Garre L. Biladeau, PE

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 – Idaho (#2802) (Licensing reciprocity available in all states)

ORGANIZATIONS:

National Society of Professional Engineers (NSPE)
Idaho Society of Professional Engineers (ISPE)
American Water Works Association (AWWA)

CAREER SUMMARY:

Over 35 years of engineering experience in technical consulting, estimating, planning, and the design and integration of electrical, process instrumentation and control, communication systems, and computer systems and networks. Work has included a wide background in project, construction, and operation management.

Specific design work has been done in water and power utility plants, nuclear reactors, mineral processing, food processing, material handling, and semiconductor manufacturing. Designs have involved process control and electrical systems using variable frequency drives, servo control system, numerous process control computers, and Programmable Logic Control (PLC) systems. Other designs have included lighting, alarm systems, wired and wireless communications systems. Computer hardware and software work has involved extensive experience with Microsoft Windows systems and other computer systems. Field experience includes construction management, and the startup and trouble-shooting of equipment. Organization management experience includes Information Technology (IT) managing Computer Aided Design and Drafting (CADD) operations, corporate Management Information Systems (MIS), engineering design groups, manufacturing production organizations, and numerous design projects.

The following includes a list of specific work experience and many specific projects:

WORK EXPERIENCE:

2004 – Present

Smarter Process Inc.

PRESIDENT - Responsible for all phases of control, instrumentation, computerization, and electrical engineering projects including, project management, engineering design, estimating and construction. Work has included a wide variety of systems involving process and computerized controls. Extensive experience in the design, review, inspection and start-up of automated systems. Some projects include:

- **Monsanto Silica Crushing Plant – Idaho**. Designed and directed the field startup and installation of a electrical power and control system upgrade to and existing silica crushing plant. Work included Motor Control Center control and new DeviceNet communication networks. Replace existing hardwired control system with a Programmable Logic Controller (PLC) system and Computer based Human Machine Interface (HMI) control interface

- **St Michael's Cathedral Building Remodel – Idaho.** Primary electrical engineer for the design for a complete new electrical power distribution in a 100 year-old building. The design consisted of a new primary utility transformer, all switchgear and building distribution circuits. Other work included new lighting, and a new fire alarm system.

- **Paradise Point Water Treatment Plant – Idaho.** Design, construction supervision and commissioning of an automated potable surface water treatment plant. Subsequent upgrades to PLC based control and monitoring system to allow monitoring and control by Internet connection including security concerns.

  Coordinate and monitor this system as required by the Idaho Department of Environmental Quality (IDEQ). Provide ongoing monitoring and testing of the drinking water quality of the plant. This water system is a Public Water Source (PWS) registered with the Environmental Protection Administration (USEPA). This system meets and present Surface Water Treatment Rule (SWTR) requirements of the USEPA.

- **Zial Networks – Boise**. Worked to help develop a WiFi network to cover a new housing subdivision. This included the location of Access Points and the design concept for backup power for the network.

2000 – 2004

JST Manufacturing Inc.

CONTROL ENGINEERING MANAGER – Responsible for all phases of electrical and control engineering for JST's a new line of automated

semiconductor process systems. Work involved the development of all of the electrical and control automation standards, designs and software for the systems.

- **Agilent Technology – Colorado.** Designed process and automation servo controls for a second automated hydrofluoric acid rinse station for semiconductor processing. This bench included the incorporation and communication development of a third party complex mechanical wafer spin-drying unit. Designed computer communication system for both of the automated benches to provide operational status, reporting and remote control with Agilent's master process control computer network

- **IBM and Hitachi – California.** Developed the controls for an automated washing system to clean read/write heads for computer hard drives prior to final assembly.

- **Delphi Electronics- Indiana**. Designed communication system for three JST automated benches to provide operational status, reporting and remote control with Delphi's master process control computer system.

- **Agilent Technology – Colorado.** Designed process and automation servo controls for an automated hydrofluoric acid rinse station for semiconductor processing. This station included the design of a two-axis servo controlled wafer transport mechanism for moving the wafers between process baths. This station also included a precision vacuum dry system developed by JST and using an updated PLC control design.

  Developed automation controls for two different wafer process systems. These systems used two-axis servo motion control systems for semiconductor wafer processing. Each system included precision process temperature control baths, PLC controllers, computer displays and alarm enunciation.

- **Motorola – Chicago, Illinois.** Developed sophisticated temperature and concentration controls for a chemical etch semiconductor process station using potassium permanganate. This station maintained precise temperatures and chemical concentrations for three large heated baths. Developed all the precision PLC control, system alarms, multiple computer displays, and automated computer data logging system.

1998 – 2000
JST Manufacturing Inc.

OPERATIONS AND ENGINEERING MANAGER – Managed an organization staff of 12 technical and engineering personnel covering all mechanical and electrical design aspects for both manual and automated semiconductor process benches and systems manufactured by JST. Addition responsibilities involved overseeing the manufacturing and assembly for an

additional 30 manufacturing personnel.

