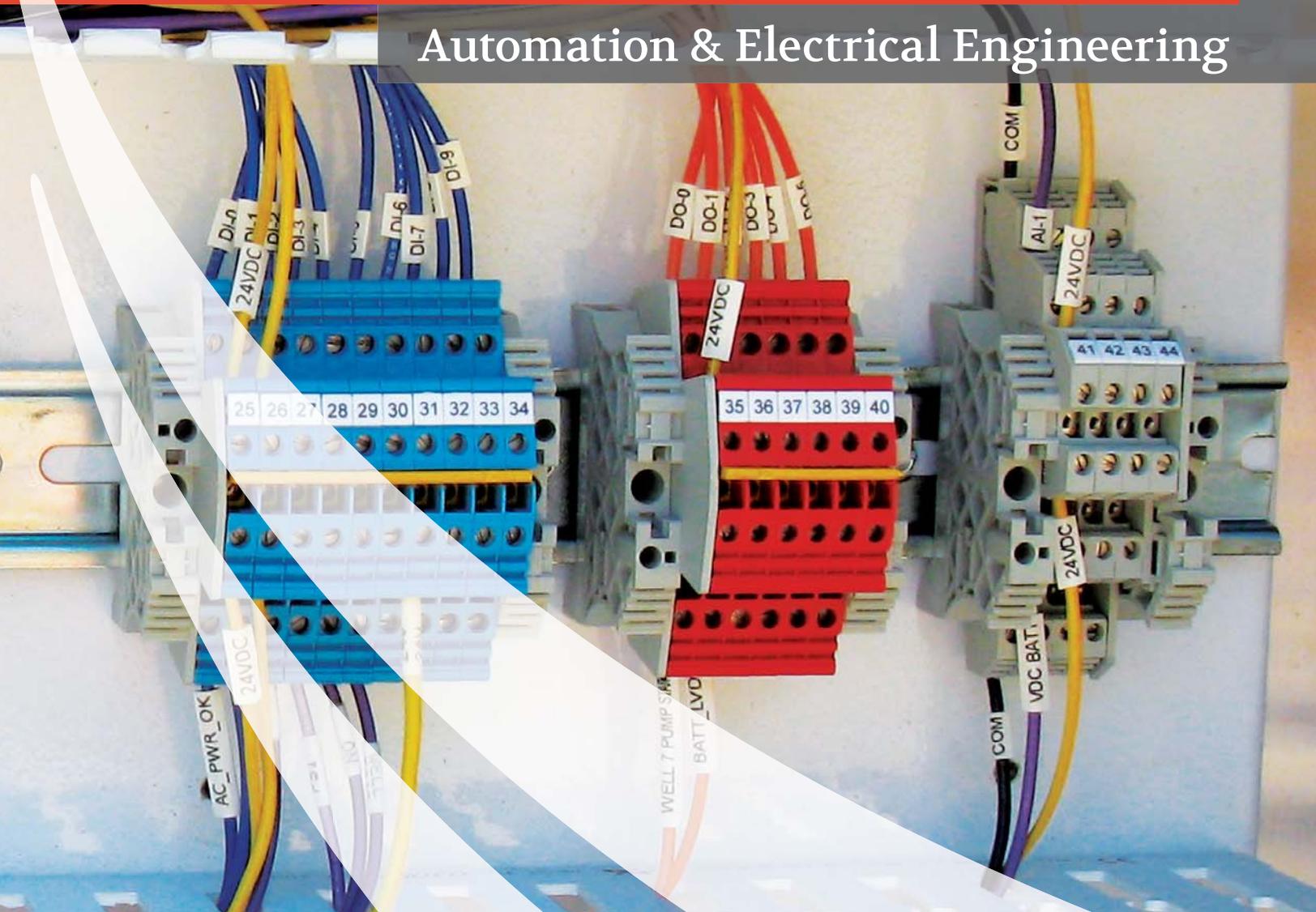


Cannon

Automation & Electrical Engineering



Reliable Responsive Solutions

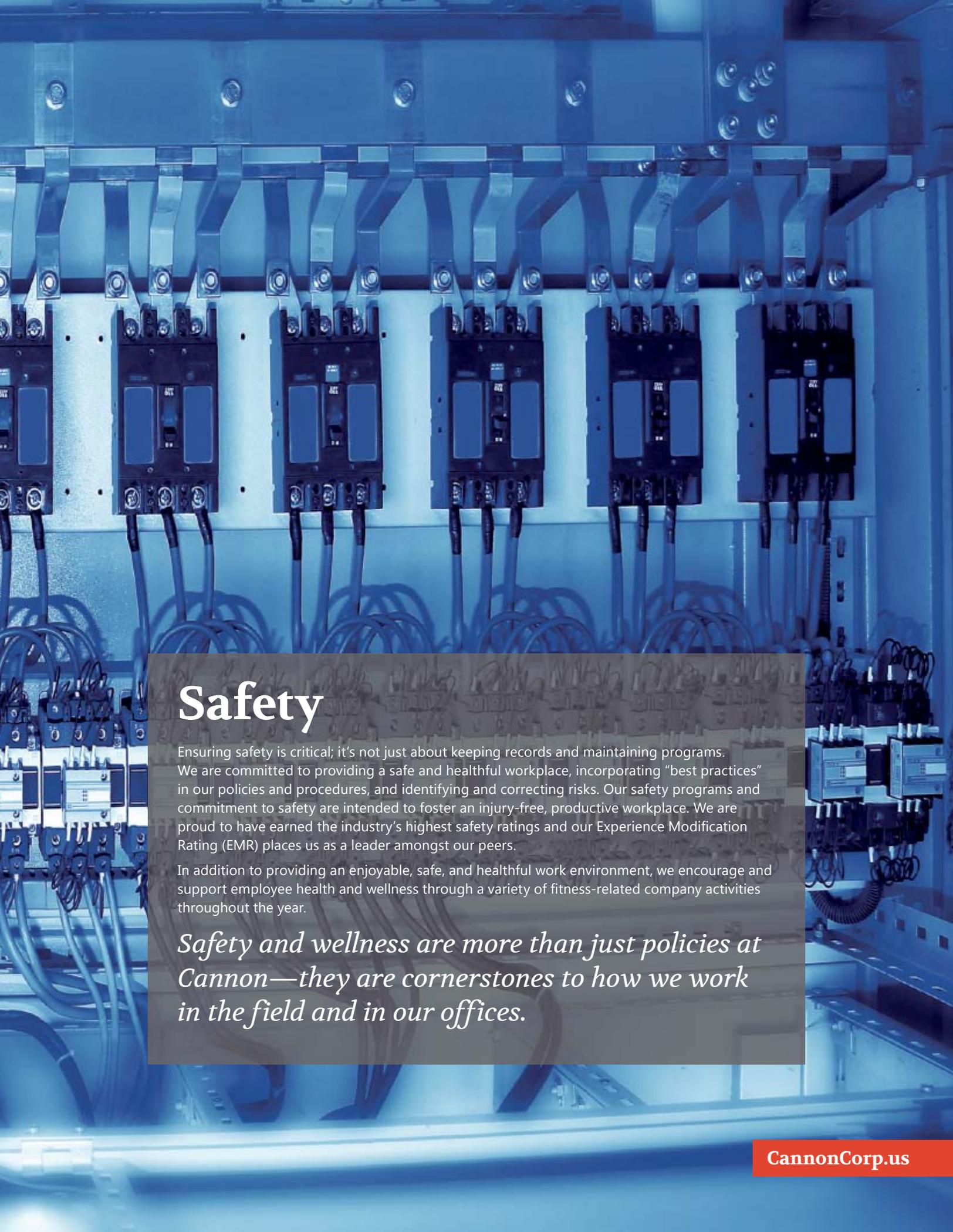
Relentless Pursuit of the *Elegant* Solution

Elegant [ˈɛlɪɡənt] *adj*: simple, refined, appropriate, harmonious. We strive for it in all we do.

Our team of professionals includes:

- Automation and Controls Engineers
- Mechanical Engineers
- Civil Engineers
- Agricultural Engineers
- Chemical Engineers
- Petroleum Engineers
- Process Engineers
- Structural Engineers
- Electrical Engineers
- Surveyors
- GIS Specialists
- Funding Administrators
- Technicians and Designers

We have provided Reliable Responsive Solutions to clients for projects large and small since 1976.



Safety

Ensuring safety is critical; it's not just about keeping records and maintaining programs. We are committed to providing a safe and healthful workplace, incorporating "best practices" in our policies and procedures, and identifying and correcting risks. Our safety programs and commitment to safety are intended to foster an injury-free, productive workplace. We are proud to have earned the industry's highest safety ratings and our Experience Modification Rating (EMR) places us as a leader amongst our peers.

