REPUBLIC OF VIETNAM
RURAL ELECTRIC COOPERATIVE
PILOT PROJECTS REPORT

December 31, 1965 - June 30, 1970

Prepared For

THE GOVERNMENT OF VIETNAM

and

THE UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

By

The National Rural Electric Cooperative Association's
Vietnam Team Under Contract To
U.S. Agency for International Development

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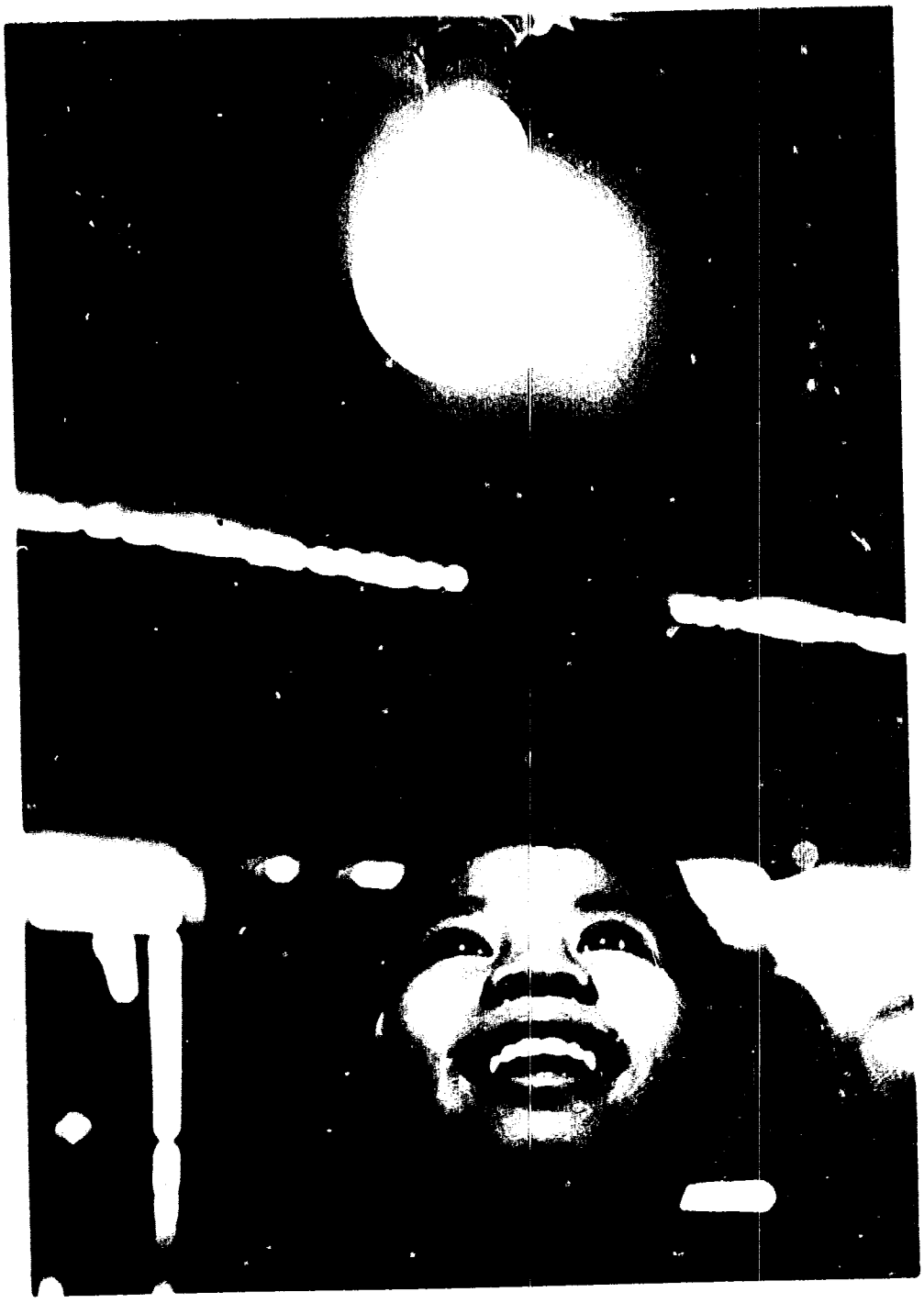


ACKNOWLEDGEMENTS

The several contracts covering the services of the National Rural Electric Cooperative Association in the Republic of Vietnam were negotiated by the Contracts Staff of the Agency for International Development, Washington, D.C. Guidance and assistance were rendered by Far East Engineering, by the Vietnam Engineer, and later by the Office of Capital and Commercial Development. Project logistical assistance in procurement was provided by AID/W's Office of Logistics. Special review and assistance was also furnished by the Office of Engineering. The combined efforts of the AID/W personnel contributed much to the completion of this project.

The broad scope of this project and the period covered from its instigation to completion required action by nearly every USAID and CORDS Organizational Unit in Vietnam. These Units were located in Saigon, Region II, Region III and Region IV Headquarters as well as in the provincial capitols of Long Xuyen, Phan Rang, Dalat and Bien Hoa. During the five year span of the project, there occurred many personnel changes in Organizational Units. It is doubtful that any other project undertaken in Vietnam required a greater amount of coordination and cooperation by USAID/CORD's personnel.

The team members are appreciative of the cooperation which they received from USOM Director James Killen, USAID Director Charles Mann, the present USAID Director Donald MacDonald, and the several Acting Directors who from time to time represented the USAID Director. USAID American, Vietnamese and TCN personnel who contributed to the Vietnam Pilot Project Rural Electrification Program will be long remembered by the inhabitants of rural Vietnam, and their NRECA advisors.

It is difficult to single out for their unusual helpfulness, particular individuals who worked with the NRECA Team members from the many who worked with the Team members during every stage of project development.

Members of the Team would particularly like to express their gratitude for the cooperation and assistance they received during their tours in Vietnam from all levels of the Government of the Republic of Vietnam, and its various authorities and agencies.

The assistance of the Ministry of Public Works and particularly the aid rendered the Team by the Directors General of Electricity of Vietnam, Mr. Nguyen Huu Minh, Mr. Nguyen Ba Nhan, Mr. Tran An Nhan, Mr. Bui Huu Tuan, and Mr. Nguyen Trung Trinh, now Chairman of the Board of Vietnam Power Company, who served as the Project Manager of the Rural

Electric Cooperative Program, the assistance of Mr. Ho Tan Phat, present Director General of E.O.V., of Mr. Le Khac Hue, E.O.V.'s former Chief Planning Engineer and of the many Vietnam Power Company's employees in Saigon and in the provinces who worked with the Team Members, the assistance of the Ministry of Agriculture, and particularly the Directors of Cooperatives, Mr. Nguyen Quang Luu, Mr. Tran Viet Yen, and Acting Director Dao Duc Xuan, the Directorate of Cooperative's Regional and Provincial Advisors, the Director General of Forestries, and the Directorate of Forestries employees in Tuyen Duc Province.

The assistance of the Ministry of Economy. The assistance of the Minister of Budget and Foreign Aid. The assistance of the Ministry of Revolutionary Development. The assistance of the Ministry of Rural Development. The assistance of the Prime Minister's Office.

The members of the Team would like to thank the many units of the U.S. Military Command in Vietnam for the special assistance that they rendered on many occasions to the developing cooperatives and to the NRECA Team members, and for numerous publications in which the cooperatives were cited as excellent examples of American aid to Vietnam. Without this strong military assistance the projects could probably not have been built.

The members of the Team would like to express their appreciation to the Joint Staff of the ARVN, and to the many Vietnamese Army Units who have rendered assistance to the development of rural electric cooperatives in Vietnam.

The Team members wish to express their great appreciation to the Province Chiefs, present and past, of Tuyen Duc, An Giang, Ninh Thuan and Bien Hoa Provinces for their efforts in establishing and developing the cooperative facilities located in their provinces.

The NRECA Team members wish to express their gratitude to the Board of Directors, employees and membership of the Tuyen Duc Rural Electric Cooperative, the Duc Tu Rural Electric Cooperative, the An Giang Rural Electric Cooperative and the National Union of Electric Cooperatives for their assistance and wise counsel during the development of their respective organizations.

The members of the Team wish that they could extend their individual expression of gratitude to the vast multitude of un-named Vietnamese who day by day allowed the Team members to share their lives, their hopes, and their aspirations.

