Electrical, Instrumentation and Control Specialist

Department/Division:	Operations/Production
Reports To:	Chief Water Systems Operator - Production
Provides Direction To:	None
FLSA Exemption Status:	Non-Exempt
Effective Date:	12/19/2024

GENERAL PURPOSE

Under general direction, plans, organizes, implements and controls the installation, maintenance, operation and repair of electrical equipment, instrumentation equipment, Supervisory Control and Data Acquisition (SCADA) systems and equipment associated with water utilities; conduct preventative maintenance, adjustment, repair overhaul, replacement and installation of electrical and instrumentation apparatus and related equipment and devices; ensure work is completed following appropriate and applicable provisions of the Electric Code, approved plans and specifications, and standard industry practices; research and prepare a variety of studies and reports regarding the District's short and long-term electrical, electronics, telemetry, communications, and related systems requirements; performs related work as required.

DISTINGUISHING CHARACTERISTICS

The Electrical, Instrumentation and Controls Specialist is a discrete class responsible for planning, coordinating, and directing the construction, installation, maintenance, repair and servicing of all industrial electrical and electronics-related systems and equipment used in the water utilities. The work of this class is complex and involves significant accountability and decision-making responsibilities. The ability to understand customer's and staff's needs and balance response with cost effective scheduling is essential. The Electrical, Instrumentation and Controls Specialist is distinguished from the Electrical and Instrument Technician in that the Electrical and Instrument Technician performs a more limited scope of work on lower voltage equipment, instruments and related equipment.

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 the class.

- May oversee contractors engaged in constructing, installing, maintaining, testing and repairing electrical mechanisms, panels, switches, motors, controls, power output frequency regulators, solenoids, telemetry, clay valves, automatic control valves (ACVs), voltage controls, low cut-out alarms, relays, electronic controls, generators,

electronically automated systems, measurement systems, chlorination control systems, and other electrical equipment and apparatus; works in and around low voltage circuits, panels, and equipment.

- May perform construction, installation, maintenance, testing and repairing electrical mechanisms, panels, switches, motors, controls, power output frequency regulators, solenoids, telemetry, clay valves, automatic control valves (ACVs), voltage controls, low cut-out alarms, relays, electronic controls, generators, electronically automated systems, measurement systems, chlorination control systems, and other electrical equipment and apparatus; works in and around low voltage circuits, panels, and equipment.
- Troubleshoots and repairs instrumentation systems, control and process loops, PIDs, and associated equipment.
- Installs, maintains, and repairs control circuits, pressure switches, floats, underground cables, motors, telemetry, copper lines, and power output frequency regulators and transducer recorders.
- Participates in the District's short and long-range planning process for water utility needs and requirements; reviews engineering design plans for the District's systems and facilities to ensure conformance with District standards and policies.
- Conducts the inspection of telemetering, electric controllers, programmable controllers, process meters, analyzers, flow systems, and a variety of other types of instrumentation for proper operations.
- Oversees and directs and/or conducts the installation, repair, modification, calibration, and preventative maintenance on a wide variety of complex digital, analog, programmable and other auxiliary equipment used in the collection, transmission and treatment of water.
- Oversees and monitors the work of others performing calibration and maintenance of meters, analyzers, recorders, control systems, and feed systems, including but not limited to electric, electronic, pneumatic, hydraulic, and mechanical equipment; keep accurate maintenance records.
- Conducts electrical and electronic apparatus and instrumentation repair, replacement, disassembling, assembling, installing, and testing.
- Reads, interprets, and applies electrical and instrumentation plans, specifications, blueprints, sketches, wiring diagrams, and schematics.
- Conducts testing of power distribution, transformers, circuit breakers, meters, and other apparatus; oversees others engaged in performing routine maintenance of electrical equipment supplies.
- Provides inspection of equipment installation work performed by contractors and other personnel for workmanship and compliance.
- Estimates labor and material for electrical installations and repairs; lay out work on the project site; prepare reports of time and material expended.
- Maintains an inventory of parts, materials, and supplies used in the electrical instrumentation shop and in performing everyday tasks.
- Oversees and participates in the documentation of all programming, testing, and updates performed.
- Evaluates and maintains records of maintenance and repair functions; prepares routine and special reports on equipment maintenance and repair.
- Assures effective cost and manpower controls through a formal and continuing maintenance management program.
- Maintains network communication between equipment, controls, field hardware, and SCADA system.

- Responds to emergency situations during off hours as required.
- Reviews and provides input and suggestions on new system requirements.
- Participates in the safety program and coordinates the training of assigned staff.
- Keeps up to date on the latest safety requirements and procedures and provide for continuing instruction of employees.
- Inspects and assures that safety equipment is consistently used and worn and that proper safety standards and procedures are adhered to and enforced.
- Prepares written and verbal reports, memorandums, and correspondence.
- Assists in the preparation of the department's Capital Improvement Plan, as assigned.
- Operates District vehicles.
- Performs other related work as required.

