R4-86-156-PGE

PACIFIC GAS AND ELECTRIC COMPANY

PG&E — 245 MARKET STREET • SAN FRANCISCO, CALIFORNIA 94106 • (415) 781-4211 • TWX 910-372-6587

February 22, 1988

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

Attention: Mr. Jack McNally, Business Manager

Gentlemen:

Pursuant to Section 109.2 of the Physical Agreement, Company proposes the adoption of revised Apprentice Meterman Training Guidelines. The program will be reviewed by the Company and the Union in one year. Basic Electricity School and the Basic Electricity Module will remain in the training program. If after the one year review it is determined that the school and the module are redundant training, the Company and Union agree to discuss the elimination of the school from the program.

The Apprenticeship Committee reviewed the Apprentice Metermen in the current training program on an individual basis for the training required to complete the revised training program and agreed to place apprentices into the new training at their current training step. Apprentices who have completed Basic Electronics will continue in their current training program until complete. Training material will be made available to all apprentices for audit, review and reference.

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

Yours very truly,

PACIFIC GAS AND ELECTRIC COMPANY

By _____
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

March 8, 1988

By _____
Business Manager

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ADMINISTRATIVE MANUAL FOR SUPERVISORS

APPRENTICE ELECTRIC METERMAN TRAINING MANUAL

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ADMINISTRATIVE MANUAL FOR SUPERVISORS

APPRENTICE ELECTRIC METERMAN TRAINING MANUAL

SECTION 1 - INTRODUCTION

In the Pacific Gas and Electric Company, one of the important responsibilities of Supervisors is the training of personnel to handle the ever increasing technological problems of a growing utility. This manual has been prepared to assist Supervisors in the administration of the Apprentice Electric Meterman Training Program.

The many changes in the art of power generation, transmission, distribution, and metering have necessitated the training of personnel with definite qualifications and job potential. Once a person has entered the apprenticeship training, a step by step program of instruction and continual help and guidance by a Supervisor will be needed.

SECTION II - OUTLINE OF ADMINISTRATIVE DETAIL

A. DIRECT SUPERVISION RESPONSIBILITY

During the period of study and related training, the apprentice will require assistance and instruction. The amount of assistance required will vary with the individual and is difficult to determine until the apprentice is into studying and training. Company time for studies and examinations to complete the Apprentice Electric Meterman Training Manual per the Schedule in Appendix A will be necessary. The presence of a supervisor will not be necessary during all of this time, however, instruction and assistance must be given as necessary.. As preparation for this assistance, all supervisors must become familiar with the program for which they will be responsible.

Apprentice training is the responsibility of all members of the supervisory team, but the primary responsibility is a direct charge of the apprentice's supervisor. Supervisors will train, assist, grade, and evaluate any apprentices that are in their department. They will follow the normal lines of reporting in the execution of these duties. The Regional Electric Operations Manager will be responsible for the overall administration of all Apprentice programs in his area.

The supervisor or a designated representative will have the responsibility of presenting lessons that cover local policy that are contained in the Apprentice Electric Meterman Training Manual. Appendix C contains a page that covers each of the lessons. The layout will be basically the same as the lessons that appear in the Training Manual. The space below the "NOTES:" is provided for comments and/or additional material the Supervisor deems necessary to properly cover the subject material.

B. INDIRECT SUPERVISION RESPONSIBILITY

1. Records of Progress

A complete up-to-date record of the on-the-job training and academic training will be kept by the supervisor at each apprentice's headquarters. The records will be kept by each Supervisor on a PC diskette which may be obtained from the apprentice meterman training coordinator at General Office. These records shall be maintained and updated weekly, and reported monthly on a printout from the PC diskette.

The records will be kept complete until the apprentice is awarded journeyman classification, or is disqualified. When the apprentice is awarded journeyman status or is disqualified, the file should be forwarded to the Regional Human Resources Department for inclusion into the employee's 701 file.

a. Reviews and examinations

In accordance with the Master Apprenticeship Agreement, the supervisor will review the apprentice's progress at the end of each three month period and each will sign the quarterly report form. In addition, by the end of each six month period. the apprentice must pass the examinations on the modules included in the Apprentice Electric Meterman Training Manual for that period.

C. TRAINING MATERIALS

1. The Apprentice Electric Meterman Training Manual

Each apprentice will receive a copy of the Apprentice Electric Meterman Training Manual when they enter the Apprentice Meterman classification. These manuals are available from the apprentice meterman training coordinator at General Office.

2. ICS-INTEXT Book Set

Each Supervisor will order a set (50 courses) of ICS-INTEXT books, Code 62-1810, and distribute to each Apprentice the courses books that are assigned to the module that the Apprentice is currently studying. Appendix B is provided as a guideline.

3. Administrative Manual for Supervisors

One copy of this manual will be supplied to the Regional Electric Operations Manager, the Regional Personnel Manager, and to each Supervisor involved in the training of Apprentice Metermen.

4. Miscellaneous

Miscellaneous stationery supplies can be drawn from headquarters' supplies or purchased locally. The apprentice will also require a

copy of the Accident Prevention Rule Book, Electric Meterman's Manual, and Handbook for Electricity Metering.

SECTION III - ON-THE-JOB TRAINING

A. REQUIREMENTS

The minimum On-The-Job training requirements (in training hours) are listed in Appendix A. The major processes have been broken down into subdivisions that are reported on the monthly printout to insure proper coverage.

B. EVALUATION

An evaluation of the On-The-Job training shall be conducted every three months in conjunction with the progress review. The journeymen that the apprentice has worked with during the three month period should be contacted for their comments on the progress of the Apprentice. After discussion with all persons involved a satisfactory or unsatisfactory grade will be recorded on the Academic Training Progress Report. If an unsatisfactory grade is recorded at the end of any six month training period, Section G Paragraph 6 of the Master Apprenticeship Agreement shall be implemented. A brief statement of the evaluation shall also be included on the report.

SECTION IV - RELATED ACADEMIC TRAINING

A. TIME ALLOWED

The academic phase of the Apprentice Program is designed to give the apprentice sufficient time to gain the technical knowledge to solve the problems encountered as a Senior Meterman. Each Apprentice will be allowed the minimum time, per Appendix A, during regular work hours to study assignment material and complete assigned lessons and examinations. The academic training will be completed during the first twenty-four months of the apprenticeship.

B. REQUIREMENTS AND GRADING PROCEDURE

The minimum requirement for the satisfactory completion of each module is a 70 percent grade. Each examination is to be graded on a straight percentage basis promptly after it is taken. The grade should then be recorded on the Academic Training Progress Report and the graded test paper reviewed with the apprentice, after which it will be retained in the apprentice's file for the duration of the apprenticeship. The security of these completed examinations must be safeguarded.

