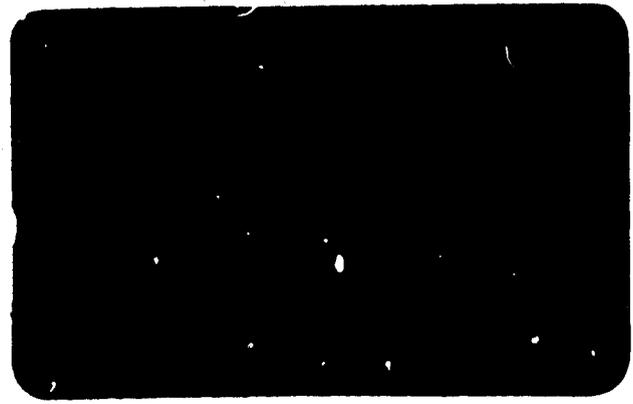


PD-444-358
ISBN 12984

4970267/53

Library

**RURAL ELECTRIFICATION PROJECTS
INDONESIA**



**NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION
JAKARTA, INDONESIA**

NRECA TEAM REPORT
FLN
INDONESIA
(MARCH & APRIL 1982)

TABLE OF CONTENTS

NRECA Team Members	page 1
Description and Objectives of Project	2
Map of Central Java	3
NRECA Jakarta Activities	4
PLN/NRECA Central Java Activities	5 - 10
Klaten RE Demonstration Unit, Billing Statistics	11
Klaten RE Demonstration Project, Customer Usage Comparison .	12
Pictures	13 - 14
PLN-Central Java Rural Electrification Program,	
Training Course Schedule	15
Organization Management Training Progress Schedule	16
PLN Implementation Plan	17
Summary of Expenditures	18
Person-months by Position	19

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

NRECA TEAM MEMBERS AS OF SEPTEMBER, 1981

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

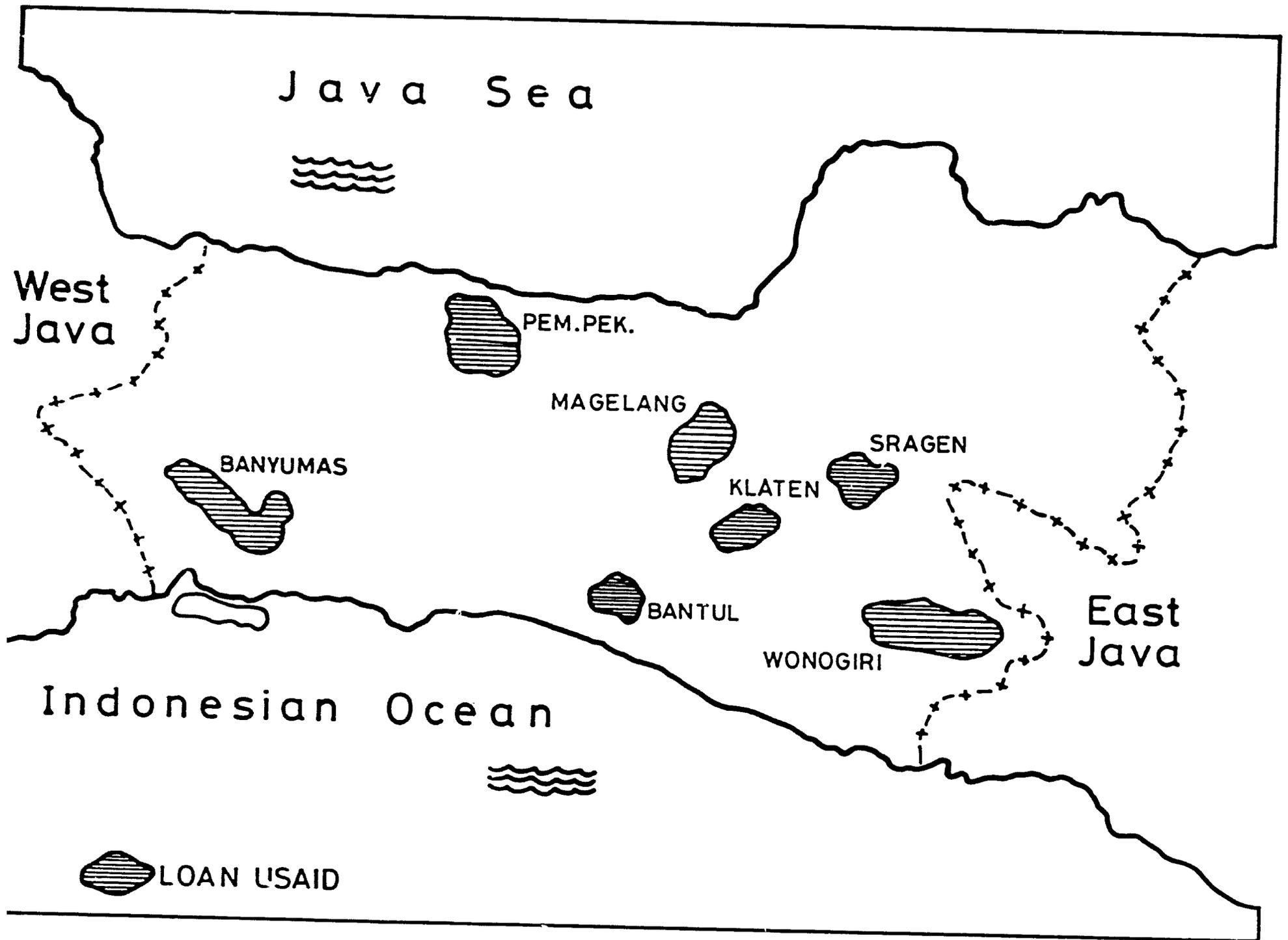
The National Rural Electric Cooperative Association through their International Programs Division is serving as consultant to PLN in organization, management and technical areas. Services for PLN includes providing assistance in organization of staffs to operate the systems in Central Java, as well as 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 Team Activities

