

NRECA TEAM REPORT
PLN
INDONESIA
(JULY AND AUGUST 1981)

**MICROFILMED FROM BEST
AVAILABLE COPY**

**MICROFILMED FROM BEST
AVAILABLE COPY**

MONTHLY REPORT

NRECA INDONESIAN TEAM REPORT

UNITED STATES AGENCY FOR
INTERNATIONAL DEVELOPMENT

Contract No. AID/ASIA CI347
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

TABLE OF CONTENTS

NRECA Team Members	page 1
Description and Objectives of Project	2
Project Activities	3 - 7
PLN-Klaten Demonstration Unit	8 - 10
Chart A - PLN Rural Electrification Projects, Central Java . .	11
Chart B - PLN Rural Electrification Projects, Central Java . .	12
Chart C - PLN Rural Electrification Projects, Central Java . .	13
Chart D - PLN Rural Electrification Projects, Central Java . .	14
Chart E - PLN Rural Electrification Projects, Central Java . .	15
Chart F - Central Java Rural Electric Projects	16
Klaten RE Demonstration Unit	17
Rural Electrification - PLN Implementation Plan	18
Organization Management Training Progress Schedule	19
PLN-Central Java Rural Electrification Program, Training Course Schedule	20
Summary of Expenditure	21
Person-months by Position	22
Pictures	23

MICROFILM REPRODUCTION **BEST**
AVAILABLE ON REQUEST

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: 713850
*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: 712034
Claude Franke	RE Specialist	P.O. Box 88 Tanjungkarang Lampung PH: 0721-52058
* PLN Advisor		

**MICROFILMED FROM BEST
AVAILABLE COPY**

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&I 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	<u>35</u>	<u>15,000</u>	<u>135,000</u>
TOTALS	440	130,000	1,170,000

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

**MICROFILMED FROM BEST
AVAILABLE COPY**

MICROFILMED FROM BEST
AVAILABLE COPY

II. PROJECT ACTIVITIES

A. Organization/Management

NRECA-Jakarta Office --- The NRECA project advisor to PLN in Central Java was on home-leave during the month of July. An NRECA-Jakarta team member traveled to Semarang on alternate weeks to fill-in for the advisor.

--- Contact was made with Mr. Soewarno, Chief of the PLN Solo branch and Mr. Suharsojo, Chief of the Technical Department, PLN Solo branch. The major subject for discussion was the accuracy of kWh metering equipment in the Klaten substation which is used to record the energy supplied to the Klaten demonstration project. kWh computations for previous months were analyzed and it was agreed that the meter readings were inconsistent and that line loss computations were unrealistic. As a result, NRECA made a request to PLN through Wilayah XIII to investigate the situation.

--- NRECA team members reviewed the plans for energizing approximately thirteen thousand (13,000) households in thirty-seven (37) desas in the RE-project area prior to April 1982. Mr. Ristam, Chief of RE, Wilayah XIII and NRECA coordinated efforts to determine the number of electricians that will be required to wire the houses within the allotted time-frame.

--- While in Central Java, NRECA-Jakarta team member contacted five of the PLN management trainees who had previously received on-the-job training in the U.S.A. and the Philippines. Discussion centered on the benefits of overseas training as put-to-use in their respective positions of employment within the PLN-RE program in Central Java.

--- In Jakarta, NRECA team members maintained contact and coordinated with PLN-Pusat RE officials. Mr. James Cudney, Regional Administrator for Asia and the Pacific, International Programs Division, NRECA, visited Indonesia during this period. He and the team leader met with Mr. Rumondor, Deputy Director, PLN-RE division, to review project status and the NRECA role as OMT advisors.

NRECA-Central Java Office --- Upon returning from home-leave, the NRECA project advisor continued the study of kWh input and sales in the Klaten area. Meter reading and billing statistics from 1979 to-date were documented and forwarded to PLN Wilayah for their review. (See pages 8 through 10.)

--- Study continued on "crash program 82", the energization of thirty-seven (37) desas in the RE project area by April 1982. The desas are as follows:

<u>BANYUMAS</u>	<u>PEKALONGAN</u>	<u>SRAGEN</u>	<u>MAGELANG</u>
1. Klapagading	1. Siragkang	1. Gemolong	1. Ngasem
2. Wangon	2. Petarukan	2. Karangmalang	2. Glagah Onibo
3. Rawaheng	3. Ujung Gede	3. Masaran	3. Banju Urip
4. Randegan	4. Sarwodadi	4. Dayungan	4. Purwosari
5. Banteran	5. Lowa	5. Sidoharjo	5. Tegalrejo
	6. Ambokulon		
	7. Ambowetan		

<u>WONOGIRI</u>	<u>KLATEN</u>	<u>JOGYAKARTA</u>
1. Ngadirojo Lor	1. Belang	1. Agomulyo
2. Ngadirojo Kidal	2. Ketandan	2. Balecatur
3. Pondok	3. Candirejo	3. Ambar Ketawang
4. Gedong	4. Dron	4. Nogotirto
5. Mlakamanis Kulon	5. Magungan	5. Trihanggo

This program will be completed through coordination of PLN's construction division, P.I. Ring, and the operating division, Wilayah XIII. P.I. Ring will use construction materials which are in-stock to build the primary and secondary distribution system. Wilayah XIII has completed their estimates of service-line, metering and housewiring material/equipment requirements and budget requests have been prepared and submitted to PLN-Pusat.

