

D & S Engineering, Inc.

A Common Sense Approach

POWER & ENERGY

Design Engineering
Engineering Services
Project Management



"A Commitment to Cost Effective, Common
Sense Engineering"

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Goals

- ★ Be a preferred supplier of design engineering, engineering services and project management.
- ★ To emphasize common sense engineering in all phases of projects.
- ★ Meet project objectives for scope, cost estimates, constructability, project schedules and project performance.

Staff

Most staff members have 20-40 years of combined experience in engineering and management.

Skills

- Mechanical Engineering
- Civil/Structural Engineering
- Electrical engineering
- Process Engineering
- Energy Optimization
- Process Controls

Licensed PE's in Connecticut, Florida, Georgia, Idaho, Illinois, Maine, Maryland, Massachusetts, Michigan, Minnesota, New Hampshire, New Jersey, New York, North Carolina, Pennsylvania, Texas, Vermont, Virginia, West Virginia and Wisconsin.

Who is D&S Engineering?

- **D&S Engineering was established in 2003 to provide COMMON SENSE, high quality consulting engineering services**
- **We have a highly skilled veteran team, many of whom have worked together for nearly three decades**
- **We provide a wide variety of engineering disciplines and services to end users, contractors and other consulting organizations.**

D&S Engineering Services

End Users:

- **Commercial**
- **Industrial**
 - ★ **Forest Products**
 - ★ **Pulp and Paper**
 - ★ **Power**
 - ★ **Manufacturing**
- **Institutional / Public**

Engineering Services:

- **Studies**
- **Design**
- **Construction Oversight**
- **Resident engineering assistance**

Partnerships

D&S Engineering is committed to teaming with other Consultants and Contractors to:

- **Provide engineering support to other consultants**
- **Provide specialized skills**
- **Teaming agreements for additional engineering manpower for large or unique projects**
- **Offer design/build and EPC contracts**

D&S Engineering – Company Experience

2011 Project Log

Project	Description
INDUSTRIAL POWER	
State Capital Complex District Heat Plant	Provide all engineering and cost estimating for a district heat plant to service an existing state capital complex district heating system and a new city district heat system.
Hydro Electric Station Switchgear Layout	Prepared drawings of existing electrical room where no drawings existed. Prepared layout of new switchgear for two hydro turbines in the electrical room and identified existing interferences.
Hydroelectric Station Roof Restoration	Perform a visual evaluation of existing concrete channel plank roof above an existing hydroelectric station and make recommendations for removal and replacement of deteriorated planks prior to installation of new roof membrane.
Hydro Station Concrete Repairs	Provide site inspection and develop scope of contractor services for repairs to hydro dam gate sections and deck.
Hydro Station Concrete Repairs	Provided site work and engineering for concrete repairs at a remote hydro station.
Hydroelectric Station Roof Restoration	Develop a plan for roof restoration at a hydroelectric station.
Hydro Station Concrete Repairs	Provided site work and engineering for concrete repairs at a remote hydro station.
Concrete and Rip Rap Restoration	Concrete repairs to a turbine inlet forebay at a hydroelectric station.
Hydroelectric Station Excavation	Monitor excavation at gatehouse at hydroelectric station to identify leaks requiring pressure grouting.
ESP Removal	Developed breaching design to allow the removal of an ESP in a power plant.

2011 Project Log

Project	Description
Power Plant Turbine Reliability Troubleshooting	Provided on-site engineering assistance during an outage to work with plant staff and contractors to identify causes of on-going turbine valve work.
COMMERCIAL	
Heat Plant - Campus Heating	Worked with a contractor for supply of a design-build biomass heating system in an existing central heat plant providing district heat to several buildings.

D&S Engineering – Company Experience

2010 Project Log

Project	Description
INDUSTRIAL – PULP AND PAPER	
Combustion Air	Providing design engineering for modifications of combustion air systems.
Natural Gas GA Drawing and Valve Train	Designed piping and controls for a gas system in a pulp mill complex.
Pulp and Paper Mill Power Study	Studied thermal and electrical systems performances. Developed a list of projects and procedures that would improve systems performance and improve plant profitability.
INDUSTRIAL – FOREST PRODUCTS	
Expansion Study Environmental Impact	Provided services to determine "permitability" of a proposed manufacturing facility expansion.
Electrical Compliance/Power Study	Performed an electrical power systems study with arc flash analysis for a wood products manufacturing plant.
INDUSTRIAL MANUFACTURING	
Manufacturing Complex Electrical/Thermal Assessments	Provided in depth review of electrical and thermal systems for a manufacturing facility and developed recommendations for reducing electrical and gas costs and simplifying the energy infrastructure.
School Boiler Replacement	Provided civil, building permit, and electrical engineering support for the installation of a biomass boiler for a school campus.
INDUSTRIAL – POWER	

