

**RURAL ELECTRIFICATION PROJECTS**

**INDONESIA**



**NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION**

**JAKARTA, INDONESIA**

NRECA TEAM REPORT

PLN

INDONESIA

(FEBRUARY 1982)

M O N T H L Y R E P O R T

NRECA INDONESIAN TEAM REPORT

UNITED STATES AGENCY FOR  
INTERNATIONAL DEVELOPMENT

Contract No. AID/ASIA C1347

Loan No. 497-T-052

IMPLEMENTING AGENCIES:

DIREKTORAT JENDERAL KOPERASI  
Directorate General of Cooperatives

PERUSAHAAN UMUM LISTRIK NEGARA  
National Electric Power Agency

CONSULTANTS:

National Rural Electric Cooperative Association  
Management, Organization and Training

C.T. Main International, Inc.  
Architect and Engineering

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NRECA TEAM MEMBERS AS OF SEPTEMBER, 1981

| <u>NAME</u>   | <u>TITLE</u>                      | <u>ADDRESS</u>   |
|---------------|-----------------------------------|--|
| Peter McNeill | Team Leader                       | Pondok Indah<br>Bukit Hijau VIII/31<br>PH: 761132                              |
| Louie Sansing | Sr. RE Specialist                 | Ratu Plaza<br>Apartment #1103<br>Jl. Jenderal Sudirman<br>PH: 712209 ext. 2020 |
| *Sam Adkins   | Sr. RE Specialist                 | c/o C.T. Main Inc.<br>Box 26<br>Semarang<br>PH: 024-311832                     |
| Paul Swanson  | Sr. RE Specialist                 | Kotak Pos 43<br>Ampenan, Lombok<br>PH: 0364-23517                              |
| John DeFoor   | RE Specialist                     | c/o Bina Marga Office<br>Jl. Imam Bonjol 8<br>Palopo, S. Sulawesi              |
| Ray Shoff     | Administrative/Finance<br>Officer | Ratu Plaza<br>Apartment #1002<br>Jl. Jenderal Sudirman<br>PH: 712209 ext. 2015 |
| Claude Franke | RE Specialist                     | P.O. Box 88<br>Tanjungkarang<br>Lampung<br>PH: 0721-53701                      |

\* PLN Advisor

I. DESCRIPTION AND OBJECTIVES OF PROJECT (PLN)

The Government of Indonesia is vitally interested in the electrification of rural Indonesia, and has taken steps with the assistance of the United States Government (USAID) to implement pilot rural electrification programs. Fewer than 1% of the rural people in Indonesia presently enjoy the benefits of electric service. Rural electrification is essential in developing the wealth of forest and agricultural land, minerals, and water resources. The "area coverage" concept of electrification will bring better living conditions to millions of rural residents and will spread benefits to all of Indonesia.

Ten Pilot Rural Electrification Project areas have been selected. Seven of the projects are in Central Java and are to be constructed and developed by the state owned national power company (PLN) who will own and operate these systems. The source of power for these systems will be the existing PLN transmission grid in Central Java.

