



POWERING YOUR FUTURE SINCE 1937

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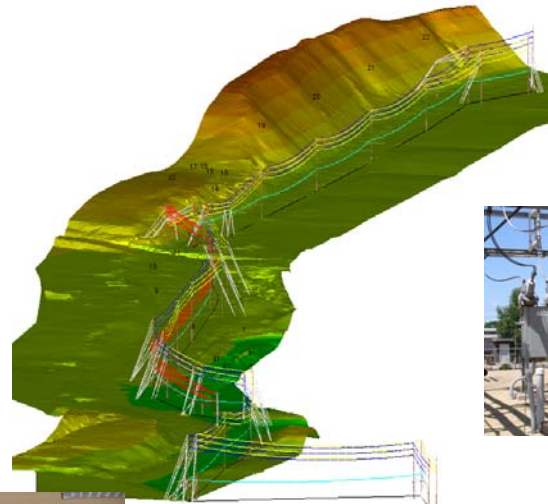
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Summary of Services

Laramore, Douglass and Popham has built a solid reputation in the electric power industry since our beginning in 1937. We have done this by **consistently delivering successful projects that meet or exceed our clients' objectives via our sole focus on power delivery engineering and design**. Our professional staff of engineers and designers are well-seasoned in practically applying our experience to create designs that are constructible, cost-effective, and on time. **How can we help?**

Services Provided:

- Transmission Line and Tower Design
- Substation Design
- Power Distribution System Design
- Protective Relay Design and Coordination
- Backup and Emergency Generation System Design
- Electrical System Analysis
- Feasibility Studies and Site Analysis
- Instrumentation and Control Design
- SCADA, PLC, and DCS Configuration
- OIT, HMI, and MMI Integration
- Industrial Networking Design
- Start-Up Assistance

Industries Served:

- Utilities
- Industrial
- Mining
- Transportation
- Governmental
- Commercial
- Education
- Healthcare

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Company History

Laramore, Douglass and Popham (LDP) is a consulting engineering firm resulting the merger of three firms which had independently established a considerable background in the engineering of utility, industrial, and institutional projects.

F.E. Laramore and F.S. Douglass were working as Chief Engineers for the Management Engineering Corporation. Between the two of them they had a vast amount of experience in the design and operation of steam electric generating stations, hydroelectric projects, transmission lines, gas plants and water works. Using this knowledge as a foundation, the two men established the consulting firm of Laramore and Douglass in Chicago in 1937. Recognizing the United States' rapidly expanding need for electric power, Laramore and Douglass built an impressive reputation in the design of rural transmission and distribution systems. As the development of rural roads increased, L&D (and later, LDP) designed and supervised construction of numerous steam electric stations to serve the burgeoning electric power requirements of the agricultural revolution. In small municipal communities, LDP modernized outdated distribution systems and designed steam, diesel and gas turbine stations to meet the substantial post-WWII need for electric power.

Meanwhile in New York City, another firm, Tenney and Ohmes, which had originally been founded under the predecessor name of Alfred R. Wolff in 1879, was specializing in mechanical and electrical engineering of monumental buildings such as the New York Public Library, the Woolworth Building, and many other New York landmarks. At the same time in New York, Richard Popham, with previous ties to Tenney and Ohmes, formed R.R. Popham Engineer under single ownership in 1949. R.R. Popham concentrated its activities in the electric power, refining, and building services industries.

Having collaborated on previous projects, the three companies soon realized the benefits of offering a broader scope of services to their clients. Over a four-year span from 1954-1958, the three firms were merged into the current corporation of Laramore, Douglass, and Popham. In the late 1950's, LDP engineered the first application of silicon-diode rectifiers for the rapid transit industry in the United States. LDP also pioneered the specification and installation of metal-clad DC switchgear for traction power applications. Since that time, the design of rapid transit traction power systems and the modernization of transit substations have become a consistent part of LDP's business. In January 2003, LDP opened an engineering office in St. Louis to offer services to a wider area of the Midwest.