C. EXAMINATIONS

A set of eight module examinations will be supplied when the order for the Apprentice Electric Meterman Training Manual is placed. It

will be the supervisor's responsibility to safeguard the security of these examinations until each examination is given.

An examination shall be given for each Module and processed in accordance with the Guidelines for the Apprentice Meterman Training Program Section VII and Paragraph G of the Master Apprenticeship Agreement.

V. ADDITIONAL ASSISTANCE

The Regional Meter Specialist is available to provide the apprentice with any assistance if any questions or problems arise regarding any aspect of the training program and/or lesson which cannot be resolved at the Division level.

In addition, an apprentice metermen training program "hot-line" has been established to assist the apprentice. The "hot-line" goes directly to the Apprentice Electric Meter Training Coordinator. Two mechanisms are set in place for this to occur. Any questions, problems, and/or comments can be written on the Request for Assistance Form and sent to the Electric Meter Training Coordinator at Room 1552, 123 Mission, San Francisco, or the Training Coordinator can be contacted directly by phone on extension 223-6559.

APPENDIX A

1/26/88 ACADEMIC AND ON-THE-JOB TRAINING	0 - 6	7 - 12	13 - 18	19 - 24	25 - 30	TOTALS HOURS	TOTALS WEEKS
A. ACADEMIC TRAINING **********							
TRAINING MANUAL						445	11.1
MODULE # 1	58					58	1.5
MODULE # 2	65					65	1.6
MODULE # 3		67				67	1.7
MODULE # 4		53				53	1.3
MODULE # 5			64			64	1.6
MODULE # 6			60			60	1.5
MODULE # 7				40		40	1.0
MODULE # 8				38		38	1.0
METER SCHOOLS							
BASIC ELECTRICITY SCHOOL	160					160	4.0
ADVANCED METERING SCHOOL			160	0		160	4.0
SUB-TOTAL ACADEMIC TRAINING	283	120	284	78	0	765	19.1
B. ON-THE-JOB TRAINING **********	0 - 6	7 - 12	13 - 18	19 - 24	25 - 30	TOTALS HOURS	TOTALS WEEKS
FIELD OPERATIONS, MAINTENANCE, AND TESTING	80	200	200	200	240	920	23.0
INSTALLATIONS & REMOVALS	80	120	160	120	120	600	15.0
SHOP OPERATIONS & PRACTICES	120	80	24	24	0	248	6.2
CUSTOMER CONTACT AND SERVICE WORK	40	80	120	120	120	480	12.0
READING & SERVICING RECORDERS	0	48	48	80	48	224	5.6
TIME-OF-USE METERING	0	0	0	120	120	240	6.0
ELECTRICAL INSTRUMENTS AND TOOLS	48	36	36	80	0	200	5.0
FIRST AID AND SAFETY PROCEDURES	10	10	10	10	10	50	1.3
SUB-TOTAL ON-THE-JOB TRAINING	378	574	598	754	658	2962	74.1
TOTAL MINIMUM TRAINING	661	694	882	832	658	3727	93.2
TOTAL HOURS IN 6 MONTHS	1040	1040	1040	1040	1040	5200	130.0
HOURS FOR OTHER ACTIVITIES	379	346	158	208	382	1473	36.8

APPENDIX B

ICS-INTEXT BOOKS

LESSON NO.	SECTION NO.	TITLE
		MODULE 1
1.02	X0301-1	PERSONAL SAFETY (Part 1)
1.02	X0302-1	PERSONAL SAFETY (Part 2)
1.02	X0303-1	SAFE USE OF HAND TOOLS
1.12	X0103-1	FRACTIONS AND DECIMALS
1.12	X0104-1	SI METRIC
1.12	X0110-1	FORMULAS
1.12	X0111-1	EQUATIONS
		MODULE 2
2.01	A0101-1	NATURE OF ELECTRICITY
2.01	A0103-1	ELECTRICAL CELLS AND BATTERIES
2.01	A0104-1	ELECTRICAL COMPONENTS AND OHM'S LAW
2.01	A0105-1	BASIC CIRCUITS ARRANGEMENTS
2.01	A0107-1	MAGNETISM AND ELECTROMAGNETISM
2.02	A0201-1	ALTERNATING CURRENT
2.02	A0202-1	ALTERNATORS
2.02	A0203-1	TRANSFORMERS
2.02	A0204-1	INDUCTORS AND CAPACITORS
2.02	A0205-1	AC CIRCUITS
2.02	A0206-1	RECTIFICATION AND ELECTRONIC DEVICES
2.02	A0207-1	ELECTRIC ENERGY DISTRIBUTION
2.02	A0208-1	TYPES OF ELECTRIC CIRCUITS
		MODULE 3
3.03	4019A-5	ELECTRIC POWER MEASUREMENTS (Part 1)
3.06	A0301-1	CHECKING SIMPLE CIRCUITS
3.06	A0302-1	TROUBLESHOOTING WITH BASIC METERS
3.06	A0303-1	HOW A VOLTMETER WORKS
3.06	A0304-1	HOW AN AMMETER WORKS
3.06	A0305-1	AC MEASURING INSTRUMENTS
3.06	A0306-1	MISC. ELECTRICAL MEASURING INSTRUMENTS
		MODULE 4
4.10	X0201-1	ALGEBRA: MONONOMIALS AND POLYNOMIALS
4.10	X0202-1	ALGEBRA: FACTORING
4.10	X0203-1	ALGEBRA: ADDING AND SUBTRACTING FRACTIONS
4.10	X0204-1	ALGEBRA: MULTIPLYING AND DIVIDING OF FRACTIONS

APPENDIX B (Continued)

LESSON NO.	SECTION NO.	TITLE
		MODULE 5
5.01	4019B-3	POWER MEASUREMENTS (Part 2)
5.08	X0211-1	APPLIED GEOMETRY
5.08	X0212-1	PRACTICAL TRIGONOMETRY
5.08	X0231-1	TRIGONOMETRIC TABLES
5.14	A0404-1	CONDUCTOR PROPERTIES AND INSTALLATIONS
5.14	A0405-1	CONDUIT CHARACTERISTICS AND INSTALLATIONS
5.14	A0406-1	ELECTRICAL FITTINGS AND CONDUIT BENDING
		MODULE 6
6.01	B0301-1	R. C. AND I. COMPONENTS
6.01	B0302-1	BASIC SEMICONDUCTOR COMPONENTS
6.01	B0303-1	SEMICONDUCTOR SWITCHING DEVICES
6.01	B0304-1	SPECIAL SEMICONDUCTOR DEVICES
6.01	B0305-1	RECTIFIERS AND ELECTRON TUBES
6.01	B0306-1	SWITCHING AND CONNECTING DEVICES
		MODULE 7
7.01	B0405-1	SWITCHING CIRCUITS
7.01	B0406-1	LOGIC CIRCUITS
7.01	B0407-1	GATING AND COUNTING CIRCUITS
7.01	B0408-1	PULSE AND DIGITAL CIRCUITS
		MODULE 8
8.03	6793-5	INSTRUMENT TRANSFORMERS
8.06	5177-16	NATIONAL ELECTRIC CODE