In addition to providing an enjoyable, safe, and healthful work environment, we encourage and support employee health and wellness through a variety of fitness-related company activities throughout the year.

Safety and wellness are more than just policies at Cannon—they are cornerstones to how we work in the field and in our offices.

Electrical Engineering

Overview

- Water and Wastewater
- Industrial
- Oil & Gas
- Refineries
- Food & Beverage
- Agricultural
- Power
- Education
- Civic/Municipal Facilities

Services

- Master Planning
- Low, Medium, and High Voltage Distribution Systems
- Power Systems Analysis and Modeling
- Motor Control Systems
- Electrical Specification
- Electrical Coordination
- Arc Flash Analysis
- Recloser Studies
- Emergency and Standby Power Systems
- Cost Estimates
- Energy Efficiency Studies
- Title 24 Calculations
- Construction Management
- Bid Assistance
- On-Site Observation
- Record Drawings
- O&M Manual Review

Projects



Lynch Canyon Facility Expansion

Monterey County, California

Eagle Petroleum expanded production of the Lynch Canyon field from 400 barrels of oil per day (BOPD) to 2,500 BOPD. Cannon provided all needed electrical engineering, facilities, engineering, and design services from concept through construction, including planning and permitting assistance. Electrical engineering services included design of a new substation, new motor control centers, and electrical distribution; preparation of specifications for procurement; and preparation of drawings for permitting.



Electrical Design for Water Facilities

Covina, California

Suburban Water Systems (SWS) provides water services to a population of 300,000 in the East Los Angeles area. With 18 wells, 32 reservoirs, and more than 800 miles of pipeline, Cannon has maintained a service agreement with SWS since 2008. During that time, Cannon engineers have prepared electrical and controls design plans and specifications for four pump stations and four wells. The electrical designs included calculations, power distribution, layout of electrical gear, coordination studies, and technical specifications. Due to specific pumping requirements, a number of these pump stations and wells were designed using variable frequency drives (VFDs). Designs included specification of the VFDs, design for the controlled operation of the pumps, and interfacing with the existing SCADA system.



Recloser Specification and Coordination Study

Kern County, California

The Western Minerals Oil Field was supplied by and metered at 480 v power from PG&E. Seneca Resources desired to change the power distribution from 480 v to 12.4 kV. As such, PG&E required Seneca Resources to provide and install a recloser for protection of the 12.4 kV system. Cannon was contracted to write a specification for a new recloser and bypass equipment including an overhead air switch and loadbreak fusible disconnect. Additionally, Seneca Resources needed to add load to the existing power system. Because of PG&E's limited substation facilities, only a certain amount of load was allowed before the substation was upgraded. The recloser coordination study Cannon prepared included an analysis of the existing load on the system. This analysis was used to determine how much and which loads could be added prior to PG&E's upgrades were completed.



Electrical Design for Pump Stations

Westlake Village, California

The City of Westlake Village needed electrical design services for the water system at a new 29-acre multi-purpose community park. Cannon provided electrical design of two reclaimed water pump stations and one potable water pump station. The reclaimed pump stations required constant pressurization to provide reclaimed water for the irrigation system. The pumps are VFD-controlled and operate on the discharge pressure of the system. The electrical design included calculations, coordination studies, layout of electrical equipment, and preparation of technical specifications. Cannon also provided dry utility coordination for the park, working closely with Southern California Edison to design primary power distribution to two service points at the site.

Design & Implementation

Overview

- Utilities
- Water and Wastewater
- Industrial
- Agricultural
- Oil & Gas Extraction
- Petroleum Refineries
- Food & Beverage
- Pipeline
- Power Generation

Services

- SCADA and HMI Development
- Panel Fabrication
- Control Philosophies
- Network Design
- Control Narratives
- PLC Programming
- Distributed Control Systems
- Instrument Specification
- Process Optimization
- System Integration and Startup Support
- Process Control Troubleshooting and Analysis
- VFD Integration and Programming
- Control System Training
- System Documentation
- Record Drawings
- Factory Acceptance Testing
- Site Acceptance Testing
- Emergency Shutdown Systems

Projects



Water and Wastewater SCADA System Upgrades

Pismo Beach, California

To improve efficiency and management of the City of Pismo Beach water and wastewater SCADA system, the City chose Cannon to combine their separate SCADA systems into one homogeneous SCADA system using Allen-Bradley Compactlogix PLCs and Wonderware ArchestrA system platform.

