

ELECTRICIAN I and II
(Ranges 15 and 17, respectively)
SENIOR ELECTRICIAN
(Range 19 – *promotional only*)

DEFINITION

Under general supervision, performs a variety of skilled-level installation, troubleshooting, maintenance and repair of electrical equipment and circuitry, pneumatic, hydraulic and electro-mechanical systems as found in water and wastewater treatment plants and related facilities, and perform other duties as assigned. SCADA and other control and communication equipment and instrumentation are handled by a separate employee class.

SUPERVISION RECEIVED AND EXERCISED

When the position is staffed, direct and general supervision are provided by the Senior Supervisor, Controls/Communications. Otherwise general supervision and direction are given by the Director of Utility Services or his delegate specified to oversee this work. No direct supervision of staff is exercised by Electrician levels I or II. The Senior Electrician may direct other electricians in the performance of specific project assignments, as instructed by the Director of Utility Services or his delegate.

CLASS CHARACTERISTICS

This skilled, advanced journey-level class performs the full range of electrical, electronic and instrumentation duties to ensure water and wastewater equipment and facilities are functioning in the most effective and efficient manner. Responsibilities include performing work in water and wastewater treatment plants and water distribution and wastewater collection systems in all locations of the District. This class is distinguished from other maintenance classes by the necessary specialized knowledge of and skill in installing, maintaining and repairing a variety of electrical and electronic equipment. The class is distinguished from the Controls/Communication class by the latter's requirement for highly specialized training and experience. The Electrician class is FSLA non-exempt.

The Electrician I level requires experience and competency as a commercial electrician. Electrician I incumbents may have little or no prior experience with water/wastewater systems or equipment, and minimal experience with control instrumentation. Staff at this level will be required to become familiar with a wide range of industry equipment.

The Electrician II is the full journeyman level of the electrical trade. The Electrician II level will exercise increased individual responsibility for troubleshooting and making electrical repairs to equipment, facilities. This level will have demonstrated knowledge of and experience with equipment typical in the water/wastewater industry.

The Senior Electrician is position that is promotional only. Staff at this level perform at the full electrician journey level, has specified supervisory responsibilities, and is responsible to ensure the District's records of installed electrical systems are accurately maintained. The Senior Electrician and will have a basic knowledge of supervisory control and data acquisition (SCADA) systems and programmable logic controls (PLCs) and other instrumentation devices.

All levels of this class are required to perform the duties listed immediately below, with levels of supervision and skill appropriate to their classification and experience.

EXAMPLES OF DUTIES (Illustrative Only)

Required for all levels:

- Inspects, installs, maintains, troubleshoots and repairs electrical equipment, lighting and safety systems, as well as power circuits, power generating equipment, control panels, switchgear, high voltage systems, and emergency systems in the District's water and wastewater operations and related facilities in accordance with electrical codes and standards.
- Performs pump maintenance and repairs on valve actuators, control circuits and variable speed and level control devices.
- Rebuilds and/or replaces, lubricates and maintains large and small electric motors.
- Maintains and repairs low, medium and high voltage switchgears.
- Performs maintenance on disinfection control equipment and valve actuators.
- Inspects and sets safety switches.
- Performs troubleshooting and diagnostic on a variety of electrical equipment and using appropriate diagnostic tools in use in the industry.
- Ensures the operational integrity of the electronic, hydraulic and pneumatic control systems, power circuits, control circuits and metering systems.
- Utilizes test equipment to perform repairs, calibration and inspection on controllers, power switching gears, distribution systems, lighting circuits, single/multi-phase power and control circuits; status and alarm circuits, and laboratory equipment.
- Requisitions parts and supplies and maintains a parts and equipment inventory.
- Performs confined space entry and rescue operations.
- May assist in providing instruction on the operation and maintenance of specialized District equipment for less experienced personnel or contract staff.
- Maintains tools, equipment, and supplies in a safe and well-organized condition.
- Maintains effective working relationships with co-workers, the public, and others met during the course of the work.
- Performs other duties as assigned.

In addition to the above, the Electrician II:

- Performs routine alignment, configuration, calibration, and preventive maintenance on electronic equipment; calibrates a variety of equipment such as flow meters, level transducers, pressure transducers and other monitoring equipment to ensure operational integrity in compliance with manufacturer's specifications.
- Works with subcontractors, including electrical firms and PG&E, to ensure installation of major electric/electronic systems and components as directed.
- Upon completion of in-house projects, produces drawings/records of modifications made.
- Ensures required maintenance information on installed equipment or systems is provided and maintained in the District's preventive maintenance program.
- In a lead-worker capacity, directs the work of others, ensuring that safety precautions are observed.

In addition to the above, the Senior Electrician:

- Trains water and wastewater plant operators in the proper use of repaired or installed electrical systems and/or equipment.
- Ensures treatment plant operational and maintenance manuals are updated as necessary following installation of new systems or equipment.

- Confers with others to ensure the District's equipment maintenance program(s) contain updated information and that District records include relevant electrical connection information.
- Where emergency response may be affected by new installations, notifies the Safety/Training officer and appropriate other(s) of new systems/equipment.
- Trains other electricians in troubleshooting newly installed/repared instrumentation and/or system components.
- Assists in the planning of specification, selection, installation of electrical equipment.
- May assist with annual performance evaluations of lower level electricians.