--- With respect to the labor requirements for Wilayah XIII's obligation in the construction program for the total project, NRECA documented their estimates

and submitted these to Wilayah XIII officials during this reporting period. (The documentation that follows includes "crash program 82".)

- Chart A (page 11) estimates of house constructions per area by months during the two-year construction period.
- Chart B (page 12) estimates of man-month labor requirements for phase-one of the consumer-connect program, Housewiring Estimates, for the construction period and first year of operation.
- Chart C (page 13) estimates of man-months labor requirements for phase-two, the actual housewiring.
- Chart D (page 14) estimates of man-months labor requirements for phase-three, kWh meter installations and connections.
- Chart E (page 15) graph of connection rate, construction period and first year of operations.
- Chart F (page 16) projections for house-connections, construction period and fifteen years in the operating period.

It is planned that contract electricians will be utilized for phase-one and two of this program. The installation of the kWh meter and final connections will be made by experienced employees of Wilayah XIII.

B. Training

--- P.I. Ring, Wilayah XIII and NRECA representatives met in Semarang on August 21st to review the overall training requirements for service-line, meter entrance and housewiring installations. Requirements for "crash program 82" were determined and related to the overall requirements. Guidelines were established, responsibilities assigned for the preparation of training materials, and subject matter was selected.

NRECA prepared teaching suggestions for the initial training course, "Trainors-Training". This twenty-eight (28) session course is designed to familiarize PLN branch and sub-branch employees with the R.E. system concept; to increase their knowledge of service-line, meter entrance and housewiring installations; and to improve teaching skills for their role as trainors.

It is expected that the curriculum for training courses to be conducted for the 37-desa construction program will be utilized in training courses conducted for the 404-desa construction program which will follow.

C. Klaten RE Demonstration Project

--- The PLN rural electrification demonstration project in Klaten, Central Java, continues to provide valuable and interesting statistics. One thousand nine hundred sixty (1,960) consumers were billed in the month of August, a figure which is approaching the total number of potential consumers in the demonstration project area.

The average kWh consumption per consumer per month, June through August 1981, was 40 kWh. This compares with an average of 30 kWh during the same period in 1980. Two factors contribute to this increase in average consumption; addition of appliances and/or additional lighting in the homes of residential consumers; and an increase in the number of business establishments where kWh consumption is relatively high. (See page 17.)

D. Meetings, Conferences, Trips

NRECA Administrative-Finance Officer

- July 8 --- Conference with Wilayah XIII RE program officials in Semarang.
- July 9 --- Conference with the manager and technical department chief, PLN Solo branch, in Solo.

- July 9 --- Conference with the manager of the Klaten sub-branch, in Klaten.
- July 23 --- Conference with P.I. Ring officials in Semarang.
- July 24 --- Conference with C.T. Main/Semarang.
- August 12 --- Attendance at project evaluation held at AID/Jakarta (NRECA team leader and administrative officer).

NRECA Central Java Project Advisor

- August 6 --- Field trip to Klaten area.
- August 8 --- Conference with Wilayah XIII chief of distribution on system losses, Klaten project.
- August 11 --- Conference with Wilayah XIII, Semarang, officials on training requirements.
- August 10 --- Attendance at coordination meeting in Jakarta, PLN, USAID, C.T. Main and NRECA officials.
- August 19 --- Conference with PLN representatives and productive-use advisor on prospective small, medium and large commercial consumers, Central Java.
- August 21 --- Conference with PLN-Pusat officials from RE and training departments, PLN-Wilayah and P.I. Ring officials, in Semarang on crash program training requirements.
- August 31 --- Meeting with PLN-Pusat RE officials and NRECA administrative officer in Jakarta on training plans and schedules.
- August 31 --- Attendance at NRECA team meeting.