FORWARD

During the period 1965 to 1970, the National Rural Electric Cooperative Association, national service organization for the Rural Electric Cooperatives and Public Power Districts in the United States, provided the services of rural electrification specialists with skills in organization, administration, management, engineering, construction, accounting, office procedures, consumer services, utility system operation and related fields to the USAID Mission in Vietnam and to the people of Vietnam to assist in the establishment of pilot electric cooperative institutions, the design and construction of utility system facilities, and in training the Vietnamese in sound management principles and techniques, safe and effective construction, operation and maintenance practices, and in accounting, record keeping and office procedures.

Services were rendered under Task Order agreements between NRECA and AID Washington.

Three pilot consumer owned electric cooperative institutions have been established, three electric distribution systems planned and mostly built, and more than 18,500 homes, schools, churches and other consumers are receiving dependable central station electric service from their own non-profit electric system at June 30, 1970. 2,150 additional connections are awaiting only the delivery of more wholesale power committed to the cooperative. The three pilot cooperatives are committed to area coverage service to 42,250 consumers, but a PIO/T imposed a participation limit of 25,775 total.

The new systems have been built and are now managed and operated by local Vietnamese personnel trained by NRECA specialists.

Scores of new businesses are flourishing and the lives of the people have developed an entirely new outlook in the newly electrified areas.

Associated with and in support of the electrification program one new power plant was designed and built for Vietnam Power Company and a wood products treating plant was designed and built to provide treated wood poles for line construction. The wood products treating plant establishes a totally new industry for Vietnam, using abundantly available local timber and labor resources to meet local needs.

The new electrification systems were, through feasibility studies by NRECA specialists, projected as economically sound developments, and are now proving this projection by paying their own way even ahead of schedule, with principal and interest payments on their construction loans to go to a revolving fund to help finance future development in electrification.

It is recognized that the Vietnamese in the new co-ops are not yet full-fledged professionals in all phases of electric utility management and operation, and that they should receive further professional guidance to help improve their capabilities and techniques.

The Vietnamese do however, now have a pattern for the future, a proven pattern they can follow for a total electrification program, but they will need stronger and more effective support and coordination from and through their National Government than they have so far enjoyed in order to effectively utilize this tremendous new tool for future development of their country and for the improvement of the lives of their people.

NRECA is proud of the effort and performance of the people in the local cooperatives and their enthusiasm to help themselves. It has been a privilege and a personally rewarding experience for NRECA electrification specialists to share the results of our own previous experience in area coverage electrification with these fine people.

CHAPTER I

PROJECT BACKGROUND

Project Conception

The Government of the Republic of South Vietnam in the late months of 1964 became gravely concerned with the rapidly increasing number of rural hamlets that were falling under the influence and control of the Communist dominated Viet Cong. The rural hamlets located beyond the influence of the metropolitan cities represented over two thirds of the Vietnamese population. The existence of the Republic appeared to depend upon how quickly the Government could prove that it was not only interested in the rural population, but could give concrete evidence of that interest.

Viet Cong were sending propaganda cadres into the rural hamlets throughout the country and these cadres lived with the people, helping them build schools and public works, supplying medical treatment and persuading them that only by joining the Viet Cong could they receive the necessary help to improve their living conditions. When persuasion was not sufficient and hamlet chiefs loyal to the Government refused to allow the propagation of communist doctrine by the cadres, these village elders and often their families were publicly executed as enemies of the people. It was noted that although several thousand of the loyal leaders had been executed, far more hamlets were persuaded to change their loyalty by cadres experienced in helping the rural people; and that these hamlets were far less likely to revert back to supporting the central government.

Dr. Phan Huy Quat, head of South Vietnam's Government and his advisor's discussed with the U.S. Ambassador, U. Alexis Smith and USOM Director James Killen, a number of constructive activities that could be undertaken by the two governments which would both give strong evidence of the GVN's concern and would also provide lasting social and economic improvement to the rural Vietnamese.

Surveys by both the GVN and USOM field representatives had revealed that the rural inhabitants desired electricity second only to improvement of their educational facilities. These surveys also revealed that although the government had provided a number of small generators (15 to 50 KW) for installation in the villages, to provide light during the early evening and early morning hours for the village offices, a few stores and even fewer residences, that little social improvement and even less economic improvement was being achieved. The small generator did not meet the need.

As a result of these considerations, early in 1965, Dr. Phan Huy Quat formally requested the U.S. Embassy and Director James Killen of USOM to

formulate a plan for the rural electrification of Vietnam. Dr. Quat based his request upon the following improvements and/or correction of conditions existing in Vietnam that would be improved by providing around the clock energy.

A. Social

1. Electricity provides rural inhabitants with light, dispelling the fear of darkness, allowing more hours of time for social interchange, and time for their children to study.

2. Electricity provides energy for radios (and now television), thereby increasing the effect of mass communication.

3. Electrical lighting will result in improved inter-communication between the hamlets comprising a village, and between the villages and provincial capitols.

4. Electricity provides energy for deep well water pumps which will give the smaller communities potable water for human consumption, alleviating many of the water borne health hazards.

B. Economic

Electrical energy in sufficient quantity and dependability will promote and allow:

1. The development of small and large industry in rural areas, helping to provide work for the members of families who are surplus to the man power required to operate the small farms.

2. The development of consumer oriented industries which by necessity must be located in the consumers' vicinity (bakeries, ice plants, etc.).

3. The installation of pumps for both irrigation and drainage, thereby allowing a greater production of farm crops, a more diversified agriculture and a vast increase in farm earning power.

4. The lighting of local merchandiser's establishments will extend the hours of business, improve by refrigeration the

quality of produce sold, reduce losses and in many instances allow previously considered perishable items to be offered for sale.

C. Security and Counter-Insurgency

The installation of "around the clock dependable electricity" in the hamlets and villages:

1. When installed as street lighting and perimeter lighting will help prevent infiltration of the Viet Cong into the area.

2. When lighting is installed around vital military and police installations the Viet Cong will be less capable of launching a surprise attack.

3. When lights are installed on highway bridges, guards can see to prevent sabotage.

4. When adequate lighting is installed it will improve all policing operations and increase the number of hours local inhabitants are moving around the hamlet, thus making infiltration considerably more difficult.

5. When lines are energized and inhabitants have electricity the citizens of rural Vietnam will have proof that their central government is interested in their welfare, thereby insuring greater loyalty to the Government by many citizens, especially the rural area citizens who are most exposed to and influenced by Communistic propaganda.

Mr. Killen then requested Mr. Clyde Ellis and Dr. Thomas Venables of NRECA to include Vietnam in their visit to several Far Eastern countries.

Mr. Ellis and Dr. Venables arrived in Vietnam on March 21, 1965. U.S. Ambassador Johnson, and USOM Director Killen, requested NRECA to undertake an immediate project study to appraise the potential of cooperative rural electrification in Vietnam. This request and methods of carrying out the assignment were discussed with appropriate Mission staff members - and it was decided that a contract should be negotiated between NRECA and AID to provide a six man study team. This team would prepare a Phase I - County Survey, a Phase II - Organization of Cooperatives, a Phase III - Economic and Engineering Feasibility Study. The duration of the team's work was to be 90 days.

PROJECT CAPITAL

Requirements and Administration

The capital requirements of this project were provided principally by U.S. Mission in Vietnam. The terms of the agreements between the Governments of the Republic of Vietnam and the United States are described in a Letter of Understanding dated October 15, 1965, executed by the Director of the United States Operations Mission to Vietnam (USOM) and the Commissioner General of Economy and Finance for the Government of the Republic of Vietnam (GVN).

This Letter of Understanding provided an estimated U.S. $2,800,000 for the foreign exchange costs of equipment and materials, the funding of necessary technical assistance, and for foreign exchange costs of a 2500 KW generating plant to be installed in An Giang Province. USOM also agreed to furnish the local piaster costs associated with the construction of the three pilot project distribution systems. The funds required to purchase the necessary piasters was estimated to be U.S. $2,200,000. The estimated total costs of the project was U.S. $5,000,000.

A second Letter of Understanding dated March 7, 1966, between the Director of the United States Agency for International Development (USAID) and the GVN's Minister of Economy and Finance, provided that USAID would procure a wood treating plant at an estimated cost of U.S. $270,000 and finance the dollar costs of a technical assistance contract for a period of two years. The cost of this contract was estimated to be $95,000.