2010 Project Log

Project	Description
Hydro Electric Units 2 and 3 Support	Supported contractor with structural solutions associated with removal and replacement of rotors and stators for rebuild of two hydro turbine generators.
Burner Front Lifting Device	Developed mechanical lifting device for removing boiler guns.
Hydro Electric Station Units 2 and 3 Station Brakes	Design mechanical systems for installation of brakes on water wheel shafts.
Engineering and Project Coordination for Pellet Boiler Installation	Provide engineering and construction coordination for replacement of a wood-fired boiler with a pellet boiler at a wastewater treatment facility.
Due Diligence	Assisted with due diligence field reviews of a biomass power plant.
Ladder Support Frame	Improve safety for access to power plant devices.
Air Heater Deck Trolley Beams	Improve safety for access to power plant devices.
Monorail Load Rating Analysis	Did field inspection of lifting devices in a power plant and provided load capacity analysis.
Breeching Design	Provided detailed drawings for breeching for a biomass boiler.
Oil Circuit Breaker (OCB) Replacement	Specify a replacement breaker, prepare elementary and wiring diagrams, provide procurement, construction and commissioning support.
Network Drawing Updates	Develop composite drawings to show interaction and overall scheme for various communications networks.
Hydro Station - Station Service	Prepare elementary and wiring diagrams for new station service and propane standby generator set.

2010 Project Log

Project	Description
Engineering Support Services for Dike Repair	Provided on-site Owner's representation to inspect earthen dike repairs at an impoundment.
Hydro Electric Station Units 1 and 8	Provided structural design for oil containment structures for relocated transformers which previously had no containment. Provided design of support structures for new electrical cables crossing a stream to two turbine units.
Fire Line Repair	Provided emergency construction monitoring services and repair recommendations for repairs to an underground mill fire line located in close proximity to hydro station penstock support structures.
Penstock Leak	Provided assistance to client's maintenance personnel for structural repairs of a leaking 10-foot diameter penstock.
Sand Silo	Developed design concept, scope of work and cost estimate for a fluidized bed sand silo.
Air to Fuel Distributor	Developed design concept, scope of work, preliminary drawings and cost estimate for modifications of air supply to fuel distributors.
Preliminary Engineering for Biomass Boiler Installation	Preliminary engineering to integrate pellet boilers and storage silos at two middle schools, with reuse of existing hot water distribution systems.
Power Plant Conversions: Coal to Biomass	Conversion of two coal-fired power plants to biomass. Prepare support documents for environmental permitting; prepare project scope documents, preliminary flow diagrams, site plans and cost estimates.
Power Generation Study	Developed thermal and electrical models, scope of work, cost estimates, and return on investment calculations for installation of a turbine generator set at an existing manufacturing facility.
Preliminary Assessment Model	Prepare dynamic spreadsheet models for the preliminary economic assessment of trash to energy power plants.

2010 Project Log

Project	Description
Due Diligence	Provided system modeling, scope development, and budget cost estimates for potential changes to a power facility.
Power Plant Due Diligence	Provided system modeling, scope development, and budget cost estimates for potential changes to a power facility.
Power Plant Motor Failure Review	Investigated potential causes of motor failures and recommended a remediation approach at two facilities.
Biomass Power Plant Upgrade	Providing scope of work development, specifications, bid solicitation, and vendor selection for upgrades at a biomass electrical power plant.
COMMERCIAL	
School Campus Oil to Gas Conversion	Developed the concept scope of work, cost estimates, and return on investment analysis for converting several school buildings from oil to gas heat.
District Biomass Heat Plant Phase 2	Provided analysis, modeling, budget scope preparation, and budget costs for a proposed biomass power plant to service a large network of buildings. Electrical generation was also reviewed.
School Building Heating Study	Provided services to inspect existing steam heating system components in a turn of the century multi-floor school building. Developed recommendations on a long range plan for the heating system.
Jail Heating System Study	Provided field work to identify all heating system components and piping system. Developing a plan to improve heating system performance.
Emergency Backup Generator Design	Providing engineering and code reviews for the installation of emergency electrical power generation for a hospital complex.

