

Metering & Substation Apprenticeship Programs

PROGRAM DESCRIPTION

Apprenticeship is a training methodology that combines supervised, structured on-the-job training with related theoretical instruction. These training programs are sponsored by the City of Roseville and trains within the work environment. The intent of the Program is to prepare employees for skilled employment as a Journeyman Technicians, with the content of the training defined and dictated by the needs of the Electric Utility and in cooperation with the International Brotherhood of Electrical Workers.



Roseville Electric Utility

Introduction

Over the last 20 years, the International Brotherhood of Electrical Workers and the City of Roseville have been engaged in an active and successful Apprentice-training program for the Line Technician series. Through joint discussions during IBEW Union/City negotiations in 2019, the City agreed to explore creating two new Apprentice programs: *Apprentice Electric Metering Systems Technician* and *Apprentice Electric Substation Technician*.

This document includes relevant documentation that establishes two joint IBEW/City Apprenticeship Programs. Final documentation within each Program may vary as needed.

Actions

The following actions are needed:

1. Modify current Memorandum of Understanding (Section 1)
2. Establish an Apprentice Substation Technician Program (Section 2)
3. Establish an Apprentice Metering Systems Technician Program (Section 3)

The following documentation identifies changes and additions in order to modify existing job descriptions and create two new Apprenticeship programs:

1. Memorandum of Understanding language changes (Section 1)
2. Program documentation (Section 1 & 2)
3. On-the-job training documentation (Section 1 & 2)
4. Job Description Changes (Appendix A, B, & C)
5. Salary Adjustments
 - a. Journey step-level (no steps – one level as discussed in Section 2 & 3)
 - b. Apprentice step-levels (various steps, based on a percentage of journey level)
 - c. Current employee step reclassification to adhere to new program:
 - i. Reclassify one current Electric Metering System Technician I to an Apprentice Technician

Definitions

APPRENTICE: Any individual employed by the City meeting the qualifications described in the Standards of Apprenticeship who has signed an Apprenticeship Agreement with the City providing for training and related instruction under these Standards.

APPRENTICESHIP AGREEMENT: The written agreement between the Apprentice and the City setting forth the responsibilities and obligations of all parties to the Apprenticeship Agreement with respect to the Apprentice's employment and training under these Standards.

APPRENTICESHIP COMMITTEE (COMMITTEE): Apprenticeship Committee (Committee) or Joint Apprenticeship Training Committee (JATC) means those persons designated by the Union and the City to act as a collective agent in the administration of the program. This oversight committee is comprised of at least two IBEW members and at least two members appointed by the City. The committee will review and revise training standards as necessary and review Apprentice assignments and progress on a regular basis.

EMPLOYER: City of Roseville – Electric Department.

HYBRID OCCUPATION: The hybrid approach measures the individual Apprentice's skill acquisition through a combination of specified minimum number of hours of on-the-job-learning and the successful demonstration of competency as described in a work process schedule.

INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS (IBEW): A labor union that represents nearly 750,000 workers and retirees in the electrical industry in the United States, Canada, Panama, Guam and several Caribbean island states; particularly electricians, or inside wiremen, in the construction industry and lineworkers and other employees of public utilities. The union also represents some workers in the computer, telecommunications, broadcasting, and other fields related to electrical work.

JOURNEYWORKER: A worker who has attained a level of skill, abilities and competencies recognized within an industry as having mastered the skills and competencies required for the occupation. (Use of the term may also refer to a mentor, technician, specialist or other skilled worker who has documented sufficient skills and knowledge of an occupation, either through formal Apprenticeship or through practical on-the-job experience and formal training.)

MEMORANDUM OF UNDERSTANDING (MOU): A type of agreement between the IBEW and the City. It expresses a convergence of will between the parties, indicating an intended common line of action.

ON-THE-JOB LEARNING/TRAINING (OJL/OJT): Tasks learned on-the-job, in which the Apprentice must become proficient before awarded completion. The learning must be through structured, supervised work experience.

RELATED INSTRUCTION: An organized and systematic form of instruction designed to provide the Apprentice with the knowledge of the theoretical and technical subjects related to the Apprentice's occupation. Such instruction may be given in a classroom, through occupational or industrial courses, or by correspondence courses of equivalent value, electronic media, or other forms of approved self-study.

SUPERVISOR OF APPRENTICE(S): An individual designated by the program sponsor to supervise or have charge and direction of an Apprentice.

TRANSFER: A shift of Apprenticeship agreement from one program to another or from one employer within a program to another employer within that same program, where there is agreement between the Apprentice and the affected Apprenticeship Committee.

Table of Contents

Introduction	2
Actions	2
Definitions.....	3
Table of Contents.....	4
Section 1 - MOU Changes	6
A. Committee.....	6
B. Training Standards.....	6
C. Nondiscrimination Provision.....	6
D. Entrance Requirements.....	6
E. Progression Tests.....	7
F. Review and Evaluation.....	7
G. Instruction.....	7
H. Salary Step Increases.....	7
I. Probationary Period.....	7
J. Reinstatement Rights.....	8
K. Demotion.....	8
Section 2 - Apprentice Substation Technician Training	9
Scope of Training	9
Outline of Training.....	9
1. Job Safety Training.....	9
2. On-the-Job Field Training.....	10
3. Off-the-Job Training.....	10
4. Documentation of Training.....	11
5. Guidelines for Training Steps.....	11
Outline of Step Progression	14
Apprentice Electric Substation Technician	14
Curriculum Topics	15
OTJ Curriculum.....	16
Class Grades.....	17
Apprentice Training Records	17
On-the-Job Booklet Information.....	18
Safety	18

Training	18
Test Equipment	19
Work Procedures	20
Software	20
Section 3 - Apprentice Metering Systems Technician Training	22
Scope of Training	22
Outline of Training	22
1. Job Safety Training	22
2. On-the-Job Field Training	23
3. Off-the-Job Training	24
4. Documentation of Training	24
5. Guidelines for Training Steps	24
Outline of Step Progression	27
Apprentice Metering System Technician	27
Curriculum Topics	28
Class Grades	29
Apprentice Training Records	29
On-the-Job Booklet Information	30
Safety	30
Training	30
Test Equipment	31
Work Procedures	31
Software	32
Apprentice Training Records	32
Appendix A	33
Substation Technician Job Description	33
Appendix B	39
Metering Systems Technician Job Description	39

Section 1 - MOU Changes

Article IX of the IBEW MOU institutes rules for establishing Apprenticeship programs in the City of Roseville Electric Department. Below are amendments to the current language in order to include the two new Apprenticeship programs:

A. Committee.

A Joint Apprenticeship and Training Committee will be established for each Apprenticeship program and shall be composed of at least two (2) voting members appointed by the International Brotherhood of Electrical Workers, Local #1245 (Union), and at least two (2) members appointed by the City. Additional parties (Union and City) may attend monthly Apprentice Committee meetings upon mutual agreement of both parties (Union and City). This committee will prepare, review and revise training standards as necessary. Decisions of this committee are subject to the approval of the Union Business Manager (or designee) and the City Manager (or designee).

B. Training Standards.

A training standard of progress will be developed for each Apprenticeship program and will be formalized in the Apprentice Training Program specific to each program. This standard will indicate the training time for each phase of training or work process. The training time indicated will not be restrictive, but rather will be indicative of the emphasis or amount of time that should be spent on each phase. Although the total time spent on any one phase during any one progression period may vary with the individual, work load and amount of related instructions, minimum assignments shall be met during the term of the Apprenticeship as outlined in each City of Roseville Apprentice Technician Training Program.