1/28/88

GUIDELINES FOR THE

APPRENTICE METERMAN TRAINING PROGRAM

GUIDELINES FOR THE APPRENTICE METERMAN TRAINING PROGRAM

I. OBJECTIVE

Pacific Gas and Electric Company has a continuing need for fully qualified employees to perform the duties of the Senior Meterman classification. These duties include setting, testing and repairing all types of electric meters, instruments, demand recorders, instrument transformers and associated equipment according to company standards and governmental regulations. This program has been created to provide a combination of Academic and On-the-Job training to allow the development of trained journeymen who can perform these duties safely and skillfully.

II. DURATION

The duration of the Apprentice Meterman training program is 36 months, divided into six time periods which coincide with the wage progression steps of the classification.

III. ACADEMIC TRAINING

The academic portion of the program consists of a combination of self-study and formal training and will normally be completed in the first 24 months of the apprenticeship. The training resources used in the program are:

1. Apprentice Electric Meterman Training Manual
   Pacific Gas and Electric
2. Accident Prevention Rules
   Pacific Gas and Electric
3. Electric Meterman's Manual
   Pacific Gas and Electric
4. Handbook for Electricity Metering
   Edison Electric Institute
5. ICS-Intext Self Study Texts
   National Education Training Corp.
6. Basic Electricity - Central Training Facility
   Pacific Gas and Electric
7. Advanced Metering - Central Training Facility
   Pacific Gas and Electric
8. Administrative Manual for Supervisors
   Pacific Gas and Electric

Self-check tests are provided throughout the academic training period to provide feedback to the apprentice on progress in the program. Progress tests will be given as outlined in Section VII of these Guidelines and shall serve as the Standards of Achievement for the academic portion of training for the various levels of the wage rate progression. The minimum passing score for the progress tests will be 70 percent.

Testing policies shall be in accordance with Section G of the Master Apprenticeship Agreement.

IV. On-The-Job Training

Progressive work experience in all phases of electric metering will be provided to the apprentice by assignment to job duties as outlined in Section V of these Guidelines. Apprentices will normally be trained by assignment to work with qualified Senior Metermen, however, assignment to work alone may be made in accordance with Section G of the Master Apprenticeship Agreement and Exhibit VI-L, Job Definitions and Lines of Progression, of the Agreement between PG&E and IBEW Local 1245. Such assignments to work alone shall not be made to the extent that the apprentice is in jeopardy of failing to attain goals set forth in these Guidelines.

Assignment of the specified hours of training on the job for each time period of the apprenticeship will be made to the extent that such duties are performed by Senior Metermen where the apprentice is headquartered. In the event such duty is not performed at the headquarters it shall be noted on the apprentice training record. Progression through the apprenticeship or to higher classifications shall not be delayed for this reason.

V. GUIDELINES

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 journeyman.

4. Progressive work experience in all phase 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 a prior period.

8. During the first year, an apprentice shall not be assigned to work on any conductors, test leads, test switches or bypass switches that are energized at 277 volts or above.

9. 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.

10. Notices

    a. An apprentice who is scheduled to attend 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 the apprentice fails the school or if the apprentice 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

0 to 6 Month's Step

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

a. Academic Training

1. Training Manual Modules

58 a. Complete Module #1. This module introduces the Electric Meter Department. It covers personal safety and driving safety, office and shop operations, and materials handling. Also covered are reading and identifying meters as well as meter terminology and geographical service area.

- 3 ICS-INTEXT courses on personal safety

- 4 ICS-INTEXT courses on mathematics covering fractions, decimals, equations, and formulas

65 b. Complete Module #2.

- 5 ICS-INTEXT courses that covers the theory and application of direct current electricity.

- 8 ICS-INTEXT courses that covers the theory and application of alternating current electricity.

160 2. PG&E Schools

a. Basic Electricity

b. On-the-Job Procedures and Duties

80 1. Field Operations, Maintenance, and Testing

a. Observe and assist Senior Meterman (No direct meter testing is required during this first six month period. Main goal is to become familiar with the scope of the electric metering.)

b. Spend three days with other departments in Electric Operations, becoming familiar with what they do and how their work relates to the Electric Meter Department.

80 2. Installations & Removals

a. Observe and assist Senior Meterman.

120 3. Shop Operations & Practices

a. Learn to identify and process all meters and associated equipment including tools and equipment on a meter truck.

b. Learn how the shop is organized and maintained.

c. Learn procedures for ordering meters and associated equipment.

d. Learn safe work procedures.

40 4. Customer Contact and Service Work

a. Learn proper conduct on customer's premises.

b. Spend a day with the Customer Service and Marketing Departments, becoming familiar with what they do and how their work relates to the Electric Meter Department.

0 5. Reading & Servicing Recorders

0 6. Time-of-Use Metering

48 7. Electrical Instruments, Calibration, & Tools

a. Learn how to handle and process electrical instruments and tools including security items.

b. Learn how to properly maintain and care for all electric tools, equipment, instruments.

10 8. First-Aid procedures & Safety Practices

a. Participate in all First Aid and Safety Meetings

b. Learn safe work procedures in all situations

c. Learn when and how to properly use safety equipment.

d. Learn cardio-pulmonary resuscitation.

e. Learn how to fill out pink slips and Accident Reports

- An apprentice 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.

7 to 12 Month's Step

The apprentice shall continue to perform the functions of the prior period and in addition, shall be instructed in the following.

a. Academic Training

1. Training Manual Modules

67 a. Complete Module #3. This module covers all aspects of magnetic tape recording, induction watthour meter wiring diagrams, customer-owned equipment, and electric service identification.

- 7 ICS-INTEXT courses on Power Measurement and the Use of Test Instruments.

53 b. Complete Module #4. This module covers test switches, bypasses, meter security, installation wiring, stabilizers and arrestors, interaction and verbal communications.