COMPASSION • ERM FURNISHED & SOLD

DATE	MONTH & YEAR	TOTAL ERM ON CIRCUIT	TOTAL ERM OTHER	TOTAL ERM PILOT FOR 3 KIDS 4	TOTAL ERM BILLINGS	TOTAL ERM LOSS*GAIN 6 KIDS 5	PERCENT LOSS*GAIN 7 / 5	PERCENT LOSS*GAIN TO DATE	REMARKS
1	2	3	4	5	6	7	8	9	10
31	JANUARY 1981	241,300	125,243	56,060	63,133	7,073	12.62	12.62	
28	FEBRUARY	232,550	170,456	61,891	64,127	2,235	3.61	7.94	
30	MARCH	275,700	197,760	75,920	77,843	1,923	2.53	5.79	
30	APRIL	249,350	191,876	72,474	67,780	<5,694	<7.75	<2.07	APRIL 25, 1981 ERM 24 050 HIN 10 HIN ERM REPLACED
31	MAY	286,410	189,700	96,810	77,875	<18,937	<19.56	<3.68	
30	JUNE	283,770	198,000	94,990	75,154	<19,836	<20.88	<7.23	
31	JULY	297,900	194,800	103,100	81,578	<21,522	<20.77	<9.67	
31	AUGUST								
30	SEPTEMBER								
31	OCTOBER								
30	NOVEMBER								
31	DECEMBER								
	TOTAL								

MICROFILMED FROM BEST AVAILABLE COPY

HOUSE CONNECTIONS PER MONTH

MONTH	TOTAL	PAGELANG	KLAMEN	BAKUL	WONGGIRI	PALANG	STAGEN	SANYUUS
1	1500	125	392	264	120	295	123	181
2	2500	208	654	441	200	491	204	302
3	2850	237	745	502	228	560	233	345
4	3000	249	785	528	240	590	245	363
5	3110	258	813	548	249	611	255	376
6	3220	267	842	563	258	632	263	390
7	3275	272	856	577	262	643	269	396
8	3300	274	863	582	264	648	270	399
9	3325	276	869	586	266	653	273	402
10	3340	277	872	591	267	656	273	404
11	3340	277	872	591	267	656	273	404
12	3340	277	872	591	267	656	273	404
13	3340	277	872	591	267	656	273	404
14	3300	274	863	582	264	648	270	399
15	3300	274	863	582	264	648	270	399
16	3245	269	848	572	260	638	265	393
17	3170	263	829	559	254	623	259	383
18	3030	251	792	534	242	596	248	367
19	2895	240	757	510	232	569	237	350
20	2770	230	725	480	222	544	226	335
21	2640	219	690	466	211	519	216	319
22	2525	210	660	445	202	496	206	306
23	2390	190	625	422	191	470	195	289
24	2290	190	599	404	183	450	187	277
TOTAL	70995	5890	18573	12520	5680	13952	5300	8580

OPERATION ESTIMATIONS - HOUSEWIRING

PLN RURAL EL

100% UNITS

CO.

CONSTR. PERIOD 1ST. YR. OF OPERATIONS

HOUSEW

70,995

25,288

12-1

MICROFILMED FROM BEST AVAILABLE COPY

CONSTRUCTION PERIOD

PROJECTS	MONTHS	YEAR															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
MAGELANG		2	4	4	4	5	5	5	5	5	5	5	5	5	5	5	5
KLATEN		7	12	13	14	14	15	15	15	15	15	15	15	15	15	15	15
BAHUL		5	8	9	9	10	10	10	10	10	10	10	10	10	10	10	10
WONOGIRI		2	4	4	4	4	5	5	5	5	5	5	5	5	5	5	5
PEKALONGAN		5	9	10	10	11	11	11	11	12	12	12	12	12	11	11	11
SRAGEN		2	4	4	4	5	5	5	5	5	5	5	5	5	5	5	5
BAIYUNUS		3	5	6	6	7	7	7	7	7	7	7	7	7	7	7	7
TOTAL		26	46	50	51	56	58	58	58	59	59	59	59	59	58	58	58
ACCUMULATED TOTAL			72	122	173	229	287	345	403	462	521	580	639	698	756	814	873

PLN RURAL ELECTRIFICATION PROJECTS

GENERAL JAWA

HOUSEWIRING PROGRAM

Chart B

MICROFILMED FROM BEST AVAILABLE COPY

MAN MONTHS

PERIOD														1ST. YEAR OF OPERATIONS											
12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL	1	2	3	4	5	6	7	8	9	10	11	12
	5	5	5	5	5	4	4	4	4	4	4	3	106	3	3	3	3	3	3	3	3	3	3	3	3
5	15	15	15	15	15	14	13	13	12	12	11	11	326	11	10	10	10	10	10	10	10	9	9	9	9
0	10	10	10	10	10	9	9	9	8	8	7	7	218	7	7	7	7	7	7	7	6	6	6	6	6
5	5	5	5	5	4	4	4	4	4	4	3	3	103	3	3	3	3	3	3	3	3	3	3	3	3
2	12	11	11	11	11	11	10	10	9	9	8	8	247	8	8	8	7	7	7	7	7	7	7	7	7
5	5	5	5	5	5	4	4	4	4	4	3	3	105	3	3	3	3	3	3	3	3	3	3	3	3
7	7	7	7	7	7	6	6	6	6	5	5	5	150	5	5	5	5	5	5	4	4	4	4	4	4
9	59	58	58	58	57	52	50	50	47	46	41	40	1255	40	39	39	38	38	38	37	36	35	35	35	35
9	698	756	814	872	929	981	1031	1081	1128	1174	1215	1255			79	16	156	194	232	269	305	340	375	410	445