--- Contact was maintained with PLN RE staff members in their Jakarta office. Subjects for discussion included; planning for additional training on feasibility-study preparation/analysis; review of in-country training plans; and discussions on NRECA consultants role in Central Java, 1982-83 period.

--- The NRECA team held their bi-monthly team meeting in Jakarta this period. The NRECA advisor to PLN-Central Java was in attendance and reported on RE progress in that area.

--- NRECA staff attended a coordination meeting held at Semarang in April. This meeting was the ninth of a series of meetings held for RE coordination. Participants included representatives of USAID, C.T. Main, and PLN.

--- The NRECA administrative/finance officer and the NRECA advisor to PLN met with PLN-RE officials in Semarang in April. This one-day session was held for the purpose of reviewing construction progress and training plans. Training course schedules were adjusted to construction time-frame.

--- Ir. Pasaribu, Chief of the Technical Branch, PLN-RE Division, and the NRECA team leader traveled to Central Java the week of March 13th. They participated in PLN's "LISTRIK MASUK DESA" (electricity enters the village) ceremony held near Bantul. Also, an inspection tour was conducted at the Headquarters site for the Bantul project, the first Headquarters facilities to be completed in the USAID-PLN funded construction program.

The Project Development Office for RE, Director General of Cooperatives, requested assistance from PLN in training power plant personnel. NRECA provided assistance and accompanied PDO-RE representatives on a trip to Ciawi to assess PLN's training facilities.

PLN/NRECA Central Java Activities

--- The NRECA advisor to PLN in Central Java continued his assignment throughout this two-month reporting period. His office is located with Wilayah XIII RE staff in Semarang.

--- As included in previous NRECA reports, PLN appointed a management trainee, Mr. Butar Butar, to serve as a counterpart to the NRECA advisor in Central Java. Mr. Butar Butar is providing valuable assistance in advisory functions of NRECA and his responsibilities are increasing as the RE construction program progresses.

--- During the month of March, PLN-Central Java completed construction in their CRASH PROGRAM and energized distribution lines. This program, initiated by PLN in 1981 using construction materials available in their own stock, expanded electric service to approximately six thousand five hundred (6,500) customers in thirty-seven (37) of the four hundred and forty-one (441) desa in the PLN/USAID RE-program area.

