Defense Nuclear Facilities Safety Board

OVERVIEW OF THE BOARD ACTIVITIES IN 2008 RECOMMENDATION 2008-1

Overview of the Board

- Established by statute in 1989 to provide oversight of the Department of Energy's (DOE) operation of defense nuclear facilities.
- Jurisdiction: DOE's defense nuclear facilities.
- Agency powers: the Board can issue recommendations to the Secretary of Energy, review and suggest standards, hold hearings, conduct investigations, and impose reporting requirements, but not issue penalties.

Overview of the Board

- The Board itself consists of five members appointed by the President and confirmed by the Senate.
- Serving members are Dr. A.J. Eggenberger (since 1989), Dr. Peter Winokur, Dr. John Mansfield, Larry Brown, and Joseph Bader.
- Board members are required by statute to be acknowledged experts in the field of nuclear safety.
- Overall Board staffing approximates 100.
- Board maintains site offices and site representatives at six major DOE sites under its jurisdiction.

Overview of the Board

- The Board informs itself by a variety of means: briefings by its own staff, by DOE, and by DOE's contractors; requests for documents and information; input from site representatives; and frequent visits to DOE sites and facilities.
- The Board reports its activities and accomplishments to Congress in an Annual Report and in special reports on topics such as safety issues in design.
- The Board maintains a website (www.dnfsb.gov) and a Public Reading Room at 625 Indiana Ave. NW.

Fire Protection Activities

- Since its inception, the [Board] has closely monitored the [DOE] fire protection program. **It is now established that at many nuclear facilities, fires are the dominant source of risk to workers and the public.** This is especially true at aging facilities and at facilities undergoing decommissioning. In past decades, several major fires have occurred at defense nuclear facilities. While no such fires have occurred in more recent times, this experience should not lead to complacency. A single major fire could result in serious damage to the DOE nuclear program and in the worst case, cause harm to workers or the public.

(DNFSB/TECH-27, June 14, 2000)

Fire Protection Activities

- What the Board's Fire Protection Experts do:
  - Headquarters activities
  - Site Fire Protection Program Reviews
  - New construction reviews

Fire Protection Activities

- Headquarters activities
  - Review and comment on Orders, Standards, Manuals and Handbooks of interest to the Board. (There is a list of all Directives of Interest to the Board on our website.)
  - Specific initiatives
    - DOE's implementation of Fire Protection Performance Metrics

Fire Protection Activities

- Site Fire Protection Program Reviews
  - Hanford Site
  - Idaho National Laboratory
  - Lawrence Livermore National Laboratory
  - Los Alamos National Laboratory
  - Nevada Test Site
  - Y-12 National Security Complex
  - Oak Ridge National Laboratory
  - Pantex Plant
  - Sandia National Laboratories
  - Savannah River Site
  - Waste Isolation Pilot Plant

Fire Protection Activities

- Site Fire Protection Program Reviews
  - Typical review topics
    - Program compliance with DOE Order 420.1B
    - DOE oversight of Contractor activities
    - Results of self assessments - DOE and Contractor
    - Status of fire protection Vital Safety Systems
    - Status of Inspection, Maintenance and Testing activities
    - Status of Emergency Services
    - Specific site initiatives and facility concerns
    - Lessons learned from recent site events
  - Specific agenda developed for each review

Fire Protection Activities

- New construction reviews
  - Detailed reviews of Safety Documentation
  - Current Major Projects
    - Waste Treatment Plant, Hanford
    - Integrated Waste Treatment Unit, INL
    - Chemistry and Metallurgy Research Replacement Project, LANL
    - Device Assembly Facility; Criticality Experiments Facility, NTS
    - Waste Solidification Building, SRS
    - Pit Disassembly and Conversion Facility, SRS
    - Salt Waste Processing Facility, SRS
    - Highly Enriched Uranium Materials Facility, Y-12
    - Uranium Processing Facility, Y-12

Recommendation 2008-1

- On January 29, 2008, the Board, issued Recommendation 2008-1, *Safety Classification of Fire Protection Systems*
- This Recommendation identifies the need for standards applicable to the design and operation of fire protection systems being relied upon as a primary means of protecting the public and workers from radiological hazards at the Department of Energy's defense nuclear facilities.
- Multiple projects in the past eight years have used fire suppression systems as part of the primary means for radiological hazard protection.

Recommendation 2008-1

- As a general matter, fire protection systems in power reactors are not safety-related because they are not relied on to achieve and maintain safe shutdown.
- DOE did not attempt to rely on fire protection systems as safety-class (to protect the public) until the late 1990's.
- First DOE action to take safety credit for fire protection systems involved Savannah River's tritium facilities.

Recommendation 2008-1

- DOE has developed general guidance for safety system classification; this guidance is found in DOE Guide 420.1-1, Nonreactor Nuclear Safety Design Criteria.
- The guide provides design criteria for mechanical, electrical, structural, HVAC, and instrumentation systems — but not for fire protection systems.
- DOE's fire protection guidance documents do not provide design and operational criteria safety-class or safety-significant fire protection systems .

Recommendation 2008-1

- The following DOE projects have or are actively considering the designation of fire protection systems as safety-class or safety-significant:

  - Chemistry and Metallurgy Research Replacement Project, LANL
  - Device Assembly Facility, NTS
  - Building 9212, Y-12
  - Explosive Bays and Cells, Pantex Plant
  - Building 332, LLNL
  - Highly Enriched Uranium Materials Facility, Y-12
  - Uranium Processing Facility, Y-12
  - K-Area Container Surveillance and Storage Capability, SRS

Recommendation 2008-1

- Four specific items recommended:
  - Develop design and operational criteria for safety-class and safety-significant fire protection systems.
  - Use the pending revision of DOE-STD-1066-99 as a starting point to provide suitable guidance for safety classification of fire protection systems. The revision to this standard must incorporate:
    - Design approaches for a variety of fire protection systems, e.g ., automatic sprinklers, gaseous suppression, alarm, detection, and passive barriers, that can be used to achieve safety-class or safety-significant designation.
    - Guidance on technical safety requirements and administrative controls, in areas such as maintenance, tests, and configuration control, so as to ensure the operability of safety-class and safety-significant fire protection systems.

Recommendation 2008-1

- Four specific items recommended:
  - Identify design codes and standards for safety-class and safety-significant fire protection systems and incorporate them into DOE Guide 420.1-1.
  - Modify other DOE directives and standards as necessary to ensure consistency with the new guidance for fire protection systems.

Recommendation 2008-1

- Status
  - The Secretary of Energy accepted the recommendation by letter dated March 19, 2008.
  - DOE is currently in the process of developing an implementation plan.
  - An Implementation Team Meeting is scheduled for Friday 8:00-12:00 to discuss Recommendation 2008-1.

Defense Nuclear Facilities Safety Board

QUESTIONS?