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PACIFIC GAS AND ELECTRIC COMPANY

PG&E — 245 MARKET STREET • SAN FRANCISCO, CALIFORNIA 94106 • (415) 781-4211

August 7, 1970

Local Union No. 1245
International Brotherhood of
Electrical Workers, AFL-CIO
P. O. Box 4790
Walnut Creek, California 94596

Attention: Mr. Ronald T. Weakley, Business Manager

Gentlemen:

Company proposes the adoption of the attached "Guidelines for the Apprentice Meterman Training Program", dated September 1, 1969, to replace the guidelines previously in effect.

This revision has been discussed in the Apprenticeship Committee and consists of designation of the vector and relay training as a centralized course in Emeryville.

If you are in accord with the foregoing and the attachment and agree thereto, please so indicate in the space provided below and return one executed copy of this letter to Company.

Yours very truly,

PACIFIC GAS AND ELECTRIC COMPANY

By W W Bonbright
Manager of Industrial Relations

The Union is in accord with the foregoing and it agrees thereto as of the date hereof.

LOCAL UNION NO. 1245, INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS, AFL-CIO

July 21, 1971, 1970 By L. L. Mitchell
Business Manager

GUIDELINES FOR THE APPRENTICE METERMAN TRAINING PROGRAM

I. Objective of the Apprentice Meterman Training Program

The need for trained and fully qualified employees to accomplish the duties specified in the Senior Meterman definition in a manner consistent with Company's Standards of Construction, Safety, and Performance has resulted in this program which coordinates extensive on-the-job and related academic training. The systematic acquisition of knowledge and skill offers the employee in training the vehicle to attain self-confidence, assuredness and satisfaction in his work and the correct and safe method of performing Company's work.

II. Training

During the 36 months of the apprenticeship, the apprentice will be offered job training divided into six time periods which coincide with the wage steps of the classification. In order that uniform and safe practices will be followed in the training period, assignment of duties and work procedures shall be provided in each of the wage steps as outlined in these guidelines and the attached schedule. The amounts of time or units of work as indicated in the schedule are believed sufficient to permit the apprentice to develop proficiency in such duty or work procedures, but should not be considered as inflexible dependent on the demonstrated ability of each individual apprentice.

The attached schedule also specifies those training periods in which the apprentice shall receive related academic or class training.

On-the-job training in the duties and amount of such training as specified in the schedule shall apply to the extent that such duties are performed by journeymen where the apprentice is headquartered. In the event such duty is not performed by journeyman at his headquarters and, therefore, not available in the training of an apprentice, it shall be noted in his work record. However, his progression through the apprenticeship or to journeyman or to higher classifications shall not be deterred for this reason.

If in the course of his apprenticeship or as a journeyman such duty later becomes available, he shall receive on-the-job training as may be required to attain expected journeyman proficiency. If, after a reasonable opportunity, he fails to attain such proficiency, his bids for progression to higher classifications may be subject to the provisions of Section 205.11 of the agreement.

A. General Guidelines

1. It is intended that assignment of the specified hours of training on the job for each period of the apprenticeship

will be made to the apprentice as early in the period as is practicable.

2. Hours shown on the schedule exclude any travel time needed to reach the place where training is to be given; however, such hours include time needed to prepare tools and equipment.

3. Except where otherwise specified, apprentices shall be trained by assignment to work with qualified journeymen.

4. Progressive work experience in all phases of meter work will be provided throughout the first five periods of the apprenticeship in accordance with the attached schedule.

5. Assignments during the last or sixth period will be made for the purpose of rounding out the apprentice's experience.

6. Upon entering each new wage step and period of training, the work assignments in the period shall be such that the apprentice will gain the basic knowledge and confidence in himself, the equipment and the procedure being used. 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 period or of a prior period.

8. During the first year, an apprentice shall not be assigned to work on any circuit energized in excess of 750 volts.

9. As an apprentice, he may be assigned to work without direct supervision only after he has been instructed and trained on the duties or work procedures required, has performed such work under direct supervision, and is capable of performing such work safely.

10. Working alone as an apprentice, he may be assigned to perform certain of the duties of a Shop Meterman or Senior Meterman. Those certain duties of these classifications to which he may be assigned shall be limited to those duties within his current or prior training periods for which he is qualified and which are within the duties normally performed by a journeyman in the course of his work. Further, such assignments shall include as a purpose the development of the apprentice's proficiency and self-confidence to perform such work as a journeyman and shall not be made to the extent

that the apprentice is in jeopardy of failing to attain goals set forth in the attached schedule.