--- Three energization ceremonies were conducted; in desa Argomulyo, Yogyakarta RE project area; desa Jatinom in the Klaten RE project area; and in desa Comal, Pekalongan RE project area.

--- Plans were formulated for use of the newly constructed Headquarters facilities (at each of the seven RE sites) to store construction and housewiring materials. These facilities, which will serve as construction control centers, will be manned by personnel from both P.I. Ring (PLN Construction Division) and by Wilayah XIII (PLN Operations Division) during construction period.

Approximately 25% of the total housewiring material-order has been received in Central Java and is presently stored in P.I. Ring's Semarang warehouse. It is expected that transfer of materials to Wilayah XIII, and use of all Headquarters facilities, will be accomplished by June 30th, 1982.

A. Training

--- Coordination continued between PLN-RE personnel and NRECA on training requirements, training course contents and schedules. At coordinating sessions, new courses were formulated and decisions reached on repeat courses.

The training course titled "Construction Supervision and Training Skills", previously held in 1980, will be repeated in June 1982. This is deemed necessary due to transfer and promotion of some PLN supervisors who attended the first course.

Three training courses included in PLN's implementation plan will be combined in one course titled "Distribution System Design and Engineering". NRECA and PLN staff completed the preparation of course contents consisting of seventeen subjects, 56 hours of instruction. Training materials were forwarded to PLN-Training Department, Jakarta.

--- NRECA completed a draft of training course titled "Operation and Maintenance of RE Systems". This course, to be scheduled during the fourth quarter of 1982, will be conducted for PLN supervisory-level employees who will have responsibility for O&M of the seven RE systems.

B. Klaten RE Demonstration Project

--- Customer-connections reached one thousand nine hundred and ninety-nine (1999) in the RE demonstration project in April. KWH consumption during the first four months of 1982 computed at an average of 45 KWH per month. (Statistics on page 11.)

--- A study of billing records was conducted to determine the percentage

of customers in various consumption levels. The results may be found on page 12 of this report.

C. Problem Areas

--- System-losses on the electrical distribution system which serves the Klaten RE area has been considered excessive. Computations for individual months have reached 25% with a 12-month average of 15% in 1981.

While studying this problem, Wilayah XIII staff determined that losses have been overstated. Fifty-six (56) PLN customers receive electric service from the Klaten RE circuit that are not included as RE demonstration project customers. Therefore, about 30% of the kWhs considered as losses during past months, were actually consumed and billed to the fifty-six customers. Future reports should depict a more accurate loss computation.

--- During PLN's Crash Program 37, two deviations were noted from practices followed in the Klaten RE demonstration project. In the housewiring installations, 2 amp limiters were installed in houses served in the 37 desa. Also, the connection charge is payable in full within six months from date of connection rather than a 48-month repayment period. USAID and PLN are reviewing the matter.

--- Tools and laboratory equipment procured through the USAID-loan have been received in Semarang by P.I. Ring. By the end of this reporting period, it appeared that Wilayah XIII had not receive' the items that were procured for their operations.

Possibly this should be an agenda-item for the next coordination meeting. A decision should be reached on the division of equipment items, and the time-frame for transfer.

D. Meetings and Trips

- March 4 : Meeting with PLN sub-branch managers from Kudus and PLN RE management trainee assigned to productive use at Klaten. Discussed operational characteristics of CSP transformers for the RE systems.
- March 9 : Meeting at PLN-Wilayah XIII - Semarang with Ir. Mrs. Wahjoeni Muhardi from the RE staff at PLN-Pusat. Discussed PLN, RE Headquarters facilities.
- March 10 : Meeting with chief of RE at PLN Wilayah XIII. Discussed labor requirements for construction of seven RE systems and for housewiring.
- March 11, 12 & 13 : Travel to Jakarta for Team Meeting.
- March 17 & 18 : Travel to Jogjakarta. Attended RE energization ceremony at desa Argomulyo, Jogjakarta RE project, with NRECA team leader.
- March 19 : Meeting with NRECA counterpart. Discussed losses at the Klaten PLN demonstration project.
- March 24 : Meeting with NRECA counterpart. Discussed request from C.T. Main, Inc., for a survey of loading of a sample number of distribution transformers at the PIN Klaten RE demonstration project.
- March 25 & 26 : Travel to Klaten to attend RE energization ceremony at the Klaten RE project, desa Jatinom.
- March 29 & 30 : Travel to Pekalongan to attend RE energization ceremony at the Pekalongan RE project, desa Comal.