MICROFILMED FROM BEST
AVAILABLE COPY

1ST. YEAR OF OPERATIONS										
3	4	5	6	7	8	9	10	11	12	TOTAL
3	3	3	3	3	3	3	3	3	3	36
10	10	10	10	10	10	9	9	9	9	117
7	7	7	7	7	6	6	6	6	6	79
3	3	3	3	3	3	3	3	3	3	36
8	7	7	7	7	7	7	7	7	7	87
3	3	3	3	3	3	3	3	3	3	36
5	5	5	5	4	4	4	4	4	4	54
39	38	38	38	37	36	35	35	35	35	445
116	156	194	232	269	305	340	375	410	445	

OPERATION HOUSEBUILDING

PLN RURAL E

TOTAL UNITS

CONSTR. PERIOD 1ST. YR. OF OPERATIONS

70,995

25,288

13-1

HOUSE

MICROFILMED FROM BEST AVAILABLE COPY

PROJECTS	CONSTRUCTION PERIOD															
	MONTHS	YEAR														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
PALEMBANG	17	28	32	33	34	36	36	37	37	37	37	37	37	37	37	37
PELAIPIH	52	87	99	105	108	112	114	115	116	116	116	116	116	115	115	115
BANJUL	35	59	67	70	73	76	77	77	78	79	79	79	79	78	78	78
WONOGIRI	16	27	30	32	33	34	35	35	35	36	36	36	36	35	35	35
PERALONGAN	39	65	75	79	81	84	86	86	87	87	87	87	87	86	86	86
SRAGEN	16	27	31	33	34	35	36	36	36	36	36	36	36	36	36	36
BAKUYUNUS	24	40	46	48	50	52	53	53	54	54	54	54	54	53	53	53
TOTAL	199	333	380	400	413	429	437	439	443	445	445	445	445	440	440	440
ACCUMULATED TOTAL		532	912	1312	1725	2154	2591	3030	3473	3918	4363	4808	5253	5693	6133	6133

- 13 - 2
 PLN RURAL ELECTRIFICATION PROJECTS
 CENTRAL JAVA
 HOUSEWIRING PROGRAM

Chart

MICROFILMED FROM BEST
 AVAILABLE COPY

MAN MONTHS

CONSTRUCTION PERIOD

1ST. YEAR OF OPERATIONS

CONSTRUCTION PERIOD														1ST. YEAR OF OPERATIONS											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	TOTAL	1	2	3	4	5	6	7	8	9	10	11
7	37	37	37	37	36	35	33	32	31	29	28	26	25	787	25	25	24	24	24	23	23	23	23	23	22
6	116	116	115	115	113	110	106	101	97	92	88	83	79	2471	79	77	77	75	75	74	73	72	71	70	70
9	79	79	78	78	76	74	71	68	65	62	59	56	54	1669	54	52	52	51	50	50	49	48	48	47	47
5	36	36	35	35	35	34	32	31	30	28	27	25	24	757	24	24	23	23	23	23	22	22	22	22	21
7	87	87	86	86	85	83	79	76	73	69	66	63	60	1856	60	58	58	57	56	56	55	54	53	53	52
6	36	36	36	36	35	35	33	32	30	29	27	26	25	772	25	24	24	23	23	23	23	22	22	22	22
4	54	54	53	53	52	51	49	47	45	43	41	39	37	1146	37	36	35	35	34	34	34	33	33	33	32
5	445	445	440	440	432	422	403	387	371	357	336	318	304	9458	304	296	293	288	285	283	279	274	272	270	266
3	4808	5253	5693	6133	6625	6987	7390	7777	8148	8500	8896	9154	9458		600	793	1181	1466	1749	2028	2302	2574	2842	3110	

13-3

Chart C

1ST. YEAR OF OPERATIONS											
3	4	5	6	7	8	9	10	11	12	TOTAL	
24	24	24	23	23	23	23	23	22	22	281	
77	75	75	74	73	72	71	70	70	68	881	
52	51	50	50	49	48	48	47	47	46	594	
23	23	23	23	22	22	22	22	21	21	270	
58	57	56	56	55	54	53	53	52	51	663	
24	23	23	23	23	22	22	22	22	21	274	
35	35	34	34	34	33	33	33	32	32	408	
293	288	285	283	279	274	272	270	266	261	3371	
373	1181	1446	1749	2028	2302	2574	2844	3110	3371		

