

**High Bridge Associates
Selected Experience Narratives
Nuclear & Fossil Power and Science Programs
Planning & Life Cycle Execution – EPC, O&M, & D&D**

September 2019



“Connecting Vision and Plans with Performance and Execution”

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**Selected Project Experience Narratives
Nuclear & Fossil Power and Science Programs
Planning & Life Cycle Execution – EPC, O&M, & D&D**

1. High Bridge Leadership – Construction Planning, Technology Screening, Life Cycle Support
2. TVA Watts Bar #2 – EPC Completion Planning & Project Management Support
3. ITER International Fusion Project (France) – Planning, Scheduling, & Integration
4. Sellafield UK Site - Standard Nuclear Performance Model Implementation
5. Entergy - Nuclear Fleet Sustainability Initiative, Planning & Management Support
6. URENCO LES Uranium Enrichment Plant - Planning & Construction Management
7. NiSource – Gas Capital Investment Program, Generation, Transmission, & Pipeline
8. Southern Company – Non Nuclear Fleet-Wide Project Controls Services
9. The B&W Company - Global Project Management Assessment
10. Dominion Power North Anna #3 NNP - Procurement Planning & Bid Evaluations

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1.A Nuclear Power Planning & Technology Screening EPC, O&M, & D&D - Life Cycle Economic Evaluations LLWR, SMR, & Advanced Reactor Designs & Risks

High Bridge has an extensive data base of nuclear power requirements, scoping, cost, schedule, and risk information developed over the past 30 years:

- Our corporate leadership staff all have over 30 years of nuclear project management experience
- We have compiled Lessons Learned & Keys to Success White Papers on 100's of projects

We have been part of owner/licensee/project teams evaluating technology options & bid proposal economics for LLWR, SMR, & Advanced Reactor Projects including:

- AEP DC Cook Unit 3 – AREVA EPR, GE ESBWR, Mitsubishi US APWR, Toshiba ABWR, & Westinghouse AP1000
- Entergy Grand Gulf Unit 3 - AREVA EPR, GE ESBWR, Mitsubishi US APWR, Toshiba ABWR, & Westinghouse AP1000
- Dominion North Anna 3 - AREVA EPR, GE ESBWR, Mitsubishi US APWR, Toshiba ABWR, & Westinghouse AP1000
- AP1000 Owner's Group – Southern Vogtle 3&4, SCANA VC Summer 2&3, Duke Lee 1&2, FP&L Turkey Point 2 Units, Progress Levy 2&3, Progress Sharron Harris 2 Units,
- TVA Watts Bar 2 and Bellefonte 1&2 – Westinghouse PWR completion
- NuScale and mPower SMR Designs – Various customers & plant locations
- Idaho National Laboratory – Advanced sodium cooled fast reactors, Toshiba 4S & GE PRISM

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1.B Nuclear Power Planning & Technology Screening EPC, O&M, & D&D - Life Cycle Economic Evaluations LLWR, SMR, & Advanced Reactor Designs & Risks

High Bridge provided nuclear industry leadership with managers serving as:

- American Nuclear Society (ANS) committee chairman reviewing SMR licensing issues & preparation of ANS guidance policies for NRC & owner/licensees
- International Atomic Energy Agency (IAEA) project management expert as part of IAEA technical support teams to assist member nation planning & preparation activities for their emerging nuclear power programs

Established High Bridge Energy Development to serve as the owner, licensee, & integrator for developing advanced reactor design applications for hybrid purpose facilities to provide material testing & power generation at the US DOE Idaho National Laboratory:

- Toshiba 4S sodium cooled fast reactor, 2 units each 10 MWE
- GE PRISM sodium cooled fast reactor, 2 units each 150 MWE with AECOM as EPC contractor & Exelon as operating contractor

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1.C Nuclear Power Planning & Technology Screening EPC, O&M, & D&D - Life Cycle Economic Evaluations LLWR, SMR, & Advanced Reactor Designs & Risks

High Bridge is an industry leader in supporting owners/licensees with planning, scope development, risk assessment, & cost estimating for modification of operating commercial nuclear power plants.

- We have prepared over 1,000 cost estimates for modification projects at more than half of the 100 operating US nuclear power plants with estimated project costs ranging from \$0.5 million to over \$500 million

High Bridge is an industry leader in supporting owners/licensees with planning, scope development, risk assessment, & cost estimating for Decontamination & Decommissioning of commercial nuclear power plants.

- High Bridge recent D&D experience includes support for several nuclear power plants including San Onofre, Diablo Canyon, Palisades, Pilgrim, Big Rock Point, and Trojan, as well as DOE experience with decommissioning the gaseous diffusion plants at Oak Ridge.

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2. TVA Watts Bar #2 Completion Planning & Management Support Engineering, Procurement, Construction & Startup

Performed initial assessment of project schedule in spring 2011

Performed follow up assessment, validated engineering/construction scope, & recommended streamlining design package process for construction

Implemented recommendations covering cost control, scheduling, project controls, change management, & engineering work package closure

- Assessed & assisted with developing performance baseline cost estimate and schedule, and with implementation/management support

Mobilized project leadership /construction management organization for completion of the project through our Work Management, Inc. affiliate

- Peaked at >100 personnel at site as part of Owner's Team

Key Lessons Learned - (1) understand license/design requirements to define scope; (2) establish cost & schedule baselines with fidelity to requirements & scope; (3) implement reporting, trending, & change control processes that provides visibility and keeps all contractor/licensee stakeholders accountable & honest.