- April 1 : Semarang - Meeting with chief of rural electrification PLN Wilayah XIII. Reviewed housewiring materials that have already arrived in Central Java.
- April 2 : Semarang - Meeting at office of C.T. Main, Inc. with representative from USAID, C.T. Main Inc., and NRECA. Discussed electrical loading of distribution transformers in the PLN Klaten RE demonstration project.
- April 2 : Semarang - PLN, RE Coordination Meeting at PLN-P.I. Ring, with representatives from PLN-Pusat, PLN-Wilayah XIII, PLN-P.I. Ring, C.T. Main, Inc. and NRECA.
- April 7 : Semarang - Meeting with chief of RE-PLN Wilayah XIII. Discussed personnel requirement for the housewiring program in Central Java.
- April 10 : Field trip in the Klaten RE project area with counterpart to review wiring of houses in the Crash Program.
- April 15 : Semarang - Meeting at PLN-P.I. Ring with representatives from PLN-Pusat, PLN-Training, PLN-Wilayah XIII, PLN-P.i. Ring, and NRECA. Discussed RE training schedule, established dates and contents of next training course.
- April 16 : Semarang - Meeting at PLN-Wilayah XIII, with representatives from PLN-Pusat, PLN-Wilayah XIII and NRECA. Discussed problems with housewiring program, status of the RE projects in Central Java, management training and operational suggestions submitted by NRECA.
- April 21 : Semarang - Meeting at PLN-Wilayah XIII with deputy

director for PLN-Wilayah XIII and NRECA counterpart. Discussed distribution transformer records and securing transformer load data from the PLN Klaten RE project.

April 21

: Semarang - Meeting at PLN-P.I. Ring with chief of construction and NRECA counterpart. Discussed use of volt/amp recording equipment to obtain transformer load data at the Klaten RE project.

KLATEN RE DEMONSTRATION UNIT

BILLING STATISTICS 13 MONTH PERIOD

COLUMN NUMBER									
1	2	3	4	5	6	7	8	9	10
APRIL, 1981	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	2890	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
FEBRUARY	89,447	1992	45	6,902,740	3465	2426	1004	54	77
MARCH	93,313	1996	47	7,064,230	3539	2494	1045	53	76
APRIL, 1982	92,115	1999	46	7,012,820	3508	2472	1035	54	76

COLUMN NUMBER

- | | |
|-----------------------------|--|
| 1. MONTH | 6. AVERAGE RUPIAH PER CUSTOMER (TOTAL) |
| 2. TOTAL KWH BILLED | 7. AVERAGE ENERGY CHARGE PER CUSTOMER |
| 3. TOTAL CUSTOMERS BILLED | 8. INSTALLATION & HOUSEWIRING CHARGE |
| 4. AVERAGE KWH PER CUSTOMER | 9. COST PER KWH (RUPIAH) ENERGY ONLY |
| 5. TOTAL RUPIAH BILLED | 10. COST PER KWH (RUPIAH) TOTAL |