C. Nondiscrimination Provision.

Selection of Apprentices under the program shall be made from qualified applicants pursuant to the Personnel Rules of the City of Roseville and without regard to race, creed, color, national origin or ancestry, physical or mental disability, medical condition, denial of family and medical care leave, gender, gender identity and gender expression, sex, sexual orientation, marital status, age, or religious affiliation, military and veteran status, genetic information, and all other applicable state and federal statutes relating to discrimination.

D. Entrance Requirements.

To be eligible to enter an Apprenticeship program, a candidate must pass an appropriate entrance examination and meet whatever other minimum requirements may be established for that classification. Employees will be given an opportunity to indicate their desires and intentions with regard to entering Apprenticeship training programs. Vacancies in Apprenticeship training programs will be announced in accordance with normal procedure.

E. Progression Tests.

To progress through the Apprentice program will require passing a progression test for each step of the program. These tests and the manner in which they will be scored will be prepared and agreed to by the Joint Apprenticeship and Training Committee and outlined in each Apprentice Technician Training Program.

F. Review and Evaluation.

The Electric Utility Director shall appoint staff who shall review and evaluate the progress of each Apprentice during the program. Employees in the Apprentice classification shall receive a performance report for each six months of training. The completed performance review will be administered through the normal City process.

G. Instruction.

Related classroom instruction, as agreed to by the Joint Apprenticeship and Training Committee, will be given to the Apprentices during regular working hours. The instructors will be selected from personnel qualified to instruct. Each Apprentice shall pursue related and supplemental theoretical studies of not less than approximately eighty (80) hours per year. This outside training shall be approved by the Joint Apprenticeship and Training Committee and shall be pursued on the Apprentice's own time and without pay from the City.

H. Salary Step Increases.

Employees are eligible for a salary merit increase based on successful (70%) completion of the required testing for each step as outlined in the each Apprentice Technician Training Program.

I. Probationary Period.

Employees in the Apprentice classification remain on a probationary status that is in effect throughout their entire Apprenticeship Program, which shall not exceed forty-two (42) months for Apprentice Line Technician, Apprentice Metering Systems Technician and not to exceed fifty-four (54) months for Apprentice Substation Technician. In any case where the Apprentice fails to adhere to standards outlined in the Apprentice Technician Program, the employee will be rejected on probation and removed from the program. The City retains its sole discretion to determine whether an Apprentice completes probation.

The Union and City acknowledge and agree that the length of the probationary period under this Apprenticeship Program reflects the unique nature and required training and evaluation time for the classifications contemplated herein. As described in Roseville Municipal Code, Section 3.06.130, the probationary period is an intrinsic part and extension of the employee selection process during which the employee shall be considered in training and under careful observation and evaluation by supervisory personnel. Generally, this period will be utilized to train and evaluate the employee's effective adjustment to work tasks, conduct, observance of rules, attendance and job responsibilities, and to provide for the release of any probationary employee whose performance does not meet required standards of job progress or adaptation.

J. Reinstatement Rights.

Employees rejected on probation within the first year of the Apprenticeship Program shall be reinstated to the classification from which the employee was promoted if the employee held regular status in the lower level position. Employees were rejected on probation from the Apprenticeship program in year two, three or four will be considered to be released from City service without cause at the sole discretion of the City and do not have reinstatement rights to a previously held position within the City. Such release shall not be subject to any appeal. Written notification of release shall be provided to the probationer, and a copy filed with the Human Resources Director or a designee thereof. As negotiated between the Union and City, the provisions of this Amendment #1 to the parties' Memorandum of Understanding control, notwithstanding any other language contained in the City's Personnel Rules, including, but not limited to, Roseville Municipal Code, Title 3, Sections 3.06.140, 3.06.170, and 3.06.180.

K. Demotion.

Employees wishing to voluntarily withdraw from the Apprenticeship Program may request a voluntary demotion pursuant to City's Personnel Rules, Roseville Municipal Code, Title 3, Section 3.07.040.

Section 2 - Apprentice Substation Technician Training

Scope of Training

The Apprentice will be required to complete job training divided into eight “steps”, each consisting of six-month intervals. In order for uniform and safe practices to be followed in each of the training steps, assignment of duties and work procedures shall be provided in each of the steps as outlined in these guidelines and the attached schedules. The amount of time or units of work provided are believed sufficient to permit the Apprentice to develop proficiency in such duty or work procedures. However, they should not be considered as inflexible, depending on the demonstrated ability of each individual Apprentice.

Outline of Training

1. Job Safety Training

Employee safety is our highest priority. Job safety shall be an integral part of Apprentice training and shall be provided in connection with the performance of work assignments and classroom assignment as appropriate. Such training shall include at a minimum:

1. Use and care of personal protective equipment (PPE)
2. Use and care of personal tools
3. Jobsite Safety
4. Instruction of safe work practices
5. Working from and operating aerial trucks
6. Vehicle and equipment operations
7. Care and use of rubber and fiber insulating tools
8. Substation equipment switching procedures
9. Clearance requests and switching orders
10. Hazard of working around energized and industrial equipment
11. Cardiopulmonary Resuscitation
12. First Aid
13. Accident Prevention/Safety Manual

All employees will study and understand safety rules, work procedures and other City policies and procedures as they apply to Roseville Electric. The Safety Manual has been developed as a guide and standard for all electric employees to comply with. Management reserves the right to make changes as conditions and equipment demand. Any changes that are implemented must be communicated to the personnel performing the work.

2. On-the-Job Field Training

1. Assignment of the specified hours of on-the-job training for each “step” of the Apprenticeship will be communicated to the Apprentice as early in the period as is practicable.
2. Except where otherwise specified, the Apprentice shall be trained by assignment to work with qualified Electric Substation Technicians.
3. Progressive work experience in all phases of Substation work will be provided throughout the Apprenticeship.
4. Assignments during the last two “steps” will be made for the purpose of strengthening their technical skills.
5. Upon entering each new step and period of training, the work assignments in the period shall be such that the Apprentice will gain the basic knowledge, confidence in himself/herself, confidence in the equipment, and the procedure being used.
6. More complex assignments shall be made progressively as the Apprentice gains in knowledge and capability.
7. Assignments of duties and work procedures in any period of training shall be confined to those specified for the current “step”, or of a prior “step”.
8. During the first six-months, the Apprentice shall not be assigned to work on any circuit energized in excess of 600 volts.
9. The Apprentice may be assigned to perform certain duties while working alone. Those certain duties to which they may be assigned shall be limited to those duties within the current or prior training periods for which they are qualified, and are within the duties normally performed by an Electric Substation Technician. Further, such assignments shall include as a purpose, the development of the Apprentice’s proficiency and self-confidence to perform such work as an Electric Substation Technician.
10. Except during a local/state/federal declared emergency, an Apprentice shall not be given the responsibility for duties or work assignments beyond his/her last completed period of training.

3. Off-the-Job Training

1. Required off-the-job (after-hours) training will be provided by Roseville Electric.
2. Apprentices attending off-the-Job training will NOT be paid outside scheduled work-hours.
3. An Apprentice who is scheduled to attend any of the centralized training programs shall be given notice of such assignments as early as possible by their Supervisor.
4. The Electric Operations Manager or their designee shall notify the employee when the employee is not maintaining an acceptable level of course work or test results. Such notice shall also be given in the event the Apprentice fails the off-the-job training. A written report shall be prepared by the Electric Operations Manager and provided to the Electric Utility Director with a recommendation for corrective action or dismissal.
5. The Apprentice is required to take approximately 320 classroom hours of related off-the-job training courses. The City of Roseville may vary both the requirements and the subject courses, as described in this program depending on the courses available. The City of Roseville may also vary the requirements of the off-the-Job training courses depending on the education and experience of the Apprentice. In order to complete the off-the-Job training program within the four-year Apprenticeship Training Program, it may be necessary for the Apprentice to enroll in more than one course during a “step” period.