A decision in June 1966, was made to provide the project local currency requirements from piasters available in the Counterpart Special Funds. The piaster equivalent of U.S. $2,200,000, calculated at the current rate of exchange of V.N. $73.5 to U.S. $1 was approximately V.N. $162,000,000. The original agreement of May 9, 1966, approved the use of V.N. $20,000,000 and was amended on October 4, 1966 to increase the total approval to V.N. $162,000,000.

Local Currency Funding

USAID/VN Program and Financial Management Divisions encountered considerable difficulty in administrating and providing the required local currency. The cooperative's development and later construction by Force Account required thousands of financial transactions over an extended period of time. The responsibility for these transactions could not be delegated to non-USAID personnel and an adequate procedure was not developed.

Frequent changes in USAID and CORD personnel often disrupted the orderly and timely flow of currency to the cooperatives.

Local currency was provided under Trust Fund Allocation, Account Symbol 72F800, Special Fund CY 1966. The initial release, on June 30, 1966, of V.N. $20,000,000 was sufficient to meet project requirements until late in 1967. NRECA/VN's staff requested an additional V.N. $20,000,000 in October of 1967. An emergency advance was made on April 10, 1968, when it was apparent the cooperatives would have to close down their construction work on April 12th for lack of funds. Amendment #1 of the Special Fund Allocation was not issued until September 17th when the projects were again faced with financial difficulty.

USAID/VN's Electric Power Section, assisted by NRECA's staff, endeavored to avoid the repetition of this local currency problem but were not successful as similar situations developed on three later occasions and a fourth existed on June 30, 1970.

The March 7, 1966 Letter of Understanding stipulated that the GVN would provide V.N. $30,000,000 initial operating capital for the Pole Treating Plant. This amount was to be in addition to the V.N. $162.000,000 provided in the original Letter of Understanding for construction of the pilot projects and generating plant. USAID Electric Power staff and NRECA were unable to obtain the release of this operating capital. The USAID Contract Representative requested this amount be released from the amounts allocated to the cooperatives for construction in order to avoid closing the pole treating plant when it commenced its operations. Although the GVN reaffirmed its intent to provide the V.N. $30,000,000 in the Project Agreement of 1969, the funds had not been released on June 30, 1970. Failure to obtain these funds contributed to USAID's and the cooperative's local currency problem.

Many of the delays in the project's progress and in the development of a strong infrastructure can be attributed to this local currency financial problem. Normal accounting procedures by the cooperatives and the local currency section of USAID were complicated to the extent that a complete audit of all accounts will be required to properly distribute expenditures to the five portions of this project.

U.S. Dollars Funding

The administration of the dollar cost portion of this project's capital requirements proved to be less difficult than was the case of local currency costs. Contracts for technical services were funded and the contractors encountered no major difficulty in receiving progress payments. Some difficulty was

encountered in the funding of commodity requisitions. These problems were primarily a result of changes in Mission procedures, personnel, and the numerous changes required during the development and construction of the project.

In one instance, the change of Mission directives cancelled the acquisition of a heavy line construction truck for each of the pilot projects. Although the requisition for these trucks was funded two years later, the increased costs of production limited the acquisition to two units. It is now anticipated that delivery will not occur prior to mid-1972. The cooperatives could have completed more line at considerably less expense using this new equipment. The same directive delayed the acquisition of a large pole handling fork lift for the pole treating plant. Another directive prevented the purchase of much needed two-way radio equipment.

Changes in project requirements resulted when vital pole treating plant equipment was lost or damaged and serious delays occurred when requisitions could not be funded until July 1 of the following year. The same funding problem delayed for two years the acquisition of emergency generating equipment for the Tuyen Duc Project, thereby preventing service to over 3,000 members of this cooperative. Neither the loss or damage to the PTP equipment, nor the loss of the Da Nhim hydro-electric plant could have been anticipated.

On several occasions, material orders could not be cancelled and locally available excess military stock could not be purchased at considerable savings to USAID and the cooperatives. The project was unable to reorder correct material after GSA had substituted unusable material, even though sufficient funds remained in the purchase document to pay for the needed material. Unused balances remaining in purchase documents when material orders were cancelled could not be transferred to other requisitions requiring additional funding.

The funding problem encountered throughout this project's history required a much larger portion of NRECA personnel time than could have been anticipated.

Many of the problems would not have existed had a Project Agreement been executed early in the program rather than in its third and fourth year.

PARTICIPANT TRAINING IN THE U.S.

A Rural Electric Cooperative Training Program was held in the United States in early 1966. USAID made arrangements for six of the individuals interested in and associated with the Vietnam Rural Electric Cooperative Program to

participate in this training program. Two interpreters from USAID's staff accompanied the trainees to the United States in April of 1966.

Three of the trainees were employees of the central government, and three were directors of the newly formed cooperative organization. One of the interpreters was then assisting the NRECA team in Vietnam.

The trainees studied the operations of the Rural Electrification Administration and NRECA in Washington, attended short courses in the development of cooperatives, visited the TVA project, and spent a few days in several rural electric cooperatives observing the operations of the rural utility systems.

The participants returned to Vietnam in mid-July, and to a great extent, applied the knowledge gained on this training trip to developing Vietnamese rural electric cooperatives.

A brief resume of each of the participant's activity in the project follows:

Tran Viet Yen, Director of the Directorate of Cooperatives remained in this position until late in 1969, when he entered the military service. He supported the program throughout this period.

Tran Duc Khye, Head of Cooperative Service, Long An Province, was reassigned to An Giang Province in order to assist the An Giang Electric Cooperative. He later was advanced to the position of supervising several of the provincial cooperative advisors located in the delta area of Vietnam, the position he holds at the present time.

Pham Duy Su, Engineer for Electricity of Vietnam, assigned to the NRECA staff, remained in this position until December 1966, when he was commissioned in the Army of Vietnam.

Phung Gi Hinh, Vice President, An Giang Rural Electric Cooperative, served later as Acting Manager of the Cooperative and at the present time is the President of Vietnam's National Union of Electric Cooperatives.

Nguyen Nhoc Ba, Treasurer, An Giang Rural Electric Cooperative, has retained an active position on the Board of Directors of the cooperative.

Pham Van Thuong, Duc Tu Rural Electric Cooperative, was active in the cooperative for approximately two years, resigned and present activity is unknown.

Miss Tran Thi Xuan, Interpreter and NRECA Staff Assistant, remained in this position and served concurrently as Acting Manager of the An Giang Cooperative. Miss Xuan received a leave of absence and returned to the United States to further her education in languages. She was later employed by the U.S. Army as a language instructor in El Paso, Texas.

Nguyen Van Sang, Interpreter USAID, returned to his prior position with the Mission. Present activity unknown.

It was originally planned that additional Vietnamese Government officials, directors of the cooperative boards, and key management employees would participate in later training courses; however the limited number of qualified personnel who could attend a training program were also most necessary to the development of the cooperative systems, and could not be made available for foreign training.

NRECA would recommend that Mr. Tran Kim Suoi, Assistant Manager of the An Giang Rural Electric Cooperative, Mr. Phan Van Tri, General Manager of the National Union of Electric Cooperatives, Mr. Nguyen Van Phuong and Mr. Le Cong Trang at the An Giang Cooperative and the new managers of the Tuyen Duc Electric Cooperative and Duc Tu Cooperative be given the opportunity to participate in future United States Training Programs for rural electric cooperative personnel.

PROCUREMENT

United States

Material and equipment procurement proved slow and time consuming. PA/PR's and PIO/C's were prepared and approved by the Public Works Division but often required many months to clear the Mission. Delivery on most items ran from 275 to 500 days following receipt by GSA of the Mission requisition or procurement document. Delivery of commodities on the initial order covered a period of from 9 months to 25 months after the purchase documents were issued by the Mission. Line trucks were received 22 months after issuance of the procurement document. Items obtained through proprietary purchase procedures were received in 3 to 6 months following issue of the procurement documents.

Materials received were, with only minor exceptions, as ordered. Substitutions made from Government stocks were usually not of the quality requested and several items were found not to be satisfactory equivalents. Where unsatisfactory and unusable substitutions were made, it was impossible to reorder necessary replacements under the original

purchase documents even though sufficient funding was available in the PIO/C to cover the additional cost. Reordering under a new PIO/C in one instance resulted in an original procurement document date to actual material receipt at over three years. Receipt of materials were not balanced and it was impossible to proceed with construction in the most economical manner.