11. Although d. c. metering training is not provided specifically in the Schedule, it is expected that in those divisions where d. c. facilities are located, training on d. c. metering shall be given in the same manner as a. c. metering.

12. Notices

a. An apprentice who is scheduled to attend any of the centralized training programs shall be given notice of such assignment as early as possible by division supervision.

b. At their request, Union's representatives or their designates will be informed by division representatives of Company's intentions in scheduling individuals to attend centralized training sessions.

c. When the roster is available, Company shall notify the Union's Apprenticeship Committee of the apprentices attending a centralized training school.

d. When an apprentice attending a centralized training school is not maintaining an acceptable level of work, notice shall be given to the Union's Apprenticeship Committee. Such notice shall also be given in the event he fails the school or if he is dropped from the school by Company.

e. If an apprentice does not maintain an acceptable on-the-job work level, notice shall be given to Union's business representative or his designate.

B. Guidelines for Training Periods

1. 0 to 6 Months' Step

During this period, the apprentice will be instructed in the following areas.

a. Shop Operations and Practices

(1) Learn different methods of cleaning meters
(2) Learn safety precautions
(3) Learn how to identify and number meters

(4) Learn how to determine when a meter should be retired
(5) Learn how to check metering equipment in and out of shop
(6) Learn test procedures for single phase meters

b. Academic Training at Emeryville (4 Weeks)

(1) Review elementary mathematics - Company outline
(2) Learn the fundamental laws and concepts of magnetism, voltage, current, reistance, and power in electric circuits
(3) Transformers; theory and operation - Company outline

c. Methods of Installation

(1) Learn the various types of conduit, wire and cable and their characteristics
(2) Learn how to make a good soldered connection
(3) Learn how to make a good clamp type (pressure) connection on wire, cable, tubing, and flat bar
(4) Learn how to use metering tools and keep them in good condition

d. Field Testing (None in This Period)

e. Field Operation and Maintenance of Metering Equipment

(1) Observe and assist Senior Meterman

f. Electrical Instruments and Calibration

(1) Learn the proper use and care of test instruments
(2) Learn to accurately read ammeters, voltmeters, and wattmeters, and to compare them to test instruments

g. Instruction Books and Circuit Diagrams

(1) Become familiar with the schematic symbols used to represent metering equipment

h. Records and Related Procedures

(1) Learn the daily field job assignment procedure
(2) Learn how to make out a satisfactory time card and pink accident form
(3) Become familiar with warehousing procedures and clerical functions as related to the electric meter shop

i. Self-Reliance, Aptitude, and Leadership

(1) Learn to keep busy
(2) Learn to contribute intelligently to the progress of any assigned job
(3) Be courteous and cooperative in working with customers and other Company departments

He shall be trained in the duties of a Senior Meterman, as indicated for the 0 to 6 months' period. In conjunction with such work, he may use test equipment when he has 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 himself or the equipment into a position where he encroaches on the contact area or into the safe working distance with respect to the primary voltage.

As early as possible in this training period, he shall be assigned to the basic electricity course (Emeryville) for the mathematic's review and training in electricity and transformers.

a. An agreed-upon test will be given at the close of the school, and should an apprentice fail to receive a passing score, he shall be given notice in writing of the areas which caused his failure.

b. After such failure, he shall be allowed to retake the test upon his request any time after one month's time from his failure. He shall be allowed two additional retests, spaced at least one month apart.

c. He shall complete the course and pass the agreed-upon test not later than the end of his ninth month of training, regardless of the number of retests that he has requested. His failure to meet this standard of achievement will be cause for his removal from the classification in accordance with Paragraph G 6 of the Master Apprenticeship Agreement.

d. His progression to the second step of the apprentice classification shall be in accordance with Paragraphs G 3 and 4 of the Master Apprenticeship Agreement.

2. 7 to 12 Months' Step

He shall continue to perform the functions of the prior period and in addition shall be instructed in the following:

a. Shop Operations and Practices

(1) Learn to work safely around energized meters
(2) Learn how to use test equipment to identify single phase, three phase, power leg, etc.
(3) Learn how to repair single phase watt-hour meters
(4) Learn how to make shop test records
(5) Learn how to test and adjust single phase meters
(6) Learn how to check register ratio and disc constant

b. Academic Training (Metermen's Handbook, 7th Edition)

(1)	Introduction to Meter Department, Chapter 1 (Safety)	2 hrs.
(2)	Math, Chapter 3 including Trig supplement	16 hrs.
(3)	D. C., Chapter 4 (Review)	4 hrs.
(4)	A. C., Chapter 5 (Review)	8 hrs.
(5)	Watt-Hour Meters, Chapter 7 including supplement	26 hrs.
		56 hrs.

c. As early as possible in this training period, he shall be assigned to the Relay and Vector Course in Emeryville.