MICROFILMED FROM BEST
AVAILABLE COPY

OPERATION - METER INSTALLED 10/13

ELN RURAL E

TOTAL UNITS

CT

CONSTR. PERIOD 1ST. YR. OF OPERATIONS

HOUSEW

70,995

25,288

14-1

MICROFILMED FROM BEST
AVAILABLE COPY

CONSTRUCTION PERIOD

PROJECTS	MONTHS	YEAR															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		MAGelang	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Klaten	3	6	7	7	7	7	7	8	8	8	8	8	8	8	8	8	8
BANtUL	2	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5
WONOgIRI	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
PEKALONGAN	3	4	5	5	5	6	6	6	6	6	6	6	6	6	6	6	6
SRAGEN	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
BANtUNGS	2	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4
TOTAL	13	23	25	26	26	27	27	29	29	29	29	29	29	29	29	29	29
ACCUMULATED TOTAL		36	61	87	113	140	167	196	225	254	285	312	341	370	397	425	453

- 14 - 2
 PLN RURAL ELECTRIFICATION PROJECTS
 CENTRAL JAVA
 HOUSEWIRING PROGRAM

Cha

**MICROFILMED FROM BEST
 AVAILABLE COPY**

MAN MONTHS

CON PERIOD

1ST. YEAR OF OPERATIONS

12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL	1	2	3	4	5	6	7	8	9	10	11
2	2	2	2	2	2	2	2	2	2	2	2	2	47	2	2	2	2	2	2	2	2	1	1	
8	8	8	8	7	7	7	7	6	6	6	6	5	165	5	5	5	5	5	5	5	5	5	5	5
5	5	5	5	5	5	5	5	4	4	4	4	4	110	4	4	3	3	3	3	3	3	3	3	2
2	2	2	2	2	2	2	2	2	2	2	2	2	47	2	2	2	2	2	1	1	1	1	1	1
6	6	6	6	6	5	5	5	5	5	4	4	4	125	4	4	4	4	4	4	4	4	4	4	3
2	2	2	2	2	2	2	2	2	2	2	2	2	47	2	2	2	2	2	2	1	1	1	1	1
4	4	4	4	3	3	3	3	3	3	3	3	2	78	2	2	2	2	2	2	2	2	2	2	2
29	29	29	29	27	26	26	26	24	24	23	23	21	619	21	20	20	20	20	17	16	16	17	17	16
312	341	370	377	426	452	478	504	528	552	575	578	619		5	31	81	101	120	135	156	173	190	206	