D&S Engineering – Company Experience

2009 Project Log

Project	Description
INDUSTRIAL – PULP & PAPER	
Waste to Energy Plant Due Diligence	Provided assistance for evaluating a waste to energy plant.
INDUSTRIAL – FOREST PRODUCTS	
Maine Pellet Plant	Develop the system flow sheet, general arrangement, site plan, cost estimates, and grant writing assistance for a proposed pellet fuel plant.
Wood Pellet Plant	Provided cost estimate and Technical Report to support a grant application for a 100,000 tons per year pellet fuel plant.
Wood Pellet Plant	Developed the scope of work and cost estimate to rebuild a 100,000 tons per year pellet plant.
INDUSTRIAL – POWER	
Hydro-Electric Station Construction Monitoring	Provide construction monitoring services for a project previously engineered by D&S.
Hydroelectric Station Cooling Water Pipe Design	Upgrade cooling water piping system in a hydroelectric power plant.
Hydro-Electric Station Seal Water	Provide engineering services related to design, drawings and specifications for a raw water system for hydro units 2 and 3 shaft seals and bearings. Includes coarse and fine screens, pump and piping.
Power Plant Access Structures	Design access ways and structures for improved operations in a gas fired power plant.
Log Loader Installation	Designed supports and platform for a log loader installation.
Biomass Power Plant Deck for Air Heater Area	Provide structural engineering for a new deck in a biomass power plant to support major work being done on the boiler.

2009 Project Log

Project	Description
Oil Water Separator Engineering	Provide engineering services related to design, drawings and specifications for oil/water separation systems at two hydro-electric stations. Includes pumps, separators and piping.
Hydro-electric Station Gate Intake Repair and a Hydro-electric Station Concrete Repair	Provided engineering to evaluate and suggest repairs of reinforced concrete beams supporting a bridge deck at a remote hydro-electric dam. Provided engineering evaluation of the bridge deck over another dam for crane access for intake gate removal.
SPCC Plan Update and Fall Protection Anchor Points	Reviewed areas around several hydro-electric dam sites for attachment points for permanent placement of retractable lanyards for employee access and tie off capabilities to existing equipment. Provided an analysis of the load capability of existing attachment points and provided design as required for new points.
Hydro-Electric Station Circuit Breaker Checkout and Commissioning	Verify control wiring and update drawings for two outdoor 34.5 kV vacuum circuit breakers prior to installation during a Hydro Station outage in September. Checkout and commissioning support will be provided during the outage.
Hydro-Electric Station Unit 2 Scroll Case Thickness Test	Provided services to make thickness measurements with ultrasonic thickness gauge in scroll cases of two dewatered hydro units for. Issued report of findings.
Satellite Dish Roof Analysis and Electrical Design for a Hydro-electric Company	Provided analysis of roof structure for placement of communications satellite dish.
Hydroelectric Station Transmission Line Markers	Specified overhead ground cable and markers for a transmission line river crossing. Performed sag and tension calculations.
Hydro-Electric Station Water Wheel Shaft Brake	Provide engineering services to evaluate the current brake arrangement on Unit No. 1 at a Hydro Station. Recommend and design required modifications.

2009 Project Log

Project	Description
Hydroelectric Station Gate Thickness Measurements	Performed dam gate thickness measurements at a remote licensed storage facility and reported results.
Hydroelectric Plant Crane Refurbishment	Review drawings and perform steel calculations on existing crane trusses and platforms.
Hydroelectric Plant Electrical	Design new station service power distribution for a hydro-electric facility. Design emergency generator controls at another hydro-electric facility.
Intake Gate Thickness Testing	Provided thickness testing for gates at a hydro-electric facility.
Public Utility Submittals	Provided calculations and documentation for filing transformer paperwork with the Public Utility.
ISO Data Submission	Prepared paperwork and electrical calculations to help a biomass power plant complete their ISO requirements.
Biomass Projects	Provide PFD's and specifications for fuel and ash systems at a Greenfield biomass power plant.
Pellet Boiler Installation	This project includes design of a 3.4 MMBtu/hr wood pellet boiler, a silo with capacity for 174,000 pounds of storage, design of the utility connection, preparation of construction documents, and construction coordination. The boiler provides underground heat transfer to various campus buildings.
Pellet Boiler Installation	This project involved the replacement of an oil-burning boiler with a 1.5 MMBtu/hr wood pellet boiler and a silo with capacity for storage of 97,000 pounds of wood pellets. The project also included a utility connection, construction documents, construction coordination, and record drawings. The boiler provides central hot water heating and domestic hot water for all building areas.