4. Documentation of Training

1. It shall be the responsibility of each Apprentice to maintain their own record logs in collaboration with their immediate Supervisor to whom the Apprentice is assigned. Upon completion, each periodic record for both on-the-job and off-the-job training shall be submitted to appropriate Supervisor.
2. It shall be the responsibility of the City of Roseville - Electric Operations Manager or Designee to keep a file of necessary records on each Apprentice and to ascertain that each Apprentice has a reasonable opportunity to meet the training requirements set forth in these guidelines.
3. Such records shall at all times be available during the Apprenticeship for review by the Electric Utility Director or his/her designee, Supervisor, the employee, and authorized representatives of the Union.

5. Guidelines for Training Steps

Outline of Steps

Each step is six months in duration (approximately 1000 hours), and a minimum total of 48-months for the entire Program.

1st Step Apprentice - Pay grade Step A

The Apprentice shall learn the use and care of tools and equipment used in the performance of substation work. The Apprentice will watch assigned substation training videos and complete any associated workbooks to gain a general knowledge of substation equipment, tasks and safe work practices.

1st -6th Month

The Apprentice will be assigned to a Substation Crew and assist the crew in all support duties as deemed appropriate by the Electric Substation Supervisor. At no time during this training period shall the Apprentice work on or encroach into the safe working distance from electrical devices, lines, buses, or any other type of electrical equipment when energized above 600 volts.

The Apprentice shall become familiar with the various City, Department and Regulatory standards applicable to the work he/she performs. They shall acquaint themselves with our standard operating procedures, and the applicable safety aspects of their job. While working with the approval of the Electric Substation Supervisor and under the direct supervision of an Electric Substation Technician.

The Apprentice may use aerial lift equipment after they have been properly trained and instructed in the use of such equipment. Such work will not be performed in such position that the Apprentice may bring themselves or the equipment into a position where they encroach on the contact area or into the safe working distance with respect to the primary voltage.

2nd Step Apprentice - Pay grade Step B

The Apprentice shall continue to perform the duties successfully completed for the first step and, in addition, shall learn the duties outlined in the second step (months 7 – 12) of the Apprenticeship. The Apprentice shall begin on-duty switching training to learn switching safety, hazard recognition and workplace procedures with tools, equipment and material used in switching and every day work.

7th -12th Month

After the Apprentice satisfactorily completes the on-duty switching training and is under direct supervision of an Electric Substation Technician, the Apprentice may perform routine switching operations (e.g. overhead switches, circuit breaker racking, and radio communication, etc.). During this step, the Apprentice shall continue to attend off-duty training courses as assigned.

3rd Step Apprentice - Pay grade Step C

13th -18th Month

The Apprentice shall continue to perform the duties specified for the first and second steps and in addition, will learn the duties outlined on the Schedule for the third step of the Apprenticeship. The Apprentice will continue to work under immediate supervision of an Electric Substation Technician when working near energized high voltage equipment. When working with an Electric Substation Technician, they shall continue to gain proficiency in the use and proper care of hot tools, rubber gloves, protective equipment, voltage detectors and any other safety devices (as appropriate) for work on and/or in proximity to energized equipment or devices. They may work from an aerial lift or similar device after they have been properly trained and instructed in the use of such equipment. During this period, the Apprentice shall continue to attend off-duty training courses as assigned.

4th Step Apprentice - Pay grade Step D

19th -24th Month

The Apprentice shall continue to perform the duties specified in the previous steps one through three. They will also continue to learn and utilize the knowledge gained in the Apprentice Electric Substation Technician on-the-job training while under general supervision of a Journey-Level Electric Substation Technician.

During this period, the Apprentice shall continue to attend off-duty training courses as assigned.

5th Step Apprentice - Pay grade Step E

25th -30th Month

The Apprentice shall continue to perform the duties specified in the previous steps one through four. They will also be allowed to perform additional work normally performed by an Electric Substation Technician while working under the general supervision of an Electric Substation Technician or other qualified employee. During this period, the Apprentice shall continue to attend off-duty training courses as assigned.

6th Step Apprentice - Pay grade Step F

31st -36th Month

The Apprentice shall continue to perform the duties specified for steps one through five and shall use this time frame to sharpen their on-the-job and electrical theoretical skills learned during their Apprenticeship training.

The Apprentice may be allowed to perform most work normally completed by an Electric Substation Technician while working under the supervision and direction of an Electric Substation Technician. During this period, the Apprentice shall continue to attend off-duty training courses as assigned.

7th Step Apprentice - Pay grade Step G

37th -42nd Month

The Apprentice shall continue to perform the duties specified for steps one through six and shall use this time frame to further their training on the more complicated aspects of being an Electric Substation Technician (i.e. working with protection relay systems, communications, fiber optics, etc.).

The Apprentice may be allowed to perform all work normally completed by an Electric Substation Technician if working with another Apprentice at the same level or a Journey level Electric Substation Technician. During this period, the Apprentice shall continue to attend off-duty training courses as assigned.

8th Step Apprentice - Pay grade Step H

43rd -48th Month

The Apprentice shall continue to perform the duties specified for steps one through seven and shall use this time frame to review, further and utilize all skills learned from the on and off the job training the last 43 months.

The Apprentice may be allowed to perform all work normally completed by an Electric Substation Technician while working alone but supervised by an Electric Substation Technician. During this period, the Apprentice shall continue to attend off-duty training courses as assigned

Outline of Step Progression

All training requirements (on-the-job and classroom) established by this program must be fulfilled in order to remain in the program, to advance to each of the next steps within the program, and to advance from Apprentice to Electric Substation Technician upon successful completion of the program.

Apprentice Electric Substation Technician

Pay scale is percentage of *Electric Substation Technician* (six month increments)

<u>Step</u>	<u>Hourly %</u>
Step A.....	55%
Step B.....	60%
Step C.....	65%
Step D.....	70%
Step E.....	75%
Step F.....	80%
Step G.....	85%
Step H.....	90%

Upon successful completion of the Journeyman Electric Substation Technician test, the Apprentice Substation Technician Step H promotes to Electric Substation Technician pay scale.

Curriculum Topics

First-year Topics

0-12 months

1. Introduction To Power Delivery
2. Substation Safety 1
3. Working in Elevated positions
4. Knots, Splices, and Rope
5. Electrical systems
6. First Aid
7. Applied Mathematics
8. Basic Electrical Theory
9. Introduction to Substations
10. Substation OSHA 1

Third-Year Topics

25-36 Months

1. Supply Station NESC 1
2. Supply Station NESC 2
3. Substation Safety 3
4. Metering and Instrument Transformers
5. Substation Design 1
6. Capacitors, Reactors, and Surge arresters
7. Introduction to Substation DC Systems
8. Electronics
9. Substations Maps and Standards
10. Substation OSHA 3

Second-year Topics

13-24 Months

1. Substation Safety 2
2. AC Fundamentals
3. Working on Lines and Stations
4. Rigging
5. Disconnects and Switches
6. Substation Conductors
7. Substation Construction
8. Substation OSHA 2
9. Circuit Breakers
10. Substation Transformers

Fourth-Year Topics

37-48 Months

1. Substation Communication System
2. Substation Safety 4
3. Substation Design 2
4. Substation Special Elements
5. Substation System Operations
6. System Automation
7. Substation System Protection
8. Circuit Breaker Instrument Transformer Testing
9. Relays
10. Transformer Testing

OTJ Curriculum

SAFETY

1. Safety Manual Review
2. Safety One Line Diagrams
3. Emergency procedures
4. Management
5. Substation Entry Procedures
6. Radio Communication
7. Dispatch Communication
8. Safety Tailboards

