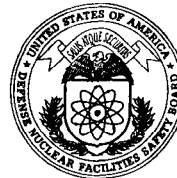


John T. Conway, Chairman  
A.J. Eggenberger, Vice Chairman  
Joseph J. DiNunno  
John E. Mansfield

# DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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March 29, 2002

The Honorable Spencer Abraham  
Secretary of Energy  
1000 Independence Avenue, SW  
Washington, DC 20585-1000

Dear Secretary Abraham:

The Defense Nuclear Facilities Safety Board (Board) is aware of the Department of Energy's (DOE) strong interest in performing its mission more cost-effectively. In the mid-1990s, DOE and its contractors undertook a major effort to change the fundamental structure of DOE's Safety Directives System to reduce the system's burden and cost. Prior to this initiative, DOE's safety directives were extensive, attempted to cover all potential applications, and were often captured wholesale in a contract. The intent was for the requirements to be tailored to specific work through use of the exemption process to screen out inapplicable requirements. This approach led to large DOE Orders with hundreds of requirements that were difficult to manage. In addition, as a result of real or perceived impediments to obtaining exemptions, DOE's contractors had difficulty tailoring the requirements to specific scopes of work and particular hazards. The result was a safety requirements scheme that was considered burdensome and wasteful.

As Integrated Safety Management (ISM) was developed and implemented beginning in 1995, DOE replaced its old system with a new one that could be considered based on a "bottom-up" approach. Directives were revised so that only a relatively small set of high-level safety expectations—ones generally applicable to most work—remained in the Orders and Manuals. Other safety requirements and guidance from the previous Orders were transferred to Guides and Standards. As before, none of the direction from DOE (other than requirements in Regulations) is binding on contractors unless it is included in their contract. However, the intent under the new system was for DOE's contractors and the Contracting Officers to use the Work Smart Standards program or the Standards/Requirements Identification Document (S/RID) process to select a set of safety requirements that would be well suited to the work at hand. Those safety expectations, regardless of their original source, would then become contractually binding safety requirements. This list is referred to as "List B" in Section 970.5204-2 of the Department of Energy Acquisition Regulations (DEAR). List B is used in conjunction with 10 Code of Federal Regulations (CFR) 830, *Nuclear Safety Management*, to form the nuclear safety requirements for the contractor.

The bottom-up approach for determining contract requirements relies much more heavily on the technical abilities of the DOE personnel involved than was the case with the previous system because the new approach starts with a minimum set of requirements that usually is inadequate, and relies on DOE managers and contractors to add others to produce an appropriate set of safety requirements. Perhaps for this reason, many of the current DOE Orders include

extensive and sometimes overlapping responsibilities for DOE managers, along with numerous requirements for internal and external oversight. Recently, senior DOE leaders have concluded that this approach has not been as successful as desired in reducing burdens and excess costs.

The Board is aware of two related but separate assessments of existing requirements: one led by Dr. Robert Kuckuck, focusing on contractors that report through the Under Secretary for Nuclear Security and the Administrator of the National Nuclear Security Administration; and one led by Mr. Richard Hopf, focusing on contractors that report through the Under Secretary for Energy, Science and Environment. In keeping with its statutory requirement to review the adequacy of DOE's safety standards, the Board has been reviewing proposed changes in safety-related Orders being considered by the team led by Mr. Hopf. To date, the Board has reviewed proposed changes under consideration for 19 directives of interest to the Board. Our detailed comments relative to these proposals are enclosed. Relative to this initiative as a whole, the Board has the following comments:

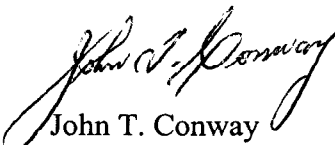
- The Board understands the motivation for this initiative. However, the Board cautions against actions that would cause DOE's safety assurance program to be diminished or lead the public to perceive a decreased emphasis on safety in DOE operations.
- DOE made a major change in its safety regulation scheme approximately 5 years ago. 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. These requirements complement those established in the Nuclear Safety Management Rule. As DOE stated in the *Federal Register* notice for the Interim Final Rule (Part 830): "DOE Orders for other nuclear safety management topics such as maintenance, training, conduct of operations, defect identification, and occurrence reporting, will be retained so that the applicable and appropriate requirements of the orders can continue to be referenced in contracts" (65 FR 60292, 60302-60303, October 10, 2000). 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.
- DOE is in the process of moving to delegate more responsibility for contract development and administration to its field managers. The Board does not believe the field offices as currently staffed have the internal expertise needed to negotiate a "necessary and sufficient" requirements set. Past experience, as noted in the Board's letters of June 3, 1998, and April 28, 1998, on the Work Smart Standards process, has

demonstrated the need for DOE to augment field resources with subject matter experts to assist in this exercise. Achieving reasonable uniformity in DOE's contract terms and conditions may necessitate the deployment of a special DOE-Headquarters team, supplemented as needed by outside experts, to assist the field managers, as has been done for ISM Verification Reviews and Operational Readiness Reviews.

