OFFICE OF THE INSPECTOR GENERAL

U.S. NUCLEAR REGULATORY COMMISSION

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

Audit of DNFSB's Oversight of Nuclear Facility Design and Construction Projects

DNFSB-16-A-06

July 6, 2016

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DEFENSE NUCLEAR FACILITIES
SAFETY BOARD
WASHINGTON, D.C. 20004-2901

OFFICE OF THE
INSPECTOR GENERAL

July 6, 2016

MEMORANDUM TO: Mark T. Welch
General Manager

Katherine Herrera
Deputy General Manager

Steve A. Stokes
Technical Director

FROM: Stephen D. Dingbaum **/RA/**
Assistant Inspector General for Audits

SUBJECT: AUDIT OF THE DNFSB'S OVERSIGHT OF NUCLEAR FACILITY DESIGN AND CONSTRUCTION PROJECTS (DNFSB-16-A-06)

Attached is the Office of the Inspector General's (OIG) audit report titled *Audit of DNFSB's Oversight of Nuclear Facility Design and Construction Projects*.

The report presents the results of the subject audit. Following the May 25, 2016, exit conference, the Board provided informal comments, which were incorporated, as appropriate, into the report. The Board also elected to provide formal comments, which have been included in Appendix B, "Board Formal Comments," of the report. OIG responses to the formal comments are included in Appendix C, "OIG Analysis of Board Comments," of the report.

Please provide information on actions taken or planned on each of the recommendations within 30 days of the date of this memorandum.

We appreciate the cooperation extended to us by members of your staff during the audit. If you have any questions or comments about our report, please contact me at (301) 415-5915 or Sherri Miotla, Team Leader, at (301) 415-5914.

Attachment: As stated

Office of the Inspector General

U.S. Nuclear Regulatory Commission
Defense Nuclear Facilities Safety Board

OIG-16-A-06

July 6, 2016

Results in Brief

Why We Did This Review

Congress created the Defense Nuclear Facilities Safety Board (DNFSB) to identify the nature and consequences of potential threats to public health and safety at the Department of Energy's (DOE) defense nuclear facilities. The Atomic Energy Act of 1954, as amended, requires that DNFSB review the design and construction of new defense nuclear facilities to ensure the adequate protection of public health and safety during operation. DNFSB provides oversight of DOE defense nuclear facilities as well as those managed by the National Nuclear Security Administration (NNSA). DNFSB provides oversight of design and construction activities at the following sites: Lawrence Livermore National Laboratory, Los Alamos National Laboratory, Nevada National Security Site, Pantex, Sandia National Laboratories, Savannah River Site, Y-12 National Security Complex/Oak Ridge National Laboratory, Hanford, Idaho National Laboratory, and the Waste Isolation Pilot Plant.

According to the DNFSB 2015 Annual Report to Congress, DNFSB is actively overseeing the design and construction of over a dozen new defense nuclear projects with a projected total cost exceeding $25 billion.

The audit objective was to assess the efficiency and effectiveness of DNFSB's oversight of nuclear facility design and construction projects.

Audit Of DNFSB's Oversight of Nuclear Facility Design and Construction Projects

What We Found

DNFSB meets the requirement to oversee nuclear facility construction projects as mandated by its enabling legislation. However, its approach to design and construction-specific oversight is not clearly defined and involved DNFSB staff are not well aligned with respect to their roles and responsibilities.

The audit found that DNFSB's approach to oversight of nuclear facility design and construction projects is not systematic and could therefore be improved. To meet the intent behind its enabling legislation, DNFSB should oversee nuclear construction projects with a consistently applied graded approach that is informed by formalized guidance, training, and lessons learned specific to construction oversight. The audit also identified misalignment between DOE/NNSA and DNFSB regarding identification and communication of significant safety issues.

These conditions potentially affect DNFSB's effectiveness and efficiency as an oversight body. Specifically, there is potential for:

- Non-safety significant issues and safety significant issues to be prioritized equally.
- Risk that potentially safety significant issues will be overlooked as DNFSB staff could limit reviews based on personal experience and knowledge (instead of guidance).
- Previously closed issues to be re-opened.
- DNFSB resources not being used in the most effective and efficient way with respect to construction oversight activities.

