

CASITAS MUNICIPAL WATER DISTRICT

JOB TITLE: SCADA and Communications Technician
REPORTS TO: Electrical, Mechanical, and Control Supervisor
SALARY LEVEL: E 41
DATE: May 2022

Definition

Under general direction of the Electrical, Mechanical, and Control Supervisor, assumes responsibility for the ongoing maintenance, troubleshooting, and repair of the district's SCADA system assets including PLC's, HMI software, servers, communication radios, and related infrastructure.. Performs a variety of technical duties related to the daily operational and maintenance needs of the district's treatment, distribution, production, and related facilities; including SCADA network administration, PLC programming, management of hardware and database software applications, radio communication equipment operation, and administration of the district's operational data collection and reporting systems. Provides comprehensive cyber security services for the SCADA network including perimeter firewalls, data encryption, access control, and network configuration. Provides technical support to other departments as needed and performs other related work as required. The SCADA and Communications Technician is an advanced journey level position and is distinguished from other classes by the level of responsibility assumed; complexity of duties assigned, specialized skillset required, and is expected to work with minimal supervision. Incumbents in this position are expected to be fully qualified to troubleshoot and resolve complex telemetry, SCADA system, and PLC hardware/software issues. Employees in this class will be required to participate in the SCADA on call rotation and respond immediately to operational emergencies in order to minimize down-time and adverse impacts on operations.

Essential Functions:

The duties listed below are intended only as illustrations of the various types of work that may be performed. The omission of specific statements of duties does not exclude them from the position if the work is similar, related or a logical assignment to this class.

- Ensures the safe, secure, and efficient administration of the district's Supervisory Control and Data Acquisition (SCADA) system communication network.
- Stays current on technical developments and applies or adapts ideas to local situations. Recommends and coordinates the acquisition, installation, and use of specific equipment.
- Operate, maintain, and administer hardware and software on computer servers, PC's, workstations, networks, encryption devices, and security devices. Work

with tech support vendors and existing IT personnel to troubleshoot issues and resolve technical problems.

- Deploy and maintain virtual machine (VM) infrastructure utilizing Hyper-V and related hypervisors; maintain all aspects of a hypervisor server installation including administration and maintenance of direct and distributed storage, RAID, virtual networking, hypervisor server scaling, resource management, security, and performance configurations.
- Administers secure implementation of SMTP and HTTP servers in order to facilitate report delivery and secure data transfers.
- Develops SCADA HMI screens for the purpose of monitoring operational processes and field equipment makes changes to existing application software to improve or expand control system or management information system performance.
- Provide SCADA network security services; maintains an active user password interface and designates network user access with appropriate user rights.
- Performs routine network surveillance for quality assurance; assesses configurations, logs, and updates software and hardware as necessary.
- Maintains quality assurance for the collection, integration, and distribution of data generated by the SCADA system; assimilates as needed for regulatory reporting; ensures proper backup of server system to protect against loss.
- Analyzes O&M SCADA network performance, establishes network specifications, implements secure network access protocols, and troubleshoots and repairs network components.
- Develop and present detailed technical documentation. Prepare and maintain written documentation for server and application environments.
- Performs SQL database server installation, maintenance, configuration and administration.
- Program and update computer logic in programmable controllers; write specialized computer software programs (ladder logic and code) in support of the water treatment, production, and diversion facilities.
- Network tasks include: monitoring system performance by analysis of computer-generated logs and charts and responding to computer problems (diagnostics and corrective action).
- Manage SCADA emergency alarm notification software and applications; ensure proper configurations and continuous functionality to safeguard district assets and maintain operations.
- Performs custom programming using various software packages and programming languages.
- Provide edge network security services; maintains an active user password interface and designates network user access with appropriate user rights. Routinely inspects devices and logs to identify intrusion attempts.
- Repair and replacement of radio transmitters, receivers and antennas on elevated structures.
- Install, terminate and test copper, fiber, and coaxial communications cable utilizing specialized procedures and tools.

- Completes related paperwork, including maintenance schedules and logs, and updates wiring diagrams and schematics.
- Install, maintain, modify, debug, and program industrial control software including operating system software for SCADA systems and PLC equipment.
- Provides training with regards to the use of computer equipment and software to ensure proper use and accuracy of input.
- Develop and present detailed technical documentation. Prepare and maintain written documentation for server and application environments.
- Participates in the preparation of work plans and schedules to coordinate with other personnel, departments, and divisions regarding a variety of electrical, instrumentation, and electronic projects; assists in the development of cost estimates/budgets, materials lists and labor requirements needed to complete capital projects and other assignments.
- Performs work in a safe manner; complies with safety policies, procedures and practices; attends and completes necessary safety training courses and events; works to ensure the safety of co-workers and the general public.
- Attend and participate in professional group meetings; stay abreast of new trends and innovations in the field of networking and communication.
- Designs and modifies low-voltage industrial control circuits and devices as needed for the conversion, amplification, filtering, or triggering of various loop process inputs, both current and voltage, as needed.
- Performs analysis of radio systems and strategizes geographical paths; designs, installs, and maintains RF solutions to carry district SCADA data including but not limited to frequencies between 400MHz and 6GHz, within licensed and unlicensed spectrums.
- Perform a variety of housekeeping duties to ensure district facilities and worksites are maintained in a clean, orderly and safe condition;
- Installs and wires electrical, control, and telemetry systems; assists with installation of conduits runs as necessary.
- Provide estimates of time, materials, and supplies required for performance of specific assignments; obtain quotes as required.
- Assists E&M department with completion of routine job tasks or assignments.
- Performs other duties as assigned; perform duties of lower level positions as required.

