# Department of Energy Interfaces with the Defense Nuclear Facilities Safety Board

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# DNFSB Mission

- The Board provides independent analysis, advice and recommendations to the Secretary to ensure adequate protection to public health and safety at defense nuclear facilities.
  - Identify Department vulnerabilities in design, construction and operations to allow the Secretary to address issues before they become major problems.
  - Review and evaluate the implementation of nuclear safety requirements through investigations, analysis and observations.

# DNFSB Safety Oversight Goals

- The Board's strategic goals are to:
  - Improve the safety of operations
  - Strengthen safety standards
  - **Strengthen safety in the design**, and
  - Maintain excellent communications with stakeholders
- Board responsibilities extend to review design and construction of new facilities and major modifications
  - The Board is currently tracking 15 DOE projects with a projected cost of over $25B
  - Majority of the projects have no ongoing safety issues
  - Two projects have multiple open safety issues
  - One project was cancelled

# DNFSB/DOE Interfaces

- The Board:
  - Levy reporting requirements for DOE elements
  - Has staff permanently assigned to some sites
  - Frequently visits sites and projects
  - Has frequent communications with the Department
  - Holds public hearings
- DOE Responsibilities
  - Fully cooperate with the Board by providing access to facilities, personnel and information
  - Consider recommendations concerning safety and meet commitments

# Safety in the Design Improvements

- Developed the process over time, improvements since 2005 include:
  - The Board provides “project  letters” at CD milestones
  - Changes were made to DOE 0 413.3 as well as developing or changing the supporting guides
  - Development of DOE STD 1189, Integration of Safety into the Design Process
  - The Board provides periodic reports to Congress concerning unresolved safety issues on a project by project basis

# Integrating Safety into Design

| Critical Decision | Report | Reference | Approval Authority |
|---|---|---|---|
| CD-1 (Alternative selection and Cost Range) | Safety Design Strategy | STD-1189 | SBAA and FPD |
| | Independent Project Review | DOE G 413.3-9 | PSO |
| | Conceptual Safety Design Strategy | STD-1189 | SBAA via CSVR |
| | Conceptual Safety Verification Report | STD-1189 | SBAA |
| CD-2 (Performance Baseline) | Technical Ind. Project Review | DOE G 413.3-9 | PSO |
| | Preliminary Safety Design Report | DOE-1189 | SBAA via PSVR |
| | Preliminary Safety Validation Report | DOE-1189 | SBAA |
| | SDS (update) | DOE-1189 | SBAA and FPD |

# Integrating Safety into Design

| Critical Decision | Report | Reference | Approval Authority |
|---|---|---|---|
| CD-3 (Start Construction) | Safety Evaluation Report | 10 CFR 830 subpart B | SBAA |
| | External or Independent Project Review | DOE G 413.3-9 | OECM > $750M<br>PMSO < $750M |
| | SDS (update) | STD-1189 | SBAA and FPD |
| | Prelim Doc Safety Analysis | 10 CFR 830 subpart B & STD-1189 | SBAA via the SER |
| CD-4 (Start Operations) | Documented Safety Analysis | 10 CFR 830 subpart B & STD-3009 | SBAA with SER |
| | SER (update) | 10 CFR 830 subpart B | SBAA |
| | ORR or RA | DOE O 425.1 and STD-3006 | |
| | Code of Record | | |

# DOE Standard 1189

- Provides a nexus to integrate safety into the design for Hazard Category 1,2 and 3 nuclear facilities
  - Emphasizes importance of integrated project teams
  - Develops the safety design strategy early in the design process
  - Allows appropriate and reasonably conservative safety structures systems and components to be selected early in the design process
  - Allows project cost estimates to include the structures, systems and components at early design stages
  - Project risks associated with safety structures, systems and component selection allow for informed risk decision making by the project approval authorities

# Lessons Learned to Implementation of Safety into the Design

- Need for detailed training on STD 1189
  - High level review focusing on the products for managers
  - Project management, safety and engineering design need more details for system integration
- Issues missed in the implementation of the STD
  - Level of hazard analysis (HA) as a function of design stage
  - Nuclear criticality safety not included in HA and controls
  - Risk and opportunity assessments not carried into project risk management plan
  - Security not included in the Safety Design Integration Team (SDIT)
- Need for formality in establishment and activities of the SDIT

# Lessons Learned to Implementation of Safety into the Design

- Project management commitment; designation of a SDIT lead for effective communication between disciplines (safety, design and engineering)
- Importance of a requirements management system
  - Need flow down of functional requirements to design documentation (System Design Descriptions – SDD)
  - Need management of change
  - Don't let the SDDs get out of sync with the safety documentation (SDS, CSDR, PSDR, PDSA)
- Need to assess/validate ability of safety structures, systems and components to provide their safety functions indicated by the hazard analysis
- Key role of the Safety Design Strategy document

# Department Representative's Role

- Facilitates communications and cooperation between the  Department and the Board
- Maintains the corporate safety issues management system tracking Board commitments and actions
- Reviews Department written communications for responsiveness to the Board and provides recommendations as required
- Coordinates Board review comments for Departmental directives of interest
- Maintains a public website for communications and information about the Board interfaces with the Department