DNFSB's non-systematic method for construction oversight also contributes to a diminishing confidence among its stakeholders who perceive DNFSB as contributing to cost overruns, project delays, or stoppages of nuclear facility construction projects.

What We Recommend

The report contains recommendations aimed at strengthening the efficiency and effectiveness of DNFSB's approach to oversight of defense nuclear facility design and construction projects. Recommendations address guidance, training, and lessons learned. The Board agreed with the recommendations but elected to provide provided formal comments, which are located in Appendix B, "Board Formal Comments," of the report.

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ABBREVIATIONS AN ACRONYMS

CFR	Code of Federal Regulations
DOE	Department of Energy
DNFSB	Defense Nuclear Facilities Safety Board
IACTS	Issue and Commitment Tracking System
IAEA	International Atomic Energy Agency
NEA	Nuclear Energy Agency
NFDI	Nuclear Facility Design and Infrastructure
NNSA	National Nuclear Security Administration
NRC	Nuclear Regulatory Commission
U.S.C.	United States Code

I. BACKGROUND

DNFSB's Role and Responsibilities

Congress created the Defense Nuclear Facilities Safety Board (DNFSB) to identify the nature and consequences of potential threats to public health and safety[1] at the Department of Energy's (DOE) defense nuclear facilities. DNFSB's enabling legislation,[2] in part, charges it with periodically reviewing and monitoring construction at defense nuclear facilities and making recommendations to ensure adequate protection of public health and safety. Recommendations are the highest form of input DNFSB provides to DOE and are reserved for issues that DNFSB deems necessary to ensure the adequate protection of public health and safety.

> "The mission of the Board shall be to provide independent analysis, advice, and recommendations to the Secretary of Energy to inform the Secretary, in the role of the Secretary as operator and regulator of the defense nuclear facilities of the Department of Energy, in providing adequate protection of public health and safety…."
> -DNFSB mission statement

DNFSB Coordination with DOE

In accordance with United States Code Title 42 (42 U.S.C.) § 2286c(a) the Secretary of Energy and DOE contractors at defense nuclear facilities are required to cooperate with DNFSB and provide DNFSB with ready access to DOE facilities, personnel, and information DNFSB deems necessary to carry out its responsibilities.

Both DOE and DNFSB recognize the need for clearly delineated roles and responsibilities in order to maintain the effectiveness of each organization in carrying out its respective mission. DOE's policy[3] is to:

- Fully cooperate with DNFSB.
- Provide DNFSB access to information necessary to accomplish its responsibilities.

[1] For the purposes of this report, the term "public" also includes co-located workers at defense nuclear facilities when used in reference to DNFSB's mission to protect public health and safety.
[2] 42 U.S.C. § 2286, et. seq.
[3] DOE's policy per DOE Manual M-140.1-1B, *Interface with the Defense Nuclear Facilities Safety Board.*

- Consider any recommendation(s) and other safety information provided by DNFSB.
- Consistently meet commitments to DNFSB.
- Conduct interactions with DNFSB in accordance with the highest professional standards.

DNFSB and the National Nuclear Security Administration (NNSA)

NNSA was established by Congress in 2000 as a separately organized, semi-autonomous agency within DOE. NNSA is responsible for the management and security of the Nation's nuclear weapons, nuclear nonproliferation, and naval reactor programs. DNFSB provides oversight to NNSA's regulation of the Nation's nuclear weapons and nuclear nonproliferation. Specifically**,** DNFSB's oversight of defense nuclear facilities[4] is limited to (1) production or utilization facilities that are under the DOE Secretary's control or jurisdiction and have a function related to national defense, and (2) nuclear waste storage facilities under the DOE Secretary's control or jurisdiction. These sites under NNSA's purview include:

- Lawrence Livermore National Laboratory.
- Los Alamos National Laboratory.
- Nevada National Security Site.
- Pantex Plant.
- Sandia National Laboratories.
- Savannah River Site.
- Y-12 National Security Complex.

In addition to the NNSA sites, there are three sites under DOE's purview. These sites include:

- Hanford.
- Idaho National Laboratory.
- The Waste Isolation Pilot Plant.