- Federal employees are bound by the requirements in the DOE Orders and Manuals. If in fact an Order requires inefficient processes or is overly prescriptive in describing actions and responsibilities of federal employees (e.g., requiring multiple layers of reviews with similar scope prior to a decision), that Order may impose indirect burdens and costs on DOE's contractors. Since all requirements for federal employees in DOE's Orders are mandatory and applicable to all federal positions and organizations specified in the Order, it may be more worthwhile for the current Order review to focus on DOE processes and the roles and responsibilities of DOE's employees rather than on requirements intended to be levied on the contractors.
- DOE is currently emphasizing 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.

The enclosure to this letter provides the Board's more detailed comments on DOE's Order review. Please contact me if you have any questions on this matter.

Sincerely,



John T. Conway  
Chairman

c: The Honorable Robert Gordon Card  
General John A. Gordon  
Mr. Mark B. Whitaker, Jr.

Enclosure

**Enclosure**  
**Comments of the Defense Nuclear Facilities Safety Board on the**  
**Department of Energy's Order Review**

**General Observations**

1. The requirements review of the Hopf team focused on the Contractor Requirements Document (CRD) portion of the Orders. This is a narrow focus that offered the least promise of identifying burdensome provisions, and that, in effect, was the outcome of the review. However, many Department of Energy (DOE) Orders are predominantly a statement of functions and responsibilities for the federal workforce. A systematic review of these Orders should have been performed to identify overlaps, needless administrative processes, or requirements that are being ignored. For example, DOE Order 414.1A, *Quality Assurance*, requires that each Program Secretarial Officer (PSO) establish a Quality Assurance Program (QAP) for work performed by his/her organization. The Defense Nuclear Facilities Safety Board (Board) notes that this Order has been in effect since September 1999, and its predecessor—DOE O 5700.6C, published in August 1991—contained a similar requirement. To the Defense Nuclear Facilities Safety Board's (Board) knowledge, however, no PSO QAP has ever been approved. A critical review of all health and safety Orders from this perspective might prove beneficial.
2. The review to date has been focused too narrowly on the reduction of requirements. More objectively, the review could have benefited from consideration of appropriate additions to the requirements set. For example, in 1999 the National Research Council (NRC) published *Improving Project Management in the Department of Energy*, which was updated in 2001. The NRC made a number of recommendations for strengthening DOE's policies and procedures for project management. The review of DOE Order 413.1, *Program and Project Management for Acquisition of Capital Assets*, could well have considered the need for changes to reflect the NRC's recommendations.
3. The Orders themselves represent but a small portion of DOE's Directives pertaining to safety and administrative practices. At the last count, there were more than 140 DOE Guides, Manuals, Handbooks, and Standards associated with safety-related Orders of interest to the Board alone. A difficulty faced by contractors and the federal contract managers is the need to screen these guidance documents for pertinence to their operations and either (1) select from them or (2) identify commercial equivalents. A useful exercise would have been to screen all DOE guidance associated with each Order under scrutiny for existing commercial equivalents.

**Order-Specific Observations**

Order Reviewed:                      M 140.1-1B, *Interface with the Defense Nuclear Facilities Safety Board*

Recommendation of  
DOE Team: Retain.

Opinion of Board's Staff: The staff agrees with the review team's recommendation.

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Order Reviewed: O 151.1, *Comprehensive Emergency Management System*

Recommendation of  
DOE Team: Retain; change CRD to capture full range of contractor responsibilities,  
as well as post-September 11 federal Directives.

Opinion of Board's Staff: The staff agrees with the proposed changes.

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Order Reviewed: O 203.1, *Software Quality Assurance*

Recommendation of  
DOE Team: Retain.

Opinion of Board's Staff: The staff agrees with review team's recommendations. The Board's  
staff provided comments on the content of the draft Order to DOE on  
December 19, 2001.