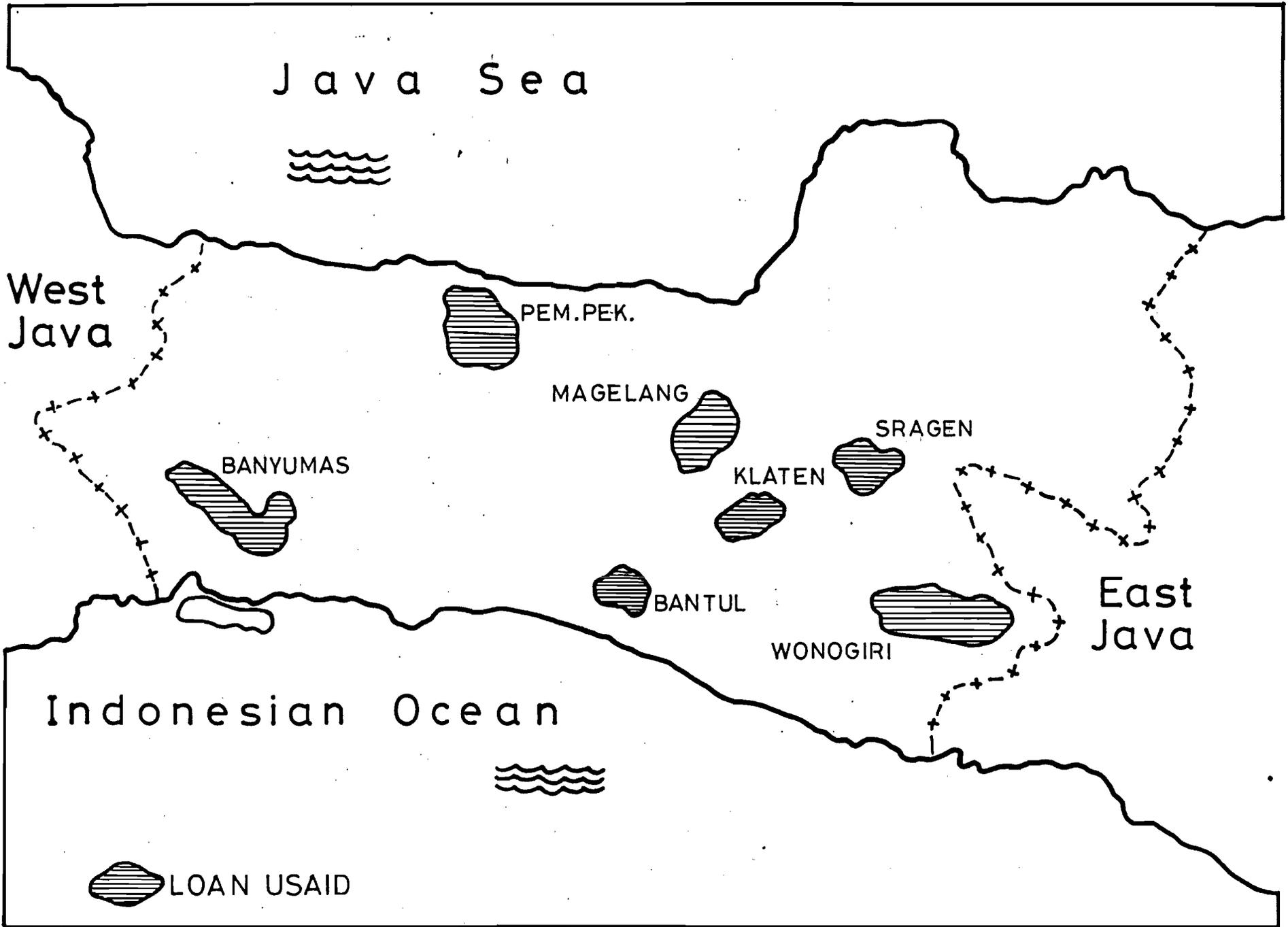
The National Rural Electric Cooperative Association through their International Programs Division is serving as consultant to PLN in organization, management and technical areas. Services for PLN includes providing assistance in organization of staffs to operate the systems in Central Java, as well as in cost accounting, O&M methods, housewiring and training.

-----  
SEVEN PLN PROJECTS

| <u>SERVICE AREA</u> | <u>VILLAGES TO BE SERVED</u> | <u>APPROXIMATE NO. OF CONNECTIONS</u> | <u>ESTIMATED NO. OF RECEIPIENTS</u> |
|---------------------|------------------------------|---------------------------------------|-------------------------------------|
| Klaten              | 95                           | 25,000                                | 225,000                             |
| Pem/Pek             | 103                          | 20,000                                | 180,000                             |
| Bantul              | 21                           | 20,000                                | 180,000                             |
| Wonogiri            | 54                           | 15,000                                | 135,000                             |
| Sragen              | 49                           | 15,000                                | 135,000                             |
| Magelang            | 83                           | 20,000                                | 180,000                             |
| Banyumas            | 35                           | 15,000                                | 135,000                             |
| TOTALS              | 440                          | 130,000                               | 1,170,000                           |

The above tabulations are estimates for the end of the third year of commercial operation.

