

ELECTRICAL/INSTRUMENTATION TECHNICIAN

DEFINITION:

Under general supervision of the Maintenance Supervisor, performs a variety of specialized and complex technical duties in support of the design, installation, testing, calibration, maintenance, and repair of electrical, electronic, instrumentation and control systems as found in the collection system, wastewater treatment plant, pump stations and related facilities; and performs related work as required.

SUPERVISION RECEIVED AND EXERCISED:

Receives general supervision from the Maintenance Supervisor. Exercises no direct supervision of staff.

CLASS CHARACTERISTICS:

The classification is responsible for performing the full range of electrical and instrumentation maintenance duties required to ensure that facilities, equipment and systems operate effectively and are maintained in a safe and effective working condition. Incumbents are expected to work independently, exercise judgment and initiative and provide oversight of contractors on assigned projects. Positions at this level receive only occasional instruction or assistance as new or unusual situations arise and are fully aware of the operating procedures and policies of the work unit.

EXAMPLES OF DUTIES:

The following functions are typical for this classification. Incumbents may not perform all of the listed functions and/or may be required to perform additional or different functions from those set forth below to address business needs and changing business practices.

- Installs, calibrates, tests, maintains, and repairs supervisory control and data acquisition (SCADA) system and programmable logic controllers (PLCs) including digital and/or analog instrumentation, flow meters, process instrumentation, level, pressure and position indicators, alarm circuits and systems, chemical feeder controllers, air quality monitoring, telemetering receivers and transmitters and related analytical instruments.
- Interprets schematics and electrical drawings and conceptualizes and sketches changes for electrical engineering approval.
- Establishes and maintains communications between remote site PLCs and SCADA; verifies accuracy of data collection at PLC and SCADA human machine interface (HMI) levels; troubleshoots and optimizes connectivity.
- Installs, fabricates, tests, performs diagnostics on, troubleshoots, repairs, and maintains electrical, electronic, and associated power generating equipment and systems found in

wastewater treatment and collection system facilities including electrical circuits, transformers, switches, light fixtures, motor starters, motors, generators, electrical components of electronic regulatory systems and equipment; calculates power load distributions to various motors and related equipment.

- Programs PLCs; troubleshoots and corrects PLC programming, communication, and network issues; creates and tests new program logic to support operational changes and modifications; manages, develops, and configures databases; modifies or develops HMI or Operator Interface Terminals (OIT) screens.
- Inspects and performs preventative maintenance on instrumentation, PLCs, and communication equipment; cleans, lubricates, calibrates and/or adjusts equipment as needed.
- Troubleshoots and diagnoses electromechanical instrumentation malfunctions and completes component level repairs.
- Conducts sophisticated radio site analyses, including antenna fault and performance measurements, transceiver performance measurements, spectrum purity and interference measurements.
- Sets up and conducts tests of equipment and components under operational conditions; assists in identifying and resolving electrical and instrumentation issues; suggests methods of minimizing such problems in an operational setting.
- Develops operational procedures and standards for electrical and instrumentation controls and systems, including automation and SCADA systems, data acquisition and archival systems, computer-based control and monitoring systems and high-speed data networks for automation and radio telemetry networks.
- Communicates with District staff, vendors and contractors in the design, installation, maintenance, and repair of equipment; inspects and tests components installed by contractors.
- Interprets applicable regulations and standards for electrical, instrumentation, automation, network, and radio system installations.
- Reads and interprets schematics, drawings, diagrams, and related technical documentation necessary to install, maintain and repair equipment in accordance with requirements and vendor specifications.
- Makes rough estimates of labor, materials and supplies needed to complete assignments; orders materials and supplies as needed.
- Operates a variety of hand and power tools and testing equipment.
- Observes safe work methods and makes appropriate use of related safety equipment as required.
- Provides needed information and demonstrations concerning how to perform certain work tasks to new employees in the same or similar class of positions.
- Maintains accurate logs and records work performed and materials and equipment used.
- Performs related duties as assigned.

