Extreme Ownership, Experience of Stakeholders, Owner Led Integrated Project Team, and Ingrained Nuclear Construction Quality and Safety Culture Mentality

Implementation Guidance 03 for NEI 20-08, "Strategic Project Management Lessons Learned & Best Practices for New Nuclear Power Construction"

Executive Summary

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Revision Table

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Executive Summary

Problem Statement: New Nuclear Power (NNP) projects, including small modular reactors (SMR), large light water reactors, heavy water reactors, microreactors, or other advanced reactor projects will have a long developmental lifecycle with multiple steps prior to authorization and construction. These steps include the early conceptual design through final design, licensing, procurement, fabrication, estimating, scheduling, and detailed construction planning. Timelines for First of a Kind (FOAK) NNP projects are lengthy and uncertain, and FOAK elements add to the project's overall risk and uncertainty. Even for Nth of a Kind (NOAK) projects, NNP projects are complex with relatively long timelines. A key challenge for owners and developers of NNP projects will be maintaining focused leadership through what promises to be a lengthy and challenging process.

NEI's Strategic Project Management Lessons Learned & Best Practices for New Nuclear Power Construction (NEI 20-08) identified critical components and key principles of effective project leadership. Through the series of Implementation Guides (IGs), NEI has provided guidance for senior management and executive leadership to build on the key lessons from past nuclear projects in the planning of the next wave of NNP projects to ensure these best practices are incorporated. Simply put, NEI 20-08 provides the "what" and these IGs are the "how."

Relevant Best Practices and Lessons Learned from NEI 20-08 are addressed in Section 2 and Appendix C with recommendations for implementation. While the lessons learned used to develop this guidance come from experience with existing reactors and other sources as noted, this guidance can be applied to SMRs, other advanced reactors, heavy water reactors, micro-reactors, or large light water reactors. All entities using the information in this implementation guide should evaluate these best practices for their own purposes.

Because of the overarching importance of "Extreme Ownership and Leadership from the Top," it will receive significant attention in this implementation guide. This IG #3 focuses on the people who will be needed to manage an NNP project and how to establish a durable accountability structure for planning and executing these projects. IG #3 focuses on the owner's role as acceptance and implementation of all lessons learned flow from Extreme Ownership and top-level Leadership, including:

- Defining and asserting the Owner's role throughout the project
- Ensuring the project's structure, including responsibilities and risk sharing, are aligned with the Owner's priorities
- Establishing a Project Leadership Team (PLT) that is empowered to deliver the project and is accountable for the results
- Utilizing the "Best Athlete" approach to develop an Integrated Project Team (IPT) that accounts for the Owner's role and the capabilities of the vendor partners
- Ensuring that the PLT and IPT have the processes, procedures, tools and resources needed to execute the work
- Ensuring the PLT and IPT have ingrained nuclear quality assurance and safety culture into their daily conduct of the work
- Ingrained Large Nuclear Construction, Quality, and Safety Culture and Mentality
- Experience of Stakeholders
- Managing external stakeholders and interested parties.

Planning and executing an NNP project requires coordination of many corporate and functional groups or stakeholders. NEI 20-08 identifies, "*An owner-led Integrated Project Team (IPT) is the single most important element required for a successful NNP project. The majority of the FOAK projects successfully completed and current active NNP projects have adopted the owner led IPT approach*." Working collaboratively in an effective IPT, that is focused on project objectives can minimize counter-productive silos and improve communication, creating opportunities for a successful project. The Owner-led Integrated Project Team in Section 5 discusses the challenges and provides guidance for successfully evaluating and implementing an IPT.

Dealing with the various groups of stakeholders addresses the levels of experience and understanding of NNP project planning and executing considers the various stakeholder groups and their understanding of NNP projects. Guidance for identifying and creating an effective communication program to "manage" these groups is presented Section 7.6.

Creating an Ingrained Large Nuclear Construction, Quality, and Safety Culture and Mentality drives the behavior of all project participants to create a Safety Conscious Work Environment (SCWE). It is an expectation of the Nuclear Regulatory Commission (and other regulators) for new nuclear plants to have an SCWE focused on the unique concerns arising from ensuring reasonable assurance of adequate protection from nuclear hazards. The existing nuclear facilities throughout North America have this today. Section 7 draws from extensive experience at other facilities and offers guidance for establishing and sustaining an SCWE. Like any large project, an NNP presents numerous other concerns, like industrial safety and financial accountability. A leadership challenge is to police SCWE implementation to remain focused on nuclear safety and not be diluted by other safety and accountability concerns.

IG #3 is intended to be a desktop guide for senior management to identify how to ensure the Owner's priorities for the NNP project are meaningfully asserted and effectively executed. With this goal in mind, IG #3 includes a series of checklists that identify specific actions the Owner's senior management should take to ensure that the goals of Extreme Ownership are communicated and met. These actions are summarized in Appendix A of IG #3.