(1) Agreed-upon tests will be given at the conclusion of the school and if he failed to receive a passing score, the apprentice shall be notified in writing of the reasons for his failing.

(2) His retesting opportunities shall be in accordance with the schedule outlined in Paragraph B-1 of these guide lines. In the event of failure to meet this academic standard of achievement, his progression shall be in accordance with Paragraphs G 4, 5, and 6 of the Master Apprenticeship Agreement.

d. Methods of Field Installation

(1) Learn the reasons for keeping metered and unmetered wiring separate
(2) Learn how to pull wire into conduit
(3) Learn how to test and identify wires installed in conduit
(4) Become acquainted with the various types of raceways suitable for meter wiring
(5) Become familiar with Company standards and learn how

to read a meter drawing

e. Field Testing

(1) Assist in the testing of self-contained meters
(2) Learn proper conduct on customer's premises
(3) Learn the methods of locating meters to be tested
(4) Learn to check for proper meter connections
(5) Learn how to make test connections
(6) Learn the sequence of operations for recording data and testing

f. Field Operation and Maintenance of Metering Equipment

(1) Learn the characteristics of three phase meters with different loads and connections
(2) Be able to make minor repairs to meters in the field
(3) Learn how to originate and complete a field test tag

g. Electrical Instruments and Calibrations

(1) Learn connections and use of ammeter, voltmeter, ohmmeter, and phase angle meters.
(2) Learn the application of current and potential transformers and the safety precautions to be observed when they are energized

h. Instruction books and Circuit Diagrams

(1) Learn to use the more common elementary electrical drawings
(2) Become familiar with the P. G. and E. meter drawings
(3) Become familiar with the P. G. and E. requirements for metering
(4) Learn to select the proper size meters and instrument transformers for given load

i. Records and Related Procedures

(1) Learn to use shop files and records
(2) Learn to use forms for meter testing and installation
(3) Become familiar with Company's accounting procedures

j. Self-Reliance, Aptitude, and Leadership

(1) Learn to carry on a job without continuous supervision

Agreed-upon tests will be given at the conclusion of the 7 to 12 months' academic training, and if he fails to receive a passing score, the apprentice shall be notified in writing of the reasons for his failing.

His retesting opportunities shall be in accordance with the schedule outlined in Paragraph 1 of these guidelines. In the event of failure to meet either the academic or on-the-job standards of achievement, his progression shall be in accordance with Paragraphs G 4, 5, and 6 of the Master Apprenticeship Agreement.

3. 13 to 18 Months' Step

He shall continue to perform the duties specified for prior periods and, in addition, learn the duties outlined on the schedule for this period of his apprenticeship.

As early as possible in this training period, he shall be assigned to more advanced duties in the shop and field.

a. Shop Operations and Practices

(1) Learn how to determine if metering equipment is safe to work on
(2) Learn to test current transformers
(3) Learn how to clean and repair demand registers
(4) Learn how to make minor repairs to shop test equipment
(5) Learn how to test and adjust transformer rated meters with watt-hour demand registers
(6) Learn to wire test blocks and switches to meters

b. Academic Training (Metermen's Handbook, 7th Edition)

(1)	Meter Reading, Chapter 18	4 hrs.
(2)	Watt-Hour Meter Testing, Chapter 15	8 hrs.
(3)	Meter Test Tables, Chapter 19	8 hrs.
(4)	Demand Meters, Chapter 8	12 hrs.
(5)	Demand Meter Testing, Chapter 16	8 hrs.
(6)	RKVA Meters, Chapter 9 including supplement	16 hrs.
(7)	Telemetering and Totalization, Chapter 10	16 hrs.
(8)	Instrument Transformers, Chapter 11	20 hrs.
(9)	Compensating Metering, Chapter 12	4 hrs.
(10)	Duncan and G. E. Meters, Chapters 20 and 21	4 hrs.
(11)	Sangamo and Westinghouse, Chapters 22 and 23	4 hrs.

c. As early as possible in this training period, he shall be assigned to the Basic Electronics Course in Emeryville.

(1) Agreed-upon tests will be given at the conclusion of the school and if he failed to receive a passing score, the apprentice shall be notified in writing of the reasons for his failing.