# CENTRAL JAVA



## NRECA Jakarta Activities

General --- The NRECA team leader and the NRECA administrative-finance officer maintained contact with PLN Rural Electrification Department officials in the PLN-RE Jakarta office. Major subjects for discussion included; the new tarif that will apply to R.E. customers in Central Java; training course schedules and course contents; and construction progress at the R.E. sites in Central Java.

--- Meetings were held with USAID-PTE officials on the subject of small-hydro and USAID's assistance in pre-feasibility studies.

--- The NRECA team leader assisted Dr. Anton Soedjarwo, the Director of Yayasan Dian Desa (model villages) in travel-plans to attend a USAID/NRECA sponsored conference. This conference on the subject of small-hydro begins March 1st, 1982, in Abidjan, on the Ivory Coast of West Africa.

## NRECA Central Java Activities

### A. General

Activities in Rural Electrification in Central Java this month centered on "Crash Program 37". This program, electrifying approximately six thousand five hundred (6,500) households in thirty-seven (37) desa, involves construction of primary and secondary distribution lines by P.I. Ring, PLN's construction branch in Central Java. (Pictures on pages 11 and 12.)

Wilayah XIII, the operating branch of PLN in Central Java, is preparing to process applications for service and to install service lines and housewiring. Customers in the 37 desa, part of the total of 441 desa in the PLN/USAID R.E. program, may avail of a "connection package" which includes financing connection-charges and housewiring costs over an extended period.

--- Construction of Headquarters facilities at each of the seven R.E. projects in Central Java continued at a rapid pace this month. Facilities include an Administrative Building, Warehouse plus open-storage areas, and are being constructed at a location near the center of each project area. (Pictures on page 12.)

It is expected that the Headquarters facilities at three or four sites will be completed by April 1982. This may coincide with completion of customer-connections in "Crash Program 37".

B. Organization/Management

--- The NRECA project advisor in Central Java continued to assist Wilayah XIII personnel in planning for the period when the seven R.E. systems will be in operation. The advisor, and his assigned PLN-counterpart, worked with the material-logistics section of PLN in Semarang establishing an identification-numbering-system for major components of the distribution system (transformers, oil circuit reclosures, etc.).

These equipment items, which are being procured through the USAID Loan, will be identified by control number, and pole location, and this information will be reflected on permanent record cards in Wilayah XIII offices.

--- Other activities for the NRECA advisor included a visitation to the Klaten R.E. demonstration project. At this location, a briefing was conducted for officials of USAID Washington and USAID Jakarta.

The PLN counterpart and the NRECA advisor inspected the concrete-pole fabricating plant at Boyolali, Central Java. Spun concrete-poles from this location are being distributed and installed in the R.E. project areas.

### C. Training

--- During this month, the contents of training course number XI, "Meter Reading", was completed and teaching suggestions outlined. Training course materials were forwarded to the chief of training, PLN-Jakarta. Training schedules indicate that the course will be conducted in mid-1982.

--- Upon request from officials of P.I. Ring, the NRECA advisor began preparations for a refresher course on the subjects of "Construction Supervision & Training Skills". This course, originally presented in Central Java in November of 1980, will be repeated since some of the thirty-six (36) participants in the first course have been reassigned to new positions. Their replacements will be the participants in the repeat course.

--- Other training activities related to preparations for training course XVII, "Operations & Maintenance of R.E. Systems". The NRECA advisor began preparing course content for this course, which will be scheduled soon.

### D. Klaten R.E. Demonstration Project

--- The PLN R.E. demonstration project, located adjacent to the city of Klaten in Central Java, was serving one thousand nine hundred ninety-two (1992) customers at the end of February. Average kwh consumption reached 45 kwh/customer in that month.

On the statistical-report, page 9 of this report, it can be noted that the average energy bill in February was Rp 2,426. This computes at slightly less than Rp 54 per kwh consumed, up somewhat from January due to the revised PLN tarif that applied country-wide beginning in February.

--- NRECA and Wilayah XIII officials continued to monitor kwh input and kwh use in the demonstration project area. On page 10, it may be noted that the average system losses for 1982 computed at 15%, slightly above the expected level. Investigation is in process to determine accuracy of metering instruments, and to explore other possibilities of computation errors.