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Order Reviewed: O 210.1, *Performance Indicators and Analysis of Operations  
Information*

Recommendation  
DOE Team: Option 1: Revise the Order, and limit its application to the provision of  
data for a Headquarters performance indicator/operational analysis  
program consistent with and supportive of the project plan from the  
Executive Safety Conference.

Option 2: Cancel the Order now, and reassess the need for this type of  
data when reviewing the Confidential Aviation Incident Reporting  
System (CAIRS) and Occurrence Reporting and Processing System  
(ORPS), which may require some modification.

Opinion of Board's Staff: Option 1 is a logical approach to improving the Directive; Option 2 should not be followed.

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Order Reviewed: O 225.1A, *Accident Investigations*, and G 225.1A, *Implementation Guide for Use with DOE Order 225.1A, Accident Investigations*

Recommendation of DOE Team: Implement the revision to the Order drafted in early 2000, which assigned responsibility for appointing Type A accident investigation boards to the Administrator of the National Nuclear Security Administration (NNSA) for NNSA elements. (The existing Order predated the NNSA organization and assigned this responsibility to the Assistant Secretary for Environment, Safety and Health). The team also recommended elevating Type A convening authority to the Under Secretary for Energy, Science, and Environment in order to provide the same level of management attention for non-NNSA elements.

Opinion of Board's Staff: The staff agrees with the review team's recommendation.

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Order Reviewed: O 231.1, Chg 2, *Environment, Safety, and Health Reporting*

Recommendation of DOE Team: Retain the Order and CRD, but reassess this Order as ORPS (O 232.1) is evaluated.

Opinion of Board's Staff: The staff agrees with the review team's conclusions.

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Order Reviewed: O 232.1A, *Occurrence Reporting and Processing of Operations Information*, and associated Manual M 232.1-1A.

Recommendations of DOE Team: Revise the Order to:

1. Provide timely notification of "significant" off-normal operating occurrences. (Note: Unusual occurrences are not affected.)
2. Change reporting thresholds, and categorize/develop different reporting thresholds for production sites, science laboratories, and closure sites.

3. Remodel the Order into the framework of Integrated Safety Management (ISM), with emphasis on continuous improvement in safety management.

Convene a working group (comprising representatives of DOE–Headquarters, field personnel, contractor personnel, and Environmental Health personnel) to change ORPS to include the above features and integrate it with other DOE reporting systems.

Opinion of Board’s Staff: The Board’s staff agrees with the need to update O 232.1A and ORPS to improve the system and provide more “value-added” reporting. However, less-significant events must still be recorded, trended, and analyzed to identify event precursors. In addition, some reporting organizations may not be fully using the flexibility of the “roll-up” feature provided in the Manual to reduce the administrative burden.

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Order Reviewed: O 251.1A, *Directives System*

Recommendation of DOE Team: Delete the CRD requiring contractors to participate in the development of DOE Directives.

Opinion of Board’s Staff: The staff disagrees with this recommendation and believes DOE should reject it. The Board has observed on many occasions that, at least in the safety arena, it is essential to involve the contractors in the development of Directives. Much of the safety expertise available to DOE resides within the contractors.

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Order Reviewed: O 252.1, *Technical Standards Program*

Recommendation of DOE Team: Retain the Order in its present form. Also retain associated Guide G 252.1-1.

The Team also recommended:

1. Establishing a corporate commercial standards service to improve the availability of voluntary consensus standards.

2. Improving coordination between activities focused on the standards program and development of Directives.
3. Clearly identifying the role of standards management in ISM.
4. Making other changes to enhance the standing of the Technical Standards Manager.

Opinion of Board's Staff:

The staff agrees with the review team's recommendation regarding retention of the Order.

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Order Reviewed:

O 413.3, *Program and Project Management for the Acquisition of Capital Assets*

Recommendation of  
DOE Team:

Retain, with the following changes:

1. Retain and formalize the application of CRD items 1 (reference to American National Standards Institute [ANSI] 748, *Earned Value Management Systems*) and 9 (ANSI 649, *Configuration Management*).
2. Delete CRD items 5, 6, 7, and 8 (prepare critical path method; develop project cost, schedule, baseline, and risk analysis) as overly restrictive.
3. Delete CRD items 11, 12, and 13 (quality assurance per O 414.1, and ISM per DEAR 970-5204-2, *Integration of ES&H into Work Planning*) as duplicative of Orders and regulations.
4. Modify CRD item 4 (status reports) to specify monthly frequency.
5. Review the CRD following issuance of the Office of Engineering and Construction Management manuals.