2009 Project Log

Project	Description
Pellet Boiler Installation	This project includes the design, utility connection, construction documents, construction bid process, and construction coordination for a supplemental 5.1 MMBtu/hr wood pellet boiler and a wood pellet silo capable of storing 174,000 lbs of wood pellet fuel. The boiler system provides central hot water for campus area space heating and for domestic hot water. The new boiler is planned for integration with an existing Siemens building management system.
ISO NE Application Assistance	Assisted a proposed new biomass power plant develop and submit their ISO applications.
Biomass Power Plant Steam Economizer	Performed extensive modeling and analysis of various fluidized bed cooling methods, economizer sizing, and the addition of C&D to the fuel mix at a biomass power plant. Provide detailed report and follow up work.
Waste to Energy Plant	Developed models for system performance improvements.
Coal Fueled Power Plant	Developed models for system performance improvements.
Recovery Boiler Gas Burner Upgrade	Provided code review of proposed system improvements.
Steam Driven Feedwater Pump Drain Survey/Study	The standby feedwater pump is turbine driven and takes too long to bring on line upon failure of the primary unit. Performed a study and made recommendations for changes such that the time required to bring the spare steam driven pump on line can be minimized.
Biomass Power Plant	Provide conceptual engineering for the development of a Greenfield biomass power plant.
Municipal Landfill Power Generation	Assisted client in evaluating options and costs for connecting a landfill site generator set to the local utility.

2009 Project Log

Project	Description
Project Manage Shop Skid Fab, Land Fill Gas	Provided fabrication information for a system to filter land-fill gas. Services included: design standard interpretation, scheduling, submittal preparation and review, drawing and component review, and shop testing.
Evaluate Power Assets	Conducted site inspections and developed a power generation potential report for modifications of an existing system.
COMMERCIAL	
Feedwater Tank Replacement	Developed specifications for replacement of a feedwater tank supplying water to two boilers.
Pellet Boiler Facility Integration	Providing code review and engineering for the installation of wood pellet heating systems in several commercial and institutional systems in multiple states.
Waste to Energy - Coffee Grinds	Developed thermal and mass balance models for a proposed coffee grinds to electrical energy facility.

D&S Engineering – Company Experience

2008 Project Log

Project	Description
INDUSTRIAL – PULP & PAPER	
Pulp and Paper Manufacturer: Power Engineering	Provide day to day technical guidance on power generation and use.
Integrated Pulp and Paper Mill: Biomass Boiler Feedwater Heater	Provided concept engineering to assist with specifying and purchasing a feedwater heater. Provide all detail design for feedwater heating installation.
Integrated Pulp and Paper Mill: Turbine Generator Installation Island Assistance	Provided general assistance for the start up of a new T/G set.
Integrated Pulp and Paper Mill: Uncertainty Analysis – Performance Testing	Provided in depth modeling and computer analysis of data to determine the performance of a T/G set.
Integrated Pulp and Paper Mill: 175# Steam Line to Paper Mill	Detailed design, including computerized stress analysis for a new steam header.
LV Substation Improvements	Provide electrical designs for the selection and installation of substation equipment.
Biomass Power Plant, High Pressure Steam Header Hanger Review	Surveyed high pressure steam distribution piping, did computerized stress analysis, and recommended hanger remediation.
INDUSTRIAL – POWER	
Hydroelectric Station: Automatic Vacuum Breaker	Provide design engineering services to replace the existing manual vacuum breaker valve and piping with an automatic valve, new piping and a silencer.
Hydroelectric Station: Auto Back- flush Strainers	Provide design engineering services to provide an automatic backflush strainer system for the station cooling water.