Knowledge, Skills, and Abilities

Thorough knowledge of computer desktop and server operating systems including Windows and Linux, PLC programming, virtualization, cyber security, data processing procedures, network systems administration, wireless networks and related infrastructure. Clear understanding and knowledge of cyber security, including remediation, prevention, detection, and configuration techniques. Basic knowledge of, automation hardware, software, electrical wiring and associated components. Requisite skills to analyze and troubleshoot operational problems related to communication networks and data acquisition; identify computer and SCADA system upgrade needs. Ability to

troubleshoot and solve complex programming tasks; integrate custom programming routines; and interface software applications. Basic knowledge of the installation, maintenance, operation, and testing of industrial wiring, communication systems, automation software, pumps and motors, valves and control apparatus common to water utilities. Working knowledge of National Electrical Code, the operation and maintenance of instrumentation and loop process control systems, micro-computer based SCADA systems, high speed wireless data communication equipment; interpret mechanical and electrical drawings, plans, and specifications.

Advanced computer skills applicable to a wide array of computer operating systems and applications mentioned above, including but not limited to Windows, Linux, U-IX, SQL, Hyper-V, and other similar applications. Basic computer skills applicable to word processing, spreadsheets, email, and the internet. Organizational skills inclusive of the ability to manage multiple priorities; communicate orally with district management, staff, and the public. Must possess adequate verbal, analytical, organizational, and interpersonal skills. Tactile skills in using a wide array of tools, diagnostic equipment, and specialized tools.

Ability to plan, direct, organize, and schedule work assignments; establish and maintain effective working relationships; communicate effectively, verbally and in writing; interpret and apply departmental policies and procedures; prepare clear and concise reports; recognize unusual, inefficient, or dangerous operating conditions and take appropriate action; accurately read, interpret and record data from gauges, meters and SCADA systems; read and interpret technical manuals, blueprints, drawings, schematics and diagrams; observe, inspect, analyze system equipment and facilities; and compile, evaluate and analyze complex data and information and recommend or take actions. Ability to diagnose and make changes to PLC hardware and software. Ability to deal tactfully and effectively with the public and fellow employees, establish and maintain positive working relationships; follow oral and written instructions for job functions and safety requirements of the district.

Education and Experience

Any combination of education and experience that has led to the acquisition of the knowledge, skills and abilities as indicated above. A typical way to obtain the knowledge, skills and abilities would be:

- Experience: Five years of significant SCADA system integration experience in the maintenance and—support of a large to medium sized water treatment, production, and distribution facilities including two years of experience diagnosing and making changes to PLC ladder logic and SCADA HMI software.

- Training: Completion of two years of college resulting in graduation with major course work in electrical engineering, control system engineering, computer engineering, mechanical engineering or related field.

OR

Graduation from high school, and Eight years demonstrated technical competency in the areas described above. Completion of computer certification programs, and a combination of training, education and experience equivalent to college level coursework in computer science, information technology, SCADA programming, and computer network administration. Institutional experience to facilitate the management of the district's networking technology internally and at remote sites. Additional experience in providing network services and/or supporting the SCADA operations of water treatment, production, and distribution system facilities. Demonstrated competency must include ability to maintain effective and cooperative relationships with other departments, staff, and outside contractors.

Certificates, Licenses, and Registrations:

- Possession of a valid Class C California driver's license.
- Possession of a valid Grade I Water Distribution certificate issued by the California State Water Resources Control Board within two years of employment.
- Rockwell Automation training courses in Control Logix, Industrial Ethernet, Process Control, and Software-
- Clean Water Environment Association (CWEA) Electrical and Instrumentation Technologist Grade 1 Certificate
- Basic electrical safety training in NFPA 70E
- CPR/First Aid certificate

Work Environment or Environmental Elements:

Employees work indoors and outdoors, and may be exposed to cold and hot temperatures, inclement weather conditions, loud noise levels, vibration, confining workspace, chemicals, mechanical and/or electrical hazards, and hazardous physical substances and fumes. Employees may periodically be required work in confined spaces, tunnels, intake structures, on ladders, or at heights of up to 50 feet including work on elevated structures, boom lifts, and towers.

Physical Requirements:

The physical demands described here are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions. Must possess mobility to work in the field, in district buildings and facilities; strength, stamina and mobility to perform light to medium physical work, to work in confined spaces, around machines, to walk on uneven terrain, and to climb and descend ladders, and operate varied hand and power tools and construction equipment. Specific vision abilities required by this job include close vision, distance vision, depth perception and color vision. Ability to communicate in person and over the telephone or radio. The job involves fieldwork requiring frequent walking in operational areas to identify problems or hazards. The employee is required to have manual dexterity sufficient to operate a district vehicle, computers and standard office machines such as fax, calculator, telephone, copiers, etc. Positions in this classification bend, stoop, kneel, reach and climb to perform work and inspect work sites. Employees must possess the ability to lift, carry, push, and pull materials and objects weighing up to 50 pounds.

Other Requirements:

- United States citizenship or legal eligibility to work in the United States.
- Medical evaluation and pre-employment physical and drug screening to determine physical fitness for the job.
- Acceptable driving record consistent with the standards established by the district.
- Participation in job training or professional development programs.

Working Conditions

Incumbents must be willing to work as needed during non-routine or emergency conditions, which may include after hours, weekends, holidays, and off-hour shifts. Must be willing to participate in the SCADA standby rotation schedule for emergency callback response. The specific statements shown in each section of this description are not intended to be all-inclusive. They represent the essential functions and minimum qualifications necessary to successfully perform the assigned tasks and functions.

Employee Signature

Date