E. Meetings & Trips (NRECA advisor in Central Java)

- Feb. 5 Semarang : Informal meeting with PLN Productive-use Counterpart - discussed status of Productive-use Program in Klaten.
- Feb. 6 Semarang : Meeting at office of C.T. Main, Inc. with C.T. Main business manager and chief of material logistics, P.I. Ring - discussed status of material received for R.E. Projects.
- Feb. 8 Semarang : Meeting with chief of R.E.-PLN Wilayah XIII - discussed visit to spun concrete-pole plant at Boyolali, Central Java.
- Feb. 10 & 11 : Field trip to Boyolali to visit concrete-pole plant. Proceeded to Klaten to meet with officials from USAID/Washington, USAID/Jakarta, and PLN Productive-use Consultant. Reviewed the PLN-R.E. Demonstration Project statistics.
- Feb. 16 Semarang : Meeting with PLN management trainees. Reviewed feasibility study method of obtaining peak-loading.

- Feb. 18 Semarang : Meeting at PLN-P.I. Ring with chief of construction. Discussed request for NRECA assistance with repeat of training course "Construction Supervision and Training Skills".
- Feb. 24 Semarang : Meeting at PLN-P.I. Ring with NRECA Counterpart and assistant to chief of construction for PLN-P.I. Ring. Discussed recording of distribution transformer data. Also met with chief of material logistics section to discuss identification of distribution transformers.
- Feb. 25 Semarang : Meeting at PLN Wilayah XIII with NRECA Counterpart and chief of computer billing. Discussed electrical losses at PLN-R.E. Demonstration Project at Klaten.

KLATEN RE DEMONSTRATION UNIT

BILLING STATISTICS 13 MONTH PERIOD

| COLUMN NUMBER |        |      |    |           |      |      |      |    |    |
|---------------|--------|------|----|-----------|------|------|------|----|----|
| 1             | 2      | 3    | 4  | 5         | 6    | 7    | 8    | 9  | 10 |
| FEB. 1981     | 61,127 | 1927 | 34 | 5,424,930 | 2815 | 1624 | 1189 | 48 | 85 |
| MARCH         | 77,843 | 1932 | 40 | 5,753,450 | 2978 | 1816 | 1162 | 45 | 74 |
| APRIL         | 67,780 | 1932 | 35 | 5,411,925 | 2810 | 1655 | 1147 | 47 | 80 |
| MAY           | 77,873 | 1946 | 40 | 5,753,855 | 2856 | 1808 | 1148 | 45 | 74 |
| JUNE          | 75,153 | 1950 | 39 | 5,652,455 | 2899 | 1770 | 1129 | 45 | 75 |
| JULY          | 81,678 | 1955 | 42 | 5,825,330 | 2980 | 1864 | 1116 | 44 | 71 |
| AUGUST        | 76,004 | 1960 | 39 | 5,712,755 | 2915 | 1781 | 1134 | 46 | 69 |
| SEPTEMBER     | 86,202 | 1960 | 43 | 5,932,410 | 3027 | 1919 | 1108 | 45 | 69 |
| OCTOBER       | 83,335 | 1964 | 42 | 5,806,480 | 2956 | 1880 | 1076 | 45 | 70 |
| NOVEMBER      | 84,129 | 1972 | 43 | 5,820,160 | 2952 | 1886 | 1066 | 44 | 69 |
| DECEMBER      | 81,762 | 1982 | 41 | 5,711,000 | 2912 | 1854 | 1058 | 45 | 70 |
| JAN. 1982     | 83,545 | 1990 | 42 | 5,820,840 | 2925 | 1867 | 1058 | 44 | 70 |
| FEB. 1982     | 89,447 | 1992 | 45 | 6,902,740 | 3465 | 2426 | 1040 | 54 | 77 |

COLUMN NUMBER

1. MONTH

2. TOTAL KWH BILLED

3. TOTAL CUSTOMERS BILLED

4. AVERAGE KWH PER CUSTOMER

5. TOTAL RUPIAH BILLED

6. AVERAGE RUPIAH PER CUSTOMER (TOTAL)

7. AVERAGE ENERGY CHARGE PER CUSTOMER

8. INSTALLATION & HOUSEWIRING CHARGE

9. COST PER KWH (RUPIAH) ENERGY ONLY

10. COST PER KWH (RUPIAH) TOTAL



Construction Activities

R.E. Projects

Central Java



A trailer for conductor-stringing, which contain four reels of pulling ropes, in use at the Klaten R.E. Project.