2008 Project Log

Project	Description
Hydroelectric Station: Governor Controls Air Compressor	Provide design engineering services to provide a new governor oil level control system consisting of redundant air compressors and controls.
Hydroelectric Station: Drain Piping	Provide design engineering services to refurbish five turbine pit drains to prevent potential collapse. Includes pump to reduce drain time requirements.
Combined cycle power plant: design of mezzanine and equipment supports	Design a mezzanine for light storage and support systems for a new superheater.
Combined Cycle Power Plant: Pipe Hanger Analysis	Provide piping stress analysis and hanger designs for the installation of two new high pressure feedwater isolation valves
Hydroelectric Power Plant: Gear Guarding and Gate Drives	Designed guarding to surround open gears for gate lifting mechanisms at two hydro electric station gate houses. Incorporated new gear motor assemblies situated on portable support mechanism to raise and lower gates.
Hydroelectric Power Plant: Dam Gate Replacements	Updated the design of existing hydro storage dam gates and prepared drawings for fabrication of replacements. Utilized ultrasonic thickness measurement equipment to determine priority of gate replacements.
Hydroelectric Power Plant: Gate Replacement	Developed design of new gate guide extensions and lifting beam for emergency gate removal. Prepared drawings for solicitation of proposal from fabricators/installers.
Hydroelectric Power Plant: Flow Monitoring Frames	Prepared design of adjustable frame work for attachment of electronic flow measurement devices for hydroelectric water wheel intake. Frame is capable of being adjusted to fit several intake structures.
Hydroelectric Power Plant: Concrete Repairs	Evaluated areas of deteriorated concrete at hydro storage dam and devised a repair plan.

2008 Project Log

Project	Description
Hydroelectric Power Plant: Ultrasonic Thickness Testing	Utilized ultrasonic thickness testing equipment to measure hydro electric gate steel thickness and prepare report for client to utilize in maintenance planning.
Hydro Station Assistance	Provide field assistance for the installation of switchgear.
Pulp and Paper Mill: Lifting Beam Evaluation	Provided design for new paper roll lifting beam for fabricator's client.
Rebuild of Biomass Power Plant	Developed project cost estimate, P&ID's, and all design engineering for the extensive rebuild and upgrades of a biomass power plant with two boilers and a TG set.
Landfill Gas Collection Control System Upgrade.	Upgrade control system HMI software to improve historical data collection and reporting. Set up data collection and alarm history databases.
MANUFACTURING, CLEAN AND/OR SANITARY FACILITIES	
Food Products Company: Biomass Boiler	Providing technical consultation to Owner's engineers for the design and installation of a biomass boiler.
COMMERCIAL	
Greenhouse Biomass Power Plant	Provide engineering services to prepare thermal models, conceptual designs and requests for quotations for Boiler Island and for EPC contractors.
Hospital Campus: Biomass Boiler and TG Study	Conduct a feasibility study, including thermal and electrical modeling; develop budget scope of work and cost estimates, and return on investment options for a proposed biomass plant.

D&S Engineering – Company Experience

2007 Project Log

Project	Description
INDUSTRIAL – POWER	
Biomass Studies	Conducted return on investment studies for in-house electrical power generation for three forest products company facilities.
Cost Optimization	Develop a cost model of a facility with several fuel sources and several boilers, including biomass.
Hydro Station Cooling Water Piping Upgrade	Analyze the station service piping system and design a replacement system at two hydroelectric facilities.
Hydro Station Switchgear Platform	Providing design of a mezzanine for new switchgear.
Pipe Hanger Analysis	Conduct field inspection of high pressure steam piping, performed computer stress analysis, and identified hanger repair.
Auxiliary Boiler	Study steam system operating conditions, recommend piping and controls improvements and an auxiliary superheater.
Turbine Lifting Beam	Providing support to a contractor to design lifting mechanisms for equipment overhaul in a biomass power plant
Biomass Power Plant Equipment Access	Design lifting structures for performing equipment overhaul.
Controls Replacement Strategy	Provide engineering and project lead for instrument upgrades at a large hydroelectric station.
Substation Transformer Containment	Designed an oil/spill containment structure at a hydroelectric station.
Specifications and Drawings for Transformer Containment	Designed an oil/spill containment structure at a hydroelectric station.
Construction Monitoring	Providing construction monitoring for safety and environmental concerns on several projects.
Hydro Station Water System Modifications Study	Replacement of station service water piping in two hydroelectric plants.

