

## SUBSTATION ELECTRICIAN APPRENTICE (I, II, III, IV)

### JOB DESCRIPTION

**Classification Responsibilities:** A Substation Electrician Apprentice (I, II, III, IV) is a trainee class used to prepare incumbents to perform highly skilled electrical work in the operation, construction, maintenance and repair of high voltage electric substations and other related electrical and mechanical equipment associated with high voltage electric substations. Responsibilities also include learning the operations of the Electric Control Room and the System Control and Data Acquisition (SCADA) system. The Apprenticeship Program requires a total of four years of on-the-job training and classroom curriculum/coursework, in combination with successful completion of formal written testing requirements. Preparation involves training in all aspects of substation and control room equipment installation, testing, operations, repair and maintenance procedures. This class is responsible for performing related duties as required.

**Distinguishing Features:** Throughout the training program, a Substation Electrician Apprentice works under the direct supervision of the Electric Substation Foreman or under the functional supervision of the Substation Electrician. The job duties of this class are either performed in the field or in the Electric Control Room. Work must be performed in an extremely efficient manner, with a very minimal error rate. The Apprentice will typically begin the training program as a Substation Electrician Apprentice I and will progress to Apprentice II, III, IV, and ultimately to the journey level Substation Electrician classification by noncompetitive, criteria-based promotion after successfully completing the required classroom curriculum/coursework, on-the-job training, testing requirements, and successful performance appraisals. At the Department Director's discretion, an Apprentice may begin the training program at a higher level based on previous education, training, and experience comparable to the program requirements for that level. This class is subject to stand-by and/or call-out duty. This class is FLSA nonexempt.

### QUALIFICATIONS

**Employee Values:** All employees of the City of Mesa are expected to uphold and exhibit the City's shared employee values of Knowledge, Respect, and Integrity.

**Minimum Qualifications Required.** Any combination of training, education, and experience equivalent to graduation from high school or GED, and any combination of training, education, and experience equivalent to one year of experience in one or more of the following areas: electrical wiring; digital electronics; instrumentation and controls; electrical metering; computer/software applications; construction, operations, or maintenance of electric distribution equipment or facilities.

**Special Requirements.** Must possess a valid Class D Arizona Driver's License by hire or promotion. Must reside in the Mesa Electric Utility call-out area (example: within an eighteen-mile radius of Main Street and Center Street intersection) within one year after hire date. Must possess, or be able to obtain within 30 days of hire date, a valid First Aid card with Cardiopulmonary Resuscitation (CPR) certification.

**Substance Abuse Testing.** Due to the safety and/or security sensitive nature of this classification,

individuals shall be subject to pre-employment or pre-placement alcohol, drug and/or controlled substance testing as outlined in City policy and procedures.

**Preferred/Desirable Qualifications.** Prior electric utility construction or operation experience, current enrollment in a Substation Electrician apprentice program, or completion of a college or technical school program with an emphasis in the substation electrical or control room operations trade. Journeyman level utility experience and certification.

## **ESSENTIAL FUNCTIONS**

This position requires that incumbents learn to perform the essential functions of the Substation Electrician class. Most of these essential functions can be learned through the successful completion of the Substation Electrician Apprentice Training Program.

Employees in this class will learn to perform and become able to independently perform the following essential functions:

**Communication:** Communicates with customers, coworkers, supervisors, and the general public in a pleasant manner (at times under unpleasant working conditions). Follows verbal and/or written directions and instructions to work safely and effectively. Prepares written documents such as substation maintenance reports and substation logbooks to record maintenance procedures and troubleshoot results. Effectively communicates with other workers regarding instructions necessary to complete assignments. Completes reports and forms related to requirements, time reporting records, and curriculum.