Today, LDP continues to serve all segments of the electric power industry, maintaining its focus on its original foundation of power delivery design. All offices are wholly-owned subsidiaries of LDP Group, Inc., a holding company established in 1994. LDP is a privately held corporation.

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Transmission

LDP's Transmission Engineers have practical design experience up to and including 345 kV. They can help from the conceptual stage of planning and can carry the project through to a construction package, even with difficult terrain constraints. We also work frequently with firms on environmental assessments.

Services Provided:

- **Cost Estimating and Route Selection**
- **Three-dimensional Modeling of Line and Structures**
- **Re-Build and Under-Build**
- **EMF and Impedance Studies**
- **PLS CADD/Tower/Pole Expertise**
- **Inter-tie Design and Coordination**
- **Re-Conductoring and Static Wire Replacement**
- **Right-of-Way and Easement Assistance**
- **Permit and Crossing Applications**
- **Surveys and Soil Boring Specifications**
- **Plans and Profiles**
- **Schematics, Sections and Details**
- **Design Criteria Creation**
- **Structure Spotting and Foundation Design**
- **Conductor and Shield Wire Specification**
- **Termination Plans and Terminal Facility Design**
- **Insulator and Hardware Design**
- **Construction Specifications and Overview.**

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Substations

With every power delivery system, comes the need to transform the power into the required voltages for practical use. LDP has a successful history of providing experienced support combined with practical designs for outdoor, indoor, conventional, low-profile, air and gas-insulated substations. We have experience with electrical design through 345 kV, and civil/structural design through 765 kV.

Services Provided:

- Any Configuration, including Main and Transfer, Breaker-and-a-Half, and Ring-Bus
- Indoor and Outdoor
- Conventional and Low-Profile
- Substation Automation
- Solid and Strain Bus Design
- Air and Gas Insulated
- Grading and Grounding Plans
- Equipment Specifications
- Design Manuals and Standards
- Structure Loading Trees
- Foundation Design
- Structure Fabrication Details
- Yard Lighting
- Shield Protection

Detailed Design:

- Protective Relay Design and Coordination
- One-Lines and Three-Lines
- Relay and Control Schematics
- Panel Wiring Diagrams
- Equipment Connection Diagrams
- Cable and Conduit Plans
- AC/DC Station Power
- SCADA Interface
- Communication Systems Interface
- Power Line Carrier Systems
- Fiber Optic Systems
- Construction Specifications
- Operating Manuals
- Commissioning and Start-Up

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Distribution

Both utility and industrial, once the power has been delivered and stepped down, it needs to be distributed to the points of use. LDP can help design or upgrade your distribution system in order that the control and measurement of your power usage will result in the most cost-effective and safe system.

Services Provided:

- **Transformer and System Load Management, Automation and Control**
- **System Voltage Conversions and Upgrades**
- **URD**
- **Cap Bank Additions**
- **Short and Long-Range Planning Studies**
- **System Voltage, Load, and Loss Analysis**
- **Distributed Generation Applications**
- **Hardware and Software Specification and System Design**
- **Sectionalizing and Reliability Studies**
- **Short Circuit and Coordination Studies**
- **Rehabilitation and Conversion of Existing Lines**
- **Material Tabulation and Inventory Control**
- **Design and Construction Standards**

Industries Served:

- **Steel Mills**
- **Metal Smelters**
- **Manufacturing**
- **Chemical Plants**
- **Data Centers**

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Automation Services

LDP's instrumentation and controls engineers are experienced in planning, designing, and implementing a broad range of process controllers, operator interfaces, networks, and sensing systems. The real benefits to your project lie in the strength of LDP's ability to tie together hardware and software from different manufacturers. This allows the design and installation of the most economically-efficient systems and the capacity to integrate new systems into systems that are already in place.