The scope of work included design and implementation of the new SCADA system. This included design and installation of new PLC panels for the existing sites, as well as programming the PLCs. Cannon also installed and configured the ArchestrA system platform SCADA software on the City's servers. Programming of the SCADA software included developing HMI screens, alarm notifications and priorities, and reports.



25-Site SCADA System Design and Implementation

Orcutt, California

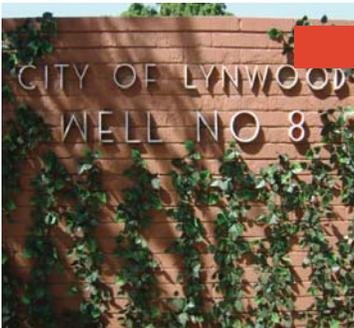
Cannon was selected to design and build a secure wireless TCP/IP Ethernet communications system for a client's oil producing system. Cannon provided instrumentation and electrical engineering, SCADA design, installation, and programming. In addition, Cannon selected software and hardware upgrades for the server tower, developed and implemented a master process of over 10,000 tags, a communication system consisting of fiber network, wireless Ethernet infrastructure (Motorola Canopy) and RF radios, multiple communication panels, and designed, constructed, and installed remote I/O panels for the oil system and the water system. Cannon provides on-going service and maintenance for the entire site.



SCADA Upgrade for Wastewater Treatment Plant

Solvang, California

Cannon combined two existing control systems and tied in the Alisal Lift Station into this new SCADA system. The scope of work included using Motorola Canopy communication network, reverse engineering the SBR control system, and programming the replacement PLC control logic. Programming included the ability to monitor and control the SBR and new SCADA software before decommissioning the existing controls. As well, Cannon provided operator training, operation manuals, and all program documentation including commented PLC code.



SCADA Design for 15 Site Water System

Lynwood, California

Cannon was selected to provide a detailed evaluation, along with design services for the City of Lynwood's 15 site water SCADA system. A key feature of Cannon's software system design is historization of operating data and minimal use of energy and Municipal Water District water supplies. This historization allows for cost-effective management of the water supply system. Additional functions provided minimize unnecessary pumping in and out of the reservoir; allow for remote access and alarm notification to City personnel 24/7; monitor security of the water system facilities; and record operational activities by City staff. The new SCADA system was designed with the ability to expand as the City's water facilities expand.

Field Service

Overview

- Utilities
- Water and Wastewater
- Industrial
- Agricultural
- Oil & Gas Extraction
- Petroleum Refineries
- Food & Beverage
- Pipeline
- Power Generation

Services

- SCADA and HMI Additions/Modifications
- PLC Programming and Troubleshooting
- Distributed Control Systems
- Process Optimization
- System Integration and Startup Support
- Process Control Troubleshooting and Analysis
- VFD Integration and Programming
- Control System Training
- System Documentation
- Record Drawings
- Emergency Shutdown Systems
- Field Service
- Instrument Calibration, Troubleshooting, and Maintenance

Projects



System Maintenance and Field Service

Arroyo Grande, California

Cannon has provided on-demand Automation and Electrical services for the City of Arroyo Grande on an ongoing basis since 2006. During this time, Cannon has responded to over 70 service calls that span the freshwater production and storage systems, as well as the wastewater collection systems. Over 500 man-hours of on-site support have been provided including emergency call outs, system maintenance, and small system upgrades to fresh and wastewater systems.



Water and Wastewater SCADA Maintenance

Solvang, California

Cannon has provided a broad range of Automation and Control Services for the City of Solvang on an on-going basis since 2006. During this time, the following types of services have been provided:

- SCADA System Upgrade
- Water System Upgrades
- Programming PLC Control Logics
- Control Decommissioning
- Software Integration
- Operator Training and Manual Write-up
- Design, Fabrication, and Installation of Control Panels
- Preparation of a Sewer System Master Plan
- Well Monitoring Plan
- System Implementation
- Human Machine Interface



SCADA System Design and Implementation and Maintenance

Orcutt, California

Cannon was selected to design and build a secure wireless Ethernet, TCP/IP communications system for Pacific Coast Energy Company's (PCEC) oil producing system. After completing the project upgrades Cannon continues to provide on-going service and maintenance for the entire Orcutt Diatomite Project. Services include installing and calibrating multiple instruments, integrating new process equipment into the SCADA system, and troubleshooting and repairing the SCADA system. Cannon provides this service to PCEC as an on-call service, responding to calls during the days, evenings, and on weekends.