- 4 ICS-INTEXT courses that make up part two of Mathematics which is Algebra.

2. PG&E Schools

a. None

b. On-the-Job Procedures and Duties

200 1. Field Operations, Maintenance, and Testing

a. Learn to test and troubleshoot all self-contained A-base KWH meters 240 volts and under.

b. Learn the meter security procedures.

c. Learn to look for energy diversion.

120 2. Installations & Removals

a. Learn to install/remove basic self-contained meters.

b. Learn PG&E's wiring requirements, including the color code.

c. Learn to identify the various electric services, service requirements, and to determine the correct metering required.

d. Learn to pre-inspect jobs and check for compliance to established standards.

e. Learn to read and interpret drawings and circuit diagrams.

f. Become familiar with Company metering standards and requirements.

80 3. Shop Operations & Practices

a. Learn to adjust, repair, and replace the basic components of any electro-mechanical meter.

80 4. Customer Contact & Service Work

a. Observe how Senior Metermen handle different types of customer contact situations including High Bill Investigations, energy diversion, shut offs, meter changes, office test, etc.

48 5. Reading & Servicing Recorders

a. Learn to sort and prepare routes for reading and servicing.

b. Learn to read and service magnetic tape accounts

c. Learn several routes.

c. Learn to read load profile recorders

0 6. Time-of-Use Metering

36 7. Electrical Instruments, Calibration, & Tools

a. Learn the application and use of instrument transformers and the safety precautions to be observed when they are energized.

10 8. First-Aid procedures & Safety Practices

a. Participate in all First Aid and Safety Meetings.

b. Learn to care and use rubber gloves and blankets. (Note: No exposure to 277/480 volts should occur in this stage.)

13 to 18 Month's Step

The apprentice 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 field.

a. Academic Training

1. Training Manual Modules

64 a. Complete Module #5. This module covers all phases of meter testing, identification and use of equipment and tools, inventory materials, job requests, and record-keeping and forms.

- 3 ICS-INTEXT courses which are Power Measurement part 2, Mathematics part 3, and Electrical Equipment Installation.

60 b. Complete Module #6 - Electronics.

- 1 ICS-INTEXT electronics course that covers the various types of components used in utility electronic equipment and systems.

2. PG&E Schools

160 a. Advanced Metering School (This School should be scheduled during this training period. However, if it is not possible because the School is not being taught during this period, then it must be scheduled as soon as possible during the next training period.)

b. On-the-Job Procedures and Duties

200 1. Field Operations, Maintenance, and Testing

a. Learn to test all basic electro-mechanical meters including self-contained and transformer rated, single and polyphase, combination demand meters, and reactive meters. Should be able to test all A-base meters without any assistance.

b. Learn the proper use of the single and polyphase test jacks.

c. Learn the proper use of a remote test jack.

d. Learn how to test phase shifting devices.

e. Learn how to separate element check a meter.

f. Learn how to check the phase rotation of a service.

160 2. Installations & Removals

a. Learn to install/remove all basic meters and associated equipment including transformer rated metering installations. Should be able to install/remove all self-contained meters without any assistance.

b. Learn how and when to install/remove a phase shifting device.

c. Learn how and when to install/remove a recorder.

d. Learn how and when to install/remove a protective capacitor and/or a voltage stabilizer.

e. Learn to plan out a job.

f. Learn how to trace the circuit wiring and make a single line drawing of any metering installation.

g. Learn how to ground meter installations properly.

24 3. Shop Operations & Practices

a. Learn how to wire up a standard test set.

b. Learn how to make fused jumpers.

c. Learn how to maintain a truck inventory.

120 4. Customer Contact & Service Work.

a. Learn to handle all customer service work including HBIs, shut-offs, turn-ons, meter changes, verifications, and energy diversions.

48 5. Reading & Servicing Recorders

a. Learn remaining routes.

b. Read and service routes without any assistance.

0 6. Time-of-Use Metering

36 7. Electrical Instruments, Calibration, & Tools

a. Learn to use a phase angle meter.

b. Learn to use a phase rotation meter.

c. Learn to use a current burden tester.

d. Learn to check standards and instruments for correct

calibration.

8. First-Aid procedures & Safety Practices

   a. Participate in all First Aid and Safety Meetings

   b. Learn the proper use and care of safety equipment required on 277/480 volt services.

   c. Learn to apply personal safety grounds.

19 to 24 Month's Step

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

a. Academic Training

1. Training Manual Modules

40 a. Complete Module #7 - Electronics.

- 4 ICS-INTEXT electronics courses that relate to two or more components so as to preform a particular function or achieve a certain circuit characteristic. Switching, logic, gating, counting, pulse , and digital circuits are the objectives.

38 b. Complete Module #8. This module covers customer complaints, instrument transformers, instrument test and repair, the National Electric Code, local policy, time-of-use metering, meterman's responsibilities, inspecting meter installations, troubleshooting techniques, and personal evaluations.

- 2 ICS-INTEXT courses covering Instrument Transformers and the National Electric Code.

2. PG&E Schools

a. Advanced Metering School (if not already taken during the 13-18 month period).

b. On-the-Job Procedures and Duties

200 1. Field Operations, Maintenance, and Testing

a. Should be able test, maintain, and troubleshoot all basic metering installations without any assistance.

b. Learn to test, troubleshoot, and maintain all metering devices including pulse generators, magnetic tape recorders, graphic chart recorders, thermal demand meters, relays, and totalizers.

c. Learn to use schematic drawings of electronic metering devices to assist in testing and maintaining these devices.

d. Learn the basic trouble-shooting techniques.

e. Learn how to handle a High Bill Investigation

f. Learn to test a co-generation metering installation.

g. Learn to test an inter-tie metering installation.

h. Learn to test a meter on a primary switchboard.

i. Learn how to organize the day's work.

j. Learn how customer loads influence metering operations.

120 2. Installations & Removals

a. Should be able to install/remove all current transformer rated meter installations without any assistance. (If the installation is energized, a qualified observer is still necessary.)

b. Learn to identify all primary metering standards and requirements and learn how to install/remove the metering equipment.

c. Learn to identify all co-generation and inter-tie metering standards and requirements, and learn how to install/remove the metering equipment.

d. Learn to install/remove all metering devices including pulse generators, magnetic tape recorders, graphic chart recorders, thermal demand meters, relays, and totalizers.

e. Become familiar with the requirements in the National Electric Code.

24 3. Shop Operations & Practices

a. Learn how to repair magnetic tape recorders

120 4. Customer Contact & Service Work

a. Should be able to handle any customer service work without any assistance.