Mr. Butar Butar, the counterpart of the NRECA advisor in Central Java, inspecting stringing operation using single-reel trailers, Klaten R.E. Project.

Construction Activities

R.E. Projects

Central Java



Lineman installing a guy-wire on a pole in a three-phase circuit, Klaten R.E. Project.



Administration Building, Klaten R.E. Project, Headquarters site.

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**PLN-CENTRAL JAVA RURAL ELECTRIFICATION PROGRAM  
 TRAINING COURSE SCHEDULE**

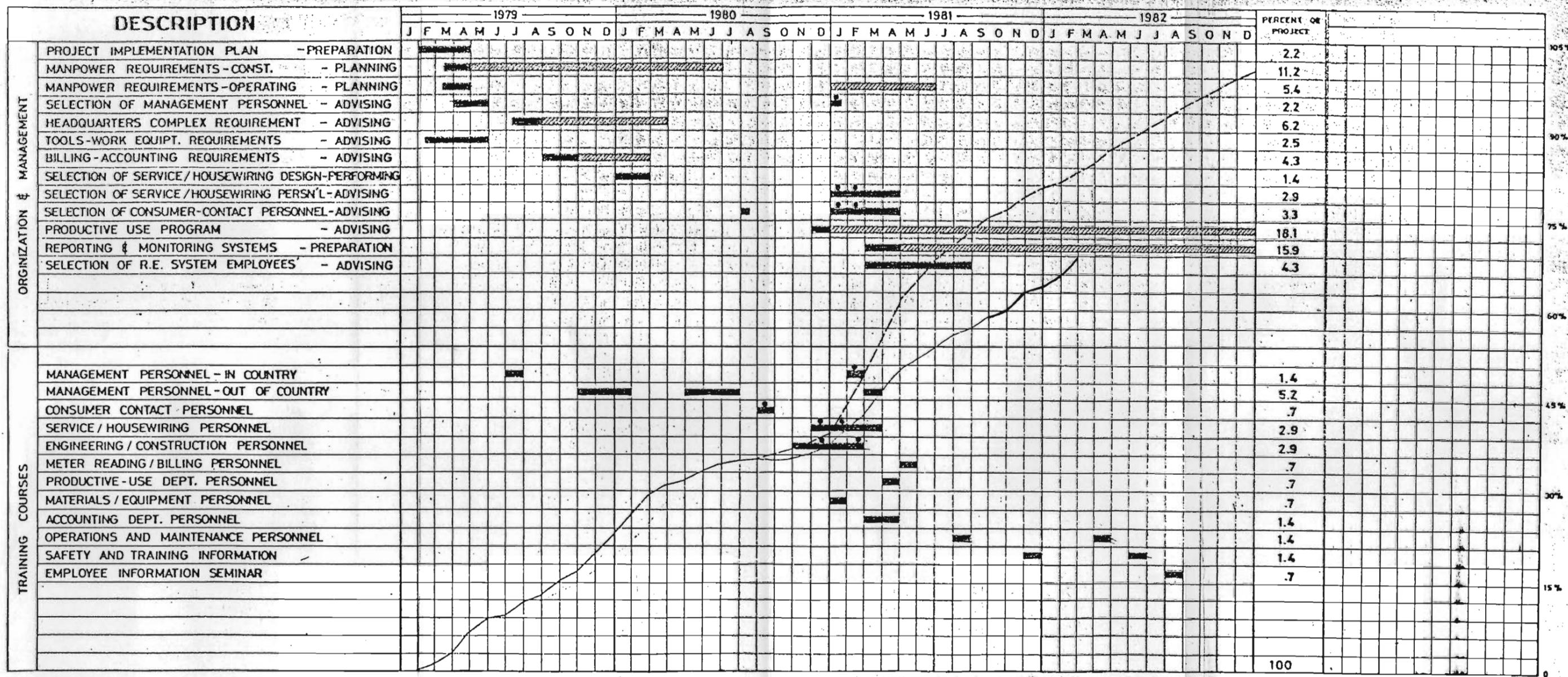
| COURSE | TITLE                         | 1979 |                 |                 | 1980            |                 |                 | 1981            |                 |   | 1982 |    |    | 1983 |    |    |
|--------|-------------------------------|------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|---|------|----|----|------|----|----|
|        |                               | 1    | 2               | 3               | 4               | 5               | 6               | 7               | 8               | 9 | 10   | 11 | 12 | 13   | 14 | 15 |
|        | LANGUAGE TR.-MANAGEMENT       |      | ■ <sup>25</sup> | ■ <sup>10</sup> | ■ <sup>11</sup> |                 |                 |                 |                 |   |      |    |    |      |    |    |
|        | OUT-OF-COUNTRY TRAINING       |      |                 |                 | ■ <sup>12</sup> | ■ <sup>13</sup> |                 |                 |                 |   | ▨    |    |    |      |    |    |
| I      | INTRODUCTION SUPERVISION      |      | ■ <sup>25</sup> |                 |                 |                 |                 |                 |                 |   |      |    |    |      |    |    |
| II     | ORIENTATION-CUSTOMER CONTACT  |      |                 |                 |                 |                 |                 |                 |                 |   | ▨    |    |    |      |    |    |
| III    | CONSTRUCTION SUPERVISION      |      |                 |                 |                 |                 | ■ <sup>36</sup> |                 |                 |   |      |    |    |      |    |    |
| IV     | TRAINERS TRAINING-HOUSEWIRING |      |                 |                 |                 |                 |                 |                 | ■ <sup>17</sup> |   |      |    |    |      |    |    |
| V      | DISTRIBUTION PLAN-DESIGN      |      |                 |                 |                 |                 |                 |                 |                 |   |      | ▨  |    |      |    |    |
| VI     | APPRENTICE LINEMAN            |      |                 |                 |                 |                 |                 |                 | ■ <sup>31</sup> |   |      |    |    |      |    |    |
| VII    | HOUSEWIRING                   |      |                 |                 |                 |                 |                 |                 |                 |   | ▨    |    |    |      |    |    |