Services Provided:

- Instrument Selection and Specification
- Loop Diagram Development
- Instrumentation Documentation
- PLC Specification and Configuration
- Distributed Control Systems
- Operator Interface Systems (OIT, HMI, and MMI)
- Safety Interlock Specification and Design

Industrial Networking:

- Ethernet
- DeviceNet
- Profibus
- ASi
- Foundation Fieldbus
- Modbus/RS-485
- Database Integration for Archiving and Trending
- Manufacturing Execution Systems
- Back-Office Integration

Functional Specification:

- Batch and Continuous Control
- Cell Control
- Machine Control
- SCADA Systems

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Generation

As more and more clients are realizing the benefits of renewable sources of energy, recovering waste energy, or installing emergency back-up power, LDP's background in power systems design has provided them with the ability to implement these initiatives.

In the tight competition of today's power market, and with the increasing need for reliable back-up power for critical systems, LDP's experience and personal response has proven to be invaluable to our clients as the requirements to meet short schedules and strict budgets dictate project objectives.

The field experience of LDP's engineers allow an in-depth knowledge of expansion, upgrade, or retrofit with minimal interruptions to existing operations. LDP's aptitude for designing constructible systems affords our clients a realistic plan with which they can improve their business position.

Services Provided:

- **Emergency Back-Up Generation**
- **Power Island Design**
- **Generator Voltage Step-Up**
- **Switchyard Exits**
- **TSO Coordination and Tie-In Design**
- **Renewable Energy**

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Electrical System Analysis

As electrical power systems become more complex, the need for comprehensive analysis to ensure safe and reliable designs is even more crucial. And as economic pressures squeeze budgets and schedules, having this analysis performed by experienced and proficient engineers is a necessity to meet critical-path milestones and approved capital appropriations. In addition, existing systems need to be analyzed periodically to ensure dependability, operability and maintainability. LDP has the technical knowledge and practical experience to help you with your new system or with the investigation of your existing systems. You benefit from our use of the latest software and design/analysis tools and techniques.

Services Provided:

- Arc Flash Studies
- Fault Analysis/Short Circuit Studies
- Demand Load Studies
- Load Flow/Voltage Drop Studies
- Protective Device Coordination
- Motor Starting Analysis
- Feeder and Transformer Sizing
- Harmonics Analysis

Benefits:

- Documentation to Meet OSHA Requirements
- Maintain a Safe Working Environment
- New System Design Confirmation
- Existing System Documentation and Control
- Analysis of Available Fault Currents
- Coordinate System Protection
- Summarize System Loads/Validate Equipment Sizing

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Client Companies

LDP has provided engineering services to meet the project challenges for wide range of companies across the power delivery industry. We invite you to joining the growing list of clients who have entrusted their capital investments to LDP, including:

- **Aerotec LLC**
- **Alliant Energy**
- **Ameren Corporation**
- **American Electric Power (AEP)**
- **American Transmission Company**
- **Central Maine Power Company**
- **Chicago Transit Authority**
- **Colton (CA) Public Utilities**
- **Commonwealth Edison Company**
- **Corn Products International**
- **Dayton Power and Light Co.**
- **Duke Energy**
- **Excelsior Energy**
- **Exelon Corporation**
- **Freeport – McMoRan Copper & Gold (Formerly Phelps Dodge)**
- **GE Energy**
- **Indianapolis Power and Light Co.**
- **Kansas City Power and Light Co.**
- **Kenny Construction Co.**
- **Madison Gas and Electric**
- **Massachusetts Bay Transportation Authority**
- **Meade Electric**
- **Miami Valley Regional Transit Authority**
- **Michels Power**
- **Minnesota Power**
- **MJ Electric**
- **Naperville (IL) Public Utilities**
- **Pfizer**
- **RMT (Alliant Wind Energy)**
- **San Diego Gas & Electric Co.**
- **Vectren Corporation**
- **Vermont Electric Power Company**
- **WE Energies**
- **Wheeling Pittsburgh Steel**
- **WorleyParsons**

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