Glenn M. Biladeau PE

Vice President
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EDUCATION:

Master of Engineering, Electrical Engineering, University of Idaho
Bachelor of Science, Electrical Engineering, University of Idaho

REGISTRATIONS:

Professional Engineer (PE) - Idaho (#3847), California (#E10820), Utah (#168598), Nevada (#14309), Oregon (#76753PE), Washington (#43418), and Montana (#18323) (Licensing reciprocity available in all states)

ORGANIZATIONS:

National Society of Professional Engineer' (NSPE)
Idaho Society of Professional Engineer's (ISPE)
Institute of Electrical and Electronics Engineer (IEEE)

CAREER SUMMARY:

Over 30 years experience in the detail design, construction and start-up of industrial electrical power generation and distribution, instrumentation, and control systems. These projects range over a wide area of industrial and power projects. Projects have included extensive electrical power systems design for industrial facilities including electrical generation, water treatment plants, pumping stations, hazardous waste treatment, minerals processing, industrial manufacturing and related systems and facilities. The work has also included automation control design of various material handling and process systems. Responsibilities included design, supervising and coordinating the preparation of specifications, requisitions, drawings, estimates and bid analyses for electrical engineering work.

Specific technical expertise includes short-circuit, motor starting analysis, load flow, and coordination computer studies. Other areas have involved the coordination of electrical engineering schedules, load summaries, transformer sizing, and Programmable Logic Controller (PLC) programming. Experienced in coordinating all design with drafting personnel as well as computer programming staff involved in all phases of industrial electrical design projects

The following includes a list of work experience including many of the specific project details:

WORK EXPERIENCE:

2003 – Present
Smarter Process Inc.

VICE PRESIDENT - Responsible for all phases of electrical engineering projects including, project management, engineering design, estimating and construction. Work has included a wide variety of electrical systems involving industrial power, process system and motor controls. Extensive experience in the design, review, inspection, supervision, and start-up of automated systems. Specific Projects have included:

- **Monsanto Silica Crushing Plant – Idaho.** Designed and directed the field startup and installation of a complete electrical power and control system upgrade to and existing silica crushing plant. Work included replacement of the primary substation, primary switchgear and all Motor Control Centers. Replace existing hardwired control system with a Programmable Logic Controller (PLC) system and Computer based Human Machine Interface (HMI) control interface.

- **Moranda Generating Station – California.** Checked and sealed the One-Line diagrams and wiring diagrams for the controls of the replacement generator that was installed in the existing facility.

- **TransAlta Coal Unloading Facility – Washington.** Designed and directed the field installation and startup of a modified rail car unloading facility to speed-up coal delivery to the TransAlta power station at Centralia Washington. Work included all power and controls required for the new equipment as well as rework of the existing equipment.

- **Small Hydro Generator Station– Oregon.** Performed an Arc Flash and Coordination study for a small Hydro Electric plant in Oregon to bring it into OSHA compliance. Work also included verifying the safety interlocking and protection relays to insure the plant controls were properly working.

- **Thompson Creek Mine – Idaho.** Performed site wide circuit breaker and relay coordination study. Work included on-site data collection of entire electrical system and redrafting and updating or site primary one-line drawings

  Designed a new 7.5 MVA substation to supply power to a new tailings pump station being built. Work included switchgear and transformer specifications, ground mat, and dead end structure design, yard layout as well as detailed fencing and grounding details. Additional ongoing work will include rework of the coordination study to include the new facilities as well as a sight wide Arc Fault analysis.

- **Agrium Chemical Phosphorus Acid Filter Building – Idaho.** Performed the electrical design to replace an existing Phosphorus acid filter building with a new facility. Work included upgrades to the existing plant electrical system including a new Unit Substation as well as all power, lighting, and controls for the new filter building.

- **Pomeroy Steam Generation System Upgrade – California.** Responsible for PLC and instrumentation upgrade for an existing steam curing system for a pre-cast concrete plant. Upgrade included an automatic temperature control system.

- **BB-Strand Winch Form Lowering System Phase 2 – California.** Assisted in startup, trouble shooting, and commissioning of the second set of 12 electric winch concrete form lowering crane and integration of original 12 winches into a 24-unit system. All 24 winches were speed synchronized for large concrete form lowering operations.

- **Paradise Point Water Treatment Plant – Idaho.** Design, construction supervision, and commissioning of a state-of-the-art potable surface water treatment plant. Subsequent upgrades to PLC based control and monitoring system to allow secure remote monitoring and control over the Internet.

- **Phelps Dodge Morenci Mine for Leach Project – Arizona.** Performed electrical and instrumentation construction cost estimate and constructability review of original design drawings to support litigation.

- **Irrigation Control - Owyhee County, Idaho.** Design, fabrication, installation, and commissioning of an automatic power generator start/stop system with incorporated automatic irrigation control system.