| VIII   | MATERIAL LOGISTICS            |      |                 |                 |                 |                 |                 | ■ <sup>31</sup> |                 |   |      |    |    |      |    |    |
| IX     | ACCNT. REPORTING-CONST.       |      |                 |                 |                 |                 |                 |                 | ■ <sup>25</sup> |   |      |    |    |      |    |    |
| X      | ELECTRIC APPARATUS            |      |                 |                 |                 |                 |                 |                 |                 |   | ▨    |    |    |      |    |    |
| XI     | METER READING                 |      |                 |                 |                 |                 |                 |                 |                 |   | ▨    |    |    |      |    |    |
| XII    | PRODUCTIVE USE-OJT            |      |                 |                 |                 |                 |                 |                 |                 | ▨ | ▨    | ▨  | ▨  | ▨    | ▨  | ▨  |
| XIII   | ENGINEERING DIST. SYSTEM      |      |                 |                 |                 |                 |                 |                 |                 |   |      | ▨  |    |      |    |    |
| XIV    | MATERIAL WAREHOUSE            |      |                 |                 |                 |                 |                 | ■ <sup>31</sup> |                 |   |      |    |    |      |    |    |
| XV     | ACCNT. REPORTING-OPERATIONS   |      |                 |                 |                 |                 |                 |                 | ■ <sup>25</sup> |   |      |    |    |      |    |    |
| XVI    | SECTIONALIZING-PROTECTION     |      |                 |                 |                 |                 |                 |                 |                 |   |      | ▨  |    |      |    |    |
| XVII   | OPERATIONS-MAINTENANCE        |      |                 |                 |                 |                 |                 |                 |                 |   |      | ▨  |    |      |    |    |
| XVIII  | SUPERVISION                   |      |                 |                 |                 |                 |                 |                 |                 |   |      |    | ▨  |      |    |    |
| XIX    | SAFETY                        |      |                 |                 |                 |                 |                 |                 |                 |   |      |    |    |      | ▨  |    |
| XX     | EMPLOYEE INFO. SEMINAR        |      |                 |                 |                 |                 |                 |                 |                 |   |      |    |    |      |    | ▨  |
| XXI    | COMM. SYSTEMS OPERATIONS      |      |                 |                 |                 |                 |                 |                 |                 |   |      |    |    |      |    | ▨  |
| XXII   | LINE MAINT. TECHNIQUES        |      |                 |                 |                 |                 |                 |                 |                 |   |      |    |    |      |    | ▨  |