SOFTWARE

1. Doble DTA
2. T-Doble
3. SFRA
4. ATRT03
5. EZCT
6. Vistanet
7. World View
8. SEL AcSElerator
9. SEL 5010
10. RTS
11. MAXIMO
12. DataSplice

Test Equipment

1. Doble
2. SFRA
3. TTR
4. Ductor
5. Megger
6. Fiber OTDR
7. Temperature Calibrator
8. Battery Impedance Tester
9. Battery Load Tester
10. Breaker Analyzer
11. Fiber Optic Splicer
12. Fiber Power Meter
13. HI-Pot
14. Transformer De-Mag
15. Vacuum Bottle tester
16. Manta
17. CT tester

Work Procedures

1. Oil samples
2. Substation Inspections
3. Hands On Switching
4. Basic Relay Testing
5. Advanced Relay Testing
6. Fiber Optic Splicing
7. RTU Configure and Monitor
8. Retrieve Relay Event Reports
9. Oil Pumping and Filtering
10. Hazardous Material Handling
11. SF6 Gas Cart and Sampling
12. Print Reading (Schematic Diagrams)
13. Print Reading (Wiring Diagrams)
14. Fiber Optic Testing
15. Grounding

Class Grades

Minimum grade level of 70% must be maintained. If the minimum level is not maintained, the employee's step-rate increases and raises will be held back. Employee's failing to demonstrate satisfactory progress, may be removed from the program if one or more of the following occurs;

1. If an employee fails a step test, they will be retested in 30-60 days. If the employee fails again, they will be removed from the program.
2. Three failures of any combination of steps during the program. Not to exceed 180 days.
3. If at any time the employee has been held back for a total of 180 days, they will be removed from the program, except for medical reasons, on a case by case basis.
4. Further specifics are outlined within the Apprentice Agreement.

Apprentice Training Records

The Apprentice will use records to keep current documentation of training and certificates earned, and will initial and submit copies of these records to management.

An Electric Substation Technician or other qualified employee will date and initial an entry in the Apprentice Electric Substation Technician Training Records. The signer is attesting that the employee has demonstrated basic proficiency for performing the task.

It is the Apprentice's responsibility to:

1. Maintain possession of all training records and have them available for review.
2. Use the training records to monitor personal progress through training and request specific training they require.
3. Notify their Supervisor of any conditions that may delay the timely accomplishment of their training.

On-the-Job Booklet Information

The following OJT items will be signed off before advancement to Electric Substation Technician can be achieved. All items must be signed by a Journey level or higher. Knowledge of the proper procedure or theory must be demonstrated in order to have an item signed off.

Safety

1. Safety Manual Review: After reading the Safety Manual discuss applicable safety items and potential safety hazards.
2. Safety One Line Diagrams: Demonstrate understanding of a safety one line diagram and identify proper clearance and grounding points to isolate any given piece of equipment.
3. Emergency Procedures: Discuss applicable emergency situations that may be encountered while performing work inside of a substation, as well as actions to be taken.
4. Risk Management: Explain the theory of risk management and how it applies to substation operation and maintenance.
5. Substation Entry Procedures: Discuss the proper procedure for entering and leaving (if applicable) for each of Roseville Electric's substations.
6. Radio Communication: Demonstrate proficiency using hand held radios.
7. Dispatch Communication: Demonstrate proper method of communicating with dispatch, using both a hand held radio during switching and a telephone during substation entry.
8. Safety Tailboards: Explain the use of a safety tailboard and what types of information you will find on one. Also discuss proper routing of a Tailboard sheet at the end of each day.

Training

1. Fall Protection
2. Respirator Training
3. Confined Space Training
4. Grounding
5. Fork Lift
6. Bucket
7. Boom
8. High Voltage Stick Training
9. Training Videos
10. CPR/First Aid
11. Fiber Optics
12. Basic Electricity
13. Beginning Relay Testing
14. Intermediate Relay Testing
15. Advanced Relay Testing
16. Switching Training SOP 6.04

Test Equipment

1. Doble: Demonstrate the ability to setup the Doble for testing breakers, transformers, and PT's. Also discuss the theory behind Doble testing, including an analysis of test results and proper safety requirements.
2. TTR: Demonstrate the ability to make proper test connections for power transformers as well as PT's. Also discuss the theory of transformer winding ratios and acceptable test results.
3. Megger: Demonstrate the ability to operate a 15KV Megger, interpret the test results, and discuss proper safety requirements.
4. Ductor: Demonstrate proper operation of a digital low resistance ohm-meter and discuss causes of high readings, as well as proper safety requirements.
5. Temp Calibrator: Demonstrate proper operation while testing temperature gauges.
6. Fiber OTDR: Demonstrate proficiency using the OTDR to test fiber optic cables and discuss the analysis of test results.
7. Battery Impedance Tester: Demonstrate the ability to properly operate the impedance tester and discuss applicable safety requirements.
8. Battery Load Tester: Demonstrate the ability to properly operate the load tester and discuss applicable safety requirements.
9. Breaker Analyzer: Demonstrate the ability to setup and operate the 60KV breaker analyzer and discuss applicable safety requirements.
10. Manta: Demonstrate proficiency operating the Manta. Discussion to include the hazards associated with using test blocks as a connection point, as well as personal and equipment safety.
11. Fiber Optic Splicer: Demonstrate proficiency operating the splicer and discuss splice losses as they apply to an acceptable or unacceptable splice.
12. Fiber Power Meter: Demonstrate proficiency using the fiber power meter and discuss applicability of test results.
13. Transformer DE-Mag: Demonstrate the ability to properly operate the De-Mag and discuss applicable safety requirements.
14. Vacuum Bottle Tester: Demonstrate the ability to properly operate the load tester and discuss applicable safety requirements.
15. CT tester: Demonstrate the ability to properly operate the impedance tester and discuss applicable safety requirements.
16. SFRA: Demonstrate the ability to properly operate the impedance tester and discuss applicable safety requirements.
17. Hi-Pot: Demonstrate proper operation of the Hi-Pot, applicability, and safety requirements during operation.

Work Procedures

1. Oil Samples: Demonstrate the ability to take an oil sample, including a DGA sample, as well as filling out the proper routing documentation.
2. Sub Inspections: Demonstrate the ability to perform both bi-weekly and monthly substation inspections.
3. Hands On Switching: Demonstrate the ability to perform switching operations in the field and discuss the role of the Utility Technician during a switching evolution.
4. Basic Relay Testing: Demonstrate the ability to test a basic relay utilizing the manufacturer's instruction manual. Use the manufacturer's curves to determine a relay's PASS/FAIL status.
5. Advanced Relay testing: Demonstrate the ability to test an advanced relay utilizing the manufacturer's instruction manual. Use the manufacturer's curves to determine a relay's PASS/FAIL status.
6. Fiber Optic Splicing: Demonstrate the proper procedure for performing a fiber optic splice starting with a bare ended fiber cable.
7. RTU configure and monitor: Demonstrate the proper procedure for configuring an RTU and discuss the parameters that maybe monitored.
8. Retrieve Relay Event Reports: Demonstrate the ability to connect to a relay and retrieve information and event using a communication port.
9. Oil Pumping and Filtering: Demonstrate the proper procedure for setting up the oil cart to pump and store oil from substation equipment. Also discuss hazardous material requirements and emergency procedures in the event of a casualty.
10. Hazardous Material Handling: Discuss hazardous materials that are found within a substation and procedures to be followed in the event of an emergency.
11. SF6 Gas Cart: Demonstrate the ability to setup the SF6 cart to add/remove gas to/from a 60KV circuit breaker and discuss the hazmat concerns when working with SF6.
12. Print Reading: (schematic diagrams): Demonstrate the ability to read schematic diagrams.
13. Print Reading: (wiring diagrams): Demonstrate the ability to read connection diagrams.
14. Fiber Optic Testing: Demonstrate the ability to setup the OTDR and perform fiber optic testing. Discuss loss requirements and potential causes associated with questionable test results.
15. Grounding: Demonstrate the ability to properly test and install grounds and explain safety and theory of grounding

Software

1. Enoserv RTS: Demonstrate the ability to operate the Manta using Enoserv RTS software.
2. Power DB Lite: Utilize Power DB Lite in conjunction with the BITE2 to test batteries.
3. Doble: Demonstrate the ability to use Doble software to perform transformer, bushing, and surge arrester testing with the Doble power factor test set.
4. SEL 5010: Demonstrate the ability to use SEL 5010 software for the testing of an SEL relay.
5. SEL AcSELerator: Demonstrate the ability to use AcSELerator software for the testing of an SEL relay.
6. T-Doble: Demonstrate the ability to perform 60KV circuit breaker timing tests using the T-Doble software.
7. ATRT03 (TTR): Demonstrate the ability to perform transformer ratio testing using the ATRT03 software.

