

**HLB Engineering**

Power Projects

Representative projects include utility and industrial service supply facilities – 345kV to 480V. Engineering design; project administration; construction supervision; operations management; forensic investigation; legal counsel; insurance claim defense; peer review; expert witness work.

<p>Brayton Point Power Plant New England Electric System</p>	<p>Design modifications to high speed relay &amp; control systems for automatic shutdown of 650MVA and 400MVA rated generators upon loss of load [load rejection] to prevent line overloading.</p>
<p>Diversey Substation ComEd/ABB Power Systems</p>	<p>Review and approval of all electrical engineering drawings prepared by ABB Power Systems; onsite construction management; 138kV transmission substation double ring bus; 138kV SF<sub>6</sub> breakers; (four) 50MVA 138kV-12kV delta-wye transformers; 12kV double ring copper bus duct distribution; 15kV class breakers; 750kcmil single conductor distribution cable feeder getaways; 9MVAR capacitor bank serving each 12kV bus. Link to project photos: <a href="http://www.hlb-engineering.us/projects/diversey/diversey.htm">http://www.hlb-engineering.us/projects/diversey/diversey.htm</a></p>
<p>Kenai Substations Alaska Power Authority</p>	<p>Designed AC/DC power, control, communications, grounding, grounding grid, SCADA RTU, station service, fencing, yard lighting, security systems for two transmission SVC substations; review of review of National Electrical Safety Code for equipment clearances [ANSI/IEEE C2]; cost estimation for secondary electrical systems [listed above]; review of secondary electrical systems design for compliance with National Electrical Code [NFPA 70]; review of all relaying and control engineering by ABB Power Systems.</p>
<p>Ft. Knox Gold Mine Morrison Knudsen</p>	<p>Construction management for all electrical activities associated with \$450M gold mine facility; start-up and commissioning for all power systems 138kV to 480V; checkout of instrumentation and control [I&amp;C] systems; review and approval of request for quotes [RFQs]; miscellaneous 480V power system design; approval of electrical system as-builts.</p>
<p>Millbury Substation No. 3 New England Electric System</p>	<p>Designed high speed relay &amp; control systems for addition of 650 MVA, 345kV-115kV-24kV Autotransformer; 345kV air blast breakers; 115kV breakers; motor operated disconnects; other ring bus equipment; other breaker &amp; half scheme equipment; all supporting short circuit &amp; relay coordination studies to support installation of new substation and interconnection between 345kV bulk power supply system to 115kV system.</p>
<p>Solomon Gulch Hydroelectric Plant Copper Valley Electric System</p>	<p>Designed dam safety early warning alarm and notification via radio link from dam site to control building; remote control of gate valves to penstock.</p>

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Northboro Rd. Substation New England Electric System	Designed high speed relay & control systems for addition of (two) 50 MVA Autotransformers in parallel with existing (two) 50MVA Autotransformers, 115kV-69kV-13.8kV; 115kV motor operated disconnect switches; 13.8kV grounding transformers; supporting equipment; all supporting short circuit & relay coordination studies; new relay settings for all equipment.
Mendenhall Wastewater Plant Haight & McLaughlin Engineers	Design and construction cost estimating for 750 kVA load bank for existing 1MW, 480V emergency generator.
Cogen Development Study New England Electric System	Performed all studies [short circuit, relay/fuse setting review] to support application of 3 <sup>rd</sup> party steel recycler cogeneration facility to connect to system at distribution level; developed equipment list for relay and control; initial cost estimating.
Sewage Outfall Line Coffman Engineers, Inc.	Designed power and control for 480V supply to heat trace equipment for 6,000 ft. waste piping system, Prudhoe Bay, AK.
Petro Star Refinery Dryden & LaRue	Designed power and grounding systems for electric power substation; substation ground grid analysis and design.
Anchorage-Fairbanks Intertie Alaska Power Authority	Managed 138kV transmission intertie for State of Alaska; performed system studies [power flow, transient stability, load forecasting, economic planning, capacity improvements]; managed operations and maintenance [O&M] budgets; member of power pool management and technical committees; negotiated contracts with power pool participants; start-up and check-out of new power plant and substation equipment and systems; testing of vendor engineered and supplied systems. Link to description: <a href="http://hlb-engineering.us/bio/operations.pdf">http://hlb-engineering.us/bio/operations.pdf</a>
Transmission Line New England Electric System	Forensic investigation of major system outage resulting in death due to trespass; relay and control system review; short circuit studies; relay setting system changes.
Beluga-Pt. MacKenzie Chugach Electric Association	Prepared as-built drawings for 230kV transmission lines, structures, anchors, and grounds.
GE Lynn Turbine Facility New England Electric System	Short circuit studies, protection & control equipment requirements, and cost estimates for addition of 270MVA independent power producer [IPP] to existing 115kV system.
Solid Waste Disposal Plant Coffman Engineers, Inc.	Designed exterior lighting, miscellaneous control systems, and construction management for expansion/enhancements to existing facility at Prudhoe Bay, Alaska.
Transmission Line Duquesne Electric	Forensic investigation of major system outage resulting in serious injury to three workers; review of automatic relaying & control for the protection serving the line and its terminals; review of manual switching subsequent to the electrical fault; review of National Electrical Safety Code for clearances [ANSI/IEEE C2]; consultation with the local serving electric utility and their legal counsel;

