretary's opening statement to the Board and included the following:

- Identifying and resolving safety issues as early in the design process as is practical.
- Revising DOE Order 413.3 to better address safety during design.
- Improving project staffing and training of Federal Project Directors.
- Involving the Chiefs of Nuclear Safety in the design development process in an oversight role.

On July 19, 2006, the Board held a second meeting focusing on the progress DOE had made in implementing the Deputy Secretary's safety-in-design initiative. Since this public meeting, DOE has completed its revision of DOE Order 413.3, *Program and Project Management for the Acquisition of Capital Assets*. However, the new Order will not be implemented until DOE has completed the accompanying standard, DOE-STD-1189, *Integration of Safety into the Design Process*. This standard is being developed to address the Order's safety-in-design objectives. DOE is also in the process of developing supplemental guides in support of DOE Order 413.3. These guides replace the existing DOE manual, DOE M 413.3-1, *Project Management for the Acquisition of Capital Assets*. The content of each guide is under development.

Issuing the new Standard 1189 and implementing the new DOE Order 413.3A are important to achieve DOE's safety-in-design objectives outlined in the December 2005 public meeting and to move towards a more standards-based approach to the design process. Again, at this time, DOE has not yet issued this standard.

The Board has made several observations on early integration of safety into the design process that fall into four categories.

- *Design maturity.*

The maturity of a design must support sound safety-related decision making. With a goal to identify safety-related issues early, essentially at the end of conceptual design, the design must be sufficiently mature to allow a reasonable evaluation of the adequacy of safety systems at this point in the design process. The current draft of Standard 1189 will achieve this level of maturity if implemented properly.

- *Rigorous implementation of directives.*

DOE needs to consistently and rigorously implement its directives. Project personnel routinely tailor the project management process to suit a variety of needs and on some occasions have chosen to not follow the formal DOE Order 413.3 critical decision process. For example, it is common for projects to combine critical decisions. The reality of this decision, from a design perspective, is that decisions are made using incomplete design information. For projects to consistently develop designs that support sound decision making, the processes outlined in DOE Order 413.3 should be followed rigorously.

- *Technically strong integrated project teams.*

The integrated project teams must be technically strong with appropriate capability consistent with the technical complexity of the respective project. Integrated project teams must be formed earlier in a project's life in order to ensure that the project is managed well from the outset and that adequate oversight, from within the project, is provided.

- *Sound design process.*

The design process must be technically sound. The Board has frequently observed that critical aspects of the design are not developed properly during the early stages of design. The best examples are the consistent problems encountered in developing the seismic design criteria. Further, the geotechnical studies needed to support early design decisions have not been completed, or they have been performed improperly. These problems have led to considerable cost and schedule impacts on the Salt Waste Processing Facility and Waste Treatment Plant designs.

In some projects, the level of desired maturity cannot be achieved due to technical uncertainties, unknown conditions or new process development; these technical areas need to be highlighted in the project's risk management plan with a clear plan for their timely resolution.

However, some of the issues frequently noted by the Board will not necessarily be eliminated by these directives. The Board will continue to encourage DOE to develop a nuclear facility design guide that outlines acceptable approaches and further elaborates on design expectations for new defense nuclear facilities. This design guide would delineate standard design practices common to all defense nuclear facility design projects such as siting standards, standards for geotechnical investigations, structural design practices, expectations for design descriptions of safety-related systems, and components. DOE should take an aggressive approach to act on what is working and what is not in the design process; a design guide would be a good place to capture these lessons learned.

As I look to the future and to the Board's plans for the year ahead, it is clear that the Board will continue to place keen attention on the directives related to safety in design in an effort to put in place a standards-based approach to this critical activity.

In addition, as many of you are probably aware, there is a large initiative to review most of the safety directives under the stewardship of the Office of Health, Safety and Security to ensure the directives are aligned with the Secretary's principles governing DOE's directives. As stakeholders, many of your organizations are involved in this initiative. The Board understands the broad principles outlined in the Secretary's September 10th, 2007 memorandum; however, there are several cautionary notes I would like to make that are important to keep in mind as this effort moves forward.

First, the Board understands the motivation for this initiative. However, the Board cautions against actions that would cause DOE's safety assurance program to be diminished or that would lead the public to perceive a decreased emphasis on safety in DOE operations.

Second, DOE has made many changes to its safety regulation scheme over the years. On the basis of extensive and detailed reviews by technical experts from both the Board and DOE, Orders and Manuals were reduced to contain only high-level safety expectations, which are generally applicable to most of DOE's defense nuclear work. More explicit "how-to" or process-related direction was extracted and placed in Guides and Standards. The structure of DOE's Directives System implies that many or most of the safety expectations set forth in Orders and Manuals should be included as safety requirements in contracts. DOE directives issued

as Guides or Standards were presumably intended to be optional or replaceable by equivalent industry standards. The core safety practices retained in Rules, Orders, and Manuals, which have evolved throughout the years in response to lessons learned, should remain relatively constant and changed only for cause.

Finally, DOE continues to emphasize the use of "performance-based" requirements that stress what is to be accomplished instead of prescribing how to accomplish a task. Contract requirements that clearly define mission expectations in the form of end products or results to be delivered have much merit and should be encouraged. However, DOE is cautioned to move slowly in replacing well-established safety practices developed by the national and international nuclear safety community with general, performance-based safety objectives in the name of eliminating "needlessly burdensome" requirements.

Thank you.