

## SELECTED EXPERIENCE - WILLIAM G. WESTGARD, P.E.

### Professional Summary

William G. Westgard is the founder and owner of Automation & Control Services and has over twenty years of experience, including fifteen plus years at Automation & Control Services, providing customers with professional electrical engineering services, turnkey control systems and the design and startup of motion systems and PLC based controls. Areas of expertise include power distribution, PC and PLC based control systems design, motion control and design of highly accurate and reliable crane control systems located in hazardous locations, hydroelectric plants, aerospace and nuclear facilities. Other projects include ferry loading systems, MV voltage motor protection, hydraulic and pneumatic material handling systems, medical device testing systems and other various machine controls. A&CS was founded in December 1993.

### Portal Crane Study and Specifications

Performed feasibility study to evaluate generator and shore power options for five U. S. Coast Guard portal cranes. The study provided evaluation of options for repowering the cranes and replacing one of the crane's existing late 60's era Avtek motor-generator controls. Also wrote commercial grade specifications for new AC and DC drive based control systems.

### Graving Dock

Electrical Engineer of Record for a graving dock to be built by General Construction Company at Port Angeles, WA. Responsibilities include complete electrical power distribution and control system design. This facility design consists of a PLC controlled pump system that controls flooding and dewatering of the graving dock and the main gate which is designed to be water ballasted and locked into place in an open or closed position. Only three phase power and Remote I/O communications were taken to the gate so that the amount of festoon-like cabling connecting the dock and gate could be minimized. Responsibilities also included manufacture, programming and startup of all controls.

### Remediation System with SCADA

Electrical Engineer of Record for an environmental remediation system for Battelle Labs and the Army. Responsibilities included complete electrical power distribution and control system design. This PC based "pump & treat" control system pumps water from an underground plume contaminated with solvents. A fiber optic network connects the main control house with the eight pump houses, each of which has local I/O and a variable frequency drive that controls the flow rate with a positive displacement pump.

### Substation Consultation

Provided consultation to Fluor Global Services / Alcoa on a substation contaminated with PCBs that supplies critical power to the Intalco Works rod shop. Worked with Alcoa personnel and vendors and wrote a report for Fluor/Alcoa outlining options and solutions for their power needs for this part of the plant. Also wrote specifications and coordinated electrical work for this project.

### Potline Control System

Worked with Fluor Global Services / Alcoa and provided potline control system design services for the Ferndale plant. This PLC based system was designed so that change over to the new system can be done quickly and seamlessly, minimizing disruption to the production process at startup.

### Powerhouse Bridge Crane

Designed, supplied and commissioned a crane monitoring system for a powerhouse crane at the Gorge Dam. The system monitors the crane operation and position and displays information to the operator.

### Dry Dock Wing-Wall Crane

Provided engineering/design services for constant-potential DC travel controls for a WWII era dry dock wing-wall crane for Marine Industries NW. Supplied new travel control drawings, new compound-wound DC brake motors, controls equipment and startup assistance.

### Aerospace Facility Bridge Crane

Provided electrical engineering, control system design and startup services for rehabilitation of a bridge crane for The Boeing Company. The controls included a vector drive hoist, and open loop VFD bridge and trolley drives and pendant and radio controls.

## **Ferry Terminal Design**

Provided electrical engineering consulting services to Washington State Ferries terminal design office on controls and power distribution for passenger and vehicle loading systems. Also provided WSF with peer review of a PLC based loading system for the Friday Harbor ferry terminal.

## **Water Jet Controls**

As a consultant to Flow International, designed PLC and operator interface software and control system hardware for ultra-high-pressure water jet pumps up to 200HP. Designed hardware and software for a single axis on-the-fly crosscutter that is integrated with a Square D PLC and receives setup data serially from a PC running Wonderware. Hardware and software design of a seven axis slitter and two axis on-the-fly crosscutter that cuts fiberglass using an Allen Bradley 1394 motion system, an SLC 5/04 PLC and a Panelmate operator interface. Designed an abrasive monitoring system for water jet cutting using an Allen Bradley PLC and an industrial PC that runs Labview and records abrasive levels to disk in spreadsheet form.

## **Medical Device Test Systems**

Designed, built, programmed and commissioned several turnkey control systems for prosthetic spinal disk testing machines for Medtronic Corporation including a six axis motion system using Parker Hannifin's Compumotor motion controllers. The systems test spinal disk prosthetics in order to meet FDA testing requirements.

## **Launch Complex Hammerhead Crane**

50/15 ton Class I, Div II hazardous location bridge crane for USAF Titan rocket Launch Complex - 41 at Cape Canaveral, FL. This 1991-92 era crane was one of the first to use line-regenerative vector drives for hoist control. It had multiple control consoles and used five G.E. 90 series PLCs on a Genius bus network and two co-processors running MegaBASIC on the main CPU backplane.

## **Crane Failure Mode Effects Analysis (FMEA)**

Performed Failure Modes Effects Analysis on 50/15 ton USAF payload assembly crane as a consultant to TRW in Redondo Beach, CA. The outcome of this analysis led to hardware and software modifications that enhanced operational safety.

## **Crane Control System Modifications and Startup**

Provided startup services and the programming modifications recommended above for the 50/15 ton USAF crane as a consultant to Brown & Root at Launch Complex - 41 at Cape Canaveral, FL.

## **Boeing Aircraft Splice Tool**

Provided Boeing with two six axis turnkey splice systems. The scope of these projects included system design and build, power distribution coordination with Boeing, all electrical drawings, and a complete operations & maintenance manual. This system runs Allen Bradley's Graphical Motion Language and is used to splice the two halves of the F/A-18E/F Super Hornet together. Additional programming and hardware modifications provide LVDT position feedback that gives Boeing faster and safer airplane assembly.

## **Truck Frame Transfer System**

Provided Kenworth Truck with a turnkey PLC based electrical control system for a multi-axis hydraulic system that transfers truck frames to and from a conveyor which is controlled by a variable speed drive. The system is operated by a touch screen and radio remote control pendants.

## **Tunnel Boring Machines**

Provided Allen Bradley PLC5, Mitsubishi PLC, Factory Link and Panelmate programming to control boring/mining machines for The Robbins Company in Kent, WA which are used in large tunneling construction projects.

## **Retractable Pontoon Bridge Controls**

Provided Manson Construction with an on-site control system review and motor control troubleshooting services on the Ford Island Bridge at Pearl Harbor. This retractable pontoon bridge connects Ford Island with Oahu.

**Education** - B.S., Electronics Technology from Indiana State University, 1986

**Continuing Education** – Arctic Regions Engineering Short Course, January, 2005

**Licensing** - Professional Engineer, Electrical - Washington (license # 33298) and Alaska (license # 11167)

**Professional Affiliations** - Member IEEE, Industrial Applications Society