80 5. Reading & Servicing Recorders

a. Continue reading and servicing recorders.

b. Learn to troubleshoot field recorder problems.

120 6. Time-of-Use Metering

a. Learn the theory and operation of the basic time-of-use meter devices and systems including the following.

1. Mechanical

2. Hybrids

3. Energy Measurement / recorder combinations

4. Electronic Recorders/registers/counters

5. Microprocessor-based electronic metering devices.

6. Programming devices

b. Learn how to disassemble and assemble any time-of-use metering device and explain how the various modules function.

c. Learn to use, test, and maintain all time-of-use metering devices.

d. Learn how to program the various TOU meters.

7. Electrical Instruments, Calibration, & Tools

a. Learn how to conduct the Annual Security Items Inventory and the Portable Instruments Calibration Inventory. (Schedule within the next 12 month period.)

8. First-Aid procedures & Safety Practices

a. Participate in all First Aid and Safety Meetings

b. Learn safety rules and procedures regarding primary switchboards and substations.

25 to 30 Month's 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 in the following areas.

a. Academic Training

0 1. None.

b. On-the-Job Procedures and Duties

240 1. Field Operations, Maintenance, and Testing

a. Continue testing, maintaining, and troubleshooting all types of metering installations and problems without assistance.

120 2. Installations & Removals

a. Continue planning, installing, and removing all types of metering installation without any assistance.

0 3. Shop Operations & Practices

a. Tasks as assigned.

120 4. Customer Contact & Service Work.

a. Continue.

48 5. Reading & Servicing Recorders

a. Continue reading, servicing, and troubleshooting recorders. Should be able to troubleshoot all recorder related problems without any assistance.

120 6. Time-of-Use Metering

a. Learn to troubleshoot any field TOU metering problem.

0 7. Electrical Instruments, Calibration, & Tools

a. Should be able to test and maintain any metering instruments used .

10 8. First-Aid procedures & Safety Practices

a. Participate in all First Aid and Safety Meetings

31 to 36 Month's Step

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 area where the apprentice has been instructed.

****

A. ACADEMIC TRAINING = 765

445 1. Training Manual Modules

320 2. PG&E Schools

B. ON-THE-JOB PROCEDURES AND DUTIES = 2962

920 1. Field Operations, Maintenance, and Testing

600 2. Installations & Removals

248 3. Shop Operations & Practices

480 4. Customer Contact & Service Works

224 5. Reading & Servicing Recorders

240 6. Time-of-Use Metering

200 7. Electrical Instruments, Calibration, & Tools

50 8. First-Aid procedures & Safety Practices

TOTAL APPRENTICE TRAINING 3,727 HOURS = 93.2 WEEKS

VI. RECORDS

A. It will be the responsibility of the apprentice to maintain an individual record of progress in the academic portion of the program in collaboration with the supervisor. Progress reviews will be conducted periodically (three month maximum) with the apprentice and so noted by the apprentice's and supervisor's signature on the progress record.

B. It shall be the responsibility of each Supervisor to maintain 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 Region Staff, supervision, representatives of Union, and the employee.

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

VII. TESTING

A. Apprentice Electric Meterman Training Manual

- Agreed-upon progress test will be given at the end of each training module. The apprentice will be required to pass each progress test within the six month period that it is scheduled before proceeding to the next step.

B. Basic Electricity

- Agreed-upon tests will be given at the end of each main section. The apprentice shall complete the course and pass the agreed-upon test not later than the end of his ninth month of training.

C. Advanced Metering

- Two agreed-upon tests will be given, one at the end of the of the first two weeks and one at the end of the second two weeks. Each test will cover its respective two week period and a passing score must be achieved on both tests to complete the course.

D. Failure

1. If an apprentice does not receive a passing score on his test, he shall be notified in writing of the reason for his failing.

2. Failure to complete the Basic Electricity Course and pass the agreed-upon tests by the ninth month of training will be cause for the apprentice's removal from the classification in accordance with Paragraph G 6 of the Master Apprenticeship Agreement.

3. Failure to complete any of the Training Modules and pass the agreed-upon tests three months after the end of the training period in which they are scheduled will be cause for the apprentice's removal from the classification in accordance with Paragraph G 6 of the Master Apprenticeship Agreement.

4. Failure to complete the Advanced Metering Course and pass the agreed-upon test by the end of the 27th month of training will be cause for the apprentice's removal from the classification in accordance with Paragraph G 6 of the Master Apprenticeship Agreement. (Note: While taking the course, failure of the first agreed-upon test will not preclude the completion of the Advanced Metering course).

5. After any such failures, the apprentice upon his request shall be allowed to retake the test any time after one month's time from his failure. He shall be allowed two additional retests, spaced at least one month apart. This applies to all academic training.

6. His progression to the next higher step of the apprentice classification shall be in accordance with Paragraph G of the Master Apprenticeship Agreement.

1/26/88 ACADEMIC AND ON-THE-JOB TRAINING	0 - 6	7 - 12	13 - 18	19 - 24	25 - 30	TOTALS HOURS	TOTALS WEEKS
A. ACADEMIC TRAINING **********							
TRAINING MANUAL						445	11.1
MODULE # 1	58					58	1.5
MODULE # 2	65					65	1.6
MODULE # 3		67				67	1.7
MODULE # 4		53				53	1.3
MODULE # 5			64			64	1.6
MODULE # 6			60			60	1.5
MODULE # 7				40		40	1.0
MODULE # 8				38		38	1.0
METER SCHOOLS							
BASIC ELECTRICITY SCHOOL	160					160	4.0
ADVANCED METERING SCHOOL			160	0		160	4.0
SUB-TOTAL ACADEMIC TRAINING	283	120	284	78	0	765	19.1
B. ON-THE-JOB TRAINING **********	0 - 6	7 - 12	13 - 18	19 - 24	25 - 30	TOTALS HOURS	TOTALS WEEKS
FIELD OPERATIONS, MAINTENANCE, AND TESTING	80	200	200	200	240	920	23.0
INSTALLATIONS & REMOVALS	80	120	160	120	120	600	15.0
SHOP OPERATIONS & PRACTICES	120	80	24	24	0	248	6.2
CUSTOMER CONTACT AND SERVICE WORK	40	80	120	120	120	480	12.0
READING & SERVICING RECORDERS	0	48	48	80	48	224	5.6
TIME-OF-USE METERING	0	0	0	120	120	240	6.0
ELECTRICAL INSTRUMENTS AND TOOLS	48	36	36	80	0	200	5.0
FIRST AID AND SAFETY PROCEDURES	10	10	10	10	10	50	1.3
SUB-TOTAL ON-THE-JOB TRAINING	378	574	598	754	658	2962	74.1
TOTAL MINIMUM TRAINING	661	694	882	832	658	3727	93.2
TOTAL HOURS IN 6 MONTHS	1040	1040	1040	1040	1040	5200	130.0
HOURS FOR OTHER ACTIVITIES	379	346	158	208	382	1473	36.8