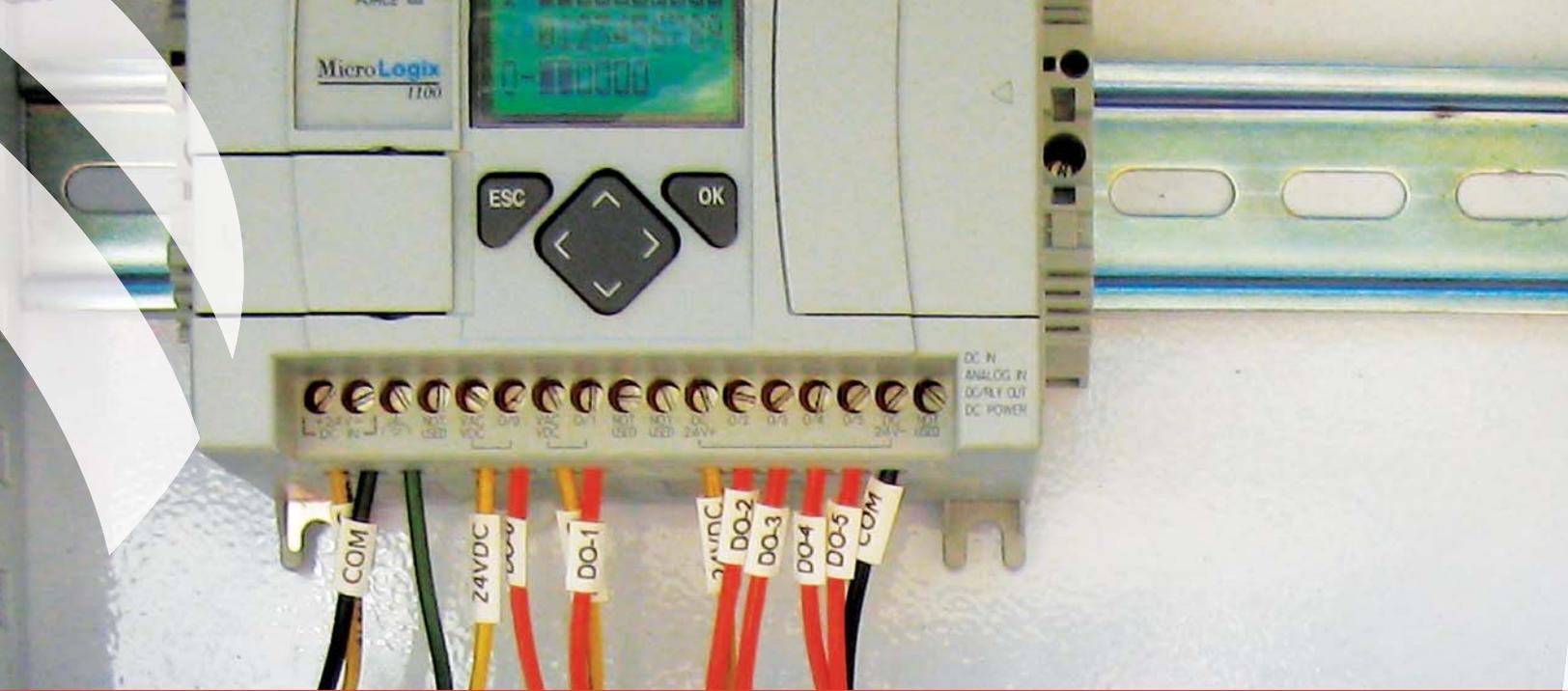


25-Site SCADA Upgrade and Maintenance

Nipomo, California

After providing a 25-site SCADA system upgrade for the Nipomo Community Services District, Cannon was contracted to provide on-call services to maintain the SCADA system. Upgrade and on-call services include the following:

- Designed and implemented communication system interfaces that connected to existing wireless internet system. Added Subscriber Modules (Client Radios) to increase coverage to the controlled pump sites.
- Designed automation and controls for the needed booster stations.
- Designed automation control philosophy and programmed the Allen Bradley PLCs.
- Programmed Allen Bradley PLC to provide remote access and system alarm functions.
- Installed wireless radio communication system using Motorola Canopy Subscriber Modules and Access points.



Reliable Responsive SolutionsSM

Cannon—CannonCorp.us

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