QUALIFICATIONS GUIDELINES

Knowledge of:

- Principles, theory, and practices of electricity, electronics, pneumatics, hydraulics, and mechanics as they apply to installation, maintenance, and repair of equipment and instruments commonly found in water production, transmission, distribution, and treatment facilities.
- Advanced SCADA theory.
- Programmable logic controller (PLC) programming theory at an advanced level for test troubleshooting, and repairs of PLC components and data highway systems.
- Applicable codes and regulations.
- Industrial electricity and safety practices, precautions, and procedures.
- Tools, materials, methods, and practices of electrical, electronic, and instrumentation trade.
- Methods, materials, and equipment used in chlorine system installation and repair.
- Symbols and standard practices used in the preparation of process and instrument flow diagram.
- Electrical installations and maintenance in water utility or reclamation facilities electrical circuits.
- Shop mathematics applicable to the electric trade.
- Advanced principles of project management.
- Appropriate safety precautions and procedures.
- Instrumentation calibration concepts and procedures.
- Mid-level computer operation skills, including word processing, database programs, spreadsheets, electronic mail, department utilized software application programs, and SCADA operation.
- Complex recordkeeping, documentation and practices.
- English usage, spelling, grammar, and punctuation.
- General principles of lead direction, work coordination and training.

Ability to:

- Plan, organize, schedule, and monitor work for efficiency, quality, and timeliness.
- Recognize, analyze, and define a variety of routine to complex mechanical, electrical, chlorination, and instrumentation problems and perform and oversee necessary repairs.
- Correct instrument operating problems and make recommendations for system

modifications to meet operational needs without close supervision.

- Operate power tools, hand tools, and light equipment used in electrical activities, operate specialized test equipment such as milliamp and millivolt calibrators, multimeters, power supplies and oscilloscopes.
- Perform a wide range of skilled water utility electrical installation, wiring, repair, and maintenance work on circuits in accordance with safety standards.
- Read, understand, interpret, and apply moderately complex materials including technical manuals, drawings, specifications, layouts, diagrams, blueprints, plans, and schematics.
- Keep detailed, complex, and accurate records.
- Recognize, report, and correct unsafe working conditions.
- Understand and carry out routine to complex instructions furnished in oral, written or diagrammatic form.
- Make arithmetical calculations involving fractions, decimals, and percentages with speed accuracy.
- Communicate clearly and concisely, both orally and in writing.
- Establish and maintain effective relationships with those contacted in the course of work.
- Exercise a high level of tact and diplomacy in dealing with the public as well as District staff;
- Operate a vehicle observing legal and defensive driving practices.
- Provide lead direction, work coordination and training, as assigned.
- Maintain a driving record which meets Vehicle Code Standards and is acceptable to the District and its insurance carrier.
- Respond to call-out or emergencies as required; handle emergency situations as directed.
- Routinely adhere to and maintain a positive attitude towards District goals.

Minimum Qualifications

Any combination of education, training, and experience that would likely provide the knowledge, skills, and abilities to successfully perform in the position is qualifying. A typical combination includes:

Education: A high school diploma or satisfactory equivalent, and the completion of two (2) years of college level or trade school coursework (60 semester units or 90 quarter units) in electrical engineering, electronics, instrumentation and control systems or a related field;

And

Experience: Five (5) years of journey-level experience in programming of PLCs, electrical and/or electronic instrumentation maintenance and repair.

Licenses, Certificates; Special Requirements:

Must possess a valid California Class “C” driver’s license issued by the California State Department of Motor Vehicles, and a good driving record

An employee within this classification may be designated as a “key responder” and as such shall be required to respond to non-normal working hour emergency operational conditions.

Possession of a Grade III Water Distribution Operator’s Certificate, issued by the State Water

Resources Control Board – Division of Drinking Water.

PHYSICAL AND MENTAL DEMANDS

The physical and mental demands described here are representative of those that must be met by employees to successfully perform the essential functions of this class. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

Work involves exposure to potential harm, infectious disease and hazardous chemicals including smoke, fumes, gas, treated water, high frequency noise, dirt, dust, grease, oil, chemicals, solvents and toxic agents. Incumbents need to be able to tolerate unpleasant odors, wet conditions and uncomfortable climate conditions. There is frequent need to stand, stoop, walk, crawl, climb and perform other similar actions during the course of the workday. Employee accommodations for physical or mental disabilities will be considered on a case-by-case basis.

Incumbents require sufficient mobility to work in a variety of environmental and weather conditions, transport materials and supplies weighing up to 50 pounds, work in boom truck with lift of 30 to 60 feet and work to heights of 150 feet. Must be able to see in the normal visual range with or without correction. Must be able to hear in the normal audio range with or without correction. Employee accommodations for physical or mental disabilities will be considered on a case-by-case basis.

THIS POSITION MAY BE ELIMINATED, OR THE DUTIES, QUALIFICATIONS AND TRAINING REQUIRED CHANGED BY THE BOARD OF DIRECTORS AND/OR THE GENERAL MANAGER, WHEN IN THEIR JUDGEMENT, IT IS CONSIDERED NECESSARY AND PROPER FOR THE EFFICIENT OPERATION OF THE DISTRICT.