Chart D

14-3

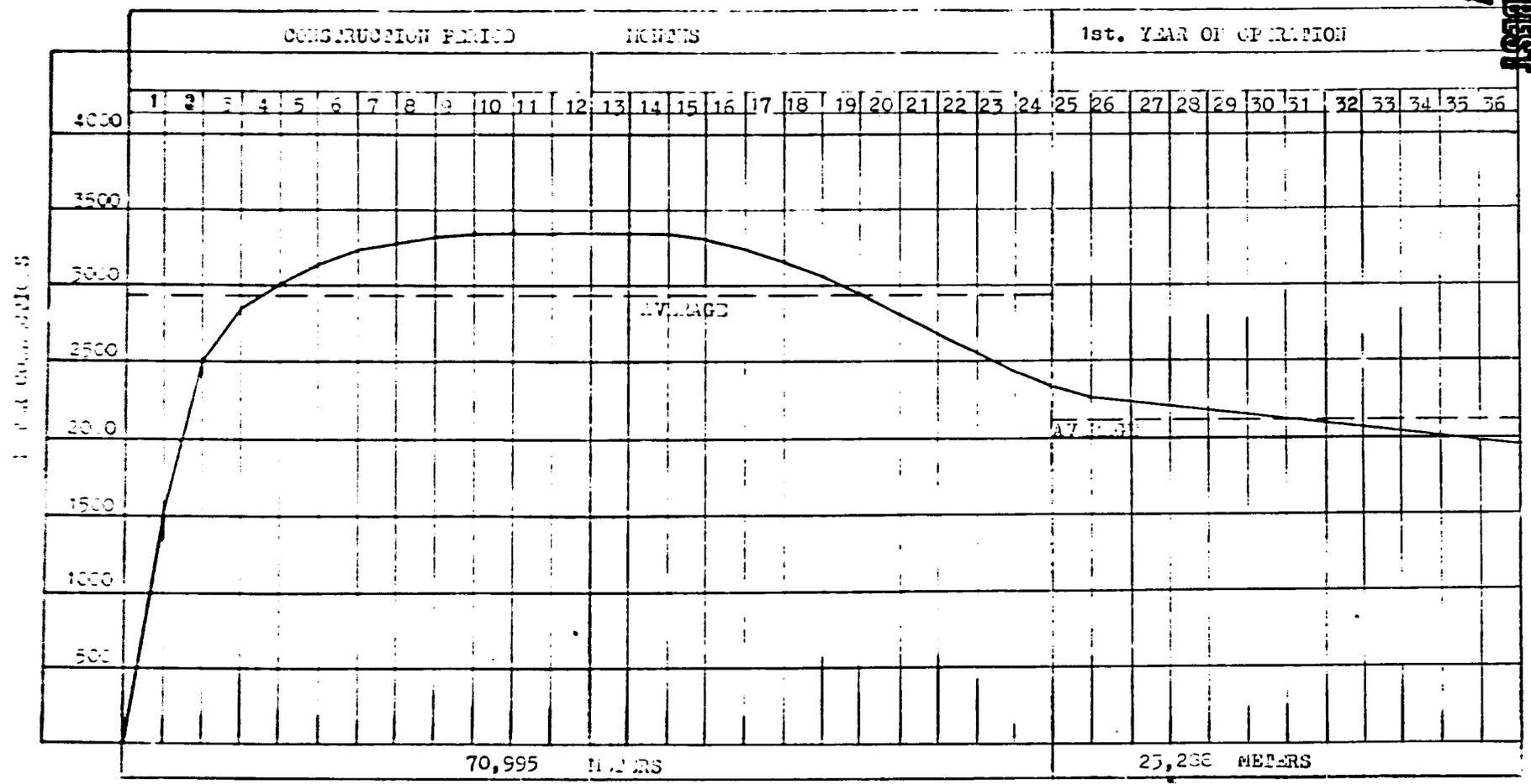
MICROFILMED FROM BEST
AVAILABLE COPY

1ST. YEAR OF OPERATIONS											
3	4	5	6	7	8	9	10	11	12	TOTAL	
2	2	2	2	2	2	1	1	1	1		20
5	5	5	5	5	5	5	5	5	5		60
3	3	3	3	3	3	3	3	3	3		37
2	2	2	1	1	1	1	1	1	1		17
4	4	4	4	4	4	4	4	3	3		46
2	2	2	2	1	1	1	1	1	1		18
2	2	2	2	2	2	2	2	2	2		24
20	20	20	17	16	15	17	17	16	16		222
61	81	101	120	135	156	173	190	206	222		

MICROFILMED FROM BEST AVAILABLE COPY

- 15 -
 PLN - RURAL ELECTRIFICATION
 GENERAL JAVA
 PROPOSED CUSTOMER CONNECTIONS

Chart E



CENTRAL JAVA RURAL ELECTRIC PROJECTS																		
METER CONNECTION SCHEDULE * RESIDENTIAL																		
PROJECTS	TOTAL HOUSES IN PROJECT	TOTAL HOUSES TO BE CONN.	CONN. DURING CONST. PERIOD	NUMBER OF CONNECTIONS														
				YEARS OF OPERATIONS														
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
MAGELANG	34,647	29,450	5,890	3151	2730	2648	2618	2408	2305	2164	1983	1189	889	642	321	255	147	110
KLATEN	53,294	45,300	18,573	4870	4199	4082	3140	2587	2084	1768	116	860	606	429	290	276	200	167
BANTUL	36,824	31,300	12,520	3363	2902	2814	2024	1847	1631	1378	952	532	426	270	200	175	151	115
WONOGIRI	33,412	28,400	5,680	3047	2630	2556	2476	2330	2133	2004	1645	1265	968	776	362	239	177	112
PEKALONGAN	51,294	43,600	13,952	4678	4042	3920	3701	3270	2768	2268	1502	952	872	654	327	314	218	160
SRAGEN	34,118	29,000	5,800	3111	2622	2617	2528	2365	2174	1940	1667	1378	1080	735	555	259	195	108
BANYUWAS	33,647	28,600	8,580	3068	2651	2571	2493	2145	1947	1716	108	669	572	429	215	206	143	106
TOTAL	277,356	235,650	70,995	27,282	21,842	21,208	18,980	16,752	15,042	13,238	10,001	6845	5413	3935	2070	1724	1231	880
ACCUMULATED TOTAL				9283	118,125	139,333	158,913	175,265	190,307	203,545	213,522	220,371	225,810	229,745	231,915	233,539	234,770	235,650

MICROFILMED FROM BEST AVAILABLE COPY

MICROFILMED FROM BEST AVAILABLE COPY

MICROFILMED FROM BEST AVAILABLE COPY

KLATEN RE DEMONSTRATION UNIT

BILLING STATISTICS, 13 MONTHS PERIOD

30

COLUMN NUMBER								
1	2	3	4	5	6	7	8	9
AUGUST 1980	56,150	1893	30	5,080,895	2684	1532	1152	90
SEPTEMBER	60,791	1903	31	5,311,065	2790	1592	1198	87
OCTOBER	62,316	1903	32	5,347,175	2890	1611	1198	86
NOVEMBER	62,020	1912	32	5,482,130	1872	1609	1262	88
DECEMBER	61,533	1922	32	5,436,135	2828	1593	1234	88
JANUARY 1981	63,133	1927	33	5,488,030	2848	1610	1238	87
FEBRUARY	64,127	1927	34	5,424,930	2815	1624	1189	85
MARCH	77,843	1932	40	5,753,450	2978	1816	1162	74
APRIL	67,780	1932	35	5,411,925	2801	1655	1147	80
MAY	77,373	1946	40	5,753,855	2856	1808	1148	74
JUNE	75,154	1950	39	5,652,455	2899	1770	1129	75
JULY	81,678	1955	42	5,825,330	2980	1864	1116	71
AUGUST 1981	76,007	1960	39	5,712,755	2915	1781	1134	75