8. Vistanet (JMUX): Demonstrate the ability to establish communications and monitor the Junglemux system using Vistanet software.
9. World View: Demonstrate the ability to use World-View software to communicate and monitor the SCADA system.
10. SFRA: Utilize the SFRA software to perform frequency response testing of a power transformer.
11. EZCT: Demonstrate the ability to test and understand the procedure on a 60KV breaker.
12. Maximo
13. Datasplice

Section 3 - Apprentice Metering Systems Technician Training

Scope of Training

The Apprentice will be required to complete job training divided into six “steps”, each consisting of six-month intervals. In order for uniform and safe practices to be followed in each of the training steps, assignment of duties and work procedures shall be provided in each of the steps as outlined in these guidelines and the attached schedules. The amount of time or units of work provided are believed sufficient to permit the Apprentice to develop proficiency in such duty or work procedures. However, they should not be considered as inflexible, depending on the demonstrated ability of each individual Apprentice.

Outline of Training

1. Job Safety Training

Employee safety is our highest priority. Job safety shall be an integral part of Apprentice training and shall be provided in connection with the performance of work assignments and classroom assignment as appropriate. Such training shall include at a minimum:

1. Use and care of personal protective equipment (PPE)
2. Use and care of personal tools
3. Jobsite Safety
4. Instruction of safe work practices
5. Vehicle and equipment operations
6. Care and use of rubber and fiber insulating tools
7. Clearance requests
8. Cardiopulmonary Resuscitation
9. First Aid
10. Accident Prevention/Safety Manual

All employees will study and understand safety rules, work procedures and other City policies and procedures as they apply to Roseville Electric. The Safety Manual has been developed as a guide and standard for all electric employees to comply with. Management reserves the right to make changes as conditions and equipment demand. Any changes that are implemented must be communicated to the personnel performing the work.

2. On-the-Job Field Training

1. Assignment of the specified hours of on-the-job training for each “step” of the Apprenticeship will be communicated to the Apprentice as early in the period as is practicable.
2. Except where otherwise specified, the Apprentice shall be trained by assignment to work with qualified Electric Metering Systems Technicians.
3. Progressive work experience in all phases of metering work will be provided throughout the Apprenticeship.
4. Assignments during the last two “steps” will be made for the purpose of strengthening their technical skills.
5. Upon entering each new step and period of training, the work assignments in the period shall be such that the Apprentice will gain the basic knowledge, confidence in himself/herself, confidence in the equipment, and the procedure being used.
6. More complex assignments shall be made progressively as the Apprentice gains in knowledge and capability.
7. Assignments of duties and work procedures in any period of training shall be confined to those specified for the current “step”, or of a prior “step”.
8. During the first six-months, the Apprentice shall not be assigned to work on any circuit energized in excess of 600 volts.
9. The Apprentice may be assigned to perform certain duties while working alone. Those certain duties to which they may be assigned shall be limited to those duties within the current or prior training periods for which they are qualified, and are within the duties normally performed by a Electric Metering Systems Technician. Further, such assignments shall include as a purpose, the development of the Apprentice’s proficiency and self-confidence to perform such work as a Electric Metering Systems Technician.
10. Except during a local/state/federal declared emergency, an Apprentice shall not be given the responsibility for duties or work assignments beyond his/her last completed period of training.

3. Off-the-Job Training

1. Required off-the-job (after-hours) training will be provided by Roseville Electric.
2. Apprentices attending off-the-job training will NOT be paid outside scheduled work-hours.
3. An Apprentice who is scheduled to attend any of the centralized training programs shall be given notice of such assignments as early as possible by their Supervisor.
4. The Electric Operations Manager or their designee shall notify the employee when the employee is not maintaining an acceptable level of course work or test results. Such notice shall also be given in the event the Apprentice fails the off-the-job training. A written report shall be prepared by the Electric Operations Manager and provided to the Electric Utility Director with a recommendation for corrective action or dismissal.
5. The Apprentice is required to take approximately 240 classroom hours of related off-the-job training courses. The City of Roseville may vary both the requirements and the subject courses, as described in this program depending on the courses available. The City of Roseville may also vary the requirements of the off-the-job training courses depending on the education and experience of the Apprentice. In order to complete the off-the-job training program within the three-year Apprenticeship Training Program, it may be necessary for the Apprentice to enroll in more than one course during a "step" period.

4. Documentation of Training

1. It shall be the responsibility of each Apprentice to maintain their own record logs in collaboration with their immediate Supervisor to whom the Apprentice is assigned. Upon completion, each periodic record for both on-the-job and off-the-job training shall be submitted to the appropriate Supervisor.
2. It shall be the responsibility of the City of Roseville - Electric Operations Manager or Designee to keep a file of necessary records on each Apprentice and to ascertain that each Apprentice has a reasonable opportunity to meet the training requirements set forth in these guidelines.
3. Such records shall at all times be available during the Apprenticeship for review by the Electric Utility Director or his/her designee, Supervisor, the employee, and authorized representatives of the Union.

5. Guidelines for Training Steps

Each step is six months in duration (approximately 1000 hours), and a minimum total of 36-months for the entire Program.

1st Step Apprentice - Pay grade Step A

The Apprentice shall learn the use and care of tools and equipment used in the performance of metering work. The Apprentice will watch assigned metering training videos and complete any associated workbooks to gain a general knowledge of metering equipment, tasks and safe work practices.

1st -6th Month

The Apprentice will be assigned to the meter shop to assist with and support duties as deemed appropriate by the Electric Operations Supervisor. At no time during this training period shall the Apprentice work on or encroach into the safe working distance from electrical devices, lines, buses, or any other type of electrical equipment when energized above 600 volts.

The Apprentice shall become familiar with the various City, Department and Regulatory standards applicable to the work he/she performs. They shall acquaint themselves with our standard operating procedures, and the applicable safety aspects of their job. While working with the approval of the Electric Operations Supervisor and under the direct supervision of an Electric Metering Systems Technician.

2nd Step Apprentice - Pay grade Step B

The Apprentice shall continue to perform the duties successfully completed for the first step and, in addition, shall learn the duties outlined in the second step (months 7 – 12) of the Apprenticeship. The Apprentice shall begin to learn to identify and recognize hazards, workplace procedures with tools, equipment and materials used in everyday work.

7th -12th Month

The Apprentice shall continue to perform the duties specified for the first step and in addition, will learn the duties outlined on the Schedule for the second step of the Apprenticeship. The Apprentice will continue to work under immediate supervision of an Electric Metering Systems Technician when working on energized equipment.

When working with an Electric Metering Systems Technician, they shall continue to gain proficiency in the use and proper care of hot tools, rubber gloves, protective equipment, voltage detectors and any other safety devices (as appropriate) for work on and/or in proximity to energized equipment or devices. During this period, the Apprentice shall continue to attend off-duty training courses as assigned.