PLN
 KLATEN RE DEMONSTRATION PROJECT
 CUSTOMER USEAGE COMPARSION

SEPT. 1981 AVERAGE 43 KWH PER MO.			MARCH 1982 AVERAGE 47 KWH PER. MO.		
KWH PER MONTH	NUMBER OF CUSTOMERS	PERCENT OF TOTAL	KWH PER MONTH	NUMBER OF CUSTOMERS	PERCENT OF TOTAL
0 - 10	211	10.76	0 - 10	269	13.48
11 - 15	156	7.96	11 - 15	167	8.37
16 - 20	208	10.61	16 - 20	226	11.32
21 - 25	208	10.61	21 - 25	233	11.67
26 - 30	197	10.05	26 - 30	198	9.92
31 - 35	181	9.24	31 - 35	163	8.17
35 - 40	147	7.50	36 - 40	118	5.91
41 - 50	188	9.59	41 - 50	165	8.27
51 - 60	120	6.12	51 - 60	119	5.96
61 - 75	109	5.56	61 - 75	102	5.11
76 - 100	95	4.85	76 - 100	109	5.46
101 - 150	73	3.72	101 - 150	71	3.56
151 - 200	33	1.68	151 - 200	25	1.25
201 - 250	18	.92	201 - 250	11	.55
251 - 300	4	.21	251 - 300	6	.30
301 - 500	8	.41	301 - 500	6	.30
500 +	4	.21	500 +	8	.40
TOTAL	1960	100.00	TOTAL	1996	100.00

PLN Central Java Activities



Transformers and equipment received at P.I. Ring's warehouse in Semarang. Mr. Butar Butar (left side) the NRECA advisor's counterpart, assists P.I. Ring personnel in checking/testing procedures.

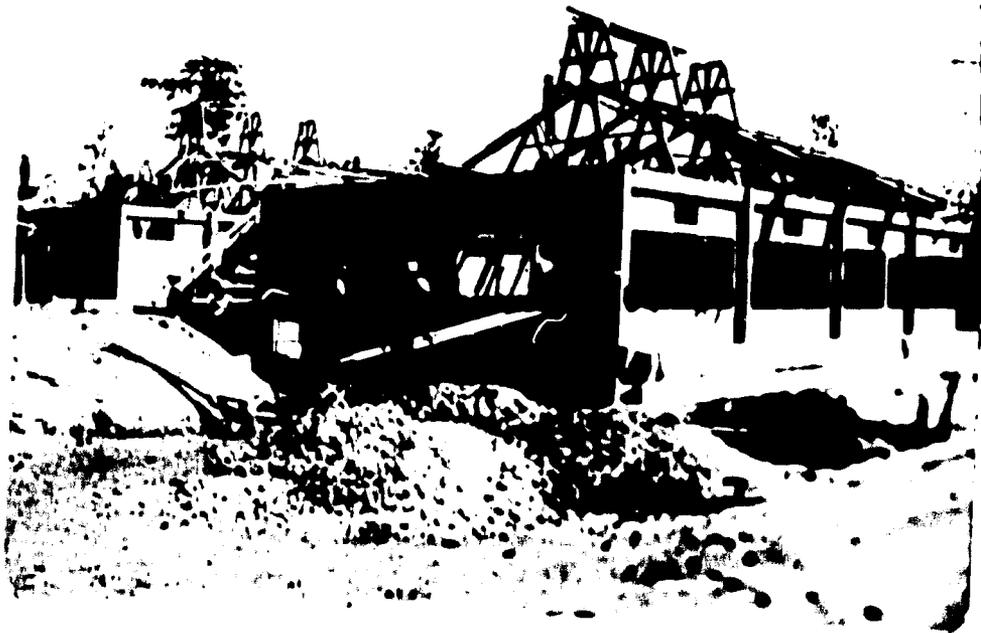


Vehicles procured through the USAID loan for use in the RI projects.

PLN Central Java Activities



A service-drop installation in PLN's CRASH PROGRAM 37, Klaten project.



Headquarters facilities under construction at the Pekalongan project.