QUALIFICATIONS

Knowledge of:

Electrician I and II:

- Electrical theory, work methods, tools and testing equipment used in the installation, maintenance, calibration and repair of water and wastewater treatment and water distribution and wastewater collections, and electrical and electronic equipment and appurtenances.
- Knowledge of the National Electric Code (NEC) and other applicable codes, laws and ordinances typical to industrial/commercial electrical installation.
- Use of test equipment including digital and analog ohmmeters, vibration meters, frequency counters, frequency generators, 35 MHZ O-scope, RF wattmeter, 4-20 ma signal generator, and valve actuator gear trains, voltmeters, infrared pyrometers, oscilloscopes, amp meters, and other equipment typically used in the industry.
- Applicable laws, codes, regulations and safety precautions related to electrical and electronic installation, maintenance and repair work.
- Basic principles of operation of water distribution and wastewater systems, including applicable electronic equipment and controls.
- Principles of variable frequency drives, motors and control systems.
- Principles and practices of heating, ventilation and air conditioning systems maintenance and repair.
- Confined space entry procedures, and equipment.
- Occupational hazards and safety precautions related to job assignments.
- Practices of record keeping and standard office procedures.
- Techniques for providing a high level of technical service including troubleshooting to public and District staff, in person and over the telephone and other electronic devices.
- It is expected that the Electrician classifications will require on-going continuing education related to ongoing improvements and updates to the electrical systems and instrumentation planned and installed the District's treatment facilities.

Electrician II, in addition to the above:

- Reading and preparing electrical and electronic schematic diagrams and engineering drawings and specifications, including symbols and standard practices as related to electronic circuitry.
- Principles and practice of report writing.
- Principles and practice of records maintenance.
- Principles of project work breakdown for effective use of staff.

Senior Electrician (*promotional only*), in addition to the above:

- Basic knowledge of the theory and operation of SCADA systems and radio communications, PLCs, and other instrumentation associated with water and wastewater facility operations, such that he/she can identify problems in such equipment and communicate effectively with District specialists assigned to maintain these systems.
- Basic understanding of the electronic theory and practice of both analog and digital circuits.
- Principles of project planning, purchasing, budgeting.
- Principles of project development, including specifications
- Principles and methods of training, monitoring, and evaluating the work of others.

Skills required for all levels:

- Performing skilled work for the implementation of a comprehensive electrical and electronic installation, maintenance, calibration and repair program.
- Skillfully and safely using and performing minor maintenance on the hand and power tools and testing equipment required to perform the work
- Reading and interpreting sketches, blueprints, schematic diagrams and equipment manuals.
- Performing a variety of technical support fabricating related to water and wastewater systems, instrumentation installation, maintenance and repair.
- Troubleshooting equipment problems, estimating materials, supplies and time required to complete the work.
- Interpreting State, federal, and local codes and standards associated with electrical work.
- Maintaining accurate of work performed and a parts inventory.
- Recognizing potentially hazardous conditions on the job site or with the equipment.
- Prioritizing own work and using independent judgment within procedural and safety guidelines and meeting critical deadlines.
- Being present and performing work in accordance with the employee's assigned work schedule.
- Establishing and maintaining effective working relationships with those contacted in the course of work.

Education and Experience:

Experience with 480 volt systems, three-phase control, programmable logic controls, portable and other power generation equipment is required for all levels. High school diploma or equivalent, and completion of a recognized apprenticeship program in the electrical trade, or an associate degree in electronic, electrical technology or closely related field.

Equivalent to graduation from high school supplemented by technical school coursework and work experience in the electrical, electronic, computer and/or instrumentation fields, preferably in a setting involving commercial power requirements and systems.

Electrician I. Requires three (3) years prior experience in commercial electrical installation and troubleshooting, including knowledge of associated electrical codes.

Electrician II. Requires six (6) years prior experience in commercial electrical installation and three years serving at the Electrician I level, or equivalent, preferably including electrical maintenance and repair work related to water and wastewater treatment and water distribution and wastewater collection systems and facilities. The Electrician II will have prior experience with instrumentation.

Senior Electrician (*promotional only*). Requires nine (9) years prior experience and team leadership in commercial electrical system and instrumentation installation, maintenance and

repair, including three years service at the Electrician II level or equivalent at water and wastewater treatment and distribution facilities, and wastewater collection systems and facilities.

Licenses and Certifications:

All members of this class: Must possess a valid California Class C driver's license and have a satisfactory driving record. Possession of a California Grade II or III Electrical/Instrumentation certificate is highly desirable. Must be legally able to work in the United States.

Electrician I: Must obtain California Grade I Water Distribution System certification within 12 months to remain employed with the District. Must obtain CWEA Electrical Instrumentation Grade 1 certification.

Electrician II: Electrician I certifications are required. In addition, must obtain CWEA Electrical Instrumentation Grade 2 certification.

Senior Electrician (*promotional only*): Above certifications are required.

Physical Demands:

The work requires exposure to all weather conditions with dust, noise, traffic, in inclement weather including temperatures above 100 degrees for multiple days; and exposure to potentially hazardous materials and around high-voltage electrical services, or around heavy equipment. Work performed in a typical office environment or other District facilities may be unseasonably warm or cool. In performing the work, the employee may also be exposed to fumes and vapors, dust, gasses, grease and solvents, chemicals, slippery conditions, raw sewage and machine noise. Must possess mobility to work in a standard office and shop setting and use standard office equipment, including a computer; mobility to inspect various water and wastewater treatment facilities and water distribution and wastewater collection systems and pumping/lift station sites; stamina to perform system and maintenance repair work, climb and descend stairs, ladders, and occasionally antennas, work on uneven terrain and lift and carry equipment and materials weighing up to 50 pounds; vision to read printed materials and a computer screen and system components within 12-inches; and hearing, speech, and English language skills to communicate effectively in person, over the telephone and through other electronic devices.

Other Requirements:

Response to off-hours emergency situations is required when electrical problems are suspected. Serving on-call in regular rotation is required, in accordance with departmental procedures.