[4] The following are specifically excluded from the statutory phrase "defense nuclear facilities": any activity or facility pertaining to the naval nuclear propulsion program; any facility or activity involved with the transportation of nuclear explosives or nuclear material; any facility that does not conduct atomic energy defense activites; any facility owned by Centrus Energy Corporation (formerly known as the United States Enrichment Corporation); and any waste storage facility developed pursuant to the Nuclear Waste Policy Act of 1982 and licensed by the Nuclear Regulatory Commission.

Map: Defense Nuclear Facility Active Sites[5]

Source: OIG with input from DNFSB

DNFSB Oversight of Nuclear Facility Construction Projects

The Atomic Energy Act of 1954, as amended, requires that the Board[6] periodically review the design and construction of new defense nuclear facilities to ensure the adequate protection of public health and safety during operation.[7] According to the DNFSB 2015 Annual Report to Congress, DNFSB is actively overseeing the design and construction of over a dozen new defense nuclear facilities with a projected total cost exceeding $25 billion.

The Nuclear Facility Design and Infrastructure (NFDI) group, within the Office of the Technical Director, at DNFSB is charged with overseeing the design and construction of nuclear facilities. The NFDI group uses a variety of methods to carry out this oversight function including:

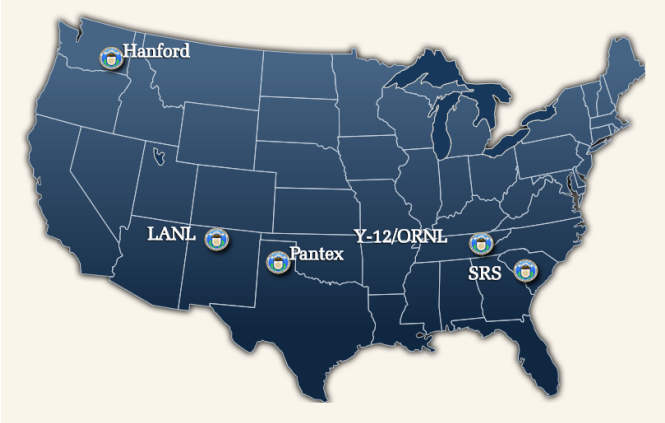
- Performing detailed reviews.
- Participating in public hearings.
- Submitting requests for information to DOE.
- Conducting on-site reviews of construction sites.
- Identifying safety issues.

[5] ORNL/Y-12 is Oak Ridge National Laboratory/Y-12 National Security Complex.
[6] The Atomic Energy Act of 1954, as amended, specifically states "the Board." In this report, "the Board" collectively refers to DNFSB as an organization.
[7] 42 U.S.C. § 2286a(b)(4)

- Tracking DOE's resolution of issues.

DNFSB also relies on its site representatives to perform direct oversight of nuclear safety at the sites including construction activity. Site representatives are DNFSB employees stationed at select defense nuclear facilities. Currently, there are ten site representatives, two stationed at each of the five sites. Site representatives are expected to periodically walk the site, maintain awareness of issues that arise, and observe major defense nuclear facility construction projects. Site representatives also coordinate with DNFSB headquarters staff to adjust their level of oversight of construction projects depending on facility significance, construction complexity, and the number of issues being encountered.

Map: Defense Nuclear Facilities with Site Representatives



Source: DNFSB Web site

II. OBJECTIVE

The audit objective was to assess the efficiency and effectiveness of DNFSB's oversight of nuclear facility design and construction projects.

III. FINDING

DNFSB meets the requirement to oversee nuclear facility design and construction projects as mandated by its enabling legislation. However, its approach to design and construction-specific oversight is not clearly defined and involved DNFSB staff are not well aligned with respect to their roles and responsibilities.

A. DNFSB's Program for Oversight of Nuclear Facility Design and Construction Projects Could Be Improved

DNFSB's current design and construction-specific oversight program is not systematic. DNFSB should oversee nuclear construction projects with a consistently applied graded approach that is informed by formalized guidance, training, and lessons learned that are specific to design and construction oversight. As a result, opportunities exist to strengthen the effectiveness and efficiency of DNFSB's design and construction oversight program and improve stakeholder confidence.