(2) His retesting opportunities shall be in accordance with the schedule outlined in Paragraph B-1 of these guidelines. In the event of failure to meet this academic standard of achievement, his progression shall be in accordance with Paragraphs G 4, 5, and 6 of the Master Apprenticeship Agreement.

d. Methods of Installation

(1) Learn how to determine the permissible number of conductors of various sizes allowed in different conduit sizes
(2) Learn about the provisions contained in the National Electrical Code with reference to industrial and power applications
(3) Be familiar with the P. G. and E. system of numbering wires in current and potential metering circuits
(4) Learn the importance of neatness in the installation of electrical equipment
(5) Learn to install CTs and PTs
(6) Be able to install or remove self-contained meters without supervision

e. Field Testing

(1) Be able to test self-contained meters without direct supervision
(2) Learn to interpret meter test readings
(3) Learn the value of recording operating loads and separate element rotation tests
(4) Learn to test indicating demand and transformer rated meters under supervision
(5) Learn the voltage check points of reactiformers

f. Field Operation and Maintenance of Metering Equipment

(1) Learn the characteristics of "demand meters" in field use
(2) Be able to make demand register replacements in the field
(3) Learn the characteristics of instrument transformers under field conditions and precautions to be observed
(4) Learn the characteristics of varhour meters under different load conditions

g. Electrical Instruments and Calibration

(1) Learn how to use and purpose of the current transformer test equipment
(2) Learn the application and use of rheostats, variacs, voltmeters, ammeters, etc.

h. Instruction Books and Circuit Diagrams

(1) Become familiar with the more complex metering drawings

(2) Be able to trace a meter circuit on the wiring diagram and make a readable copy of the circuit
(3) When maintaining or repairing a piece of equipment, be able to use the manufacturer's instruction books to do a more efficient job

i. Records and Related Procedures

(1) Learn to maintain meter files and records in an intelligible manner

j. Self-Reliance, Aptitude, and Leadership

(1) Learn to plan and complete minor jobs alone
(2) Take an active interest in the various jobs that are being done by fellow workers

4. 19 to 24 Months' Step

The apprentice shall continue to work as provided in the prior periods and, in addition, will be instructed in the following areas.

a. Shop Operations and Practices

(1) Learn to safely test potential transformers
(2) Learn to assemble a watt-hour meter field test set
(3) Learn to repair printing, graphic and magnetic tape demand meters.
(4) Learn how to test and adjust pulse operated demand meters and meter pulse initiator

b. Academic Training (Metermen's Handbook, 7th Edition)

(1)	Terms, Chapter 2	2 hrs.
(2)	Meter Laboratory, Chapter 17	4 hrs.
(3)	Instruments, Chapter 6	16 hrs.
(4)	Meter Wiring Diagrams, Chapter 13	20 hrs.
(5)	Services and Installations, Chapter 14 (P. G. and E. requirements Eng. Stds.)	20 hrs.
(6)	Necessary standard practices letters, etc.	4 hrs.

c. Electronic, Application to Metering

(1) Become familiar with the use of resistors, capacitors, and inductance coils, etc., as applied in metering circuits

(2) Know the application of diodes, transistors, and Hall crystals
(3) Learn to interpret symbols for electronic components used in metering
(4) Learn how to check and service amplifiers and oscillators used in impulse generators
(5) Learn to use instruments and schematic diagrams to maintain electronic equipment, such as pulse generators, magnetic tape recorders, totalizers, etc.

d. Methods of Installation

(1) Learn the wiring connections for switchboard type meters
(2) Learn to trace a metering circuit and make a sketch
(3) Learn how to locate a ground on a circuit
(4) Learn the precautions to be observed when making meter changes on energized circuits

e. Field Testing

(1) Be able to test demand and transformer rated meters
(2) Be able to use a phase angle meter and draw vectors for any meter installation
(3) Learn to test and check contacts and associated demand devices
(4) Learn to check totalizing relays

f. Field Operation and Maintenance of Metering Equipment

(1) Know the operation, construction, and maintenance requirements of all revenue meters and accessories
(2) Know the operation and maintenance of demand meter contacts (mechanical, electrical)
(3) Be able to change magnetic tapes, charts and maintain inking on graphic demands

g. Electrical Instruments and Calibration

(1) Learn the basic principles of design and operation of rotating standards
(2) Know the use of wattmeters and varmeters
(3) Know the use of special test equipment, such as phase angle meter, phase shifter, etc.

h. Instruction Books and Circuit Diagrams

(1) Be able to check continuity of a circuit using an ohmmeter

(2) Learn to draw diagrams as a means of recording the connections of metering circuits

i. Records and Related Procedures

(1) Learn to make out meter report forms

j. Self-Reliance, Aptitude, and Leadership

(1) Be able to assist fellow workers who have less experience
(2) Learn when it is necessary to secure assistance from other sources