2007 Project Log

Project	Description
Hydroelectric Governor Upgrades	Prepare an EPC bid package for replacement of hydraulic turbine governors at a hydro electric facility
Hydro Gate Thickness Testing	Worked with diving team to do UT thickness testing of gate structures.
Hydro Unit UT Test	Performed UT thickness testing in a penstock.
Sheet Pile Core Wall UT Test	Non-destructive testing of sheet piling at a hydroelectric facility.
Station Service Study	Evaluated remaining capacity of the station service electrical system at a biomass power plant.
Performance Improvements	Provide all engineering disciplines to support an upgrade of a fluidized biomass boiler.
Energy Improvement Project	Provide engineering support for replacement of the economizer and to implement a DOE project (on hold).
Coal Hopper Replacement	Design of a new coal unloading structure.
Biomass Power Plant	Providing all engineering disciplines for upgrade of a biomass power plant with two boilers.
Pulp Mill and Biomass Boiler Energy Model	Developed a plant-wide energy model and made the model dynamic with real time automated entry of data.
Landfill Gas Collection	Provided all controls design and systems integration for a landfill gas collection and burn-off system.
Landfill Gas Collection Data Retrieval	Provided controls engineering
Landfill Parshall Flume Data to Recorder	Provided controls engineering

D&S Engineering – Company Experience

2006 Project Log

Project	Description
INDUSTRIAL – FOREST PRODUCTS	
Dry Fuel Bin Replacement	Provided engineering to replace an indoor 100 cubic foot wood waste metering bin with a new bin. Designed a bin deflagration suppression system.
INDUSTRIAL – PULP AND PAPER	
Energy Systems Resident Technical Services	Provide day to day resident technical and engineering assistance for the generation and sale of power and operations of the power system.
Utility, Stock, and Services Piping to New TM	Provide the design for three steam lines, condensate, raw water, potable water, stock, whitewater, and compressed air lines to a new paper machine. Prepared computer models and stress analyses for the steam systems.
Utility Services Tunnel Structure	Designed an enclosed utility and passage tunnel between mills.
Turbine Generator Related Projects	Provided conceptual scopes and cost estimates for a series of projects associated with a new turbine-generator.
MCC Room and Equipment	Design new MCC Room to support installation of new turbine-generator at biomass boiler. Includes HVAC, tray penetrations and equipment layout. Design engineering for all electrical systems in MCC room.
600 PSIG Steam Line to Turbine Generator Building	Design and computerized stress analysis for a new 600 psig steam header.
ID Fan Turbine Drive Replacement	Design an electric variable speed drive to replace a steam turbine drive for an ID fan on a recovery boiler.
Feedwater Pump Turbine Drive Replacement	Design an electric variable speed drive to replace a steam turbine drive for a boiler feedwater pump. Includes the design of a new MCC structure.

2006 Project Log

Project	Description
Recovery Boiler FD Fan Air Heater	Design of the steam supply system for an air preheater.
Evaporator and Blow Down Improvements	Design of an improved continuous blow down tank and evaporator steam supply piping
INDUSTRIAL – POWER	
Magnet Relocation Biomass Power Plant	Designed the support system for a new tramp metal magnet.
Hydroelectric Station	Provide engineering support for the dismantling of a hydroelectric unit.
Flashboard Fall Protection	Design of fall protection structures for several hydroelectric stations.
Hydroelectric Station	Provide all engineering for upgrading electrical systems in a hydroelectric station.
Hydroelectric Station Maintenance and Reliability Plan	Inspect the station, interview staff, and develop a maintenance and reliability plan.
Hydro Station Oil Containment	Design of an oil containment structure.
Hydro Station Fishway Gate	Design of an automated gate for a fish passage device.
Boat Launches	Field surveys and designs of several boat launching sites on remote lakes.
Pump Station Power Supply	Field work and design for a new power supply to a remote hydroelectric pumping station.
Hydroelectric Station Spillway	Concrete restoration design.
SPCC CAD Work	Provide drawings to support SPCC paperwork.
Structural Analysis for Hoist Installation	Provide an analysis of a lifting mechanism to support a construction project.
Circuit Breaker Replacement	Design controls for outdoor substation vacuum circuit breakers at a hydroelectric facility
Direct Transfer Trip	Develop drawings to support electrical operations.

2006 Project Log

Project	Description
Evaluate Lifting Beams	Evaluated existing lifting structures and proposed modifications.
Boiler Shaft Lifting Jig	Evaluated existing lifting structures and proposed modifications.
INDUSTRIAL – MANUFACTURING	
Energy Study	Conducted a feasibility study for a co-generation power plant for a wood products manufacturer.
Fuel Storage Bin	Develop the design of a new biomass boiler fuel storage structure.