A

PLN-CENTRAL JAVA RUP
TRAINING

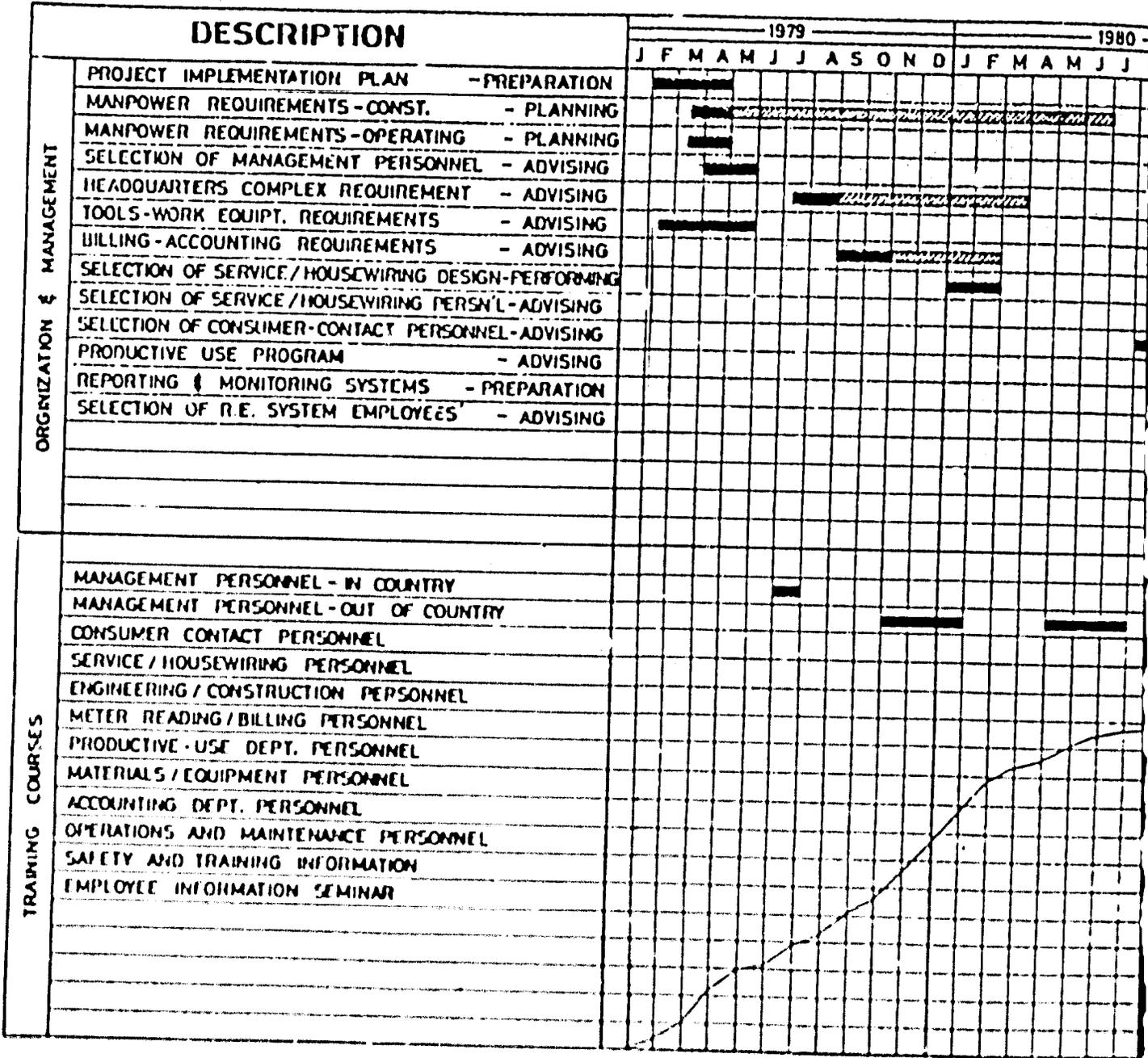
COURSE	TITLE	1979				19
		25	10	11	12	
	LANGUAGE TR - MANAGEMENT	■	■	■		
	OUT-OF-COUNTRY TRAINING				■	
I	INTRODUCTION SUPERVISION		■			
II	ORIENTATION-CUSTOMER CONTACT					
III	CONSTRUCTION SUPERVISION					
IV	TRAINERS TRAINING-HOUSEWIRING					
V	DISTRIBUTION PLAN-DESIGN					
VI	APPRENTICE LINEMAN					
VII	HOUSEWIRING					
VIII	MATERIAL LOGISTICS					
IX	ACCNT. REPORTING-CONST.					
X	ELECTRIC APPARATUS					
XI	METER READING					
XII	PRODUCTIVE USE-OJT					
XIII	ENGINEERING DIST. SYSTEM					
XIV	MATERIAL WAREHOUSE					
XV	ACCNT. REPORTING-OPERATIONS					
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 — ■