5. 25 to 30 Months' Step

The apprentice will be allowed to do any work normally performed by a Journeyman under the direction of the Foreman, Subforeman, or a Journeyman as required by the job, and in addition, learn the duties outlined on the Schedule for this period of his apprenticeship.

a. Shop Operations and Practices

(1) Learn to safely perform all shop duties
(2) Learn to prefabricate meter panels for KVAR and other complex installations
(3) Learn to shoot trouble and make repairs on field test set
(4) Be able to shoot trouble and repair totalizing demand installations
(5) Be able to test and adjust totalizing demand meter installations

b. Electronics On The Job

(1) Testing and checking pulse generating, totalizing, and recording equipment

c. Methods of Installation

(1) Be able to "shoot trouble" on meter wiring on a new switchboard or on additions to an existing switchboard
(2) Learn how to make a neat installation
(3) Be able to install any of the metering equipment used in the P. G. and E. system

d. Field Testing

(1) Be able to test any meter installation without supervision
(2) Know the limitations of various meters and systems
(3) Be able to apply the various checks to determine if the metering is operating properly
(4) Be able to determine when maintenance is required
(5) Know how various kinds of customer's loads influence meter operation

e. Field Operation and Maintenance of Metering Equipment

(1) Become acquainted with the construction, characteristics and maintenance requirements of all specialized equipment
(2) Be able to identify trouble on any metering system
(3) Be able to replace worn or damaged parts on complex meter systems
(4) Become acquainted with test procedures on intertie metering

f. Electrical Instruments and Calibration

(1) Learn to clean, test, and make minor repairs to the common electrical instruments used
(2) Know the required frequency of checking rotating standards
(3) Be able to recognize errors or defects in test equipment

g. Instruction Books and Circuit Diagrams

(1) Learn to adjust metering equipment according to written instructions
(2) Learn to make corrections to a metering print and be able to make circuit changes as shown on a drawing
(3) Be familiar with all drawings pertaining to metering
(4) Know all applicable standard practices and rules

h. Self-Reliance, Aptitude, and Leadership

(1) Be able to accept responsibility for the satisfactory completion of all revenue metering jobs
(2) Learn to offer constructive ideas
(3) Be courteous and intelligent in discussing metering

problems with customers, electricians, and contractors

(4) Be able to secure cooperation from others in altering installations to comply with P. G. and E. standards

6. 31 to 36 Months' Topping Off

The apprentice will be allowed to do any work normally performed by a journeyman. It will be the object of this step to attain satisfactory proficiency in all the areas where the apprentice has been instructed.

7. Records

(a) It shall be the responsibility of each apprentice to maintain his own record in collaboration with each Foreman or Subforeman to whom he is assigned. Upon completion, each periodic record shall be submitted to the Division Meter Foreman.

(b) It shall be the responsibility of each Meter Foreman to keep necessary files of records on each apprentice and to ascertain that each apprentice has a reasonable opportunity of meeting the Standards of Achievement set forth in these guidelines.

(c) Such records shall at all times be available during the apprenticeship for review by the Division Meter Foreman or higher levels of supervision, the employee, and representatives of Union.

(d) In addition to and precedent to these guidelines, the provisions of the Master Apprenticeship Agreement are applicable.

SCHEDULE

	ACADEMIC ASSIGNMENT MONTH	0 - 6	7 - 12	13 - 18	19 - 24	25 - 30
A.	Basic Electricity Course - Emeryville	160				
B.	Relay and Vector Course - Emeryville		120			
C.	Basic Electronics Course - Emeryville			120		
D.	Metermen's Handbook		56	104	66	
	"ON-THE-JOB" PROCEDURES AND DUTIES					
1.	Safety, First Aid, and Resuscitation	8	8	8	8	8 ⊛
2.	Shop Operations and Practices	180	128 ○	60	40	10 ✳
3.	Electronics					68 ⊛
4.	Methods of Installation	64	64	110 ○	100	94 ✳
5.	Field Testing		48	166 ○	164	204 ✳
6.	Field Operation and Maintenance	48	48	60 ○	60	40 ✳
7.	Electrical Instruments and Calibration	48	48	60	60 ○	40 ✳
8.	Instruction Books and Circuit Diagrams	96	96	20 ○	20	20 ✳
9.	Records and Related Procedures	60	64 ○	20	20	20 ✳
10.	Self-Reliance, Aptitude, and Leadership	4	4	4	4	4 ⊛

○ Indicates point at which apprentice can be expected to know all aspects of specified work but with limited proficiency to perform such work.

✳ Indicates point at which full knowledge and proficiency is a requirement.