Opinion of Board's Staff:

Changes 1 and 2 are likely to make DOE oversight more difficult and should not be accepted.

Change 3 does not affect defense nuclear facility projects directly, but is undesirable since it may remove Order requirements related to quality



and safety from some projects with a potential impact on defense nuclear facilities.

Changes 4 and 5 are reasonable; the Board's staff has no objection to them.

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Order Reviewed: O 414.1A, *Quality Assurance*

Recommendation of DOE Team: The Order should be retained.

Opinion of Board's Staff: The staff agrees with the review team's conclusion.

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Order Reviewed: O 420.1A, *Facility Safety*

Recommendation of DOE Team: Retain the Order, revising as needed. Conduct meetings to discuss possible minor improvements.

Opinion of Board's Staff: The staff agrees with the team's report and its responses to the minority view.

The fire protection requirements in O 420.1A are programmatic in nature and far less prescriptive than the requirements in the predecessor Order (5480.7A). Further changes toward generality would be damaging to fire safety. The Board has observed in technical report DNFSB/TECH-27, *Fire Protection at Defense Nuclear Facilities*, as well as in numerous letters, that strong fire protection requirements are necessary at defense nuclear facilities.

O 420.1A and the Implementation Guides for Part 830 appropriately capture the Board's views regarding criticality safety, as reflected in DNFSB/TECH-29, *Criticality Safety at Department of Energy Defense Nuclear Facilities*. This report recommends areas for improvement that can be captured as part of the review team's recommendation.

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Order Reviewed: O 425.1B, *Startup and Restart of Nuclear Facilities*

Recommendation of  
DOE Team: Retain.

Opinion of Board's Staff: The staff agrees with the review team's recommendation.

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Order Reviewed: O 433.1, *Maintenance Management Program for Nuclear Facilities*

Recommendation of  
DOE Team: Retain the Order and CRD without change. A significant number of outside opinions were submitted, all of which were all reviewed and addressed by the review team.

Opinion of Board's Staff: The Board's staff agrees with the review team's recommendation. The development and implementation of an effective maintenance program is a primary cornerstone of safe and efficient operation. This Order establishes an appropriate baseline of requirements and affords the flexibility desired from a graded approach.

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Order Reviewed: O 440.1A, *Worker Protection Management for DOE Federal and Contractor Employees*

Recommendation of  
DOE Team: Retain the Order, revising as needed to include minor improvements, reduce redundancies with 29 CFR 1910.1096 on radiation safety, and incorporate biohazards.

Opinion of Board's Staff: The staff agrees with the review team's recommendation. The team's report and the Office of the General Counsel's (OGC) (Henderson) response to the OGC's (McRae) views are correct.

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Order Reviewed: O 452.1B and 452.2B, *Nuclear Explosive and Weapons Surety Programs*

Recommendation of  
DOE Team: No changes are needed.

Opinion of Board's Staff: The staff agrees with the review team's recommendation.

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Order Reviewed: O 460.1A, *Packaging and Transportation Safety/Packaging*;  
O 460.2, *Departmental Materials Transportation and Packaging Management*; and O 461.1, *Transfer or Transportation of Materials of National Security Interest*

Recommendation of DOE Team: In the short term, complete revisions under way for each Order so NNSA will manage its packaging and transportation process independently while allowing reciprocity between NNSA and Environmental Management for the acceptability of package designs. In the long term, consolidate all three Orders. For on-site moves, adopt performance-based standards.

Opinion of Board's Staff: The staff agrees, if NNSA/Environmental Management reciprocity results in a single packaging and transportation standard. More work is needed to improve the clarity and content of pending criteria for on-site transport, as well as of descriptive material on off-site transportation.

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Order Reviewed: O 470.2A, *Security and Emergency Management Independent Oversight and Performance Assurance Program*

Recommendation of DOE Team: Retain; update to address new roles and responsibilities.

Opinion of Board's Staff: The staff agrees with the team's recommendation. The staff will provide comments on the draft Order to DOE.

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Order Reviewed: O 5480.20A, *Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities*

Recommendation of DOE Team: Retain the Order and the CRD.

Opinion of Board's Staff: The staff agrees with the review team's recommendation.