The failure of the engineer to provide accurate estimates of material requirements handicapped USAID and NRECA in initiating timely procurement of necessary equipment and hardware. The majority of early purchases were made through GSA. These were made particularly accurate and faster by the direct communications available once each week via teletype from Saigon to San Francisco. The majority of later purchase orders were placed through the GVN Central Purchasing Authority. It is believed that this procedure lengthened the delivery date by 60 to 90 days, as additional review and evaluation procedures were required by the Authority. Future cooperative material and equipment orders will be processed by this GVN Agency.

Local

Service drop wire was purchased through competitive bidding from local manufacturers. Specifications for a No. 8 copper equivalent aluminum duplex wire were prepared. Two Saigon companies were requested to submit quotations and samples for inspection. Both companies were found to be qualified to produce the conductor using three strands aluminum wire with a high density polyethylene insulation with the insulated cable spiraled around the three strand twisted bare aluminum neutral conductor.

Initial orders were placed with both companies for approximately 60% of project requirements. Original quotations were approximately 12.75 V.N.$ per meter. A later order was placed at 20 VN$ per meter. Early in 1970, a request for quotations revealed both companies had increased their price to over 50 VN$ per meter and that the import of electrical conductor had been stopped by the Ministry of Economy. Fortunately, the project was able to purchase some U.S. Military excess No. 6, copper equivalent, aluminum duplex wire for approximately 18 VN$ per meter.

Entrance cable was similarly designed, produced and purchased at competitive prices to imported cable. Prices on later inquiries followed the same cost increase pattern. Arrangements were made to encapsulate surplus military copper wire with high density polyethylene

insulation, and a lower cost was achieved. Service connectors were required prior to the receipt of U.S. ordered connectors. A locally produced porcelain insulated sleeve and set screw connector was purchased at approximately 12 VN$ each.

Meter mounting boards were produced locally and were used when a special designed porcelain meter mounting box tripled in price in less than one year.

Some items of line hardware, including crossarm braces, lag screws, carriage bolts and service masts, were locally procured. Cost of these items exceeded that of the identical imported product by over 100% when no import duty was charged.

Other

Electric watt hour meters were purchased from Korea and Taiwan. These meters were found to be reasonably accurate and cost approximately one seventh as much as the equivalent size U.S. meter. Some failures can be expected in the first 24 months of operations due to faulty case seals and in failures of the register gear trains. The lower initial cost offsets these disadvantages. Three phase meters suitable for use on grounded Y systems were not produced by either country at the time project requirements were ordered. The larger 3Ø power loads should justify the higher cost of U.S. meters.

MATERIAL

Handling

Originally USOM/VN contemplated that all materials would be received in Saigon by the USOM Logistics Division, accumulated in USOM operated warehouses and upon request of NRECA's chief engineer, shipped by USOM Logistics to the cooperative job sites.

However, when materials started to arrive in mid-1966, USAID did not have warehousing space and could not adequately handle the material receipt. The USAID Chief of Public Works did not desire the material to be stored with materials belonging to EOV. Further, he felt storage of project material with other USAID commodities would result in many items being lost. It was, therefore, decided that NRECA should locate and rent a separate warehouse for USAID to store the material until it was ready for shipment to the project areas. In order to receive and disburse the material, a PIO/T and contract was to be written to obtain a contractor for this purpose.

Space was obtained in the National Federation of Cooperative Association's (NFACA) Cong Dong warehouse and contract negotiations were entered into with Hubeck, Inc. The first materials were then being off loaded and the USAID Contract Service Office, anticipating no difficulty in approving a contract based upon the Hubeck proposal, agreed to make the contract retroactive to the earliest date. Hubeck's service could be utilized. The contract was ready for signature two and one-half months after the contractor commenced warehousing operations. The contractor refused to sign the contract as his proposal had failed to indicate his fee was based on a per month charge rather than for the 9 month term of the contract. A satisfactory settlement was negotiated and the contractor's chief employee was released by the contractor to work for USAID on the cooperative project.

USAID's Personnel Division was unable to employ quickly the warehouseman due to his third country national status, and as a temporary measure, he was paid from project funds. This temporary measure, and later the rental of the warehouse became permanent. Supervision of the warehousing activity remained with the Mission and NRECA was charged with the responsibility of maintaining proper warehousing control.

At a later date USAID attempted to change this responsibility by including it in the Lyon Associates Engineering Contract. Considering the volume of work already accomplished, the inability of the engineering firm's Vietnamese employees to enter and search various AID warehouses for materials that had been misshipped, and the higher cost of this service through the engineering firm (their proposal was based on using the same warehouseman and adding their overhead charges), it was the Electric Power Division's decision not to use Lyon Associates, and to continue directing the central warehousing in the same manner it perviously was accomplished. Although this responsibility was not turned over to NUEC, payment of salary and expenses were made through cash disbursement vouchers drawn by that organization's Saigon office. The PIO/T and Lyon Associates monies were later transferred to fund the extension of the major line engineering contract.

Disbursement of materials to the cooperative's warehouse was at all times handicapped by Lyon Associates inability to provide accurate estimates of quantities of material required for each project. In order to prevent a surplus of material on one project and a shortage on the others, it was necessary to make smaller unit shipments and retain a substantial amount of each item in the Saigon warehouse with distribution on an as-needed basis. This procedure also diminished the greater possibility of pilferage losses in the less secure field warehouses.

Every method of in-country material movement was employed in the material distribution to the cooperative job sites. Tons of hardware, transformers, conductors, meters and poles were airlifted to the Tuyen Duc Project by U.S. military cargo flights. Barges rented with project funds moved materials, poles and equipment to An Giang Province. A trucking contract was negotiated to haul materials to all three cooperative sites whenever highway security permitted, and payment was again made from project funds through NUEC. Military LST's were used for the coastal water deliveries to Cam Ranh, from Cam Ranh to Phan Rang, and for deliveries up the Mekong and Bassack Rivers to the An Giang Province. Small deliveries were occasionally made by bus and Air America carrier planes. An Giang and Duc Tu used cooperative owned flat bed trucks to move part of their materials from the central warehouse to their projects.

Future Local Production

Many items of material and equipment required by electrical distribution systems could be produced economically and competitively in Vietnam. Development of these industries will expedite the electrification of the entire country.

High density insulators can be manufactured from the procelain clays found in many sections of Vietnam. Feldspar and other glazing materials are also part of Vietnam's abundant natural resources. Clay grinding, compressing equipment and forms appear to be the major items of additional equipment that will be required.

A number of Saigon-Cholon factories are producing metal products molded and formed in shapes similar to the normal hardware used by electrical utilities. Only the installation of galvanizing equipment would be required to produce satisfactory hardware.

The Vietnam Power Company's officials have indicated that VPC will, in the near future, install a transformer manufacturing plant and a watt hour meter plant.

The existing Vietnam wire manufacturers are presently using plastic pellets for insulating wire. The addition of pressure molding machinery would allow these companies to produce many plastic items required for secondary and service installation.

Seen in front of the NRECA office in Washington, D.C., is the NRECA's first Survey Team with Clyde T. Ellis, General Manager and Tom Venables, Coordinator, International Programs Division. From left: R. Powers Luse, Lyle M. Robinson, Jerry A. Anderson, Charles Ham, Dean Searles and Hubert L. Bush. April 1965.

TASK ORDER NO. 40

Project Feasibility

Mr. Ellis and Dr. Venables returned to Washington and with AID/W developed Task Order No. 40, covering the Mission's requirements.

The six-man team was selected, briefed by NRECA and AID/W and arrived in Vietnam on April 17, 1965.

This team first determined that a number of areas existed in Vietnam where security was adequate for a system to be organized, built and operated, that these systems could have the scope and impact desired by the Governments of Vietnam and the United States, that economic feasibility appeared to vary from fair to good.

The team proceeded with the Phase II requirements. With the assistance of USOM's Cooperative Section, the GVN Directorate of Cooperatives, and the Director of the Vietnam Cooperative Research and Training Center, it was determined that there existed a cooperative law under which electric cooperatives could be organized, a decree which enumerates and details the steps to be taken in organizing a cooperative, and the procedure necessary to obtain the required license.