3rd Step Apprentice - Pay grade Step C

13th -18th Month

The Apprentice shall continue to perform the duties specified in the previous steps one through two. They will also continue to learn and utilize the knowledge gained in the Apprentice Electric Metering Systems Technician on-the-job training while under general supervision of an Electric Metering Systems Technician or other qualified employee. During this period, the Apprentice shall continue to attend off-duty training courses as assigned.

4th Step Apprentice - Pay grade Step D

19th -24th Month

The Apprentice shall continue to perform the duties specified in the previous steps one through four. They will also be allowed to do any work normally performed by an Electric Metering Systems Technician while working under the general supervision of an Electric Metering Systems Technician. During this period, the Apprentice shall continue to attend off-duty training courses as assigned.

5th Step Apprentice - Pay grade Step E

25th -30th Month

The Apprentice shall continue to perform the duties specified in the previous steps one through four. They will also be allowed to do more work normally performed by an Electric Metering Systems Technician while working under the general supervision of an Electric Metering Systems Technician. During this period, the Apprentice shall continue to attend off-duty training courses as assigned.

6th Step Apprentice - Pay grade Step F

31st -36th Month

The Apprentice shall continue to perform the duties specified for steps one through five and shall use this time frame to sharpen their on-the-job and electrical theoretical skills learned during their Apprenticeship training.

The Apprentice may be allowed to perform any work normally completed by an Electric Metering Systems Technician while under the supervision and direction of an Electric Metering Technician. The Apprentice may be working concurrently with other sixth step Apprentices. During this period, the Apprentice shall continue to attend off-duty training courses as assigned.

Outline of Step Progression

Apprentice Metering System Technician

Pay scale is percentage of top step Electric Metering Systems *Technician* (six month increments)

<u>Step</u>	<u>Hourly %</u>
Step A.....	65%
Step B.....	70%
Step C.....	75%
Step D.....	80%
Step E.....	85%
Step F.....	90%

Upon Successful completion of Journeyman Electric Metering Technician test, the Apprentice Electric Metering System Technician Step F promotes to top step Electric Metering Technician pay scale.

Curriculum Topics

First-Year Topics

0-12 Months

1. Introduction to Power Delivery
2. Safety 1
3. Electrical Systems
4. First Aid
5. Applied Mathematics
6. Basic Electrical Theory
7. Transformer Basics
8. OSHA 1
9. Safety 2
10. Ac Fundamentals

Second-Year Topics

13-24 Months

1. Electronics
2. Electrical Test Equipment
3. Introduction to Substations
4. OSHA 2
5. Safety
6. Metering
7. Advanced Transformers
8. Maps and Standards
9. System Protection
10. NESC 1

Third-Year Topics

25-36 Months

1. NESC 2
2. OSHA 3
3. Safety 4
4. Special Elements 1
5. Special Elements 2
6. System Operation
7. Communication Systems
8. System Automation
9. Trouble Investigation
10. Crew Leadership
11. Additional Topics/OJT sign offs
 - a. Conducting a Tailboard
 - b. Substation safety
 - c. Communication with Dispatch
 - d. Properly recording documentation in Maximo
 - e. Testing Meters
 - f. Time Keeping
 - g. Troubleshooting (AMI)
 - h. Meter Programming
 - i. Print Design Review
 - j. Commercial Solar Inspection
 - k. Install and record power quality meters
 - l. Properly request a clearance
 - m. Effectively navigate Maximo
 - n. Properly install CT's and test switch
 - o. Competently audit CT's and Meters
 - p. Competent Knowledge of AMI
 - q. Safety and Procedures Review
 - r. Journeyman Test Preparation

Class Grades

Minimum grade level of 70% must be maintained. If the minimum level is not maintained, the employee's step-rate increases and raises will be held back. Employee's failing to demonstrate satisfactory progress, may be removed from the program if one or more of the following occurs;

1. If an employee fails a step test, they will be retested in 30-60 days. If the employee fails again, they will be removed from the program.
2. Three failures of any combination of steps during the program. Not to exceed 180 days.
3. If at any time the employee has been held back for a total of 180 days, they will be removed from the program, except for medical reasons, on a case by case basis.
4. Further specifics are outlined within the Apprentice Agreement.

Apprentice Training Records

The Apprentice will use records to keep current documentation of training and certificates earned, and will initial and submit copies of these records to management.

An Electric Metering Technician or other qualified employee will date and initial an entry in the Apprentice Electric Metering Technician Training Records. The signer is attesting that the employee has demonstrated basic proficiency for performing the task.

It is the Apprentice's responsibility to:

1. Maintain possession of all training records and have them available for review.
2. Use the training records to monitor personal progress through training and request specific training they require.
3. Notify their Supervisor of any conditions that may delay the timely accomplishment of their training.

On-the-Job Booklet Information

The following OJT items will be signed off before advancement to Electric Metering Systems Technician can be achieved. All items must be signed by a Journey level or higher. Knowledge of the proper procedure or theory must be demonstrated in order to have an item signed off.

Safety

1. Safety Manual Review: After reading the Safety Manual discuss applicable safety items and potential safety hazards.
2. Emergency Procedures: Discuss applicable emergency situations that may be encountered while performing work inside of an electric room, as well as actions to be taken.
3. Risk Management: Explain the theory of risk management and how it applies to Meter maintenance.
4. Substation Entry Procedures: Discuss the proper procedure for entering and leaving (if applicable) for each of Roseville Electric's substations.
5. Dispatch Communication: Demonstrate proper method of communicating with dispatch.
6. Safety Tailboards: Explain the use of a safety tailboard and what types of information you will find on one. Also discuss proper routing of a Tailboard sheet at the end of each day.

Training

1. Arc Flash
2. Fork Lift
3. Training Videos
4. CPR/First Aid
5. Basic Electricity/Electrical Theory
6. CT sizing
7. CT installation
8. Meter Socket Identification
9. Wire Test Switch's
10. Conduct a Safety Tailboard
11. Audit All types of meters
12. Effectively Navigate Maximo
13. Create Meter Image file
14. Connect to Meter and Trouble Shoot
15. Correctly Program Commercial Meters
16. LOTO Training
17. Grounding

Test Equipment

1. WECO 2350 AND 4150 AUTOMATED 3 PHASE BENCH TESTER: Demonstrate the ability to properly test all meter Forms, also the ability to interpret test results.
2. WECO 3206G WARM UP BOARD: Demonstrate the ability to set up and test multiple meters at a time (AMI)
3. SPIN LAB 6000: Demonstrate the ability to conduct a field CT/METER audit, interpret/understand results, and properly document results.
4. RADIAN BANTUM PLUS PORTABLE 3 PHASE TESTER: Ability to demonstrate and properly test, record 2S,4S,12S,16S field meter audits.
5. FLUKE POWER QUALITYMETER: Ability to demonstrate and properly record data collected by the (PQM).
6. FLUKE MUTLI METER: Demonstrate how and where to test for voltage. Demonstrate when and why we test continuity in a meter socket. Demonstrate how to check all of the neutrals are connected correctly using the multi meter.
7. FLUKE ROTATION METER: Demonstrate the correct location to test rotation, and understand why rotation documentation is important.
8. FLUKE AMP METER: Demonstrate correct placement of the amp clamp. Demonstrate safe practices when applying Fluke amp flex loop on larger bus.