APPRENTICE METERMAN'S TRAINING PROGRAM

DAILY ACTIVITY REPORT

DAR#: _____

Entry Date: _____

Apprentice ID#	Apprentice	Training Date			Trainer	Travel time
QTY	ID#	OBSERVED	PERFORMED	TOTAL	COMMENTS	

J1		FIELD OPERATIONS/MAINTENANCE/TESTS					
J1 01		FORM	1S	100A	120V	2W 1P	
J1 01I	I	TEST	1S	100A	120V	2W 1P	
J1 01P		FORM	1S	100A	120V	2W 1P	PULSE
J1 01R	R	TEST	1S	100A	120V	2W 1P	
J1 01T	O	TEST	1S	100A	120V	2W 1P	
J1 02		FORM	2S	200A	240V	3WD 1P	
J1 02D		FORM	2S	200A	240V	3WD 1P	DEMAND
J1 02DI	I	TEST	2S	200A	240V	3WD 1P	DEMAND
J1 02DR	R	TEST	2S	200A	240V	3WD 1P	DEMAND
J1 02DT	O	TEST	2S	200A	240V	3WD 1P	DEMAND
J1 02I	I	TEST	2S	200A	240V	3WD 1P	
J1 02P		FORM	2S	200A	240V	3WD 1P	PULSE
J1 02PI	I	TEST	2S	200A	240V	3WD 1P	PULSE
J1 02PR	R	TEST	2S	200A	240V	3WD 1P	PULSE
J1 02PT	O	TEST	2S	200A	240V	3WD 1P	PULSE
J1 02R	R	TEST	2S	200A	240V	3WD 1P	
J1 02T	O	TEST	2S	200A	240V	3WD 1P	
J1 04		FORM	4S	20A	240V	3WD 1P	
J1 04D		FORM	4S	20A	240V	3WD 1P	DEMAND
J1 04DI	I	TEST	4S	20A	240V	3WD 1P	DEMAND
J1 04DR	R	TEST	4S	20A	240V	3WD 1P	DEMAND
J1 04DT	O	TEST	4S	20A	240V	3WD 1P	DEMAND
J1 04I	I	TEST	4S	20A	240V	3WD 1P	
J1 04P		FORM	4S	20A	240V	3WD 1P	PULSE
J1 04PI	I	TEST	4S	20A	240V	3WD 1P	PULSE
J1 04PR	R	TEST	4S	20A	240V	3WD 1P	PULSE
J1 04PT	O	TEST	4S	20A	240V	3WD 1P	PULSE
J1 04R	R	TEST	4S	20A	240V	3WD 1P	
J1 04T	O	TEST	4S	20A	240V	3WD 1P	
J1 05		FORM	5S	20A	120-240-480V		3W 3P
J1 05D		FORM	5S	20A	120-240-480V		DEMAND
J1 05DI	I	TEST	5S	20A	120-240-480V		DEMAND
J1 05DR	R	TEST	5S	20A	120-240-480V		DEMAND
J1 05DT	O	TEST	5S	20A	120-240-480V		DEMAND
J1 05I	I	TEST	5S	20A	120-240-480V		3W 3P
J1 05P		FORM	5S	20A	120-240-480V		PULSE
J1 05PI	I	TEST	5S	20A	120-240-480V		PULSE
J1 05PR	R	TEST	5S	20A	120-240-480V		PULSE
J1 05PT	O	TEST	5S	20A	120-240-480V		PULSE
J1 05R	R	TEST	5S	20A	120-240-480V		3W 3P
J1 05T	O	TEST	5S	20A	120-240-480V		3W 3P
J1 08		FORM	8S	20A	240V	4WD 3P	
J1 08D		FORM	8S	20A	240V	4WD 3P	DEMAND
J1 08DI	I	TEST	8S	20A	240V	4WD 3P	DEMAND
J1 08DR	R	TEST	8S	20A	240V	4WD 3P	DEMAND
J1 08DT	O	TEST	8S	20A	240V	4WD 3P	DEMAND
J1 08I	I	TEST	8S	20A	240V	4WD 3P	
J1 08P		FORM	8S	20A	240V	4WD 3P	PULSE
J1 08PI	I	TEST	8S	20A	240V	4WD 3P	PULSE
J1 08PR	R	TEST	8S	20A	240V	4WD 3P	PULSE
J1 08PT	O	TEST	8S	20A	240V	4WD 3P	PULSE
J1 08R	R	TEST	8S	20A	240V	4WD 3P	
J1 08T	O	TEST	8S	20A	240V	4WD 3P	
J1 09		FORM	9S	20A	120-277V	4WY 3P	
J1 09D		FORM	9S	20A	120-277V	4WY	DEMAND
J1 09DI	I	TEST	9S	20A	120-277V	4WY	DEMAND
J1 09DR	R	TEST	9S	20A	120-277V	4WY	DEMAND
J1 09DT	O	TEST	9S	20A	120-277V	4WY	DEMAND
J1 09I	I	TEST	9S	20A	120-277V	4WY 3P	
J1 09P		FORM	9S	20A	120-277V	4WY	PULSE
J1 09PI	I	TEST	9S	20A	120-277V	4WY	PULSE
J1 09PR	R	TEST	9S	20A	120-277V	4WY	PULSE
J1 09PT	O	TEST	9S	20A	120-277V	4WY	PULSE
J1 09R	R	TEST	9S	20A	120-277V	4WY 3P	
J1 09T	O	TEST	9S	20A	120-277V	4WY 3P	
J1 ON		FORM	12S	200A	120V	3WY NETWORK	
J1 OND		FORM	12S	200A	120V	3WY N	DEMAND
J1 ONDI	I	TEST	12S	200A	120V	3WY N	DEMAND
J1 ONDR	R	TEST	12S	200A	120V	3WY N	DEMAND
J1 ONDT	O	TEST	12S	200A	120V	3WY N	DEMAND
J1 ONI	I	TEST	12S	200A	120V	3WY NETWORK	
J1 ONP		FORM	12S	200A	120V	3WY N	PULSE
J1 ONPI	I	TEST	12S	200A	120V	3WY N	PULSE
J1 ONPR	R	TEST	12S	200A	120V	3WY N	PULSE
J1 ONPT	O	TEST	12S	200A	120V	3WY N	PULSE
J1 ONR	R	TEST	12S	200A	120V	3WY NETWORK	
J1 ONT	O	TEST	12S	200A	120V	3WY NETWORK	
J1 10		FORM	10S	20A	120-277V	4WY	RKVA
J1 10I	I	TEST	10S	20A	120-277V	4WY	RKVA
J1 10R	R	TEST	10S	20A	120-277V	4WY	RKVA
J1 10T	O	TEST	10S	20A	120-277V	4WY	RKVA
J1 12		FORM	12S	200A	240-480V	3WD 3P	
J1 12D		FORM	12S	200A	240-480V	3W	DEMAND
J1 12DI	I	TEST	12S	200A	240-480V	3W	DEMAND
J1 12DR	R	TEST	12S	200A	240-480V	3W	DEMAND
J1 12DT	O	TEST	12S	200A	240-480V	3W	DEMAND
J1 12I	I	TEST	12S	200A	240-480V	3WD 3P	
J1 12P		FORM	12S	200A	240-480V	3WD	PULSE
J1 12PI	I	TEST	12S	200A	240-480V	3WD	PULSE
J1 12PR	R	TEST	12S	200A	240-480V	3WD	PULSE
J1 12PT	O	TEST	12S	200A	240-480V	3WD	PULSE
J1 12R	R	TEST	12S	200A	240-480V	3WD 3P	
J1 12T	O	TEST	12S	200A	240-480V	3WD 3P	
J1 14		FORM	14S	200A	120-277V	4WY 3P	
J1 14D		FORM	14S	200A	120-277V	4WY	DEMAND
J1 14DI	I	TEST	14S	200A	120-277V	4WY	DEMAND
J1 14DR	R	TEST	14S	200A	120-277V	4WY	DEMAND
J1 14DT	O	TEST	14S	200A	120-277V	4WY	DEMAND
J1 14I	I	TEST	14S	200A	120-277V	4WY 3P	
J1 14P		FORM	14S	200A	120-277V	4WY	PULSE
J1 14PI	I	TEST	14S	200A	120-277V	4WY	PULSE
J1 14PR	R	TEST	14S	200A	120-277V	4WY	PULSE
J1 14PT	O	TEST	14S	200A	120-277V	4WY	PULSE
J1 14R	R	TEST	14S	200A	120-277V	4WY 3P	
J1 14T	O	TEST	14S	200A	120-277V	4WY 3P	
J1 15		FORM	15S	200A	240V	4WD 3P	
J1 15D		FORM	15S	200A	240V	4WD 3P	DEMAND
J1 15DI	I	TEST	15S	200A	240V	4WD 3P	DEMAND
J1 15DR	R	TEST	15S	200A	240V	4WD 3P	DEMAND
J1 15DT	O	TEST	15S	200A	240V	4WD 3P	DEMAND
J1 15I	I	TEST	15S	200A	240V	4WD 3P	
J1 15P		FORM	15S	200A	240V	4WD 3P	PULSE
J1 15PI	I	TEST	15S	200A	240V	4WD 3P	PULSE
J1 15PR	R	TEST	15S	200A	240V	4WD 3P	PULSE
J1 15PT	O	TEST	15S	200A	240V	4WD 3P	PULSE
J1 15R	R	TEST	15S	200A	240V	4WD 3P	
J1 15T	O	TEST	15S	200A	240V	4WD 3P	
J1 16		FORM	16S	200A	120V-277V	4WY 3P	
J1 16D		FORM	16S	200A	120-277V	4WY	DEMAND
J1 16DI	I	TEST	16S	200A	120-277V	4WY	DEMAND
J1 16DR	R	TEST	16S	200A	120-277V	4WY	DEMAND
J1 16DT	O	TEST	16S	200A	120-277V	4WY	DEMAND
J1 16I	I	TEST	16S	200A	120-277V	4WY 3P	
J1 16P		FORM	16S	200A	120-277V	4WY	PULSE
J1 16PI	I	TEST	16S	200A	120-277V	4WY	PULSE
J1 16PR	R	TEST	16S	200A	120-277V	4WY	PULSE
J1 16PT	O	TEST	16S	200A	120-277V	4WY	PULSE
J1 16R	R	TEST	16S	200A	120-277V	4WY 3P	
J1 16T	O	TEST	16S	200A	120-277V	4WY 3P	
J1 20		MISCELLANEOUS METER FORM					
J1 21		REACTIVE METERING					
J1 22		MAGNETIC TAPE RECORDER					
J1 23		PRIMARY METERING					
J1 24		CO-GENERATION / INTER-TIE					
J1 25		GRAPHIC CHART RECORDERS					
J1 26		THERMAL DEMAND RECORDERS					
J1 27		RELAYS AND TOTALIZERS					
J1 41		SINGLE PHASE TEST JACK					
J1 42		POLYPHASE TEST JACK					
J1 43		REMOTE TEST JACK					
J1 45		SECURITY DEVICES & PROCEDURES					
J1 50		OTHER DEPARTMENT VISITS					
J1 AP		POLYPHASE ABASE METER					
J1 AS		SINGLE PHASE ABASE METER					
J1 DC		DIRECT CURRENT METER					