1995 - 1998

Mobex Communications Inc.

CHIEF ENGINEER - Primarily responsible for site and network design and development of wireless two-way Specialized Mobile Radio (SMR) for Motorola trucking radio systems and paging systems. This work includes RF site design, developing computerized Radio Frequency (RF) coverage maps for all of our major repeater sites. Technical sales support and coordinating technical issues related to Federal Communication Commission (FCC) licensing and auctions. Coordinated several multi-million dollar auctions for the company in several regions of the country.

Supported systems with over 400 radio channels in six states. Technical support included RF safety studies and engineered analyses for network connections, power, site locations, system reliability, and coverage issues. Designs included new site RF design and network implementation for optimizing coverage and performance of SMR and paging systems.

Provided engineering design and operational support for remote sights including off-grid sights with extensive photo voltaic and thermal power systems.

- **Acting Corporate Information Systems Manager** – In this acting position from 1996-1998 during a rapid growth time for the company and until the company became large enough to hire a full time corporate computer systems administrator.

  During this time the computer network went from a small stand alone UNIX server with a few dumb terminals to a corporate Intranet with sites in 5 states and with over 100 users. The network included multiple UNIX database servers, and UNIX, Windows NT and Novell file servers with remote terminal and print servers; and Microsoft Windows client workstations. Technology implementation included Ethernet LAN's, frame relay telephone interconnections, T-1 microwave links and network routers and bridges using Novell IPX and Internet TCP/IP protocols.

1993 - 1995

Hewlett-Packard Corp.

FACILITIES RELIABILITY ENGINEER - Team coordinator for a number of teams working on process improvement and development for the Boise site facilities maintenance organization. Work involved working with the facilities maintenance staff to improve overall working productivity and safety. Some specific projects included:

- Major contributions to the maintenance teams involved emphasis on strategic and tactical planning, process and statistical day analysis and the use of Total Quality Management (TQM) team practices. Worked with supervisors and their staffs to improve maintenance processes and develop measurable process performance metrics.

- Other team projects included the selection of new maintenance management computer software. Contributions to this team involved technical support and training for the maintenance staff and technical knowledge of computer networks, computer system integration and personal computer (PC) hardware and software.

1988 - 1993
Hewlett-Packard Corp.

FACILITIES SYSTEMS ENGINEER - Provided technical management coordination with site customers for site facilities computer monitoring of site and production utilities.

- **Two-way Radio and Paging System – Boise**. Supplied engineering support for, design, selection and upgrades for a 150-unit radio system and a 400-unit radio paging system for HP's facilities, security, and production personnel. The job included writing proposals and providing system design specifications for equipment, system usage analyses and metrics. Coordinated vendor contract negotiations and reviews. Provided software and firmware programming for the setup and continued operation of the computer controlled two-way tanking radio system. Wrote PC based software programs in BASIC and XBASE to interface the paging system with site computer networks and to maintain user database and system usage logs.

- **Utility Monitoring System – Boise.** Other system engineering responsibilities included the design, development, installation, and management of real-time computer based Supervisory Control and Data Acquisition (SCADA) systems. This work included coordinating the technical work of several technicians. Other work included the selection of instrumentation transducers and systems, integration of user PC 's, the design of electrical distribution projects and uninterruptable power supplies (UPS).

1987 - 1988
Morrison-Knudsen Co.

STAFF ENGINEER – Provided electrical and control engineering support for construction projects.

- **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 to electrical

hardware. Damage assessment report was used to determine repair or replacement cost for this plant.

1982 - 1987
Morrison-Knudsen Co.

COMPUTER AIDED DESIGN DEPARTMENT MANAGER - Spent five years managing computer system services operation with a staff of 11 for an engineering department with 40 designers, engineers, and managers. These services included drafting support for engineering design, geological modeling, database management, word-processing and CADD applications.

- Provided system administration support for IBM compatible PC 's and minicomputers with local support in Boise and network terminal support in Denver. Designed and coordinated hardware and software modifications, upgrades and system strategies. Designed, implemented and documented the departmental computer systems operating, security and backup strategies. Work included teaching user software courses in Boise, Denver, and San Francisco. This work also included software design using FORTRAN compilers and macro language interpreters for DEC and PRIME minicomputer based operating systems, and IBM compatible PC's.

- Wrote various reports and papers on the use and applications for computer based engineering and CADD systems. Several of the papers were presented at local seminars and one was presented and published internationally. (See final section on Papers and Presentations.)

1979 - 1982
Morrison-Knudsen Co.

SENIOR ENGINEER - Spent four years working on a number of engineering design and construction projects. Provided lead engineering and technical supervision for a project engineering staff that varied from two to seventeen designers and engineers. This project work included the design of computer and Programmable Logic Controller (PLC) based process control, instrumentation, and SCADA systems for industrial and mining facilities. Work often included field construction coordination and inspections. Other work included designs, studies and analyses of material handling control systems, radio communication systems, and manufacturing and mining production processes.