- **Generator Control - Owyhee County, Idaho.** Design, fabrication, installation, and commissioning of a radio telemetry system for site monitoring and alarming. Design, installation, and commissioning of an on demand power generator control system.

1997 – 2003
Washington Group International Inc.

PRINCIPAL ELECTRICAL DESIGN ENGINEER - Responsible for all phases of multiple electrical engineering projects including design and construction for a wide variety of mining, hazardous waste, and industrial facilities and systems. Work included estimating, material takeoffs, design review, inspections and start-up. Experience included:

- **BB-Strand Winch Form Lowering System Phase 1 – California.** Designed, built, and tested a 12-unit electric winch crane for lowering concrete forms. The PLC safety system synchronizes winch speeds in both directions as well as control of all winch functions.

- **Advance Mixed Waster Treatment Project – Idaho.** On-site final engineering and startup. Completed design and assisted startup to accommodate late procurement of equipment.

- **San Roque Multipurpose Project - Philippines.** Designed and replaced the PLC control system and Human Machine Interface (HMI) computerized display system that controlled the dam site construction conveyor and aggregate processing facility. Work included on-site design, selection and specification of equipment, and installation. Control system replacement was done with existing system still in operation to minimize downtime. Design and engineering assistance for electrical problems in all parts of the facility including on-site power generation station.

- **Clines Corners - New Mexico.** Lead electrical engineer to rework the control system and install additional equipment for the aggregate crushing and asphalt cement plant for a highway construction project. Work was performed in the field.

- **San Mateo Bridge Seismic Upgrade - California.** Lead electrical engineer to design and install a temporary 15 kV power distribution system on the bridge to support construction. Interfaced with PG&E to obtain utility power feed for the project and development of system for temporary on-site generation.

- **Chemical Weapons Disposal Plant - Alabama.** Performed construction takeoffs and cost estimates.

- **Civilian Radioactive Waste Management System at Yucca Mountain - Nevada.** Design engineer for PLC control system for the underground ventilation system.

- **Canal Cities Pump Station Rehabilitation - Egypt.** Lead electrical engineer responsible for site inspection and design upgrades of fifteen sewer lift stations at Port Said and Ismailia, Egypt.

- **Yuzhno - Sakhalinsk Housing Project - Sakhalin Island, Russia.** Lead electrical engineer for design of project housing for Exxon Neftegas Limited in Russia. Work included on-site power generation and distribution to all buildings as well as area street lighting and support facilities. Design of complete electrical and communication systems for the community. Design included fiber optics communication network for telephone, computer network, cable TV systems, and satellite dishes.

1993 – 1997
Morrison Knudsen Co.

SENIOR STAFF ELECTRICAL DESIGN ENGINEER - Project activities included:

- **Kennecott Project - Magna, Utah.** Lead electrical engineer responsible for conceptual design and all utility site surveys required for permitting. Responsible for final design including all power and grounding requirements for the project. Project included 44 kV and 13.8 kV overhead transmission and distribution systems. Three major double ended substation with 32 MVA and 16 MVA capacities and secondary switchgear. Facilities included a reclaim water system and two cyclone stations for handling all the tailings. Work included power design for a number of pumping and power facilities. Installed multiple medium and low voltage Variable Speed Drives (VFD) totaling 30,000hp and nine substations totaling 96 MVA. Conducted study and evaluation of energy recovery system on turbine generators used for pressure reduction in the tailing line.

1988 – 1993
Morrison Knudsen Co.

STAFF ELECTRICAL DESIGN ENGINEER - Responsible for all phases of electrical design and construction work for a wide variety of projects. Those included hazardous waste, mining, and industrial facilities and system projects. Extensive experience doing design reviews,

inspections, and start-ups for hazardous waste treatment, storage, and incineration facilities and projects. Specific experience included:

- **Lucky Peak Power Plant Project – Boise, Idaho.** Performed evaluation and trouble shooting of the Allen Bradley PLC-3 control system for the generator control system for the powerhouse. The system was a redundant processor system with automatic processor switching in the event of the primary processor fault.

- **SEDEM project - Yucca Mountain, Nevada.** Member of review selection committee for underground and mining equipment.

- **MSDGC Des Plaines Tunnel – Chicago.** Lead electrical engineer for the design of the waste rock handling system. The waste rock generated by a 35' Tunnel Boring Machine (TBM) was removed from the tunnel by means of a PLC controlled conveyor system. Work included design of the control system, operator control panel, HMI annunciator, control interface to the TBM, fabrication of panels, and field startup of the system.

- **Taipei Subway System – Taipei, Taiwan.** Designed controls for lubrication system and monitoring for two 25' TBMs. Work included design of the PLC control system, HMI annunciator, and the TBM control interface.

- **Morrison Knudsen Equipment Group – Boise, Idaho.** Lead electrical engineer for remodel work on two road-header mining machines for construction projects within the Morrison Knudsen's (MK) equipment group.

