

# Quality

IS THE CENTERPIECE

OF THE VALUE AND SERVICE

WE PROVIDE TO OUR CLIENTS.

IT IS INFUSED THROUGHOUT OUR PEOPLE,

OUR PROGRAMS, AND OUR PROCESSES.

WE BELIEVE THAT IT IS THE QUALITY OF OUR DELIVERABLES

THAT ULTIMATELY DELIVERS OUR CLIENT PROJECTS

**ON SCHEDULE AND IN BUDGET.**

WE'VE BEEN **THINKING POWER... EXCLUSIVELY**

FOR MORE THAN 100 YEARS. THAT'S OUR COMMITMENT

TO WHAT WE DO BEST: COMPREHENSIVE CONSULTING,

ENGINEERING, DESIGN, AND ANALYSIS FOR ELECTRIC

**POWER GENERATION AND POWER DELIVERY**

**PROJECTS WORLDWIDE.**



# THINKING POWER... EXCLUSIVELY

Sargent & Lundy is the company that specializes in professional services for electric power and energy intensive clients. We have been dedicated exclusively to serving the electric power industry and related businesses since the firm began. Our current work is at the forefront of helping companies with their power business needs for today and tomorrow.

We provide complete consulting, engineering & design, project management, project development, and analysis services for all types of fossil-fuel, nuclear, and renewable power generation and power delivery projects. System-wide technical and economic planning. New generation, transmission, and distribution. Improving and troubleshooting existing installations. O&M support. Our comprehensive capabilities provide domestic and international clients and partners with a thoroughly reliable resource for each power project.

**OUR DIVERSE CLIENT BASE INCLUDES VIRTUALLY EVERY TYPE OF PARTICIPANT IN THE POWER INDUSTRY TODAY:**

**Investor-owned and government utilities**

**Developers**

**Industrial complexes**

**Rural cooperatives**

**Municipal and public power systems**

**Regional transmission organizations / ISOs**

**Financial institutions**

**Gas-line and oil companies**

**Government agencies... and others**



For some clients we are their staffs' primary engineering resource for full-service assistance. For others, we provide expert specialists for one-of-a kind tasks. Our project teams respond to midnight calls for immediate engineering assistance, and they collaborate on project strategy development and integrated project implementation as our clients' partner-of-choice.

With a large, highly experienced staff solely dedicated to the energy business, we have the ability and know-how to staff the smallest tasks alongside the largest projects with the right people at the right time at the right place and with the right logistical support.



## OPERATING POWER PLANTS SUPPORTED

- Nuclear (PWR, BWR, CANDU) ..... 143 units  
including continuing preferred AE services, engineering, design, and analysis
- Fossil fuel ..... 1,582 units  
including engineering, design, analysis, repowering, and life extension

## CONSULTING AND SYSTEM-WIDE SERVICES

More than 450 consulting projects in the past 5 years, including due diligence, financial analysis, resource planning, transmission impact, and project developer support

## NEW GENERATION PROJECTS DESIGNED

**902 new units totaling 125,175 MW for 191 clients**

- Coal-fired ..... 542 units    60,798 MW
- Gas-fired ..... 289 units    34,085 MW
- Oil-fired ..... 33 units    5,112 MW
- Nuclear ..... 30 units    24,926 MW
- Other ..... 8 units    254 MW

## POWER DELIVERY SYSTEMS DESIGNED

### Transmission Lines

- 5,900 circuit miles
- 69 kV through 765 kV

### Substations

- 450 open-air and GIS
- 13.2 kV through 765 kV
- More than 75,000 MVA of transformer capacity

# EXPERIENCE THAT COUNTS

**Overall, we have worked with 1,346 clients in 73 countries. We continue to work with some of our earliest clients, and each year new clients enlist our support.**

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## THE SARGENT & LUNDY PEOPLE AND RESOURCES

In the course of serving power clients for more than 100 years, we have developed an unparalleled reservoir of expertise and know-how that benefits each client.

- Our management is actively engaged in guiding each project and ensuring that every client is satisfied.
- Our staff is predominately power professionals, with industry-leading experts in all areas of power facility engineering, operation, and industry strategy.
- Worldwide communication links facilitate information exchange with clients and project partners anytime and anywhere.
- Our resources include joint ventures with other world class organizations to bring clients a full complement of extended services.
- We have forged carefully chosen alliances with large, multi-faceted companies and smaller specialized firms that give us additional, proven options for teaming with the right companies when multi-company collaboration or contracting is the right approach.

- As part of our quality focus, we have a company-wide Quality Management System based on ISO 9001:2000. Compliance with the S&L Quality Program is mandatory for all work across our company. For nuclear safety-related work, compliance is required with our Nuclear Quality Assurance Program, maintained as a Topical Report that is approved by the U.S. Nuclear Regulatory Commission.
- Integrated internal systems effectively distribute throughout our organization the knowledge gained in our work so that every client benefits from Sargent & Lundy's total expertise.



**The end results are the high-quality, environmentally sound, cost-effective power production and power delivery assets that contribute to our clients' continued success.**

## FOSSIL POWER

Clients in the fossil-fueled power market have recognized Sargent & Lundy as a global leader in fossil plant design, advanced technologies, environmental compliance planning, and operating plant services.

### NEW GENERATION

Our knowledgeable staff provides clients with reliable engineering services for all types of solid fuel including pulverized coal, CFB, IGCC, and gas-fired combined cycle plants.

Our new generation design services encompass all scenarios including technology assessment, site selection and permitting, as well as conceptual and full scope detailed design. Projects are performed in a variety of contracting configurations to meet the technical and financial requirements of our clients.

Sargent & Lundy provides a comprehensive menu of design services for new units, operating plants, and repowering projects.