- **Cerrejon Coal Project – Columbia, South America**. Performed control system review and developed the inspection plan procedure of the port facilities ship loader and bucket wheel stacker/reclaimer control system. Provided instrumentation design for the port potable water system and coordinated control and instrumentation issues at the port site.

- **Chevron Oil Shale Pilot Facilities – Utah.** Coordinated with client and designed instrumentation and control systems for ore handling, crushing, and conveying..

1974 – 1979
EG&G Idaho/Aerojet Nuclear

ENGINEERING SPECIALIST – Assigned to various contractor's projects at the Idaho National Engineering Laboratory. The assignments primarily involved design and analysis of instrumentation performance, testing procedures, and measurement reliability

- Worked on the Loss of Fluid Test (LOFT) nuclear test reactor. Primary responsibilities included the statistical analysis of measurements taken during testing. These analyses were used to determine overall performance accuracy, reliability, and uncertainty on the measurements. Other assignments included instrumentation system designs using minicomputers for data acquisition.

- Wrote or co-authored a number of published reports on instrumentation performance analyses for the U.S. Nuclear Regulatory Commission. Co-authored a paper on the statistical analysis procedure for evaluating measurement performance uncertainty. (See final section on Papers and Presentations.)

1972 - 1974
University of Idaho

GRADUATE STUDENT/CONSULTANT - Non-thesis graduate studies centering on electrical and electronic engineering applications and network interfaces for computer systems. Masters degree program had heavy emphases on computer science. Consultant work, during this time, included a major redesign and installation coordination of the University Student Union Building audio system.

1969 - 1972
Texas Instruments, Inc.

DESIGN ENGINEER - The work involved project coordination with customers within the U.S. Department of Defense. Responsible for the analog and digital hardware design of electronic circuits and systems for personnel detection and computer interface projects. Project assignments included the design of various coil and thin film magnetic transducers. Served as lead engineer for the design and manufacturing coordination for a prototype magnetic intrusion alarm system. Other assignments included writing technical proposals, designing production test equipment, and providing engineering support for printed circuit board assembly.

- **Mobility Equipment Research and Development Center (MERDC) - Virginia**

Developed a magnetic detection system for intrusion for the US Army. This system used magnetic characteristics of metallic objects interacting with the earth's magnetic field to detect military equipment. Lead engineer in developing the prototypes and tested the systems in the field.

Prior to 1969

Various Positions

ENGINEERING ASSISTANTS - While pursuing an undergraduate degree, held summer and part-time jobs as engineering assistants.

This work included analysis of geo-science data and the development of FORTRAN based computer programs for the University of Idaho.

Other work involved doing a power distribution and transformer load flow study for the City of Idaho Falls electrical utility.

Provided surveying support, construction inspection, and engineering data computation for the Idaho Department of Highways.

FORMAL PUBLICATIONS, PAPERS, PRESENTATIONS, AND INSTRUCTION:

- "Potable Water Treatment Plant" Pacific Northwest Section meeting of American Water Works Association (AWWA) in Boise, Idaho, May 2003
- "Fundamentals of Instrumentation Engineering" HP technicians (9 weeks/l8 total hours) in Boise, Developed and taught training class for 1994
- "Introduction to Computer Programming" Developed and taught training class for HP technicians (6 weeks/l2 total hours) in Boise, 1990
- "CADD User Training" Developed and taught training class for MK drafting personnel (2 week classes/so total hours) in Boise, Denver, and San Francisco, 1986-1987
- "Computer Aided Engineering for Facilities Management" The Fourth Pacific Northwest Conference on Digital Technologies Seminar in Boise, Idaho, January 1986
- "The Aggressive Use of Computer Aided designed, Planning to Building Development R.S.A. June/July 1984, p. 17.
- "Computer Aided Design in Education" Idaho Vocational Association State Conference in Boise, Idaho, August 1984.

- "Digital Systems investment" Computer Aided Drafting & Mapping & Geographic Seminar in Boise, Idaho. 1984.

- "The Aggressive Use of Computer Aided Design" ARCSA (ply) Ltd. Computer Aided

- Design Symposiums in Cape Town, South Africa and Johannesburg, South Africa, April 1984

- "Microprocessors in Mineral and Material Handling" Morrison-Knudsen Engenharia, S.A. Brazil, South America, June 1982.

- "LOFT Nuclear Reactor Safety Tests" Southeast Chapter of the Idaho Society of Professional Engineers meeting in Idaho Falls, Idaho. 1979.

- "LOFT Experimental Measurements Uncertainty Analysis" NUREG/CR-OI69 illegal 1089) U.S. Nuclear Regulatory Commission, 1978.

- "Is Your 1 % day 10% Uncertain? - The Technique of Uncertainty Analysis" Proceedings of Western Regional Strain Gage Committee, 1975, p. 11