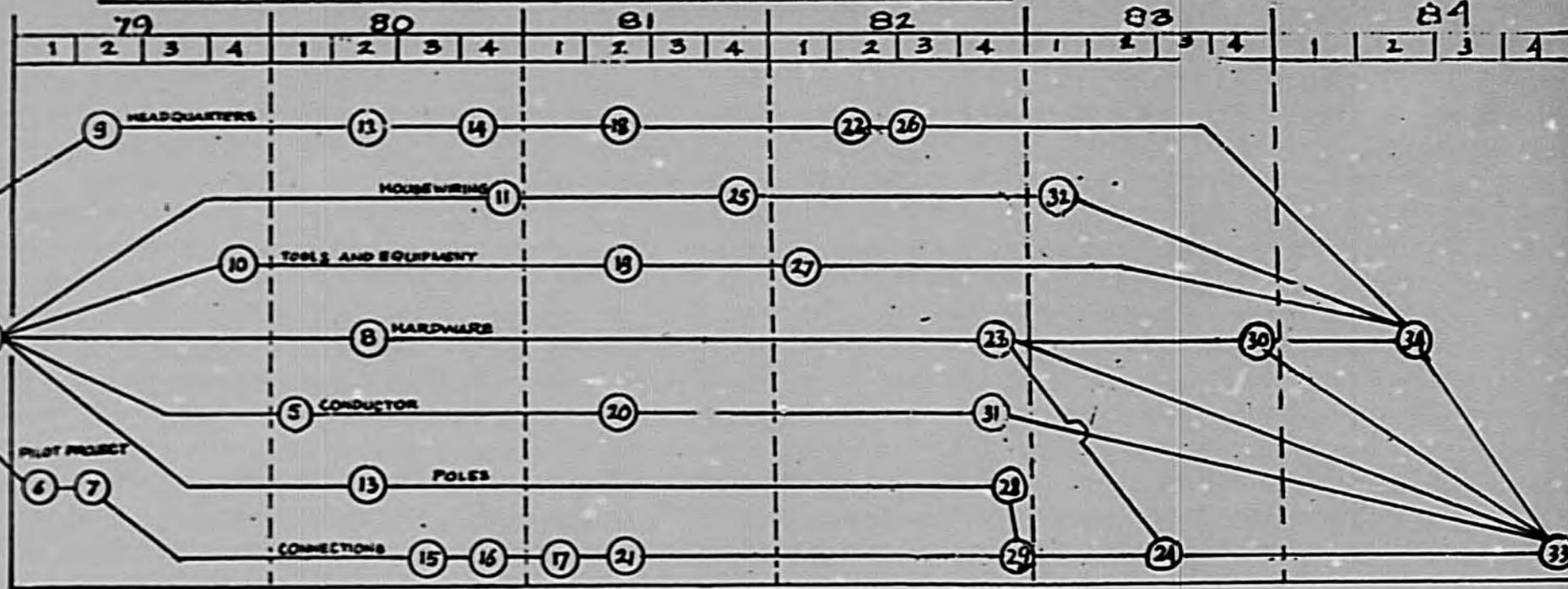
INDICATES PERIOD OF PERFORMANCE
 INDICATES PERIOD OF EVALUATION

ORGANIZATION MANAGEMENT
 RURAL ELECTRIC



LEGEND: WORK SCHEDULED 871
 WORK COMPLETED 721

RURAL ELECTRIFICATION - PLN IMPLEMENTATION PLAN



LEGEND

- | | |
|--|--|
| 1. FEASIBILITY REPORTS COMPLETED (8/77) | 22. WAREHOUSES COMPLETED |
| 2. LOAN AGREEMENT SIGNED (5/78) | 23. FIRST DELIVERY OF HARDWARE & MATERIALS |
| 3. ALL B.O.M. CONTRACTS SIGNED (8/78 & 9/78) | 24. FIRST TESTING AND ENERGIZATION OF SYSTEM |
| 4. CENTER LINE STAKING BEGINS (10/78) | 25. FIRST DELIVERY OF HOUSEWIRING |
| 5. IFB ISSUED - CONDUCTOR | 26. HQ'S COMPLETED |
| 6. BEGIN CONSTRUCTION OF PILOT PROJECT | 27. FINAL DELIVERY OF TOOLS |
| 7. BEGIN OPERATION OF PILOT PROJECT | 28. ALL POLES DELIVERED |
| 8. IFB ISSUED - HARDWARE | 29. COMPLETE SETTING OF POLES |
| 9. BEGIN PURCHASE OF HQ SITES | 30. FINAL DELIVERY OF HARDWARE |
| 10. IFB ISSUED - TOOLS AND EQUIPMENT | 31. FINAL DELIVERY OF CONDUCTOR |
| 11. IFB ISSUED - HOUSEWIRING | 32. FINAL DELIVERY OF HOUSEWIRING |
| 12. SURVEY PROPERTY SOIL TESTING | 33. SYSTEM COMPLETION |
| 13. FIRST DELIVERY OF POLES | 34. HOUSE CONNECTIONS IN PROCESS |
| 14. CONTRACTS LET FOR SITE PREPARATION | SYSTEM OPERATING |
| 15. CENTER LINE STAKING COMPLETED | |
| 16. SYSTEM DESIGN COMPLETED | |
| 17. CONSTRUCTION BEGIN (STAPLES) COMPL. | |
| 18. SITES PREPARED | |
| 19. FIRST DELIVERY OF TOOLS & EQUIPMENT | |
| 20. FIRST DELIVERY OF CONDUCTOR | |