- **Vertac Chemical Site – Arkansas.** Lead electrical design engineer for the waste incinerator project. Work included plant power system, material handling control system, incinerator train control system, and motor starting studies. Also provided electrical supervision for plant start-up and commissioning; work included control system checkout and operations assistance during facility certification trial burn.

- **Waste Oil Cleanup and Recovery – Texas.** Lead electrical engineer for refinery hazardous waste treatment facility. Work included pilot plant design and start-up assistance, commercial plant design, preparation of specifications, and direction of all engineers, designers, and drafters assigned to the project**.**

- **Highway 36 Treatment, Storage and Disposal Facility - Colorado.** Design and inspection services associated with the design and construction management. This is the first facility to be built in the United States under the 1984 RCRA requirements**.**

- **Celanese Chemical Plant - Pampa, Texas.** Electrical engineer for insurance damage assessment team on the Celanese Chemical Plant explosion and fire. Performed and directed in-depth review of fire and explosion damage. Damage assessment report was used to determine repair or replacement cost for this plant.

1982 – 1988
Morrison Knudsen Co.

STAFF ELECTRICAL ENGINEER - Responsible for all phases of the electrical design and construction work for a wide variety of mining projects, and industrial facilities and systems. Extensive experience in design reviews, equipment inspections and system start-up of mining facilities. Specific experience included:

- **Chevron Resources Vernal Phosphate Project – Utah.** Lead electrical design engineer for Phases 1 and 2 of the project. Wrote all the electrical specifications including the design criteria. Supervised all design and drafting personnel as well as the computer programming staff involved in the design. Design work included in-plant power distribution, main substation, unit substations, short-circuit, and coordination computer studies, control system wiring, and computer programming for a touch screen controlled System Control and Data Acquisition (SCADA) system. Performed in-plant inspection and start-up for power and control systems.

- **Coeur-Rochester Mining Facility – Nevada.** Lead electrical engineer for the remodel of the facility. Redesigned the electrical distribution system and medium and low-voltage Motor Control Centers (MCC). Redesigned and replaced entire control system. Performed supervision of on-site contractors and start-up and check-out of facilities. Performed rework, modifications, and expansion to the Coeur-Rochester Mine PLC control system for a fourth crushing circuit and pre-screening plant.

- **Cerrejon Coal Project – Columbia, South America.** Performed control system review and inspection of the port facilities ship loader and bucket wheel stacker/reclaimer control system as well as performed the load flow, fault analysis, and shovel impact electrical studies.

- **Rojo Caballos Mine - Gillette, Wyoming.** Acting as the client representative, coordinated field start-up and monitored electrical subcontractors on coal facilities projects for Mobil Oil Company.

- **Union Geothermal – Salton Sea Steam Gathering System – California.** Electrical and control system design for the geothermal steam gathering system.

- **Skyline Mines - Utah.** Performed field start-up assistance and monitoring of subcontractors on coal facilities projects for Coastal States Energy Company.

1981 – 1982
Morrison Knudsen Co.

SENIOR ELECTRICAL DESIGN ENGINEER – With responsible for the electrical design work on various material handling projects and process facilities.

- **Skull Point Terminal in Kemmerer, Wyoming**. Lead electrical engineer for Chevron's molten sulfur railcar loading facility. Duties included design of control systems for the plant, review and checking of all design drawings and electrical

specifications including main substation equipment, MCCs, programmable logic controllers, and miscellaneous electrical equipment. Performed bid analysis of all major electrical items.

1975 – 1981
Morrison Knudsen Co.

ELECTRICAL DESIGN ENGINEER – Engineering designs involved power transmission, distribution systems, substations, transmission lines, lighting, and control systems. Other work included computer-aided load and short-circuit analyses

- **Rawhide and Caballo Open-Pit Coal Mines, Wyoming**. Electrical design work for Carter Oil Company.
- **Nose Rock Uranium Mine – New Mexico**. Electrical design work for Phillips Petroleum Company.
- **Stansbury Coal Mine – Wyoming**. Electrical design work.
- **Rio Blanco Oil Shale Facilities – Colorado.** Electrical design work.
- **Northumberland Gold and Silver Recovery Facilities - Nevada**. Electrical design work.
- **Thompson Creek, Molybdenum Mine – Challis, Idaho**. Electrical design review for Cyprus Mines.
- **Wood Particle Board Plant – California**. Worked on fiber alignment system at Louisiana Pacific's plant.
- **Automotive – Ohio and Oklahoma.** Field experience included start-up and checkout of electrical systems at General Motors stamping and assembly plants.

1968 – 1974
Idaho Division of Highways

ENGINEERING AIDE – Performed inspection of concrete, aggregate, and plant mix for highway projects. Worked as survey crew chief and instrument man.