A model Rural Electric Cooperative By-Laws were developed, acceptable to the Government of Vietnam and USOM.

Temporary procedural responsibilities of various Government of Vietnam ministries were developed to carry out the pilot project.

The Ministry of Public Works, through its agency, Electricity of Vietnam, would act in the position of Project Manager. All capital funds were to be administered by EOV.

The Ministry of Rural Affairs, through its Directorate of Cooperatives, would assume certain technical, legal and administrative control functions. The establishment of a revolving fund to receive the cooperative's loan repayment, and to make loans, at a later date, to the existing and future cooperatives, was mutually agreed to by appropriate GVN officials and USOM.

An Giang and Tuyen Duc Cooperatives were organized June 28 and June 21, respectively, and became corporate entities. Boards of Directors were elected and monthly board meetings were started. This

action was not taken in the case of Khanh Hoa or Bien Hoa pending a decision by the GVN and USOM as to which cooperative should be included in the three pilot projects.

Team members working in Tuyen Duc Province observed the extensive forests of pine trees appearing to be similar to the Southern Yellow Pine of the United States. Further investigation revealed a widespread need for treated utility poles and other chemically preserved timber existing in Vietnam. The team suggested to USAID, that the installation of a wood preserving treating plant would provide poles for the cooperatives. The Mission Director then requested that a wood treatment and timber specialist make an in-country study of the forest woods and if they were found to be suitable for treatment, to make recommendations concerning the type and cost of a treating plant.

Initial plans were formulated for member education training schools, for cooperative Board of Directors development courses, and for training the future cooperative personnel.

Studies were made to determine the potential use of electrical appliances and motor driven machinery. Recommendations were also formulated for home-wiring. This concluded the Phase II aspect of the Task Order on June 30, 1965.

On the basis of the findings of the Phase I and II Studies, the team proceded with the Phase III, Engineering and Feasibility Analysis for the proposed An Giang and Tuyen Duc and Khanh Hoa projects. A brief analysis was also prepared for the alternate Bien Hoa project.

The Engineering and Feasibility Analysis reveal that:

1. The Tuyen Duc, An Giang and Bien Hoa distribution systems could be constructed under conditions existing (mid-1965) in Vietnam.

2. The Khanh Hoa project would have to be limited to the area adjacent to Nha Trang due to security conditions.

3. EOV's power supply in Tuyen Duc Province was adequate for all electrical requirements of that part of Vietnam and it would only be necessary to construct a 1500 KVA 31/15KV sub-station to serve that cooperative.

4. EOV's power supply in Bien Hoa Province was adequate and a 15 KV bay was available in EOV's Dong Nai sub-station to serve the cooperative.

5. A contract with the French owned company SIPEA would have to be negotiated that this company would be willing to negotiate such a contract, that SIPEA would increase their Nha Trang plant capacity 5000 KW on or before March 1966, and would at that time have sufficient capacity to serve the proposed cooperative.

6. It would be necessary to provide a 2500 KW diesel electric power plant to serve the An Giang Rural Electric Cooperative as a portion of this project. This plant would be owned and operated by EOV upon its completion.

7. The Tuyen Duc Project should, by the end of the fifth year following the date of energization, be on a sound financial basis.

8. The An Giang Project should, by the end of the fourth year following the date of energization, be on a sound financial basis.

9. The Khanh Hoa Project should, by the end of the fourth year following the date of energization, be on a sound financial basis.

10. The Bien Hoa Project should, by the end of its third year of operation, be on a sound financial basis.

11. The primary lines would be 8.7/15 KV and the secondary 220/330 V, and the distribution system would be designed by REA standards.

12. The service drop wire, entrance cable and service mast would be purchased from local Vietnamese manufacturers, metering equipment from Asian manufacturers, and all other material from U.S. sources.

13. The total budget for capital expenditures on distribution systems, sub-stations and the An Giang Power Plant would be approximately $4,300,000 U.S. and that USAID/NRECA costs of technical assistance would not be included as a portion of this cost.

The urgency and "crash program" aspect of this project necessitated the use of certain assumptions by the Team and by the Mission's technical staff. Although these assumptions were based on the best data

available at that time, changes in the Vietnam War conditions and war economy often resulted in major revision of the Phase III Study.

A PIO/T was prepared and a PASA Agreement with USDA-REA was developed to implement the requested wood treating plant study. Mr. James Taylor arrived in Vietnam on June 28, 1965, and completed his study August 1. He recommended that a pole-treating plant be immediately established.

NRECA staffing during Phase I, II and III Studies:

	Principally Work On Phase: I	II	III	Position	Arrival Vietnam	Depart Vietnam
J.L. Anderson	X	X		Law and Organization	4/17/65	7/65
H.L. Bush	X		X	Engineering & Application	4/17/65	8/5/65
C.E. Ham	X		X	Engineering & Application	4/17/65	7/65
R.P. Luse	X	X	X	Team Leader	4/17/65	TDY/W 7/65
L.M. Robinson	X		X	Engineer	4/17/65	6/65
D.L. Searls	X	X		Utilization & Organization	4/17/65	7/65

This completed the Phase III portion of Task Order No. 40, on July 10, 1965.

Interim Period Phase III - Phase IV
August 1 - December 31, 1965

The Phase III Study was completed in late July 1965. The Mission Director desired that project development work be continued during the period required for USOM to develop the Phase IV Construction PIO/T and negotiate a contract with NRECA for technical assistance. Additional funding for this interim period was made available. Mr. Powers Luse, Team Leader; Mr. Charles Moore, Country Engineer; Mr. Vesta Orr, and later Mr. Johnny Ammons filled the NRECA Temporary Team positions during this period.

The Mission decided not to proceed with a project in Khanh Hoa Province due to lack of security but to develop the project located in Duc Tu District of Bien Hoa Province as the third pilot project. In accordance with this decision, the Team organized the Duc Tu Rural Electric Cooperative. This cooperative became a legal entity on December 8, 1965.

A Letter of Understanding (LOU) between the Governments of the Republic of Vietnam and the United States was signed by the USOM Director on October 15, 1965, and approved by the GVN Minister of Economy and Finance on November 19, 1965. This basic agreement provided that the United States would provide funds for all foreign exchange costs of the distribution facilities associated with the development of the three pilot rural electric cooperatives, the construction of a 2500 KW generating plant at Long Xuyen, and provide the technical services to assist the cooperatives in the organization, construction and purchase of distribution and generating facilities. USOM also agreed to furnish the local piaster costs associated with the construction of distribution facilities and the generating plant. The dollars required to purchase piasters were estimated to be $2,200,000 and the estimated total cost of the project would be $5,000,000.

This LOU established also initial agreements needed to get the rural electric cooperative program under way. Many additional details were left to be worked out subject to discussions between representatives of the GVN, the cooperatives and the NRECA Advisory Team.

During the interim period, PIO/T 430-295-3-60163, providing for the technical service of the NRECA Team on the Phase IV was developed. Task Order #46, under Contract No. AID/csd-225 was not, however, executed until March 13, 1966. This Task Order was made retroactive to December 31, 1965.

The Mission Director approved the Jim Taylor pole treating plant report on September 11, and implementation of this project by the Mission and NRECA personnel started immediately.

PAPR's were prepared for the initial line hardware order, watt hour meters, the 2500 KW generating plant, and the pole treating plant. A PIO/T was prepared for operating and management specialists to train the employees of the pole treating plant. The National Union of Electric Cooperatives, the national service organization for the electric cooperatives, was organized in October and licensed by the GVN on December 15, 1965.

The Mission and NRECA Team, in order to expedite construction, decided to start staking the main line of Tuyen Duc's electric system from Don Duong sub-station to the Fimnon area, a distance of 27 kilometers. A contract with the Thai-American Engineering Company was negotiated to perform this work.

TASK ORDER No. 46
January 1, 1966 - June 30, 1968
PIO/T 430-295-3-60163

Project Implementation

This Task Order was executed on March 18, 1966, and made retroactive to December 30, 1965. The objective of this Task Order was to implement the recommendations and plans developed by NRECA under Task Order #40. The scope of work included the supervision of construction and training in management of cooperative facilities. Twenty-nine specific areas of responsibility were listed; seven of these were concerned with the development and construction of a sound physical plant; the remaining 22 were concerned with the development of an infrastructure that would enable the Vietnamese to operate and manage the completed system.

