

Plant Modernization Benchmarking and Assessment



Nuclear plant modernization supports efforts to maintain and enhance competitiveness in emerging energy markets. The Nuclear Plant Modernization Benchmarking and Assessment Supplemental (PM B&A) provides a forum where nuclear plant owners and operators can:

- **Benchmark their modernization programs through facilitated virtual and in-person exchanges**
- **Share lessons learned, operational experience, and best practices**
- **Collaborate on targeted research efforts**
- **Access EPRI expertise regarding utility and site-specific modernization efforts**

Background, Objectives, and New Learning

Nuclear plants are examining how advanced technologies and enhanced processes could improve plant productivity and efficiencies across functional areas while reducing costs and potentially enhancing plant safety and reliability. These new approaches could represent a fundamental transformation in nuclear plant operation, but achieving their full value will require focused research, development, demonstration, and deployment efforts.

Since 2019, EPRI's Nuclear Plant Modernization program has aimed to develop the technical foundation and analytical tools to support this transformation, culminating in the Plant Modernization Toolbox (PMTB), at <https://nuclearplantmod.epri.com>. The Toolbox aids nuclear power plants in identifying and evaluating cost saving opportunities from technology and process improvements.

Several nuclear plant owners are using these tools to assess the costs and benefits of modernization ideas for their specific circumstances and operating experience.

The PM B&A will establish a modernization peer and benchmarking group, providing participants with modernization insights and guidance, industry-wide operational experience, subject matter expertise, peer modernization benchmarking, and targeted research associated with specific modernization needs.

Benefits

Through the PM B&A, EPRI will provide the following benefits to participants:

- Engagement with modernization peers to discuss and exchange lessons learned and best practices
- Bi-annual workshops
- Quarterly research updates and reviews with PM B&A stakeholders
- One modernization benchmarking assessment per member every three years; scope includes utility-specific modernization improvement and optimization recommendations and benchmarking plus/delta dashboards
- Targeted research projects addressing topics of mutual interest to participants

PM B&A Approach and Summary

PM B&A participants will provide input on planned research projects, scope, and deliverable content. The research topics could include, but are not limited to, business case analysis model examples, modernization technology assessments, and targeted application integration and energy systems common information model research.

The PM B&A will convene at two workshops per calendar year. The workshops will provide a forum for exchanging operational experience and sharing lessons learned and best practices. Additionally, the workshops will allow participants to engage and provide feedback on current research activities.

Modernization Benchmarking Approach and Summary

The modernization benchmarking assessment, performed once every three years for each participant, will be conducted using the framework established in EPRI Product 3002020908, *Nuclear Power Plant Modernization - Strategy Development and Implementation Process*. The assessment will include the following:

- Acquiring and reviewing data associated with the utility's modernization program and outcomes
- Analyzing data and documents associated with the utility's modernization program to prepare a gap analysis
- Determining best practices and lessons learned from the industry applicable to the utility
- Preparing a final benchmark report that details utility progress against industry standards and includes implementation plans to address gaps

The benchmarking assessment will last about 8 to 10 weeks from project kickoff to closeout.

PM B&A Deliverables

The deliverables for this project will include:

- Bi-annual workshops, where lessons learned from industry plant modernization activities will be shared.
- Targeted modernization research projects, such as the development of additional modernization technology assessments, business case analysis model examples, modernization process guide updates, technology and process enabler improvements, and enhancements to the Plant Modernization Toolbox.
- Utility-specific assessment reports summarizing the benchmarking effort and providing recommendations for future actions. The exact scope of the benchmarking effort will be developed in consultation with the participating plant owner. Participants will be eligible for one benchmark every three years.

The non-proprietary results of this work will be incorporated into EPRI R&D Programs and made available to the public for purchase or otherwise

Price of Project

For participating utilities, the annual cost for participation will be \$40,000 per utility for single-site utilities, \$47,000 per utility for multi-site utilities. A three-year commitment is required.

Project Status and Schedule

This project is available for participation beginning in 2022. Initial activities include the formation of the PM B&A group and compilation of research project ideas. Utility-specific assessments will be scheduled in consultation with individual participants.

Who Should Join

Nuclear power plant owners/operators implementing advanced technologies and enhanced processes to modernize and improve plant productivity, reduce operating costs, and potentially enhance plant safety and reliability.

Contact Information

For more information, contact the EPRI Customer Assistance Center at 800.313.3774 (askepri@epri.com).

Technical Contacts

Robert Austin at 980.225.2712 (raustin@epri.com).

Colton Smith at 346.831.1806 (cosmith@epri.com).

Plant Modernization Inbox (nuclearplantmod@epri.com).

EPRI

3420 Hillview Avenue, Palo Alto, California 94304-1338 • PO Box 10412, Palo Alto, California 94303-0813 • USA
800.313.3774 • 650.855.2121 • askepri@epri.com • www.epri.com