| 21. BEGIN DEMARKING RIGHT OF WAY | |
| SITES AND MATERIALS OF POLES | |

Summary of Expenditures

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

AID/ASIA - C 1347

Date: March 1982

Period of contract: 8/25/78 - 8/25/82

	Budget	Total Expense To Date	Prior Billings	Current Billings
Salaries - Field	\$ 1,095,000	\$ 868,185.68	\$ 844,303.94	\$ 23,881.74
Salaries - Home	187,000	136,282.23	132,018.27	4,263.96
Fringe Benefits	416,000	321,676.10	314,643.42	7,032.68
Consultant Fees	34,706	33,906.25	33,906.25	-
Allowances	398,000	296,172.12	288,764.09	7,408.03
Travel and Transportation	386,470	283,071.73	278,601.54	4,470.19
Other Direct Costs	140,000	87,094.83	85,731.75	1,363.08
Overhead	292,000	229,410.65	222,937.14	6,473.51
Equipment and Materials	28,000	17,999.14	17,999.14	-
TOTAL	\$ 2,977,176	\$ 2,273,798.73	\$ 2,218,905.54	\$ 54,893.19

PERSON-MONTHS BY POSITION, NRECA CONSULTANT TEAM

(Contract as amended September 11, 1981)

POSITION	PRESENTLY FILLED BY	CONTRACT PERSON-MONTHS	EXPENDED THIS PERIOD	EXPENDED THROUGH APRIL		PERCENT OF CONTRACT
				PLN	PDO	
Team Leader	Peter McNeill	54	1	9	34	80
Training Officer	Louie Sansing	45	1	7	32	87
Administrative Officer	Ray Shoff	33	1	4.5	25.5	91
PLN Advisor	Sam Adkins	42	1	37.5	.5	90
Lampung Advisor	Claude Franke	54	1	.5	42.5	80
Lombok Advisor	Paul Swanson	50	1	0	39	78
Luwu Advisor	John DeFoor	49	1	0	38	78
Short-term Advisors		19	0	14	3	89
Consultants		8	0	7.5	.5	100
		354	7	80	215	83