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)

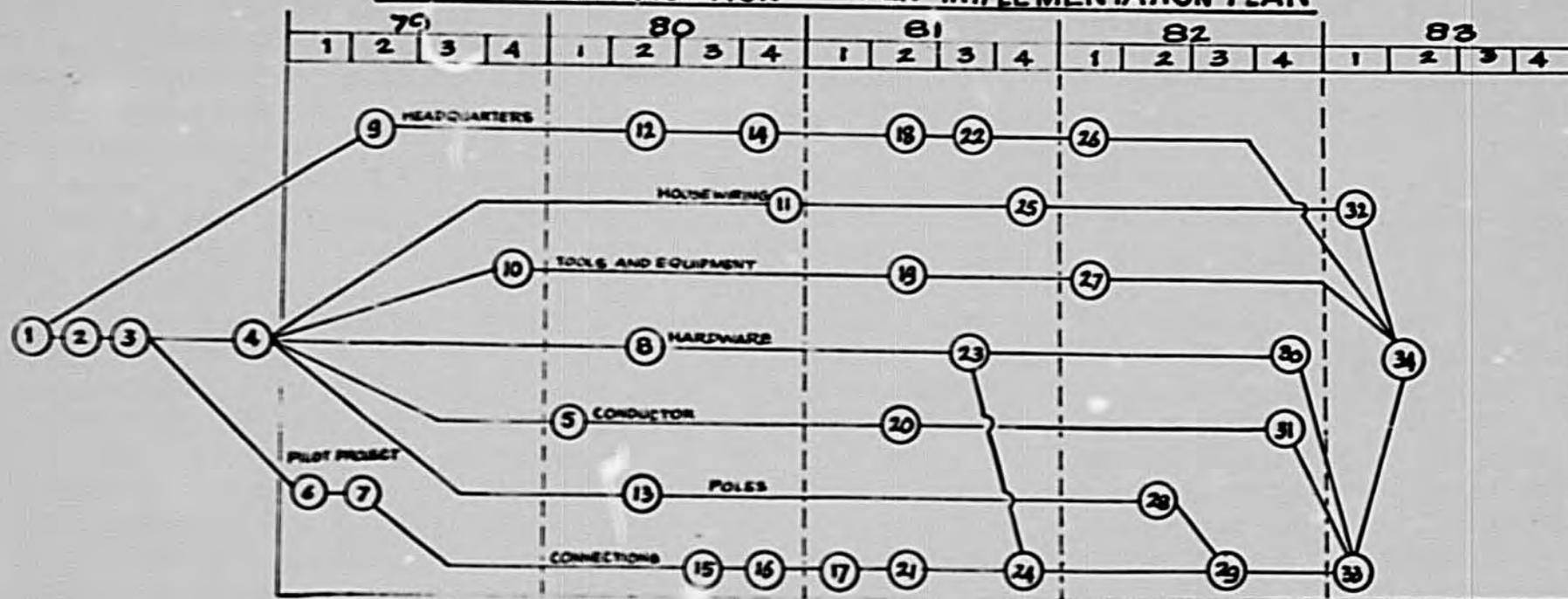
7. Average Energy Charge Per. Customer

8. Installation & Housewiring Charge

9. Cost Per. KWH (rupiah)

RURAL ELECTRIFICATION - PLN IMPLEMENTATION PLAN

- 18 -



LEGEND

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

MICROFILMED FROM BEST AVAILABLE COPY

INDICATES PERIOD OF PERFORMANCE
 INDICATES PERIOD OF EVALUATION

**ORGANIZATION MANAGEMENT TRAINING
 RURAL ELECTRIFICATION**

DESCRIPTION		1979												1980											
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	
ORGANIZATION & MANAGEMENT	PROJECT IMPLEMENTATION PLAN - PREPARATION	[SCHEDULED]																							
	MANPOWER REQUIREMENTS - CONST. - PLANNING	[SCHEDULED]																							
	MANPOWER REQUIREMENTS - OPERATING - PLANNING	[SCHEDULED]																							
	SELECTION OF MANAGEMENT PERSONNEL - ADVISING	[SCHEDULED]																							
	HEADQUARTERS COMPLEX REQUIREMENT - ADVISING	[SCHEDULED]																							
	TOOLS-WORK EQUIPT. REQUIREMENTS - ADVISING	[SCHEDULED]																							
	BILLING-ACCOUNTING REQUIREMENTS - ADVISING	[SCHEDULED]																							
	SELECTION OF SERVICE/HOUSEWIRING DESIGN-PERFORMING	[SCHEDULED]																							
	SELECTION OF SERVICE/HOUSEWIRING PERSNL-ADVISING	[SCHEDULED]																							
	SELECTION OF CONSUMER-CONTACT PERSONNEL-ADVISING	[SCHEDULED]																							
	PRODUCTIVE USE PROGRAM - ADVISING	[SCHEDULED]																							
	REPORTING & MONITORING SYSTEMS - PREPARATION	[SCHEDULED]																							
SELECTION OF R.E. SYSTEM EMPLOYEES - ADVISING	[SCHEDULED]																								
TRAINING COURSES	MANAGEMENT PERSONNEL - IN COUNTRY	[SCHEDULED]																							
	MANAGEMENT PERSONNEL - OUT OF COUNTRY	[SCHEDULED]																							
	CONSUMER CONTACT PERSONNEL	[SCHEDULED]																							
	SERVICE/HOUSEWIRING PERSONNEL	[SCHEDULED]																							
	ENGINEERING/CONSTRUCTION PERSONNEL	[SCHEDULED]																							
	METER READING/BILLING PERSONNEL	[SCHEDULED]																							
	PRODUCTIVE-USE DEPT. PERSONNEL	[SCHEDULED]																							
	MATERIALS/EQUIPMENT PERSONNEL	[SCHEDULED]																							
	ACCOUNTING DEPT. PERSONNEL	[SCHEDULED]																							
	OPERATIONS AND MAINTENANCE PERSONNEL	[SCHEDULED]																							
