



# POWER & ENERGY CAPABILITIES

*People Building Success*



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## CAPABILITIES

**B**urns and Roe is a full-service engineering, construction, and operations and maintenance firm headquartered in Oradell, New Jersey. With over 1,700 personnel worldwide, we provide comprehensive technical services to governmental and commercial clients. Our experience includes the consulting, design, engineering, procurement, construction and operations and maintenance of domestic and international power projects on time and within budget.

### Proven Results through Innovative Solutions

Burns and Roe is a leading provider of engineering, procurement and construction (EPC) services. Our experience in the power industry has led to the completion of over 170 fossil fueled generating units totaling over 75,000 MW. We have developed processes that result in more cost effective and efficient power plants. Through our wealth of qualified personnel and our diverse experience base, we were ranked as the No. 8 power plant design firm in 2005 by Engineering News-Record.

Our Company's activities encompass the entire spectrum of



Burns and Roe provided engineering, procurement and startup support services the Texas City CHP Project, a 650 MW combined cycle cogeneration plant in Texas.

### Domestic EPC Power

technical and project management services, from project onset through start-up and operation. We bring added value in the area of EPC performance, as well as in the individual areas of engineering, procurement and construction management. As a quality power engineering firm, we have the unique ability to work closely with constructors who have detailed knowledge of the local market conditions. We have helped public and private power generators retrofit their facilities to meet stricter requirements for NO<sub>x</sub> and SO<sub>x</sub> emissions. For both greenfield and repowering projects, Burns and Roe's extensive experience with simple cycle and combined cycle combustion turbine facilities adds value to the current technological preference.

### International EPC Power

Burns and Roe has been active in the international electric power industry since the 1950s. We have experience in evaluating, designing and constructing power plants around the world. This experience includes detailed engineering and design, procurement and construction management services, and power supply planning. We have contributed to the



Burns and Roe performed Engineering, Design and Owners Engineering for the Paiton Private Power Project, 2 x 660 MW units in East Java, Indonesia.

advancement of power and energy technologies in many countries. We are actively involved in international projects for fluidized bed combustion, supercritical coal-fired facilities, advanced gas turbine technology and various other forms of fossil fuel power. Through our affiliated companies in Asia and Australia and our use of the latest information technology, we are able to cost effectively meet the needs of power producers around the world.

## Case Study Westbrook Energy Center, Maine

**Westbrook, Maine** • This gas-fired combined cycle plant consists of 2 GE 7FA gas turbines and steam turbine generator. The plant utilizes two triple-pressure heat recovery steam generators and includes inlet air cooling for the combustion turbines. Burns and Roe provided engineering, design and procurement support services to GE International Power Services on this project.



The Westbrook Energy Center went into commercial operation in September 2001 with a capacity of 540 MW.

### CHALLENGES:

- Perform engineering on a fast track basis to support construction schedule.
- Design high voltage interconnections between plant and utility within a limited space.
- Design a facility capable of operating at peak efficiencies year round with temperature extremes of -20°F to 90°F and the ability to handle large Maine winter snows.

### SOLUTIONS:

- Engineering activities were performed in parallel. Interdisciplinary coordination provided estimated loads for preliminary design of superstructure
- Moved switchyard to transmission line right-of-way. Ran high voltage cables between plant and switchyard in an underground trench system.
- Enclosed the major equipment into a powerhouse building with appropriate ventilation. Gas turbine inlet air chiller system maximizes efficiencies during the warm weather months.

## Burns and Roe Power and Energy Capabilities:

### Consultation and Studies

- Owner's Engineer Services
- Master Planning
- Technical and Economic Feasibility
- Market Surveys and Appraisals
- Site and Subsurface Investigations
- Permits and License Applications
- Environmental Impact Reports
- Fire Hazard Analysis

### Preliminary Engineering

- Site Selection
- Criteria Preparation
- Conceptual Design Studies
- Plant Layout Recommendations
- Cost Estimates
- Environmental Studies
- Logistics
- Planning/Scheduling
- Security Studies

### Plant Retrofit Programs

- Condition Assessments
- Consultation and Studies
- Detailed Engineering and Design
- Construction Services

### Detailed Engineering and Design

- Engineering Analysis
- Specifications
- Bid Analysis
- Final Drawings
- Quality Assurance
- Progress Reports
- Vendor Document Reviews

### Construction Services

- Construction Management
- Planning and Coordination
- Work Supervision
- Resident Engineering
- Material Control and Warehousing
- Progress and Cost Reporting
- Quality Control and Assurance
- Labor and Safety Programs
- As-Built Drawings

### Services to the Financial Community

- Independent Engineering - Due Diligence
- Technical Audits
- Construction Progress Reviews
- Funding Disbursement Certification
- Witness Testing
- Appraisals

### Plant Decommissioning

- Engineering Studies
- Engineering, Design and Construction
- Quality Control and Assurance

### Procurement Services

- Prescreening and Selection of Bidders
- Development of Terms and Conditions
- Negotiations
- Claims Evaluation
- Bid Analyses
- Expediting
- Vendor Surveillance

### Operation and Maintenance

- Plant Start-up
- Acceptance Testing
- Technical Manual Development
- Maintenance Manual Development
- Operating Parameter Documentation
- Operator Training
- Maintenance & Operations Reports
- Plant Operation and Maintenance

## The Burns and Roe Advantage

- As a privately owned and managed company, we offer our customers direct access to the owners of the company.
- Our design tools include the latest in 3-D CADD/CAE technology, allowing for virtual “walk-throughs” and reducing field work.
- We can provide instantaneous changes to digital documents and CADD/CAE drawings from any location worldwide through our project web site.
- Our EPC approach is integrated with the latest information technology to provide global solutions cost effectively and ahead of schedule.
- Our full service procurement and expediting staff insure on time delivery and quality products for outstanding Supply Chain Management.
- We operate and maintain technically complex facilities worldwide through our state-of-the-art Maintenance Management System.

