

Organizational Challenges, Collaborative Contracting Strategies, and Aggressive Risk and Opportunity Management

Implementation Guidance 02 for NEI 20-08, “Strategic Project Management Lessons Learned & Best Practices for New Nuclear Power Construction”

Executive Summary

Revision 1

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Revision Table

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Executive Summary

New Nuclear Power (NNP) projects, including small modular reactor (SMR) projects will have a long lifecycle with multiple steps prior to authorization and construction. The construction of a nuclear power plant, whether First of a Kind (FOAK) or Nth of a Kind (NOAK) is subject to relatively long project schedules and uncertainty, and FOAK construction has additional elements that add to the overall risk. The key to long term economic competitiveness with respect to the deployment of nuclear power plants is making both the design and project execution highly standardized reducing both the project schedule and risk. NEI 20-08, “Strategic Project Management Lessons Learned & Best Practices for New Nuclear Power Construction,” identifies 14 areas of construction best practices, with a total of 59 key construction best practices, that have been critical in the successful execution of large complex projects. Implementation guides (IG) are developed to explain how these best practices can be incorporated into actual new nuclear projects. This IG 02 discusses how to develop contract strategy and collaborative approaches to project delivery and execution together with an aggressive risk management plan to support project success. This approach aligns the objectives of project stakeholders while actively managing risk thereby increasing confidence in the ability to deliver the project to cost and schedule.

Relevant Best Practices and Lessons Learned from NEI 20-08 are addressed in Section 2 and Appendix D with recommendations for implementation. In this guide, these practices are laid out with a focus on organizational structure, approach to contracting and aggressive risk management to ensure a project can be managed to cost and schedule while continuing to reduce uncertainty as a project is executed. 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 both small modular reactors (SMRs) and conventional large light water reactors. All entities using the information in this implementation guide should evaluate these best practices for their own purposes.

The success of any project, in particular a FOAK NNP, will be highly dependent upon the level of transparency, trust, collaboration and integration the project team achieves. Thoughtful consideration should be given to the organizational design that is best suited to enable and deliver this culture. The selection of the project delivery model depends on the intersection of the entity’s core competencies and risk tolerance. Collaboration through use of an Integrated Project Delivery (IPD) model or through another “One-Team” approach aligns the objectives of all key project participants towards project success. This type of model establishes a culture of equality on the project by having the parties equally represented on the Steering Committee and Leadership Teams that oversee the delivery of the project. Regardless of the specific contract model, the project’s culture must be developed and fostered from the top down and tested frequently throughout the lifecycle of the project to ensure it remains intact.

The contract model employed must also reflect the desired culture that is intended through the organizational design (ingrained nuclear construction, quality, and safety culture mentality). This is addressed in IG 03, “Extreme Ownership, Experience of Stakeholders, Owner Led Integrated Project Team, and Ingrained Nuclear Construction Quality and Safety Culture Mentality”). Focus should be given to remove standard rigid clauses and reduce the inherent tensions created through clauses that appear punitive or seek to transfer unreasonable risks given the lack of maturity in scope definition. The contract should be phased to match the gating and sanctioning process that is used to approve the project. This will reduce the level of risk and associated contingency by only having the partners commit and monitored against a cost and schedule baseline that is established based on a much higher level of scope definition (estimating a cost and schedule baseline is addressed in IG 01, “Design Completion and Reliability of Schedule and Cost Estimations to Support Construction Decisions”). Prior to engaging the

market to secure the project partners, the Owner should establish a set of “Principles” and “Key Terms” that it believes aligns to the project goals and will establish the culture that is required for success.

The Risk Management Plan lays out the process of defining how to conduct risk management activities for a project. Nuclear projects are larger, subject to a higher degree of regulation and are generally longer in duration than many other types of projects. A risk management plan starts with risk identification with risks being managed using both a qualitative approach to understand and address the risks, and a quantitative approach to calculate the appropriate contingency to cover the inevitable occurrence of some risks. Risks must be managed throughout the project. Active risk management on an ongoing basis is essential to project success.