Work Procedures

1. Downloading Load Profile Data: Demonstrate how to connect, download and send Load Profile data for both ABB and Itron meters. (Record data in house and as well as send to TriMark)
2. Download and save Meter Image Files for Itron Meters: Demonstrate how to connect, download, understand and properly document as well as save Meter Image Files.
3. Meter/System Audits: Demonstrate How to properly test Meter and System (CT's included). How to record and where to file paper copies. Download and store digital portion in correct location.
4. Determine CT multiplier: Properly identify correct system multiplier and record correctly. Demonstrate where to put multiplier on meter and insure correct recording in Maximo.
5. Selecting correct programming: Demonstrate how to program both Itron and ABB meters. Explain what program to use and why.
6. Commercial Turn ON/OFF': Demonstrate how to properly initiate an ON/OFF. Proper steps to take depending on circumstances. Demonstrate how to open disconnects and how to identify bypass section is open. Demonstrate how to safely open large circuit breakers. Properly close work order in Maximo.
7. CNP's: Demonstrate how to communicate with billing for a CNP turn customer off and back on after payment promptly.
8. Wiring Diagrams: Ability to demonstrate how to translate to a wiring diagram and correctly wire CT systems.

Software

Ability to demonstrate proper usage and recording of data using each of the following programs.

1. Pc-Pro
2. ABB metering programming
3. Word
4. FDM tools
5. FND
6. Spinlab
7. Radion meter testing
8. Powersight
9. Fluke power log
10. Provision
11. Excel
12. Outlook
13. Maximo

Apprentice Training Records

The Apprentice will use records to keep current documentation of training and certificates earned, and will initial and submit copies of these records to management. An Electric Metering Technician will date and initial an entry in the Apprentice Electric Metering Technician Training Records. The signer is attesting that the employee has demonstrated basic proficiency for performing the task.

It is the Apprentice's responsibility to:

1. Maintain possession of all training records and have them available for review.
2. Use the training records to monitor personal progress through training and request specific training they require.
3. Notify their Supervisor of any conditions that may delay the timely accomplishment of their training.

Appendix A

Substation Technician Job Description

CITY OF ROSEVILLE

ELECTRIC APPRENTICE SUBSTATION TECHNICIAN
ELECTRIC SUBSTATION TECHNICIAN

DEFINITION

To perform work in the installation, testing, maintenance, calibration, repair and modification of electrical and electronic, communication and protective relay equipment related to the City's receiving and distribution substations and electronic metering systems.

DISTINGUISHING CHARACTERISTICS

Electric Apprentice Substation Technician - This is the entry-level class in the Electric Substation Technician series. Positions in this class typically have little or no directly related work experience and work under immediate supervision while learning job tasks. The Electric Apprentice Substation Technician class is distinguished from the Electric Substation Technician by the performance of less than the full range of duties assigned to the Electric Substation Technician. Incumbents work under immediate supervision while learning job tasks, progressing to general supervision as procedures and processes of assigned area of responsibility are learned.

Electric Substation Technician - This is the full journey level class in the Electric Substation Technician series and is distinguished from the Apprentice level by the ability to perform the full range of duties assigned with only occasional instruction or assistance as unusual or unique situations arise. Positions in this class are flexibly staffed and are normally filled by advancement from the Apprentice level.

This class is distinguished from the Senior Electric Substation Technician in that the latter performs the most difficult and responsible types of duties assigned to classes within this series including assigned responsibilities for the installation, maintenance and repair of electric substations and may exercise technical and functional supervision over an Apprentice.

SUPERVISION RECEIVED AND EXERCISED

Electric Apprentice Substation Technician

Receives immediate supervision from an assigned supervisor; and receives technical and functional supervision from a Senior Electric Substation Technician. Electric Apprentice Substation Technicians may receive technical supervision from an Electric Substation Technician as assigned at a worksite.

Electric Substation Technician

Receives general supervision from an assigned supervisor; and receives technical and functional supervision from a Senior Electric Substation Technician.

May exercise technical supervision over an Electric Apprentice Substation Technician assigned at a worksite.

EXAMPLES OF ESSENTIAL DUTIES– Duties may include, but are not limited to, the following:

Design, install and maintain various types of telecommunication and supervisory equipment including Supervisory Control and Data Acquisition (SCADA) system; JungleMux, perform splicing and testing of fiber optic equipment, Ethernet networks and phone systems.

Install, troubleshoot, repair, upgrade, test and program electromechanical, solid state and microprocessor protective relays, operating devices, power transformers and related communication systems.

Perform work in the repair and maintenance of live circuits and related low and high voltage equipment.

Install, test and maintain power transformers, high voltage breakers, PT's, CT's and Air Disconnects.

Work in high voltage electric substations in the construction, commissioning, testing, troubleshooting, maintenance and operation of substation and switchyard equipment which includes power transformers, 60 kV breakers, 12 kV breakers and associated equipment; perform periodic trip and other testing.

Design, understand and troubleshoot complicated control and relaying schemes; test, maintain, and troubleshoot all components using computer software.

Sample and test insulating oil and other insulation media and maintain testing records.

Perform high-voltage substation switching operations in coordination with Line Technicians and/or dispatch.

Perform infrared scanning of transmission/distribution switchgear and substation equipment to determine issues with connection.

Routinely inspect all substation equipment; maintain required records of inspections, repairs and testing for regulatory purposes.

Receive, test and accept new equipment.

Operate equipment in a safe and efficient manner in a variety of hazardous environments including toxic liquids and gases and high voltages.

Build and maintain positive working relationships with co-workers, other City employees, and the public using principles of good customer service.

Perform related duties as assigned

MINIMUM QUALIFICATIONS

Electric Apprentice Substation Technician

Knowledge of:

Types of tools, methods and materials used in electrical work preferred but not required.

Components, parts and basic safety used in substations preferred but not required.

Computer software.

Safe work practices.

Ability to:

Perform maintenance, troubleshoot and repair work on substations and related equipment.

On a continuous basis, know and understand operations, and observe safety rules; intermittently analyze problem equipment; identify and locate equipment; interpret work orders; remember equipment location; and explain jobs to others.

Intermittently, sit while studying or preparing reports; bend, squat, climb, kneel and twist when installing, repairing, and servicing equipment; perform simple and power grasping, pushing, pulling, and fine manipulation; and lift or carry weight of 40 pounds or less.

Understand and interpret written and oral instructions, electrical drawings, blueprints, plans and wiring diagrams.

Maintain and repair SCADA systems.

Install and maintain city communication systems.

Use and care for tools and equipment used in maintaining and repairing electrical and electronic devices.

Work safely under emergency, hazardous conditions and high voltage environments.

Assist others in municipal electrical and electronic maintenance and repair duties.

Maintain accurate records.

Communicate clearly and concisely, both orally and in writing.

Establish and maintain effective working relationships with those contacted in the course of work.

Experience and Training

Experience:

One year of experience in the maintenance, repair and testing of high voltage electrical equipment in an industrial environment is preferred.

Training:

Equivalent to the completion of the twelfth grade GED, or higher-level degree.

License or Certificate

Possession of a valid California driver's license by date of appointment.

Possession of First Aid and cardiopulmonary resuscitation (CPR) certificates within six (6) months of date of appointment.

Electric Substation Technician

In addition to the qualifications for the Electric Apprentice Substation Technician:

Knowledge of:

Computer controlled test equipment.

Complex control electric and electronic schematics.

Communications systems including RTU, SCADA, JMUX, fiber optic splicing, datalink Ethernet Radio Modem and phone land lines.

Electric circuit protection.

Process control and instrumentation devices.

Lockout/Tagout and high voltage procedures.

Complex principles of electrical and electronic repair, maintenance and system design.

Principles, methods, materials and equipment used in the installation, testing, maintenance, operations and modification of electronics equipment.

Ability to:

Independently troubleshoot and repair a wide variety of electrical and electronic equipment and devices found in electric substations.

Analyze electrical and electronic prints, schematics and test data.

Bench test equipment.