D&S Engineering – Company Experience

2005 Project Log

Project	Description
INDUSTRIAL – POWER	
DCS Documentation	Assisted Client with verification and documentation of boiler/turbine DCS alarms and trips.
Boiler Feedwater Trim Valve	Assisted Client with DCS logic modifications and characterization curves for a new boiler feedwater trim valve.
OPC Data - Ecotube to Bailey	Assisted the Client with selection, procurement, installation, and programming of an OPC server for data collection from a Bailey Info 90 DCS.
Reversing Variable Frequency Drives to Bailey	New VFD's were being installed by the Owner on cooling tower fans. DSEI provided DCS interconnection and logic design, check out, and start-up assistance.
480V Transformer Temperatures to Bailey	Provided wiring details and DCS logic modifications for 480V transformer temperature monitoring and alarming.
Electrical Upgrade	Provide all engineering to convert the station from 2 phases to 3 phase power generation. Design includes 5kV switch-gear, station service, protection, controls, and concrete structures to support a substation erected on an embankment.
Hydro Station Tie-offs	Conduct field investigations and design a fall-protection system to be used while working on flash-boards.
Power Station Emergency Generator Upgrade	Provided budget scope and cost estimate for a new emergency generator system, including support structures.
Transformer Containment	Designed an outdoor concrete transformer spill containment structure.
Power Station Spill Containment	Provided construction monitoring services for the installation of a spill containment and oil separation system at two hydroelectric stations.
Lime System Study	Conducted a feasibility study to convert a lime make-down system to utilize a lower cost raw material.

2005 Project Log

Project	Description
Monorails	Evaluate and rate lifting beams. Provided designs to bring beams up to desired load capacity.
Walkway Extension to Roof Control Room	Provided the design of a walkway for accessing an operating room roof.
VF Drive Installation Biomass Power Plant	Provided design engineering and drawings for supports needed to place a new variable speed drive on the roof of an operating room. Provided DCS interconnection and logic design, check out, and start-up assistance.
Boiler Shaft Lifting Jig	Provided preliminary engineering for jacking the boiler's live bottom shaft for performing maintenance.
Equipment Lifting System	Evaluated existing lifting structures and designed modifications.
Roof Top Safety Personnel Safety Tie System	Designed a tie-off system for people accessing rooftop mounted fans.

D&S Engineering – Company Experience

2004 Project Log

Project	Description
INDUSTRIAL – POWER	
Energy Systems Resident Technical Services	Provided ongoing resident engineering assistance for the day to day production, sales and purchase of power for two pulp and paper mill complexes.
Common Wall Between Boiler and Turbine Area	Provide structural evaluations on an as-needed basis to isolate two boiler houses as one of the structures was being dismantled.
April Shutdown	During a semi-annual outage, worked with the Client to modify and/or test various DCS control loops.
October 2004 Shutdown	Modified and tested DCS logic for tripping a series of conveyors upstream of a bark shredder during certain operating conditions.
Biomass Steam Plant	Provided all engineering disciplines to conduct due diligence for a bank at a commercial biomass fueled power plant.
Frequency Conversion	Provided all engineering to convert station services at a hydro electric plant from 40 Hz to 60 Hz. Also provided mechanical and structural engineering for the project.
Power Generation Options Review	Provided technical support for evaluating power generation options.
Hydroelectric Station Deck	Provided engineering for restoration of a structure at a hydroelectric facility.
Power House Water Control	Provided engineering to resolve water infiltration issues at a hydroelectric plant.
Energy Optimization System Communication Strategy	Provided strategic planning/implementation oversight for control system communication network and data collection system spanning fifteen hydroelectric stations in two states.
Hydroelectric Station and Dam Observation Cameras	Performed a study to determine the most cost-effective means of providing video surveillance from remote hydroelectric facilities back to a central operations facility.