What Is Required

Best Practices for Creating a Strong Nuclear Oversight Program

Recognized best practices pertaining to the oversight of nuclear facility design and construction projects originate from both the international and domestic nuclear industries. Within the worldwide nuclear power industry there is general agreement that a strong and effective nuclear facility design and construction oversight program is systematic. Specifically, it is based on a graded approach and includes the elements of formal guidance, training, and documented lessons learned. Together, these elements help to:

- Establish requirements.
- Develop program objectives.
- Reduce dependency upon individual engineering judgement.

- Efficiently use limited resources.
- Effectively plan for oversight activities.

Graded Approach

A graded approach to construction oversight means that the most important safety related activity, item, service, or process is provided a level of oversight that directly corresponds to its safety significance. A graded approach helps ensure that the most safety significant items are addressed first in oversight activities and helps to prioritize these activities so that an oversight organization's resources are most effectively expended.

Formal Guidance

The International Atomic Energy Agency (IAEA)[8] published safety standards pertaining to the construction of nuclear facilities. These safety standards state the importance of having an established framework, including formal guidance, to facilitate the oversight of construction activities. Formal guidance helps ensure that construction activities and oversight are carried out in a consistent and thorough manner.

The Nuclear Regulatory Commission issued NUREG-1055, *Improving Quality and the Assurance of Quality in the Design and Construction of Nuclear Power Plants: A Report to Congress*, which states the importance of guidance in the oversight of nuclear construction. NUREG-1055 notes that guidance helps identify evaluation criteria as well as facilitate a common understanding among staff of how a construction oversight program should function. Additionally, this guidance provides a logical foundation for applying quality measures to plant structures, systems, and components commensurate with their relative importance to achieving a system objective, such as safety or reliability.

Formal Training

A key element of a systematic method for construction oversight is a formalized training program. Training is a recognized best practice in the nuclear power industry and is cited in United States' statutory law.

[8] IAEA's statute was approved on October 23, 1956, by the Conference on the Statute of the IAEA held at United Nations' headquarters, New York. It entered into force on July 29, 1957. IAEA headquarters are located in Vienna, Austria. Its principal objective is "to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world."

The Nuclear Energy Agency (NEA)[9] recognizes training as a best practice noting, "Each organization needs to understand its role…; what skills, knowledge and experience are necessary to effectively implement this role; the gap between the skills, knowledge and experience of its staff…." Additionally, the Chartered Quality Institute Nuclear Special Interest Group, an international organization focused on quality in nuclear construction, recognizes that training is essential in the nuclear construction oversight process. With respect to the construction process, the Institute states, "Staff participation in training facilitates appropriate levels of qualification and experience such that there is a common understanding of what is important to ensure safety."

Laws contained in the United States Code (U.S.C.)[10] and the Code of Federal Regulations (CFR) [11] recognize the important role training has in an organization's ability to achieve its mission. These laws define training as the process of providing an employee a planned, prepared, and coordinated program of instruction or education in fields, which will improve individual and organizational performance and assist in achieving the agency's mission and performance goals. Heads of Federal agencies are charged to:

- Develop strategies to train employees including developing and maintaining plans and programs that identify mission-critical occupations and competencies.
- Identify competency gaps.
- Develop strategies to close the gaps.

In its Strategic Plan, DNFSB recognizes the need to have adequately trained employees and calls for "…training and qualification of a workforce that is technically competent." Since DNFSB is charged with overseeing nuclear facility design and construction projects, it should ensure that staff performing construction oversight activities are appropriately trained and qualified to perform their job function.

[9] NEA is an intergovernmental agency that facilitates cooperation among countries with advanced nuclear technology infrastructures to seek excellence in nuclear safety, technology, science, environment, and law. NEA is under the framework of the Organisation for Economic Co-operation and Development.
[10] 5 U.S.Code 4103; Title 5: Government Organization Employees; Part III: Employees; Subpart C: Employee Performance; Chapter 41: Training; Section 4103: "Establishment of Training Programs"
[11] Code of Federal Regulations (CFR): Title 10, Part 830 (10 CFR 830), "Nuclear Safety Management," and Title 5 Part 410 (5 CFR 410), "Training" (5 CFR 410).