J2	FIELD INSTALLATIONS AND REMOVALS
J2 01	FORM 1S 100A 120V 2W 1P
J2 02	FORM 2S 200A 240V 3WD 1P
J2 04	FORM 4S 20A 240V 3WD 1P
J2 05	FORM 5S 20A 120-240-480V 3W 3P
J2 08	FORM 8S 20A 240V 4WD 3P
J2 09	FORM 9S 20A 120-277V 4WY 3P
J2 ON	FORM 12S 200A 120V 3WY NETWORK
J2 10	FORM 10S 20A 120-277V 4WY 3P RKVA
J2 12	FORM 12S 200A 240-480V 3WD 3P
J2 14	FORM 14S 200A 120-277V 4WY 3P
J2 15	FORM 15S 200A 240V 4WD 3P
J2 16	FORM 16S 200A 120-277V 4WY 3P
J2 20	MISCELLANEOUS METER FORM
J2 21	REACTIVE METERING
J2 22	MAGNETIC TAPE RECORDER
J2 23	PRIMARY METERING
J2 24	CO-GENERATION / INTER-TIE
J2 25	GRAPHIC CHART RECORDERS
J2 26	THERMAL DEMAND RECORDERS
J2 27	RELAYS AND TOTALIZERS
J2 30	PROTECTIVE DEVICES - STAB / CAP
J2 31	METERING & SERVICE REQUIREMENTS
J2 32	COMPANY STANDARDS & REQUIREMENTS
J2 33	CIRCUIT DRAWINGS AND DIAGRAMS
J2 AP	POLYPHASE ABASE METER
J2 AS	SINGLE PHASE ABASE METER
J2 DC	DIRECT CURRENT METER
J3	SHOP OPERATIONS AND PRACTICES
J3 1	IDENTIFY/PROCESS METERS & EQUIPMENT
J3 2	ORDER METERS & EQUIPMENT
J3 3	ADJUST/REPAIR METER COMPONENTS
J3 4	WIRING UP A STANDARD TEST SET
J3 5	MAKING UP FUSED JUMPERS AND LEADS
J3 6	RECORDER REPAIR
J4	CUSTOMER CONTACT AND SERVICE WORK
J4 1	HIGH BILL INVESTIGATION
J4 2	TURN-ON/SHUT-OFF, CHANGE PARTY, ETC
J4 3	PROVE-UPS / TRACE-OUTS
J4 4	ENERGY DIVERSION INVESTIGATION
J4 5	VISIT CUSTOMER SERVICE DEPARTMENTS
J5	READING AND SERVICING RECORDERS
J5 1	PREPARING RECORDER READING ROUTES
J5 2	READING/SERVICING TAPE ROUTES
J5 3	READING/SERVICING LPR'S
J5 4	LEARNING SERVICE ROUTES
J5 5	TROUBLE-SHOOTING RECORDER PROBLEMS
J6	TIME-OF-USE / SOLID-STATE METERING
J6 1	THEORY AND OPERATION OF TOU METERS
J6 2	ASSEMBLE & DISASSEMBLE TOU METERS
J6 3	TEST, MAINTAIN, TROUBLESHOOT TOU
J6 4	PROGRAMERS & PROGRAMING
J6 5	TOU / SOLID-STATE RECORDERS
J7	ELECTRICAL INSTRUMENTS AND TOOLS
J7 1	PROCESS/HANDLE INSTRUMENTS & TOOLS
J7 2	USING A PHASE ANGLE METER
J7 3	USING A PHASE ROTATION METER
J7 4	USING CURRENT BURDEN TESTER
J7 5	USING VOLTOHM METER
J7 6	USING AMMETER
J7 7	TEST-CALIBRATE-INVENTORY TOOLS&INST
J8	FIRST AID AND SAFETY PROCEDURES
J8 1	SAFETY MEETING
J8 2	FIRST AID MEETING
J8 3	REPORTING INJURIES & ACCIDENTS
J8 4	CARDIO-PULMONARY RESUSCITATION
J8 5	GENERAL USE OF SAFETY EQUIPMENT
J8 6	277V/480V SAFETY PROCEDURES & EQUIP
J8 7	PRIMARY SWITCHBOARD & SUBSTATIONS