Troubleshoot and repair electrical and electronic equipment.

Provide training and technical supervision to Electric Apprentice Substation Technicians.

Work unusual and prolonged work schedules during emergencies, seasonally caused circumstances in varying weather and temperature conditions.

Experience and Training

Experience:

Four years of responsible electrical maintenance experience performing duties similar to that of an Electric Apprentice Substation Technician with the City of Roseville.

Training:

Equivalent to the completion of the twelfth grade GED, or higher-level degree,

License or Certificate

Possession of a valid California driver's license by date of appointment.

02-26-22	Electric Apprentice Substation Technician/Electric Substation Technician
05-09-20	Electric Substation Technician I/II
03-15-18	
11-09-10	
01-01-07	Electric Utility Technician I/II

Appendix B

Metering Systems Technician Job Description

CITY OF ROSEVILLE

ELECTRIC APPRENTICE METERING SYSTEM TECHNICIAN ELECTRIC METERING SYSTEM TECHNICIAN

DEFINITION

To perform work in the installation, testing, programming, maintenance, calibration, repair and modification of electric revenue and power quality metering equipment.

DISTINGUISHING CHARACTERISTICS

Electric Apprentice Metering System Technician - This is the entry level class in the Electric Metering System Technician series. Positions in this class typically have little or no directly related work experience and work under immediate supervision while learning job tasks. The Electric Apprentice Metering System Technician class is distinguished from the journey level by the performance of less than the full range of duties assigned to the Electric Metering System Technician. Incumbents work under immediate supervision while learning job tasks, progressing to general supervision as procedures and processes of assigned area of responsibility are learned.

Electric Metering System Technician - This is the full journey level class in the Electric Metering System Technician series and is distinguished from the Apprentice level by the ability to perform the full range of duties assigned with only occasional instruction or assistance as unusual or unique situations arise. Positions in this class are flexibly staffed and are normally filled by advancement from the Apprentice level.

This class is distinguished from the Senior Electric Metering System Technician in that the latter performs the most difficult and responsible types of duties assigned to classes within this series including assigned responsibilities for the installation, maintenance and repair of electric revenue meters and may exercise technical and functional supervision over an Apprentice.

SUPERVISION RECEIVED AND EXERCISED

Electric Apprentice Metering System Technician

Receives immediate supervision from an assigned supervisor; and receives technical and functional supervision from a Senior Electric Metering Systems Technician. Electric Apprentice Metering System Technicians may receive technical supervision from an Electric Metering System Technician as assigned at a worksite.

Electric Metering System Technician

Receives general supervision from an assigned supervisor; and receives technical and functional supervision from a Senior Electric Metering System Technician.

May exercise technical supervision over an Electric Apprentice Metering System Technician as assigned at a worksite.

EXAMPLES OF ESSENTIAL DUTIES– Duties may include, but are not limited to, the following:

Install, program, maintain, rebuild, repair and wire electrical revenue meters and associated equipment including transformer rated meters, pulse relays and recorders.

Operate, troubleshoot and maintain Advanced Metering Infrastructure (AMI) hardware and software; perform system administration functions for AMI and Meter Data Management (MDM) platforms and field programming of devices including the maintenance testing and installation of firmware upgrades and new meter programs and profiles.

Perform routine field and shop testing and audits on existing electric meters and transformers, ensuring accuracy of meter reads; respond to and investigate power diversion concerns.

Configure and install power quality monitors; download recorded data for analysis.

Review blueprints for permit application of new construction and remodels; conduct field inspections to ensure consistency with City standards.

Maintain inventory of electrical meters and related equipment and supplies; acquire quotes from vendors.

Safely connect and disconnect electrical meters and related equipment.

Install, test, and provide data interpretation for voltage and current recordings, power quality analyzers, and energy recordings at customer sites.

Track and monitor the installation, removal and retirement of AMI metering and communication equipment.

Perform scheduled preventative maintenance; answer emergency and trouble calls.

Maintain accurate records concerning all functions of assigned work.

Use computerized maintenance management systems.

Evaluate and document equipment testing performed.

Operate equipment in a safe and efficient manner in a variety of hazardous environments including toxic liquids and gases and live (energized) circuitry.

Build and maintain positive working relationships with co-workers, other City employees, and the public using principles of good customer service.

Perform related duties as assigned.

MINIMUM QUALIFICATIONS

Electric Apprentice Metering System Technician

Knowledge of:

Computer software.

Safe work practices.

Ability to:

Learn principles of electrical systems and electrical theory.

Learn types of tools, methods and materials used in electrical work preferred, but not required.

Learn the components, parts and basic safety used in metering and substations preferred

Perform maintenance, troubleshooting and repair work on a wide variety of electric revenue meters and AMI equipment.

On a continuous basis, know and understand operations, and observe safety rules; intermittently analyze problem equipment; identify and locate equipment; interpret work orders; remember equipment location; and explain jobs to others.

Intermittently, sit while studying or preparing reports; bend, squat, climb, kneel and twist when installing, repairing, and servicing equipment; perform simple and power grasping, pushing, pulling, and fine manipulation; and lift or carry weight of 40 pounds or less.

Understand and interpret written and oral instructions, electrical drawings, blueprints, plans and wiring diagrams.

Set electrical recording devices.

Use and care for tools and equipment used in maintaining and repairing electrical and electronic devices.

Work safely under emergency, hazardous conditions.

Assist others in municipal electrical and electronic maintenance and repair duties.

Communicate clearly and concisely, both orally and in writing.

Establish and maintain effective working relationships with those contacted in the course of work.

Experience and Training

Experience:

One year of experience in the maintenance and repair of electrical equipment and systems related to an electric or service utility is desired.

Training:

Equivalent to the completion of the twelfth grade GED, or higher-level degree. Specialized training in electrical or an electronics field preferred but not required.

License or Certificate

Possession of a valid California driver's license by date of appointment.

Possession of First Aid and cardiopulmonary resuscitation (CPR) certificates within six (6) months of date of appointment.

Electric Metering System Technician

In addition to the qualifications for the Electric Apprentice Metering System Technician:

Knowledge of:

Computer controlled test equipment.

Complex control electric and electronic schematics.

Electric circuit protection.

Electrical safety and Personal Protective Equipment (PPE) procedures.

Lockout/Tagout procedures.

Complex principles of electrical and electronic repair, maintenance and system design.

Principles and practices associated with installing current transformers, metering circuits, potential transformers and the programming of electrical revenue meters.

National Electrical Code/California Electric Code and related standards.

Methods for troubleshooting telecommunication issues.

Principles, methods, materials and equipment used in the installation, testing, maintenance, operations and modification of electrical revenue meters.

AMI systems, including communication equipment and meter programming.

Ability to:

Troubleshoot and repair a wide variety of electrical metering devices, AMI communication devices and associated equipment.

Analyze electrical and electronic prints and schematics.

Troubleshoot and repair electrical metering devices.

Analyze test data from voltage and current recordings.

Follow detailed manufacturer instructions to perform tests.

Work assigned shift schedules; be available for callback and on-call assignment.

Work unusual and prolonged work schedules during emergencies, seasonally caused circumstances in varying weather and temperature conditions.

Experience and Training

Experience:

Three years of responsible electrical maintenance experience performing duties similar to that of an Electric Apprentice Metering System Technician with the City of Roseville.

Training:

Equivalent to the completion of the twelfth grade GED, or higher-level degree, Completion of a recognized Electric Metering Systems Technician Apprenticeship program or equivalent.

License or Certificate

Possession of a valid California driver's license by date of appointment.

02-26-22	Electric Apprentice Metering System Technician/Electric Metering System Technician
05-09-20	Electric Metering Systems Technician I/II
03-15-18	
11-09-10	
01-01-07	Electric Utility Technician I/II