Lessons Learned

The practice of identifying and documenting lessons learned is another hallmark of a systematic method for overseeing nuclear facility construction projects that is recognized within the worldwide nuclear power industry. The benefits associated with a formalized lessons learned program specific to design and construction oversight programs include:

- Learning from operational experience.
- Identifying best practices.
- Understanding and limiting safety risk.
- Reducing cost and timeliness over-runs.
- Adding efficiency into the design and construction oversight process.

What We Found

DNFSB's Program for Oversight of Nuclear Facility Design and Construction Could Be Improved

DNFSB oversees defense nuclear facility construction projects as evidenced in planning documents such as oversight plans and review agendas. However, DNFSB's approach to design and construction-specifc oversight could be improved by systematizing and aligning organizational and staff-specific communications, roles, and responsibilities in construction oversight activities.

In 2006, Congress directed DNFSB and DOE to report jointly to the congressional defense committees on their efforts to improve the timeliness of issue identification and resolution. Committee members felt that both parties would benefit from a more structured process that would allow significant issues to be raised, evaluated, and adjudicated at logical points in the design and construction process. Therefore, committee members requested DNFSB to consider more frequent use of the formal recommendation process in order to facilitate more structured communications between DNFSB and DOE. In the 2007 joint report to Congress, the two agencies identified "significance and immediacy" as the factors for pursuing formal recommendations. For the period 2005 to 2015, DNFSB has not issued any recommendations directly associated with design and construction safety issues. Additionally, DNFSB focused

on improving the frequency and timeliness of all communications relating to early issue identification and resolution. In 2015, DNFSB, DOE, and NNSA agreed to review the processes by which DNFSB interacts with DOE to identify potential safety issues in the design and construction of new defense nuclear facilities.

DNFSB staff have not consistently prioritized issues raised to DOE. Subsequently, there is a perception that DNFSB is undisciplined in its communications and inundates DOE with issues ranging in significance.

Adequate protection is not an absolute, but reflects the condition achieved when all necessary measures are being taken in a manner that is consistent with applicable requirements and regulatory process. However, it appears that DNFSB staff pursue "perfection" when reviewing design and construction. Stakeholders perceive DNFSB's non-systematic approach to communications and issue resolution as inefficient, ad hoc, driven by staff interests, and "miss(ing) the mark" with regard to identifying "the major safety concerns." Stakeholders did not question the technical validity of DNFSB's oversight. Yet, some feel that DNFSB staff continuously pursue low level issues. DNFSB's current approach was likened to the adage "If you have a hammer, everything is a nail." Although DNFSB is perceived as seeking perfection, this is not in accordance with DOE's statute.[12] The statute simply states that DOE facilities must operate in a manner to ensure adequate protection for their workers and the surrounding community.

Within DNFSB, there is an inconsistent view on the need for observation of actual construction activities versus document reviews despite the Office of the Technical Director developing workplans. Work plans are approved by the Board and identify prior year and new work that needs to be done. Yet during interviews of 25 DNFSB staff members, management, and Board members, an inconsistent view emerged regarding how the reviews should be done. For example, some interviewees stated that they do not believe observing actual construction activities are as important or as necessary as the paper based reviews of design documents. However, others stated DNFSB's approach should include observation of actual construction activities. Among those who agree that observing construction activities is an important part of oversight, there is misalignment on whether DNFSB should be proactive

[12] DOE Policy, 420.1, *Department of Energy Nuclear Safety Policy, July 2011.*

or reactive in its approach. Specifically, some individuals feel that DNFSB needs to proactively observe and review ongoing construction activities with a high safety significance, in real time, for oversight effectiveness. In contrast, other interviewees feel that DNFSB should be reactive and review construction incidents only after a problem has been identified in the interest of resource efficiency.

There is also misalignment in the roles and responsibilities of site representatives with respect to their participation in construction oversight. For example, among DNFSB staff involved with construction oversight, some view site representatives as essential in DNFSB's approach. In contrast, other staff do not view site representatives as having an important role in construction oversight.

Even within the site representative population there are differing views regarding roles and responsibilities associated with construction oversight. Some site representatives view construction oversight, including observation of construction activities, as part of their job. However, other site representatives do not feel they have an active role in construction oversight and generally only become involved if there is a construction issue or a request for their assistance. This divergence suggests that the role of site representatives in construction oversight is not consistently understood and therefore, may not be aligned with management and the Board's expectations.