To accomplish these specific objectives, NRECA was authorized eight field positions, consisting of a Team Leader and a Chief Engineer, plus a Project Coordinator and Project Engineer/Assistant Coordinator for each system. In addition, provision was made for two management instructors for up to a total of 120 man-days to provide special instruction at the Research and Training Center in Vietnam, but these were never called forward by USAID.

The Task Order authorized manpower appropriate to the responsibilities described under the scope of work. AID, USAID and NRECA concurred in holding staffing to less than the maximum authorized during the time delays in delivery of material for construction and the lack of staff of the cooperatives held project activity and opportunity for staff training well below anticipated levels.

Task Order No. 46 provided 29 specific points under the scope of work, and in addition provided that additional work and/or services might be required as agreed between the Director of the Mission or his representative, and the Team Leader.

Under the latter provision, the NRECA Team provided many services and performed many duties contributing to the overall objectives of the

program but assigned to them only because of the urgency of the work and the lack of qualified USAID technicians or other contractors normally performing those functions. The Team at all times endeavored to fulfill the requests for extra activities, recognizing that at times it was necessarily at the expense of work described specifically in the Task Order, and also that at times the project could not have continued without this special help.

During the term of this Task Order, the NRECA Team strength in Vietnam varied from a minimum of three men to a maximum of six. The average on board was four and one-third men.

TASK ORDER NO. 8
August 15, 1968 - June 30; 1970
PIO/T 730-357-3-8130309

Project Continuation

Task Order No. 8 superceded Task Order No. 46 and provided for the continuation of the contractor's assistance to USAID and the GVN, but at the same time, reduced the NRECA Team strength limit to four men plus certain short term specialists during the period when activity on the project reached its peak.

The objectives of this Task Order limited the services required of the Team to the three pilot projects previously established under Task Order No. 46.

The scope of work of Task Order No. 8 was modified significantly from the scope of work in Task Order No. 46, and provided a greater emphasis on institutional development and training, and a more advisory type of supervision in other activities than the previous more direct supervision.

Less than the proposed and anticipated assistance from others to the construction effort during this period of maximum construction and training activity proved to be a determining factor in the proportion of time and effort of long term specialists available to the maximum training efforts scheduled to coincide with beginning of system operations.

The services of four professional consultants and advisors with specific professional level skills in management and administration, consumer services and power use programs, and in accounting and office procedures were provided to the program for a total of 7 man-months during

the final four months of the Task Order assignment as system personnel moved into full application of these skills with the advent of utility operations.

Under Task Order #3, training and guidance was provided in institutional development, guidance was given to boards of directors in administrative management, including policy development, understanding of basic responsibilities, and in proper delegation and controls.

Managers and key staff personnel were given training and guidance in all of the basic techniques of planning, organizing, directing, coordinating and controlling. Direction and assistance was provided in establishing appropriate operating and personnel policies and in establishing standards for quality of service and staff performance.

Accountants, bookkeepers, billing clerks and meter readers were given training and assistance in accepted accounting and record keeping procedures with appropriate checks and controls. Special attention was directed to handling and accounting for all cash income and disbursement, adequate consumer ledger accounts, establishing proper plant accounts and depreciation schedules, work order accounting procedures, use of journal entries, check registers, etc.

Technical and operation personnel were shown the need for and the application of sound construction standards and safety standards and trained in construction, operation and maintenance procedures and practices, both by class type instruction and by on-the-line example.

All management, office and operating personnel were indoctrinated to the need to assist the consumer in effective and productive application of electric power and energy to help him increase production and income as well as improve his standard of living. Personnel charged specifically with carrying out the consumer service function were given guidance in developing and implementing practical and effective consumer programs.

Completion of all proposed assistance by NRECA Specialists under Task Order No. 8 was restricted by the failure of the consulting engineers to complete their assignment in staking scheduled lines and completing accurate staking sheets and tabulations of lines and equipment actually installed.

Limited supervision of construction by the consulting engineer and the problems associated with effectively regulating the activities of the cooperatives own force account crews also resulted in more than normal clean-up and correction work after construction.

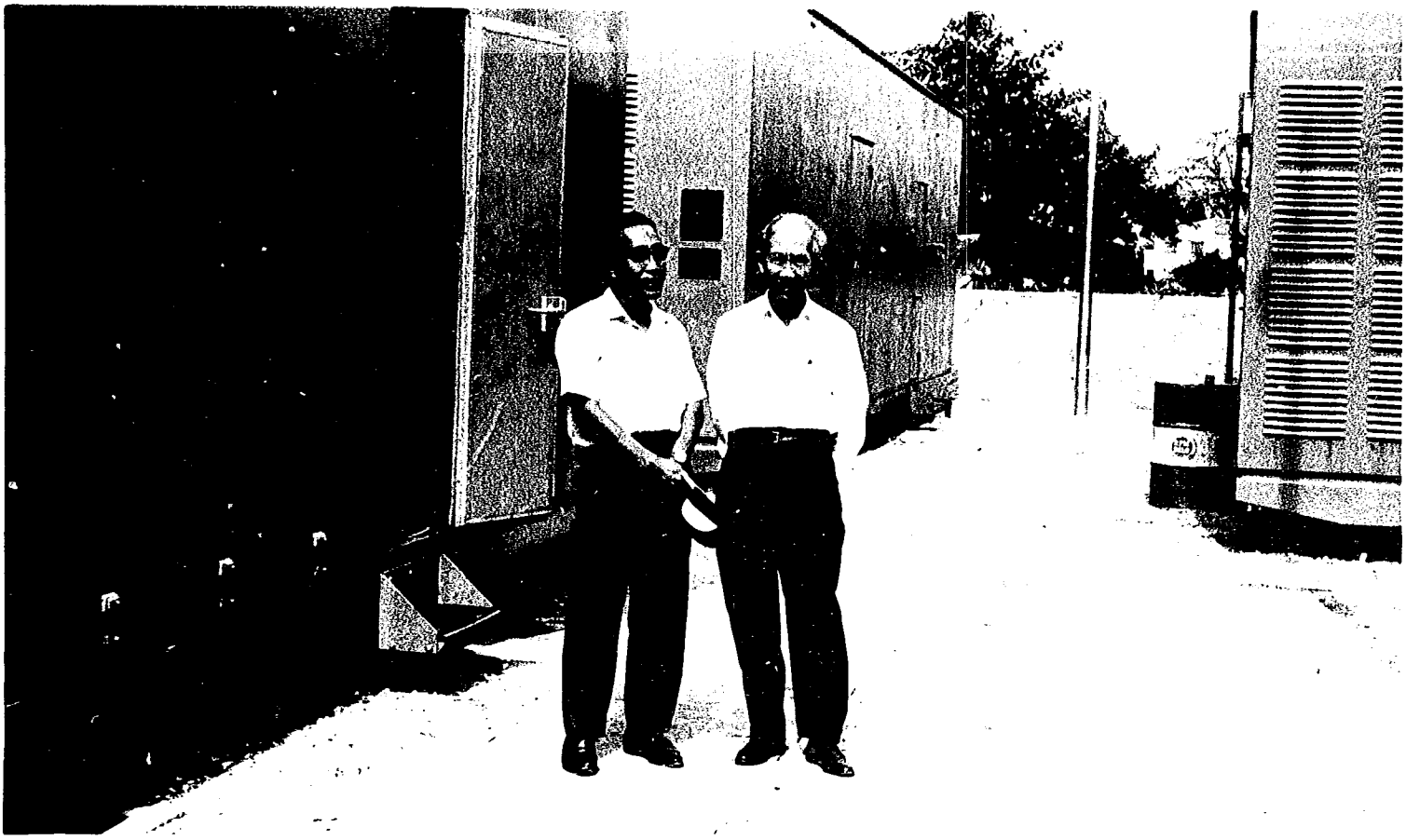
Approximately 35% of all physical plant construction was accomplished during the term of Task Order No. 8 by force account crews trained by NRECA Specialists.

Generally, full team strength was maintained by the contractor throughout the term of the contract, including authorized short term specialists.

Typical three-phase main line construction on Vietnam's Cooperative Rural Electric Systems.

AN GIANG

RURAL ELECTRIC COOPERATIVE



An Giang Rural Electric Cooperative's Manager Huynh Van Chuan and Board of Directors President Vo Van Tan at the generating plant which serves the cooperative system at Long Xuyen.