2004 Project Log

Project	Description
Hydroelectric Station Energy Optimization System	Developed the project scope and prepared bid documents for expanding an existing fiber optic network at two hydroelectric stations and at two substations. Provided construction monitoring.
Hydroelectric Station Gate Platforms	Provided engineering for designing an access structure for operations of gates at a hydroelectric facility.
Hydroelectric Station Tainter Gates	Provided engineering for designing an access structure for operations of gates at a hydroelectric facility.
Dam Inspection	Provided field engineering and analysis to prepare restoration plans for a remote dam. Provided design engineering, drawings, repair plan, and construction bid package.
Hydroelectric Station Gates	Evaluated lifting mechanisms for gates at a hydroelectric plant and provided design concepts for equipment modifications.
Hydroelectric Station Monorails	Provided design engineering for installation of monorails for removal of old equipment and installation of new water wheels.
Hydroelectric Station Hydraulic Systems Reliability	Evaluated hydraulic systems and backup power requirements at a hydroelectric facility.
Hydroelectric Station Water Control	Provided engineering to resolve water infiltration issues at a hydroelectric plant.
Hydroelectric Station Manual Brakes	Provided engineering for design and installation of a brake system for waterwheels. Provided construction monitoring services.
Hydroelectric Station Engineered Lift	Provided an evaluation of existing lifting equipment and designed a lifting jib.
Hydroelectric Station Masonry Wall	Evaluated a load bearing masonry wall structure and developed repairs plans.
Combustion Control Optimization	Assisted with the design and implementation of a new combustion control strategy at a waste-to-energy facility. The new control scheme resulted in a 20% - 30% reduction of natural gas usage and an increase in waste throughput.

2004 Project Log

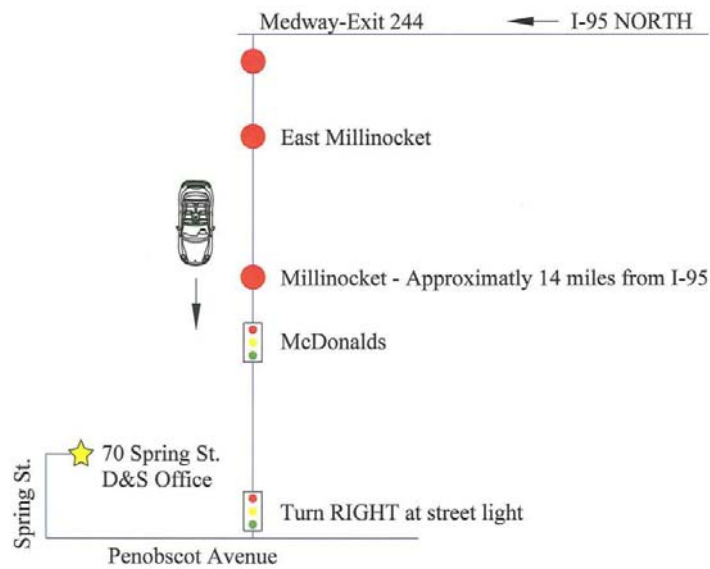
Project	Description
Feedwater Piping	Redesigned a piping system to utilize a low pressure pump to fill the medium and high pressure systems on the HRSG system prior to re-start from cold shut downs.
Screen Handling System	Provided field measurements and designed a structure for removal of cooling tower screens.
Structural Evaluation and Certification	Evaluated and rated lifting beams. Provided designs to bring all deficient beams up to required load capacity.
Monorails Evaluations	Evaluated and rated lifting beams. Provided designs to bring deficient beams up to required load capacity.

D&S Engineering – Company Experience

2003 Project Log

Project	Description
INDUSTRIAL – PULP AND PAPER	
Energy Systems Resident Technical Services	Provided ongoing resident engineering assistance for the day to day production, sales and purchase of power for two pulp and paper mill complexes.
INDUSTRIAL – POWER	
Boiler Controls Assistance	Assisted client to troubleshoot boiler attemperation water controls. Provided recommendations for corrective actions.
Circulation Pump Troubleshooting	Provided trouble-shooting and developed corrective actions for cooling tower circulation pump issues. Verified DCS logic and pinpointed faulty field device.
Hydroelectric System Automation	Provided engineering for upgrading control systems at several hydroelectric stations. Developed specifications, prepared drawings, and prepared construction bid packages.
Hydroelectric Station Deck Repair	Provided engineering for the removal and replacement of a deck between the gate house and powerhouse. Engineering tasks included site investigations, detailed design, drawings, and preparation of bid documents.
Hydroelectric Station Wall	Conducted evaluation of the exterior masonry and concrete structure for the gate house. Developed repair plan, created drawings, and prepared construction bid documents.
Hydroelectric Station Frequency Conversion	Provided an engineering study to evaluate the full scope of work needed to convert a four unit hydroelectric station from 40 Hz to 60 Hz power generation. Developed the scope of work, cost estimates, and EPC bid documents.
Power Generation Options Review	Provided technical support for evaluating power generation options.
Monorail Reviews	Evaluated equipment lifting requirements and prepared detailed drawings for fabrication of monorail system.

“A Commitment to Cost Effective, Common Sense Engineering”





Contact Information

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