	SAFETY AND TRAINING INFORMATION	[SCHEDULED]																							
	EMPLOYEE INFORMATION SEMINAR	[SCHEDULED]																							

LEGEND: - - - - - WORK SCHEDULED - 73%
 _____ WORK COMPLETED - 42%
 ● NOT COMPLETED

19-3

NRECA



MICROFILMED FROM BEST AVAILABLE COPY

D	PERCENT OF PROJECT	
	2.2	100%
	11.2	
	5.4	
	2.2	
	6.2	
	2.5	10%
	4.3	
	1.4	
	2.9	
	3.3	
	18.1	75%
	15.9	
	4.3	
		60%
	1.4	
	5.2	45%
	.7	
	2.9	
	2.9	
	.7	
	.7	30%
	.7	
	1.4	
	1.4	
	1.4	
	.7	15%
	100	0

PLN-CENTRAL JAVA RURAL
TRAINING COURSE

28-1

COURSE	TITLE	1979			1980		
		25	10	11	12	13	
	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 — ■

Summary of Expenditures

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

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

	Budget	Total Expense To Date	Prior Billings	Current Billings
Salaries - Field	\$ 374,520	\$ 643,099.80	\$ 620,895.82	\$ 22,203.78
Salaries - Home	140,050	108,017.35	105,819.24	2,198.11
Fringe Benefits	256,664	240,184.83	233,852.54	6,322.29
Consultant Fees	95,800	33,906.25	33,966.25	
Allowances	366,145	244,523.91	235,718.23	8,805.68
Travel and Transportation	310,000	221,262.25	213,220.37	8,041.88
Other Direct Costs	125,900	74,511.56	70,773.79	3,737.77
Overhead	225,000	171,946.01	166,333.52	5,612.49
Equipment and Materials	15,000	18,392.51	15,705.27	2,687.24
TOTAL	\$ 2,410,000	\$ 1,755,844.47	\$ 696,225.03	\$ 59,619.44

PERSON-MONTHS BY POSITION, NRECA CONSULTANT TEAM

POSITION	PRESENTLY FILLED BY	CONTRACT PERSON-MONTHS	EXPENDED THIS PERIOD	EXPENDED THROUGH AUGUST	PERCENT OF CONTRACT
Team Leader	Peter McNeill	36	1	35	97
Training Officer	Louie Sansing	36	1	31	86
Administrative Officer	Ray Shoff	19	1	22	115
PLN Advisor	Sam Adkins	42	1	30	71
Lampung Advisor	Claude Franke	44	1	35	79
Lombok Advisor	Paul Swanson	44	1	31	70
Luwu Advisor	John DeFoor	44	1	30	68
Short-term Advisors		27	0	18	66
Consultants		31	0	0	0
		323	7	232	71

Central Java RE Activities



A consumer of PLN service in the Klatch area utilizes electric saws to cut boards for furniture construction and electric lights to permit finishing-work during evening hours.



A concrete-pole fabrication facility under construction near Boyolali, a source of poles to be used to supplement wood-pole supply in primary distribution line construction in the RE projects. When completed, this facility can fabricate in excess of 2,000 poles per month.