CHAPTER II

AN GIANG RURAL ELECTRIC COOPERATIVE

Background

The An Giang Rural Electric Cooperative is located in the Mekong River Delta, 150 kilometers west by southwest of Saigon. The franchise area of the cooperative includes that portion of An Giang Province which is located south and west of the Bassack River, and outside of the limits of the city of Long Xuyen on National Road #19.

This cooperative is the largest of the three pilot projects to be created by the Vietnam Electric Cooperative Program. The cooperative was organized on June 29, 1965, and licensed by the Government of Vietnam in December of 1965. The project was incorporated to serve 65 named villages with a potential membership of 22,000 residences and 2,000 small stores and cottage-type industries, public buildings, rice mills, and medium sized industrial enterprises.

The cooperative conducted a membership drive over the entire area of their franchise and by mid-1966 had received over 7,000 paid applications for membership.

Construction schedules were arranged to develop the electric system as a part of the GVN-USAID An Giang Province High Priority Program. The area between Long Xuyen and Thot Not included several USAID/CORDS special development projects, and the cooperative was asked to start building lines to serve these projects.

Lyon Associates, an engineering firm, had been contracted by USAID to provide the cooperative's required engineering services. This firm started aerial photographic procedures in July and on October 1, commenced staking pole locations for the primary and secondary lines located near Long Xuyen.

In mid-November, 1,200 wood poles of varying lengths were borrowed from the U.S. Army. These poles and a small part of the material items required for construction were shipped by barge to Long Xuyen.

Construction of secondary lines were undertaken by force account to provide on the job training of the cooperative's field personnel, and to provide physical evidence to the membership that the cooperative's board of directors were doing everything possible to speed up the electrification program.

The cooperative employed their first construction workmen and NRECA advisors trained these men to do the construction work. It soon became evident that with sufficient material the lines could be built by force account at a much lower cost than by an American contractor, and the same amount of training time would be required if a Vietnamese contractor should be employed. Neither an American or Vietnamese contractor could start until all of the material was readily available.

The board of directors decision to complete the system by the force account method was approved by the GVN Project Manager and by USAID.

The construction crews were enlarged and construction of primary lines, as well as secondary, was undertaken. Construction proceeded throughout 1968, and the rate of progress increased as the personnel received additional on the job training and became experienced in their work.

Delaying factors in the construction were: repetitive breakdown of the excess property trucks, lack of some material not yet received in Vietnam, frequently encountered engineering errors in field design, and an intermittant flow of construction funds.

The responsibility for supervision of the construction crews were gradually shifted from the NRECA advisors to the cooperative's excellent assistant manager.

On January 30, 1969, the An Giang Power Plant was placed in full operation. This action provided electric service to the first 400 members of the cooperative. Additional watt hour meters were rapidly installed along the secondary lines completed in 1968.

Major construction work continued throughout 1969 on the completion of Feeder #1 (Long Xuyen-Thot Not) and on Feeder #2 (west along the Long Xuyen River). The cooperative crews connected an average of 164 new members each week during the year. The cooperative was serving 8,535 members on December 31, 1969.

Construction funds for An Giang Cooperative were depleted late in December of 1969, as the additional funding provided by the June 30, 1969 Project Agreement had not been released by USAID. In order to continue construction, the board of directors decided to use the membership funds and the small amount of net revenues they had accumulated for construction purposes. This self-financing was only sufficient to continue construction into mid-February. The cooperative was then reluctantly forced to release 75% of its trained construction workers.

USAID, anticipating further delay in the release of funds, on April 1, 1970, advanced 15,000,000 piasters for construction purposes. Although An Giang Cooperative's share of this advance was hardly sufficient to cover the prior expenditure of membership funds, the board again decided to use this money for construction. The cooperative experienced some difficulty in rehiring the trained construction workers and were unable to regain the rate of progress developed earlier.

Although the engineers final tabulation of staking sheets was not completed at the end of the NRECA and Lyon Contract, An Giang and NRECA records indicate the cooperative had completed 96% of the kilometers of line allowed in the PIO/T and connected over 9,800 of the 13,131 members. Primary and secondary lines are completed to serve an estimated additional 3,000 members.

Financial Summary

An Giang Rural Electric Cooperative
Cost Analysis to March 31, 1970

U.S. DOLLAR COSTS

Engineering - Lyon Associates	$ 164,643.50
Material and Equipment	492,509.78
TOTAL U.S. $ COST:	$ 657,153.28
Converted to V.N.$ at 60 to 1 U.S.$	$51,714,126.00

LOCAL CURRENCY COSTS

Engineering - Lyon Associates	$ 7,062,793
Local Material	5,222,116
Poles	6,042,116*
Labor and Supervision	13,874,501
Gas, Oil and Repairs	1,132,298
Expendable Tools	304,492
Stores and Transport	5,178,228
Misc. Construction Cost	295,716
Pre-Survey	300
Clearing Account	18,265
Office Supplies	75,014
Office Expenses (184.23)	401,500
Office Equipment	167,863
Office Salary	2,169,377
Office Expenses (GA-2)	200,636
Board Expenses	284,494
Miscellaneous	805,383
	$30,950,183
Non-Distributed Cost (Regional CDR - First Quarter 1970)	$ 4,340,220
TOTAL V.N.$ COST:	$87,004,529

Some items of equipment and material on order have not arrived or actual costs have not been received by USAID/VN at the time of this report. The above calculations are as accurate as available data allowed but cannot be considered to be either exact or final.

* Cooperative owes NUEC for pole cost of V.N.$3,912,215.

Board Development

The majority of the current board members of An Giang Electric Cooperative started their training in electric cooperative directorship by attending the NRECA conducted school held in Vietnam's Cooperative Research and Development Center.

Since that school was held in 1965, these directors have received formal and informal training in those skills required for the director to best serve the interests of the entire cooperative membership.

A large part of the training given these directors consisted primarily of the NRECA advisor working closely with the board members during their board meetings, field inspection trips, committee meetings and in preparation for their membership meetings. The advisor also assisted invividual board members whenever a director appeared to have difficulties in understanding the need for specific management action.

This method of administrative board development was usually quite successful and in the case of An Giang Cooperative provided the board members with the concepts that are unique to rural electric cooperatives.

The training conducted in this manner and in the office of the cooperative appeared to offer several advantages over a more formal classroom presentation.

All of the cooperative's directors were given an equal amount and kind of training, rather than the same few individuals who had the time, financial ability, and were not deterred by the necessity of travel and stay in places they believed less safe than Long Xuyen.

The directors in their own meetings were able to develop Vietnamese concepts that effectively paralleled the new and often strange foreign rules of action or conduct they were being asked to adopt.

Advice and suggestions made by the project advisor were directly related to the specific and timely interests of the director. For problems that required decision - advice was given which helped the director make that decision.

The An Giang directors occasionally failed to recognize the depth and extent of knowledge they acquired by this informal advisor-board member training procedure and were inclined to prefer the more formal classroom approach in Saigon, even though many of their fellow directors could not have equal training.

A program for training committee members was developed by the NRECA staff. This training was specifically designed to give detailed instruction in direct management of the cooperative having a weak management staff. Although this condition did not exist in the An Giang Cooperative, the entire membership of the Operations and Financial Committees attended the 1970 Committee Training Classes held in Saigon.

Regular and special board meetings are presently conducted in a business-like manner, and all of the directors participate in board discussions and in the decisions of the board. The decisions are seldom unanimous, however, all directors abide by the decision.

The board of directors conduct the cooperative's business in accordance with the laws of Vietnam and for the most part, adhere closely to the basic cooperative philosophy.

Relationships of the board of directors with the key management personnel, the employees, and the membership is very good. The board of directors are aware of the unique position the cooperative holds in developing a better understanding of democratic principles among rural Vietnamese, and recent board minutes reveal that they are taking action to assist the provincial and central Government's efforts to promote the participation of all Vietnamese in their Government affairs.

Until recently, the board of directors was primarily interested in the development of the physical plant of the cooperative and was less responsive to the NRECA's advisors training in developing broad board policies, proper board delegations and controls than they were in the technical training. The board of directors is hesitant to make necessary delegations to the management and in establishing board policies to guide the manager. It is probable that the board of directors will take greater interest in these areas of good board action now that a sizable percentage of their membership is receiving electricity.