COURSES COMPLETED — ■  
 COURSES SCHEDULED — ▨

PARTICIPANTS — ■<sup>25</sup>

INDICATES PERIOD OF PERFORMANCE  
 INDICATES PERIOD OF EVALUATION

### ORGINIZATION MANAGEMENT TRAINING PROGRESS SCHEDULE RURAL ELECTRIFICATION-I-PLN.



LEGEND:  WORK SCHEDULED - 69%  
 WORK COMPLETED - 83%

Summary of Expenditures

National Rural Electrification Cooperative Association  
1800 Massachusetts Ave., N.W.  
Washington, D.C. 20036

AID/ASIA - C 1347  
Date: December 1981  
Period of contract: 8/25/78 - 8/25/82

|                           | Budget       | Total Expense To Date | Prior Billings | Current Billings |
|---------------------------|--------------|-----------------------|----------------|------------------|
| Salaries - Field          | \$ 1,095,000 | \$ 793,036.00         | \$ 769,154.26  | \$ 23,881.74     |
| Salaries - Home           | 187,000      | 126,599.90            | 121,474.59     | 5,125.31         |
| Fringe Benefits           | 415,000      | 298,532.68            | 291,678.00     | 6,854.68         |
| Consultant Fees           | 34,706       | 33,906.25             | 33,906.25      | -                |
| Allowances                | 398,000      | 277,369.91            | 271,634.58     | 5,735.33         |
| Travel and Transportation | 386,470      | 271,089.01            | 267,850.30     | 3,238.71         |
| Other Direct Costs        | 140,000      | 83,654.73             | 82,131.85      | 1,522.88         |
| Overhead                  | 292,000      | 210,705.31            | 204,033.68     | 6,671.63         |
| Equipment and Materials   | 28,000       | 17,952.23             | 18,292.46      | (340.23)         |
| TOTAL                     | \$ 2,977,176 | \$2,112,846.02        | \$2,060,155.97 | \$ 52,690.05     |

PERSON-MONTHS BY POSITION, NRECA CONSULTANT TEAM

(Contract as amended September 11, 1981)

| POSITION               | PRESENTLY FILLED BY | CONTRACT<br>PERSON-MONTHS | EXPENDED<br>THIS PERIOD | EXPENDED<br>THROUGH FEB. |       | PERCENT<br>OF<br>CONTRACT |
|------------------------|---------------------|---------------------------|-------------------------|--------------------------|-------|---------------------------|
|                        |                     |                           |                         | PLN                      | PDO   |                           |
| Team Leader            | Peter McNeill       | 54                        | 1                       | 8                        | 33    | 76                        |
| Training Officer       | Louie Sansing       | 45                        | 1                       | 7                        | 30    | 82                        |
| Administrative Officer | Ray Shoff           | 33                        | 1                       | 4                        | 24    | 85                        |
| PLN Advisor            | Sam Adkins          | 42                        | 1                       | 35.5                     | .5    | 86                        |
| Lampung Advisor        | Claude Franke       | 54                        | 1                       | .5                       | 40.5  | 76                        |
| Lombok Advisor         | Paul Swanson        | 50                        | 1                       | 0                        | 37    | 74                        |
| Luwu Advisor           | John DeFoor         | 49                        | 1                       | 0                        | 36    | 73                        |
| Short-term Advisors    |                     |                           | 0                       | 14                       | 3     | 89                        |
| Consultants            |                     | 8                         | 0                       | 7.5                      | .5    | 100                       |
|                        |                     | 354                       | 7                       | 76.5                     | 204.5 | 79                        |