

CAPABILITIES IN
TRANSMISSION AND DISTRIBUTION



 **Burns and Roe**



*Jackson Road Substation - 45MVA - 230/13kV,
Transformers T3, T4*

Burns and Roe Enterprises, Inc., established in 1932, is a global independent consulting engineering organization devoted to the practices of engineering, design, construction and related support services for the power generating industry. Burns and Roe has been acknowledged for its accomplishments in the engineering, design and construction of power generating stations and associated transmission and distribution facilities. On many of these projects, Burns and Roe responsibilities have expanded to include the ancillary activities vital to developing power projects. These include site selection studies, environmental impact studies, operations and maintenance plans, environmental permitting, financing, and licensing support services. Our power project portfolio includes more than 170 generating units totaling over 70,000 MW of capacity.



Jackson Road Substation- 230kV Disc. Switch

T&D EXPERTISE

Burns and Roe has performed a significant number of substation, switchyard and transmission projects. Many of the more recent projects have been related to the work we have done on Independent Power Producer/Merchant Plant design and construction projects and with tying these new power producers into electric utility systems. Our experience includes the following:

- Layouts and Modifications
- Civil/Structural Design
- Design of Additions and Modifications to Bus Work
- Design of Raceways, Manholes, Grounding, Lighting, and Lightning Protection
- Design of Additions and Modifications to Controls and Relays
- Wiring Diagrams
- Preparation of Documents for State or Municipal Approvals
- Scheduling and Cost Estimating
- Design Support During Construction

Transmission Lines Designed by Burns and Roe

500 kV: 23 miles in Richland, Washington

345 kV: 525 miles in North & South Dakota

230 kV: Nebraska

161 kV: 1 mile in Centertown, Kentucky

69 kV: Belize, Central America

Recent Switchyard and Substation Design Projects

| Client | Plant | Voltage |
|---|---|----------------|
| Public Service Electric and Gas Newark, NJ | Modifications and Expansion to the Athena Switching Station, including two new 550 MVA Auto Transformers Clifton, NJ | 230kV/138kV |
| Public Service Electric and Gas Newark, NJ | Add a new 26kV breaker position and 400amp reactor South Orange Substation South Orange, NJ | 26kV |
| Public Service Electric and Gas Newark, NJ | Add two new transformers 230kV - 26kV, new 26kV sheltered-isle switchgear lineups South Waterfront Switching Station Jersey City, NJ | 230/26kV |
| Public Service Electric and Gas Newark, NJ | Phase I - Add two 26kV breaker positions and 26/13kV substations Essex Switching Station Newark, NJ | 26/13kV |
| Public Service Electric and Gas Newark, NJ | Phase II - Add bank of 138kV - 26 kV Transformers and associated 138kV and 26kV buswork and breakers Essex Switching Station Newark, NJ | 138/26kV |
| Public Service Electric and Gas Newark, NJ | Add two 230/13kV transformers and two 13kV feeder rows. Jackson Road Substation Totowa, NJ | 230/13kV |
| Public Service Electric and Gas Newark, NJ | Add a new 26kV breaker position West Orange Switching Station West Orange, NJ | 26kV |
| Public Service Electric and Gas Newark, NJ | Add one 69/13kV transformer and two 13kV feeder rows Penn's Neck Substation Windsor Township, NJ | 69/13kV |
| Public Service Electric and Gas Newark, NJ | Add a new 26kV breaker position Bayway Switching Station Linden, NJ | 26kV |
| Edison Mission Energy US Mitsui Corporation, Japan | Switchyard at Paiton Private Power Project East Java Republic of Indonesia | 500kV |
| Republic of Ukraine | Switchyard at Lugansk Power Station Ukraine | 220kV |
| Calpine Corporation, CA | Switchyard at Westbrook Energy Center Westbrook, Maine | 115kV |
| Clark Public Utilities, WA | Switchyard at Cogentrix-River Road Generating Station Project Clark County, Washington | 115kV |



*Essex Switching Station
Modification of towers and connections*



*Athenia Switching Station
230kV GCB 71H Load, Side Disconnect View*

RECENT PSE&G PROJECT EXPERIENCE

- 9 projects at 8 stations in Northern New Jersey
- Ranging in voltage from 13kV to 230kV
- Projects included replacement, major expansion and modifications to existing substations
- Layout design
- Civil/structural design including site grading and drainage, equipment foundations and detail design of new and modified steel structures
- Design of new and modifications to existing buswork
- Design of raceways, manholes, grounding, lighting and lightning protection
- Design of new and modifications to controls and relays
- Design of new circuit breakers and transformers
- Preparation of an overall comprehensive schedule
- Provided support for construction
- Participated in on-site construction meetings



*Jackson Road Substation
230kV Pothead Termination*



*Athenia Switching Station
230kV Switch 70J60 Tower*



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