Source: DOE Flickr Web site

Within the Nuclear Facility Design and Infrastructure group, the Issue and Commitment Tracking System (IACTS) is used to track issues and

commitments pertaining to design and construction of defense nuclear facilities. Yet, according to the IACTS Handbook, only the *Title* field is required to be completed. The audit team reviewed IACTS and noted that it is inconsistently used by staff. For example, the frequency of staff reviews and updates to entries varies from routinely to infrequently. Management expects staff to consult IACTS to inform the development of review planning documents such as review agendas and lines of inquiry.[13] However, for the most part, staff does not do this.

Why This Occurred

DNFSB Lacks a Systematic Program for Design and Construction Oversight

Recently, DNFSB management recognized the need to align its approach for design and construction oversight. Following are some examples of actions DNFSB management has taken:

- Providing quality assurance training to select staff.
- Hiring staff with experience in performing construction oversight activities.
- Initiating a review of the functionality and use of IACTS.

However, further improvement in systematically aligning DNFSB's approach for construction oversight is needed. With respect to construction-specific oversight, an opportunity exists for improvement in defining and applying a graded approach. With respect to design and construction-specific oversight, opportunities exist for improvement in developing formal guidance and training, and instituting a lessons learned program.

The absence of a clearly defined and consistently applied graded approach, specific to design and construction oversight, contributes to the way DNFSB identifies and continues to pursue certain issues. In some instances, DNFSB staff have identified and resolutely pursued issues based on their personal experience, professional opinion, and knowledge

[13] Review agendas are planning documents drafted by project cognizant engineers at DNFSB in preparation for a review. Lines of Inquiry are contained within review agendas and are questions drafted by DNFSB staff and presented to DOE to obtain additional information on the review subject.

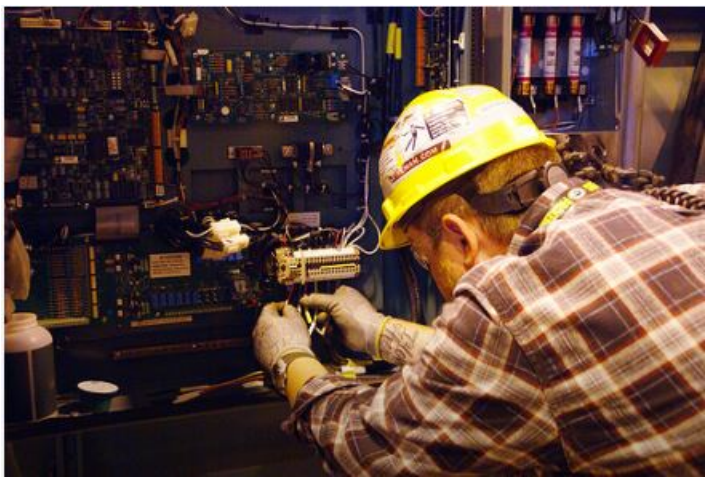
rather than the actual level of safety significance and potential impact to public health and safety. Instances cited by DNFSB Board members and DOE and NNSA stakeholders include issues pertaining to the plutonium facility at Los Alamos National Laboratory and the Waste Treatment Plant at Hanford. This has frustrated the working relationship between DNFSB and DOE and has given rise to the perception that DNFSB staff do not know when to stop pursuing an issue and are not satisfied with attaining adequate protection.

The lack of formal guidance was noted by DNFSB staff and senior management who indicated that it may be a reason for the inconsistency and misalignment in DNFSB's approach to design and construction oversight. Specifically, DNFSB staff and senior management stated that discipline specific review guides pertaining to construction oversight activities, such as quality assurance, would be useful in facilitating alignment and consistency within DNFSB's method for overseeing nuclear facility construction projects.

IACTS guidance does not provide clear expectations for how it should be used to inform review planning for design and construction oversight activities. Specifically, current IACTS guidance does not clearly articulate requirements for field completion and frequency of entry reviews and updates.

DNFSB does not provide or require formal design and construction oversight training. Rather, DNFSB primarily relies on staff-to-staff mentoring, on-the-job training, and self-selection of training. DNFSB recognizes the need for formal training and recently developed a set of draft engineering expectations that describe the knowledge, skills, and abilities to be a successful subject matter expert at DNFSB.