Our capabilities include:

- Technology assessment
- Site selection and permitting
- Conceptual design and full scope, detailed design
- Front End Engineering/Design (FEED Studies)
- Owners engineer services and lenders engineer

### ENVIRONMENTAL COMPLIANCE

Sargent & Lundy leads the industry in the design of SCR and FGD retrofit applications performed in the last decade. Our expert teams provide innovative, forward-looking environmental control solutions tailored to the unique needs of each application. Our teams focus on cost-effective reduction technology for all types of plants.

Sargent & Lundy's environmental staff provides expert knowledge of SO<sub>2</sub>, NO<sub>x</sub>, Hg, and particulate control processes alongside continued evaluation of their application. A sampling of Sargent & Lundy's environmental capabilities includes:

- Air Quality Strategic Planning
- Permitting and licensing
- Wet/ Dry FGD, SCR, Baghouse, and Hg control retrofit
- Fuel Switching
- Particulate control
- NO<sub>x</sub> compliance studies and low-NO<sub>x</sub> burner retrofits
- CO<sub>2</sub> capture and sequestration technologies
- Water treatment

## POWER DELIVERY

Power delivery projects are an integral part of Sargent & Lundy's capabilities. A dedicated, multi-discipline group focuses specifically on the design, construction management, and commissioning of substations, transmission lines, and distribution systems. Our experience encompasses all types of electric utility and industrial installations from 2.3 kV to 765 kV. This includes overhead and underground lines, air and gas-insulated substations and switchyards and transmission system interconnections for conventional and renewable energy generating facilities.

We offer comprehensive transmission and distribution services that can take your project from initial stages and site selection to startup. Clients also rely on us to provide innovative, cost-effective solutions for upgrading existing transmission, substation, and distribution facilities. And we can assist with the strategic planning and detailed studies to determine your power delivery needs.

Applying our depth of technical expertise, we collaborate with clients to develop innovative approaches that address the many challenges associated with designing facilities in highly congested urban centers, suburban communities, and environmentally sensitive remote areas.

Our technical experts conduct transmission line and substation engineering courses that provide practical project-oriented training for engineers, managers, and others involved with power delivery projects.

IN ADDITION, OUR CAPABILITIES INCLUDE:

- Transmission system impact studies
- Licensing and permitting support
- Development of design standards
- SCADA and control system upgrades
- Due diligence reviews
- Material condition assessments

From resolving a technical problem with a phone discussion to a long-term alliance relationship for major projects, Sargent & Lundy is the source for power delivery services that you can count on.



## GLOBAL ENERGY CONSULTING

The Sargent & Lundy Global Energy Consulting Group provides energy-sector planning, advisory, technical, and financial consulting services. We bring together exceptional capabilities for technical, financial, and management consulting with a cadre of seasoned professionals having extensive project planning, development, engineering and operations experience. We also draw upon the extensive Sargent & Lundy engineering resources to provide a full range of high level technical and energy business consulting services.

Our expert teams provide consulting services in support of fossil, nuclear, hydroelectric, renewable, emerging power generation resources, and transmission facilities. Our due diligence experience also extends across the energy supply and delivery spectrum, including gas and oil pipelines, water treatment, desalination, material handling, ports, and fuel unloading facilities.

KEY AREAS OF OUR CONSULTING SERVICES INCLUDE:

- Independent engineering and due diligence review for all commercial and technical aspects of projects and construction, commissioning, and operations monitoring.
- Resource planning and procurement, providing generation resource and integrated resource planning.
- Electric power market studies and forward pricing analyses to develop long-range forecasts for regional wholesale power and locational marginal prices.
- Project development support in siting, development, and permitting.
- Financial services and contract development support, including project pro forma financial models, power supply proposal support, tariffs structuring, economic studies for technology choices, competitive analyses.
- Asset transaction consulting services supporting buyers and sellers in the bidding and negotiations for T&D systems and fossil, nuclear, and hydroelectric generating assets, asset swaps, and integrated utility strategic sales.

Clients across the industry – financial institutions and investors, public and private utilities, developers, governments, and private companies – confidently enlist our power industry experience and know-how.

## NUCLEAR POWER

Nuclear power clients have been a primary part of our power focus since 1954. We have been continuously involved in nuclear power since then, designing successive generations of new stations and supporting operating plants on an on-going basis.

Our nuclear power work encompasses developing cost-effective solutions for emerging issues and new plant activities, such as:

- New plant engineering, detailed design, and procurement
- Combined Operating License (COL) preparation
- Owners Engineer and early site permit preparation
- EPC Technical Requirements development
- Power uprates, digital controls, and adjustable speed drive replacements
- Security upgrades and dry fuel storage
- Design Basis calculation reconstitution, piping systems vibration analysis, and plant/equipment test optimization

At the same time, our project teams are providing extensive engineering, design, and analysis for PWR, BWR, and CANDU station owners for diverse, on-going and cyclical projects including:

- Modifications and performance improvement
- Outage and restart support and O&M optimization

Many owners enlist our broad support as their preferred engineer for long-term, comprehensive support, relying on our ability to manage complex projects and concurrent programs. Other assignments are fast-track and depend on our capability to rapidly deploy significant engineering and design resources for a short time. And clients depend on our nuclear power knowledge and independence to provide critical input to their corporate decisions on long-range strategic business plans.

In addition, we are called on repeatedly to help clients accurately resolve operating plant problems and issues. From complex analysis of design margin needed immediately to keep a plant on-line to large backlog reduction assignments, our teams are proficient at rapidly sizing up and solving problems that are highly dependent on individual station design and client unique practices.

Whatever the circumstances, we're the company that gets it done for our clients with the highest quality engineering, regulatory knowledge, and attention to constructibility and operability.



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