M1	ACADEMIC TRAINING - MODULE #1
M1 X0103	FRACTIONS AND DECIMALS
M1 X0104	SI METRIC
M1 X0110	FORMULAS
M1 X0111	EQUATIONS
M1 X0301	PERSONAL SAFETY (PART 1)
M1 X0302	PERSONAL SAFETY (PART 2)
M1 X0303	SAFE USE OF HAND TOOLS
M2	ACADEMIC TRAINING - MODULE #2
M2 A0101	NATURE OF ELECTRICITY
M2 A0103	ELECTRICAL CELLS AND BATTERIES
M2 A0104	ELECTRICAL COMPONENTS AND OHM'S LAW
M2 A0105	BASIC CIRCUIT ARRANGEMENTS
M2 A0107	MAGNETISM AND ELECTROMAGNETISM
M2 A0201	ALTERNATING CURRENT
M2 A0203	TRANSFORMERS
M2 A0204	INDUCTORS AND CAPACITORS
M2 A0205	AC CIRCUITS
M2 A0206	RECTIFICATION & ELECTRONIC DEVICES
M2 A0207	ELECTRIC ENERGY CIRCUITS
M2 A0208	TYPES OF ELECTRIC CIRCUITS
M3	ACADEMIC TRAINING - MODULE #3
M3 4019A	ELECTRIC POWER MEASUREMENTS PART 1
M3 A0301	CHECKING SIMPLE CIRCUITS
M3 A0302	TROUBLESHOOTING WITH BASIC METERS
M3 A0303	HOW A VOLTMETER WORKS
M3 A0304	HOW AN AMMETER WORKS
M3 A0305	AC MEASURING INSTRUMENTS
M4	ACADEMIC TRAINING - MODULE #4
M4 X0201	ALGEGRA: MONONOMIALS & POLYNOMIALS
M4 X0202	ALGEGRA: FACTORING
M4 X0203	ALGEGRA: ADD/SUBTRACTING FRACTIONS
M4 X0204	ALGEGRA: MULTIPLY/DIVIDE FRACTIONS
M5	ACADEMIC TRAINING - MODULE #5
M5 4019B	POWER MEASUREMENTS PART 2
M5 A0404	CONDUCTOR PROPERTIES & INSTALLATION
M5 A0405	CONDUIT CHARACTERISTIC/INSTALLATION
M5 A0406	ELECTRICAL FITTINGS & CONDUIT BENDS
M5 X0211	APPLIED GEOMETRY
M5 X0212	PRACTICAL TRIGONOMETRY
M5 X0231	TRIGONOMETRIC TABLES
M6	ACADEMIC TRAINING - MODULE #6
M6 B0301	R C & I COMPONENTS
M6 B0302	BASIC SEMICONDUCTOR COMPONENTS
M6 B0303	SEMICONDUCTOR SWITCHING DEVICES
M6 B0304	SEMICONDUCTOR SWITCHING DEVICES
M6 B0305	RECTIFIERS AND ELECTRON TUBES
M6 B0306	SWITCHING AND CONNECTING DEVICES
M7	ACADEMIC TRAINING - MODULE #7
M7 B0405	SWITCHING CIRCUITS
M7 B0406	LOGIC CIRCUITS
M7 B0407	GATING AND COUNTING CIRCUITS
M7 B0408	PULSE AND DIGITAL CIRCUITS
M8	ACADEMIC TRAINING - MODULE #8
M8 5177	NATIONAL ELECTIRIC CODE
M8 6793	INSTRUMENT TRANSFORMERS
SA	ADVANCED METERING SCHOOL
SB	BASIC ELECTRICITY SCHOOL
XX	MISCELLANEOUS
XX 1	MISCELLANEOUS 1
XX 2	MISCELLANEOUS 2
-0-	----------