A key component of a systematic approach for design and construction oversight is developing and implementing a lessons learned program. DNFSB senior leadership agrees with the benefits of a lessons learned program and expects that lessons learned are being identified and captured in the interest of knowledge management. However, DNFSB does not have a formal lessons learned program or procedure for identifying and documenting lessons learned specific to design and construction oversight.



Source: DOE Flickr Web site

Why This Is Important

Effectiveness, Efficiency, and Stakeholder Confidence Potentially Compromised

DNFSB's approach for design and construction oversight can potentially negatively affect its effectiveness and efficiency as an oversight body. DNFSB's current approach to construction-specific oversight results in the potential for non-safety significant issues and safety significant issues to be prioritized equally. Due to a lack of design and construction guidance and training, there is a risk that DNFSB staff may limit their reviews to issues related to their personal experience and knowledge, thereby overlooking potentially safety significant concerns. Additionally, without a lessons learned program for design and construction oversight, new DNFSB employees have re-opened issues that DOE staff thought were resolved. As a result, DNFSB's resources are not being used in the most effective and efficient way.

DNFSB's non-systematic approach for design and construction oversight contributes to a diminishing confidence among its stakeholders. Specifically, DOE, NNSA, and congressional staff perceive, that at times, DNFSB is inappropriately, and sometimes repetitively, identifying and pursuing non-safety significant issues in an undisciplined and ad hoc manner. As such, DNFSB is seen as contributing to cost overruns, project delays, or stoppages of nuclear facility construction projects. However, it should be noted that DNFSB's enabling legislation provides that a DNFSB action, or a failure to act, may not delay or prevent the Secretary of Energy from carrying out the design or construction of a facility.

> "The Board places a very high value on making the most of the resources we are granted, since every dollar effectively applied to oversight contributes to ensuring the safety of the American public and the enduring viability of our nation's nuclear deterrent."
>
> -DNFSB Strategic Plan 2014-2018

DNFSB should continue to systematically align its approach for design and construction oversight so that DNFSB staff and stakeholders know and understand the rules of engagement by having a consistent understanding and application of the expectations, roles, and responsibilities associated with oversight of nuclear facility design and construction projects. This will improve the effectiveness and efficiency of DNFSB's oversight through facilitating a consistently and reasonably applied graded approach to identifying and resolving safety significant issues. This will also strengthen the working relationship with DOE and NNSA. Moreover, it will bolster DNFSB's image as a conscientious oversight body focused on protecting public health and safety.

Recommendations

OIG Recommends that DNFSB

1. Develop and implement guidance for construction-specific oversight, which clearly defines a graded approach and includes instructions for its consistent application.

2. Develop and implement design and construction oversight guidance including work practice review guides for construction disciplines.

3. Revise current IACTS guidance to address how it is to be used to inform design and construction oversight activities.

4. Develop and implement a formal design and construction oversight training program.

5. Develop and implement a design and construction oversight lessons learned program.

IV. BOARD COMMENTS

On May 11, 2016, OIG provided DNFSB with a discussion draft of this report prior to the exit conference which was held on May 25, 2016. Subsequently, agency management provided supplemental information via informal written and verbal comments that have been incorporated into this report, as appropriate.

On June 27, 2016, DNFSB management provided formal comments to the draft report that indicated general agreement with the finding and recommendations. Appendix B contains a copy of DNFSB's formal comments. Appendix C contains OIG analysis of DNFSB's formal comments.

Appendix A

OBJECTIVE, SCOPE, AND METHODOLOGY

Objective

The audit objective was to assess the efficiency and effectiveness of DNFSB's oversight of nuclear facility design and construction projects.

Scope

The audit focused on assessing the efficiency and effectiveness of DNFSB's oversight of nuclear facility design and construction projects.[14] We conducted this performance audit at DNFSB headquarters (Washington, D.C.) from October 1, 2015 to April 18, 2016. Internal controls related to the audit objective were reviewed and analyzed. Throughout the audit, auditors were aware of the possibility or existence of fraud, waste, or abuse in the program.

Methodology

The OIG audit team did not at any time question the validity of DNFSB's technical work; however, OIG did thoroughly review the processes used by DNFSB in carrying out its mission.