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	consultation with independent engineers and legal counsel.
Bradley Lake Hydroelectric Plant Alaska Power Authority	Review of all electrical engineering preliminary drawings & documents for hydroelectric facility; transmission line siting; engineering analyses [power flow, voltage drop, VAR support, required power capacities] for transmission line conductor selection and operating voltage.
Outage Investigation New England Electric System	Review of operations of relay and control systems; SCADA alarm and event log review; short circuit analyses; reporting on incidents associated with loss of customers or damage to major system equipment.
Landfill Maintenance Facility Coffman Engineers, Inc.	Designed prime power diesel generation, control, lighting, fire alarm & detection systems; start-up and checkout for heavy equipment maintenance facility at Prudhoe Bay, Alaska.
Millbury Substation No. 1 New England Electric System	Designed high-speed relay & control systems for addition 69kV capacitor bank, breaker, supporting equipment.
Feeder 47 Petersville Road Tap Matanuska Electric Association	A report to an Alaska rural electrical coop [REA] on problems and solutions to power delivery on a very long distribution circuit. Link to report: <a href="http://www.hlb-engineering.us/docs/petersville.pdf">http://www.hlb-engineering.us/docs/petersville.pdf</a>
Chevron USA Asphalt Plant Coffman Engineers, Inc.	Designed upgrade and conversion of electrical service entrance & power distribution systems; new 750kVA 34.5kV-480V padmount transformer and metering enclosure; power and control circuits for industrial motor loads, Class I, Division I locations.
Solomon Gulch Hydroelectric Plant Solomon Gulch Transmission Line Alaska Power Authority	Managed hydroelectric facility and attendant transmission line and substations for the State of Alaska; managed operations and maintenance [O&M] budgets; filed FERC exhibits for licensing; administered project contracts; filed exhibits for state permitting; coordinated annual insurance inspections and five year FERC safety inspections; managed insurance claims; adjudicated disputes with adjacent property owners and 3 <sup>rd</sup> parties.
Petrochemical Plant Incident St. Paul Fire & Marine	Forensic investigation into foreman electrician's contact of energized 480V motor control system; review; reporting.
IPP & Cogen Interconnection New England Electric System	Headed up task force to develop major utility's requirements for 3 <sup>rd</sup> party power supply to transmission and distribution lines. Third parties include independent power plants [IPPs] and cogeneration plants [Cogen]. Published this standard for New England Electric System [NEES] as the minimum requirements for interconnection to "the grid."
Transient Stability Study University of Alaska, Fairbanks	Master's thesis: Stability of Anchorage-Fairbanks Interconnected Power System; power flow and stability study; data development and review; published report for utilities funding research; thesis published.
System Protection Review	Submitted to LADWP to assist their widespread system outage

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Los Angeles Dept. Water & Power	investigation: the outage occurred in late summer, 2005. Link to proposal: <a href="http://www.hlb-engineering.us/docs/ladwp.pdf">http://www.hlb-engineering.us/docs/ladwp.pdf</a>
Regional System Improvements New England Electric System	Review of engineering plans and proposals for transmission facility improvements to Northeast Power Coordinating Council [NPCC] member utility projects – capacity expansions of transmission lines and substations, power plant modifications, short circuit studies to improve reliability and response of protective systems, development of standards and guidelines for regional operation of these facilities.
Generator Plants Coffman Engineers, Inc.	Construction management of all electrical and mechanical engineering for installation of village power plant diesel generation; control panels; heat recovery systems.
Steel Mill Outage St. Paul Fire & Marine	Forensic investigation into electrician’s contact of energized 2.4kV distribution system; insurance claims review; reporting.
Power Plant Development Study Copper Valley Electric System	Performed power flow and transient stability studies to support proposal to provide all utility power to U.S. Air Force military site. Studies included impact on local serving utility’s generation and transmission network; alternatives for capacity development.
Water & Sewage Treatment Plants Coffman Engineers, Inc.	Designed power, lighting, standby generation, control and signal systems for these facilities in Arctic environments.
Coal Dragline Golden Valley Electric Association	Designed, tested, operated instrumentation and measurement equipment to continuously monitor and record changing conditions to high voltage supply to walking dragline.
Wind Generator Supply U.S. Public Health System	Design of electrical power and control systems for village energy storage and delivery from wind farm, western Alaska.