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3. ITER International Fusion Project (France) Planning, Scheduling, & Integration Support

Provided Owner's Team support 2008 to 2015

- ITER Integrating Organization (IO) is owner/operator/licensee
- 7-nation collaboration with China, EU, India, Japan, Russia, South Korea, & US

Planning, organizing, and scoping definition activities, including development and maintenance of the Program/Project Work Breakdown Structure (WBS).

Program integration, project controls, performance measurement reporting, risk management, and training support activities

Assessed & supported implementation for simplified risk management approach.

- Developed/implemented risk workshops in Japan, China, South Korea, & USA

Assessed/recommended/supported implementation for simplified scheduling/integration approach.

- Assisted with transition from 200,000 activity project schedule to 20,000 activity project schedule

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4. Sellafield UK Nuclear Decommissioning Authority Nuclear Management Partners (NMP) Implementing Standard Nuclear Performance Model

Provided two top-down assessments of all facets of the operating organization including:

- Engineering & Construction
- Operations
- Maintenance
- Work Management
- Outage Management

Supported development of Management Change Plan to implement the INPO Standard Nuclear Performance Model

Provided Change Management Team focused on guiding the implementation of process and culture in the above functional areas.

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5. Entergy Nuclear Fleet Sustainability Initiative Planning & Project Management Support

Performed initial assessment of small to medium size project scope and estimate quality in 2016

Developed plan and proposed a program to provide structure and quality management information on over 1,200 projects

Mobilized project management and control teams for corporate integration and Nuclear Sites specific project scope and schedules

Established schedule standard incorporating planning and approval milestones and activities for projects

Currently developing baseline cost estimates & schedules

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6. URENCO/LES Uranium Enrichment Facility Completion Planning & Management Support Engineering, Procurement & Construction

Provided Owner's Representative support 2006 to 2014

Assessed/recommended/assisted with implementing integrated owner/EPC project team organization & contracting approach

- Identified dysfunctional/silo project organization & assisted with implementing Integrated Project Team approach

Assisted with validating engineering/construction scope

Developed baseline cost estimate

Construction Management at NM site as part of Owner's Team

- Project Manager / Construction managers/superintendents; Field engineering managers/specialists; Procurement managers/specialists; Material managers/specialists; QA managers/specialists (peaked at ~70 staff personnel)

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7. NiSource Gas Capital Investment Program Generation, Transmission, & Pipeline Planning

Mobilized project controls team for the construction & management of multiple Clean Air Program upgrades at Fossil Power Sites

Developed multiple cost estimates for various fossil and hydro power construction projects

Developed and currently implementing standard project cost and schedule processes across the various NiSource business units

Established schedule standards incorporating planning and approval milestones and activities for projects as well resource requirements for future projects.

Currently have approximately 100 employees supporting this Client through our Work Management, Inc. affiliate.

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8. Southern Company Non Nuclear Fleet E/P/C Project Controls Services

Awarded Fleet Project Control Partner contract in 2015 to assist construction planning & execution as part of Owner's Team

Mobilized project controls team for the management of multiple Clean Air & Combustion Coal Residual Program upgrades at Sites

Developed multiple cost estimates for various power projects

Developed and currently implementing a project control training program for all project control positions supporting Southern

Developed and currently implementing earned Value Management processes starting with the Engineering organization and transitioning to Construction

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9. The Babcock & Wilcox Company (non-nuclear) Global Project Management Assessment

Performed Planning & Project Management Assessment in 2016

Addressed five B&W business units:

- B&W Power Segment: Barberton, Ohio
- B&W Construction Co., Inc.: Barberton, Ohio
- B&W SPIG: Arona, Italy
- B&W Volund: Copenhagen, Denmark
- B&W MEGTEC: DePere, Wisconsin

Identified strengths, gaps, & areas for improvement

- Compared skills, procedures, and processes against industry standards
- Provided recommendations & project management best practices
- Recommend information technology related to support systems for the project management

Recommended implementation of enterprise-wide Project Management Organization (PMO) to implement procedures, processes, and training

- Various organization, system, process, & software platform actions

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10. Dominion Power, North Anna #3 NNP Procurement Planning, Bid Evaluations, & Management Support

Provided project management/controls support to Owner Team

Developed proposal pricing/schedule/risk templates for inclusion in Requests for Proposals for NNP OEM/EPC

Performed evaluation/ranking of proposals for price/schedule/risk

Supported Owner negotiations & interactions with proposers

Evaluated/ranked OEM EPC proposed organizations, construction plans, qualifications, & responsiveness

Proposals submitted by Areva Bechtel (EPR), GE URS (ESBWR), Westinghouse Shaw (AP1000), Toshiba Shaw (ABWR), & Mitsubishi URS (APWR)

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