OIG reviewed laws and regulations to identify criteria for this audit, including, but not limited to:

- Atomic Energy Act of 1954, as amended.
- "Enabling Statute of the Defense Nuclear Safety Board (DNFSB)," 42 U.S.C. § 2286 ET. Seq.
- 10 Code of Federal Regulations Part 830, "Nuclear Facility Management."
- 5 Code of Federal Regulations Part 410, "Training."

[14] For the purposes of this audit, and in accordance with the description provided in DNFSB's enabling legislation, oversight was considered to include safety reviews, which are primarily paper based design reviews as well as construction reviews which include observation of physical construction activity.

- 5 U.S.C. § 4103, "Establishment of Training Programs."
- NUREG-0980, Volume 1, Number 10, "Nuclear Regulatory Legislation 112th Congress; 2nd Session."

OIG also identified and reviewed DNFSB policy statements, operating procedures, information papers, work practices, and DOE orders and standards to identify available guidance relating to the oversight of nuclear facility construction projects. In addition, OIG reviewed DNFSB procedures regarding the tasks and responsibilities required for the oversight of construction of DOE defense nuclear facilities. Lastly, OIG also identified and reviewed recognized best practices pertaining to nuclear facility construction published by the IAEA, NEA, and NRC.

Audit work was conducted by performing fieldwork and interviews with individuals located in the Washington D.C. metro area. For example, the audit team interviewed staff and management at DNFSB headquarters to gain an understanding of roles and responsibilities as they relate to DNFSB oversight of nuclear facility design and construction projects. The audit team also interviewed pertinent congressional staff as well as staff from DOE and NNSA. Additionally, the audit team interviewed NRC staff, located in Rockville, MD., with experience in and knowledge of performing construction oversight activities.

We conducted this performance audit in accordance with generally accepted Government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

This audit was conducted by Sherri Miotla, Team Leader; Jaclyn Storch, Audit Manager; Kevin Nietmann, Senior Technical Advisor; Stephen Morgan, Auditor; George Gusack, Auditor; and Meredith Johnson, Management Analyst.

Appendix B

BOARD FORMAL COMMENTS

DEFENSE NUCLEAR FACILITIES SAFETY BOARD
Washington, DC 20004-2901

June 27, 2016

Mr. Stephen D. Dingbaum
Assistant Inspector General for Audits
11555 Rockville Pike
Rockville, MD 20852

Dear Mr. Dingbaum:

Thank you for the opportunity to review the Office of Inspector General draft report, *Audit of the Board's Oversight of Nuclear Facility Design and Construction Projects*, the first technical project audit we have undergone with your office.

The DNFSB has undertaken significant effort in the last three years to develop procedures for its critical activities, train its employees, and provide greater transparency in how it executes its mission. Examples include:

- In 2014, the DNFSB established formal guidance which is used to prioritize staff and Board identified safety issues.
- In 2015, the DNFSB initiated collaboration with the Department of Energy (DOE) and the National Nuclear Security Administration to enhance their acceptance and response to Board identified issues, strengthen the effectiveness and efficiency of DNFSB's design and construction oversight program, and improve stakeholder confidence. This activity is ongoing.
- The DNFSB has developed a documented work practice with guidance for performing systematic reviews at each phase of design and construction, including conceptual design, preliminary design, final design and construction. Employee training started in May, 2016.

Your recommendations will provide an opportunity to enhance our oversight of the design and construction of DOE defense nuclear facilities. We will work to implement the report recommendations commensurate with the size and scope of our agency and our statute.

Sincerely,

Mark T. Welch
General Manager

Appendix C

OIG ANALYSIS OF BOARD COMMENTS

DNFSB provided formal comments, which are included in Section IV, "Board Comments," of this report. The formal comments identify efforts undertaken by DNFSB in the past three years, including developing procedures, training employees, and providing greater transparency in how it executes it mission.

OIG acknowledges these efforts initiated by DNFSB and feels that the audit recommendations will further strengthen DNFSB's oversight program for nuclear facility design and construction projects.

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COMMENTS AND SUGGESTIONS

If you wish to provide comments on this report, please email OIG using this link.

In addition, if you have suggestions for future OIG audits, please provide them using this link.