QUALIFICATIONS:

Knowledge of:

- Principles, practices, techniques, equipment, and tools required for designing, installing, calibrating, testing, maintaining, and repairing SCADA system, PLCs, electrical, electronic, and associated equipment found in wastewater treatment plant, pump stations and related facilities.
- Hydraulic principles related to the operations of recording and metering instruments.
- National electrical codes applicable to the installation, maintenance, and repair of designated facilities and equipment.
- Information technology/systems infrastructure, operating systems and equipment required to install, calibrate, maintain, and repair SCADA, PLCs, and associated equipment.
- Operational characteristics of a wide range of instrumentation, electrical and electronic systems, devices, and components.
- Operational characteristics, use of and maintenance requirements of diagnostic and testing equipment, instruments and related hand tools required for the work.
- Basic mathematic techniques.
- Applicable federal, state, and local laws, regulatory codes, ordinances, policies, and procedures relevant to assigned area of responsibility.
- Occupational hazards and safety principles, practices and procedures including the use of protective protection equipment as needed.
- Techniques for providing a high level of customer service by effectively dealing with the public, vendors, contractors, and District staff.
- The structure and content of the English language, including the meaning and spelling of words, rules of composition and grammar.
- Modern equipment and communication tools used for business functions and program, project, and task coordination, including computers and software programs relevant to work performed.

Ability to:

- Install, calibrate, test, maintain and repair SCADA system, PLCs, and related instrumentation and a diverse range of electrical, electronic, and power generating equipment and systems.
- Troubleshoot and correct PLC programming, communication, and network issues.
- Read, interpret, and prepare schematics, drawings, specifications, and related technical documents.
- Safely and effectively use and operate a vehicle and tools and equipment required for the work.
- Understand, interpret, and apply all pertinent laws, codes, regulations, policies, procedures, and standards relevant to work performed.
- Follow District policies and procedures related to assigned duties.
- Make accurate mathematical calculations.
- Respond to and troubleshoot emergency situations.

- Maintain accurate logs, records and basic written records of work performed.
- Organize own work, set priorities, and meet critical time deadlines.
- Effectively use computer systems, software applications and modern business equipment to perform a variety of work tasks.
- Communicate clearly and concisely, both orally and in writing, using appropriate English grammar and syntax.
- Use tact, initiative, prudence and independent judgment within general policy, procedural and legal guidelines.
- Establish, maintain, and foster positive and effective working relationships with those contacted in the course of work.

EDUCATION AND EXPERIENCE:

Any combination of training and experience that would provide the required knowledge, skills, and abilities is qualifying. A typical way to obtain the required qualifications would be:

Equivalent to the completion of the twelfth (12th) grade and completion of an electrical or instrumentation apprenticeship or completion of a two-year program at an accredited college or trade school and five years of journey-level experience troubleshooting and maintaining instrumentation, electrical and/or electronic systems.

LICENSES AND CERTIFICATIONS:

- Possession of a valid California Driver's License by time of appointment and satisfactory driving record consistent with requirements established by the District.
- Possession of an Electrician Certification from the State of California is desirable.

PHYSICAL DEMANDS:

Must possess mobility to work in a wastewater treatment plant setting and in the field; stamina and mobility to work in confined spaces and around machines, to climb and descend ladders, to use specialized test equipment, to operate varied hand and power tools and equipment and to operate a motor vehicle and visit various District sites; vision to read printed materials and a computer screen; and hearing and speech to communicate in person and over the telephone or radio. The job involves fieldwork requiring frequent walking in operational areas. Finger dexterity is needed to access, enter, and retrieve data using a computer keyboard and to operate above-mentioned tools and equipment. 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 50 pounds, on average, or heavier weights with the use of proper equipment and assistance from other staff.

ENVIRONMENTAL ELEMENTS:

Employees work in a wastewater treatment plant and in the field, and are exposed to pollen, dust, loud noise levels, cold and hot temperatures, inclement weather conditions, road hazards, vibration, confining workspaces, chemicals, mechanical and/or electrical hazards and hazardous physical substances and fumes.

OTHER REQUIREMENTS:

Per California Government Code, Title 1, Division 4, Chapter 8, Section 3100, "all public employees are hereby declared to be disaster service workers subject to such disaster service activities as may be assigned to them by their superiors or by law."

Must be available for regular and emergency standby, weekend assignments, shift assignments and to be called back and work emergency overtime as needed.