**Manual/Physical:** Learns to perform electrical and mechanical work in the installation, inspection, maintenance, troubleshooting and repair of the following: substation equipment such as oil and SF6 circuit breakers, transformers, tap changers, voltage regulators, bus work, disconnect switches, switchgear, air circuit breakers, and auxiliary equipment; substation control equipment such as batteries, charging equipment, circuit breakers, protective relays, and the SCADA system (example: remote terminal units, transducers, and other related telemetry equipment and devices); and control systems within the substations, control buildings, and control center. Operates the Electric Control Room and SCADA system as needed. Inspects, programs, and downloads information from electronic relays as needed for analysis and reporting using a laptop computer. Assists in outage restoration, and preparation and execution of switching procedures. Installs personal protective grounds. Tests insulating oil in breakers and transformers for dielectric strength. Replenishes and filters oil as work is performed on the tap changers or breakers. Measures, cuts, bends, threads, assembles, and installs electrical conduit. Measures, terminates, and connects control wiring to terminal blocks, relays, etc. Operates pickup trucks requiring a standard Class D Arizona Driver's License to travel to the substations to perform assigned duties. Uses common hand tools in maintaining and repairing substation equipment. Digs trenches for conduit for electric and communication lines and ground wires. May be assigned to train staff in proper work techniques and procedures, safety precautions to be followed, and the proper use of tools and equipment as needed. Prepares sketches showing the location of wiring and equipment. Operates distribution switches, breakers, and transformer tap changers to transfer power from one area to another of the distribution system. Enters data into a terminal to operate equipment via the SCADA system. Moves light (less than 20 pounds) to heavy (more than 50 pounds) objects using a cart or other aid for distances of up to 50 feet or more. Works in a variety of weather conditions; in small cramped areas; and at heights of greater than 20 feet. Works with cleaning fluids and chemicals in maintaining

and/or cleaning work area, equipment, buildings, and yard area. Reads and follows schematic diagrams and control schemes or blueprints in the operation of electrical and electronic devices and equipment. Reads blueprints to verify or determine the routing of underground facilities. Distinguishes colors to make correct electrical connections using color-coded control wires or cables. Detects traffic sounds and backup warning devices when working near traffic and around moving equipment. Takes or directs the taking of substation instrument readings. Meets scheduling and attendance requirements.

**Mental:** Applies knowledge of electronics and electrical systems to diagnose and correct problems. Plans the layout and installation of electrical apparatus and control equipment. Reviews the work of staff to ensure conformance with department standards. Learns job-related material in on-the-job and classroom settings regarding safety practices and procedures, substation maintenance and repairs, and SCADA equipment installation and maintenance. Prioritizes work assignments. Comprehends and makes inferences from written material in troubleshooting electric and electronic problems. Writes and approves switching procedures. Directs switching and updates circuit maps in the control room upon request. Understands relay software with the ability to update/modify database and download event reports.

**Knowledge/Skills/Abilities:**

(Knowledge/Skills/Abilities are obtained through the successful completion of the various levels of Mesa's Substation Electrician Apprentice Training Program.)

Knowledge of:

the methods, materials, and equipment used in the Substation Electrician trade;  
electrical theory and practices;  
Arizona Blue Stake Law; and  
the occupational hazards and safety precautions of the trade. the safe operating procedures of power equipment and vehicles used in overhead and underground electrical system.

Skill in the use of basic hand tools used to install, maintain, and operate Electric Substations and various electric equipment.

Ability to:

use the safety procedures and equipment associated with working on high-voltage electrical lines and equipment;  
perform the physical requirements of the position;  
understand and follow verbal and written instructions; and  
establish and maintain effective working relationships with management, coworkers, other City employees, and the general public.

The duties listed above are intended only as general illustrations of the various types of work that may be performed. Specific statements of duties not included does not exclude them from the position if the work is similar, related, or a logical assignment to the position. Job descriptions are subject to change by the City as the needs of the City and requirements of the job change.

Substation Electrician Apprentice (I, II, III, IV)

Page 4

Revised 3/20

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CS4434.DOCX (Substation Electrician Apprentice I) PAY GRADE: 45

CS4646 (Substation Electrician Apprentice II) PAY GRADE: 48

CS4807 (Substation Electrician Apprentice III) PAY GRADE: 50

CS5015 (Substation Electrician Apprentice IV) PAY GRADE: 52

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INCREMENTS:

(Substation Electrician Apprentice I): 194-200

(Substation Electrician Apprentice II): 185-200

(Substation Electrician Apprentice III): 190-200

(Substation Electrician Apprentice IV): 190-200