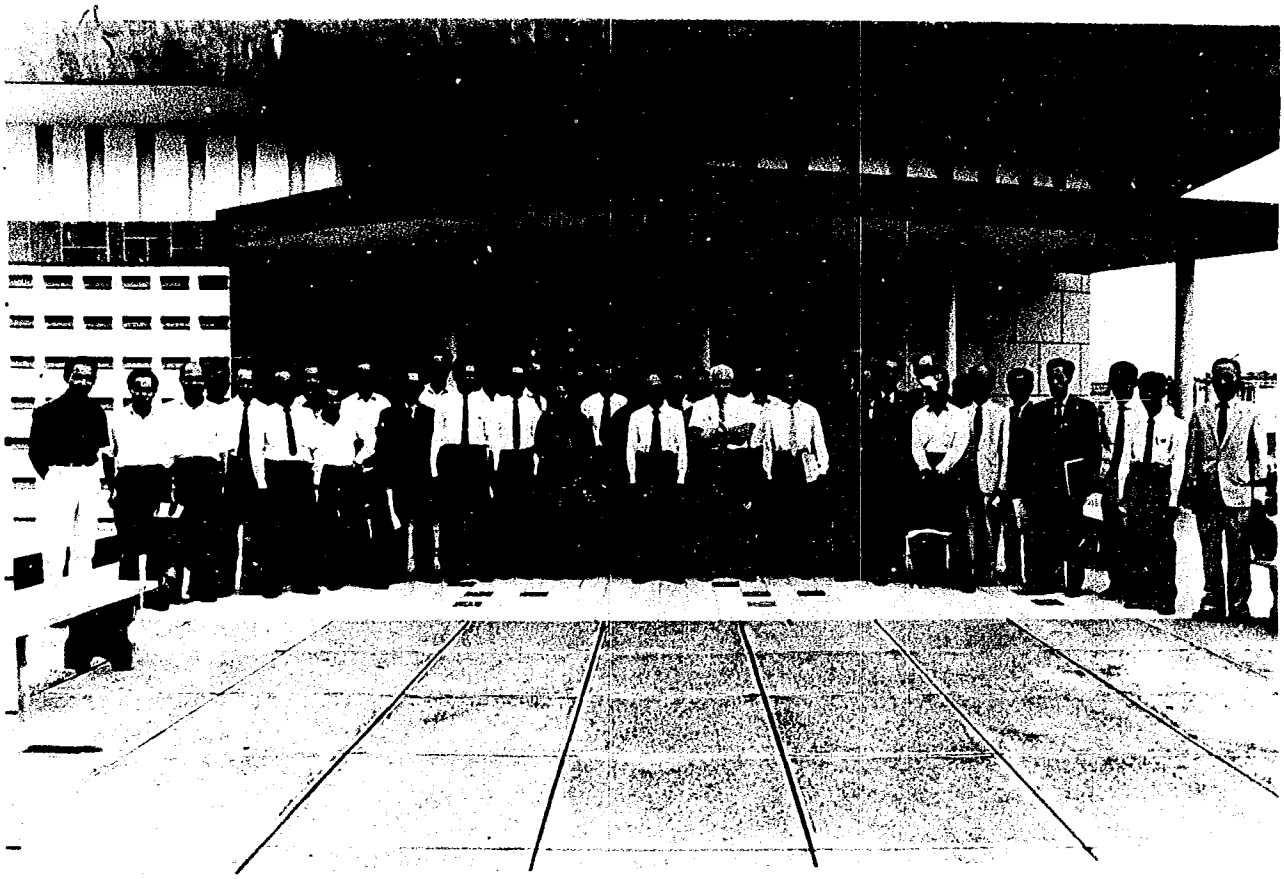
The board of directors of An Giang Electric Cooperative are capable men who, with occasional guidance, will be able to conduct the affairs of the cooperative to best serve the interest of its membership.

Training - Management and Key Staff

The board of directors of this cooperative w e quite reluctant to employ a manager until line construction work was initiated, relying instead on the NRECA advisor or a member of NRECA/VN's Vietnamese staff to serve in this capacity. On February 1, 1967, one of the directors of the cooperative was appointed acting manager and served in this capacity until July 1967. The board of directors on October 1, 1967, hired their present manager. This individual is extremely well qualified by having served for over 12 years as a cooperative Management Advisor in the Government of Vietnam's Directorate of Cooperatives. He participated in a cooperative management training course held in the United States. This training included a visit to one of the United States Rural Electric Cooperatives. He frequently applied the knowledge and techniques acquired during this visit to the management of the An Giang Cooperative.

Training of this manager consisted primarily of a day-to-day consultation and advice in areas where management of an electric cooperative differs from that of other farm cooperatives.

In all areas of management where he has proper authority and responsibility he has proven to be an excellent manager. His relationship with the board of directors, the employees, and the membership are uniformly good. He delegates responsibility and the necessary authorities to the cooperative's staff members, and maintains adequate controls to insure that the work is accomplished. He displays competence in the organization and coordination of the various departments of the cooperative. The manager is handicapped to some degree by not having been delegated the full responsibility for management of the cooperative, and by not having proper board policies to use as guidelines in carrying out his managerial responsibilities.



As a part of their training, elected members of the Vietnam Rural Electric Cooperative's Board's of Directors, attended an orientation course at the Vietnam Cooperative Research and Training Center, Saigon.

The cooperative employs an assistant manager who also serves as chief of construction and operations. The assistant manager was formerly a high school principal in An Giang Province and he has been working with the cooperative since its organization. He has acquired a good working knowledge of every department of the cooperative. For the past two years he has directed and supervised all of the construction work involved in building the cooperative's physical plant. He is developing efficient maintenance and operation crews and he serves the cooperative as their staking engineer. The NRECA advisor worked closely with the assistant manager in all areas of the cooperative's operations.

The cooperative, upon the suggestion of the NRECA advisor, established a public relations department, and employed a former newspaper editor to serve as the department's director. The public relations director prepares a bimonthly newsletter, which is distributed by the cooperative's voting delegates to the 40 members each represents. The newsletter is one of the few publications received and read regularly by the rural people. The NRECA co-op advisor provided assistance in the preparation of suitable material for membership education in the safe use of electricity, and the members responsibilities to the cooperative organization through the newsletter.

The public relations director also serves as a power use advisor to the cooperative's members. This department of the cooperative should be expanded to promote better member understanding and participation in the cooperative's activities, and to establish programs designed to promote the greater use of electricity by the cooperative's minimum use members. The board of directors have agreed to expand the activities of the public relations department and to employ additional personnel.

In February of 1970, NRECA's Member Relations Consultant visited the cooperative's public relations department and assisted the department personnel in developing a long-range promotional program. Further assistance and guidance in marketing techniques should be provided.

The cooperative employs an accountant in a staff position, who supervises the work of 12 employees; a cashier, several office typists, billing clerks, meter readers, and collectors. This accountant is capable, and in the opinion of NRECA's accounting consultant, is knowledgeable of the standard accounting procedures. His knowledge of the electric utility uniform system of accounts is somewhat limited, and he needs additional assistance and guidance in establishing proper plant accounts. In two instances, a deficiency in accounting procedure was noted. The same deficiency was found to exist in the accounting departments of all

these cooperatives. This apparently resulted from erroneous Vietnamese instructions given to the accountants.

The office personnel are well organized and are competent to perform their assigned duties. Training and instruction has been provided these employees on the job and day-by-day. Additional training sessions were conducted by the NUEC staff and by members of the NRECA team.

The NRECA team believes that the board of directors of the An Giang Rural Electric Cooperative has selected excellent management, key staff and office personnel.

Additional assistance should be provided to the manager and his staff in preparing and using long-range financial forecasts, in preparing budgets, and in managing the cooperative within the limits of a reasonable budget, in establishing and enforcing policies that will provide for and maintain close control of financial transactions, in establishing operating and maintenance schedules and budgets of money and manpower, and in developing programs that will promote the participation of the membership in their cooperative's activities.

Training - Field Personnel

Training of the cooperative's field personnel was started in December 1967. The cooperative employed a few laborers who were shown how to dig holes and set small secondary poles. This crew was gradually increased in size and a selection of men capable of being foremen was made. New crews were formed as each new construction procedure was started.

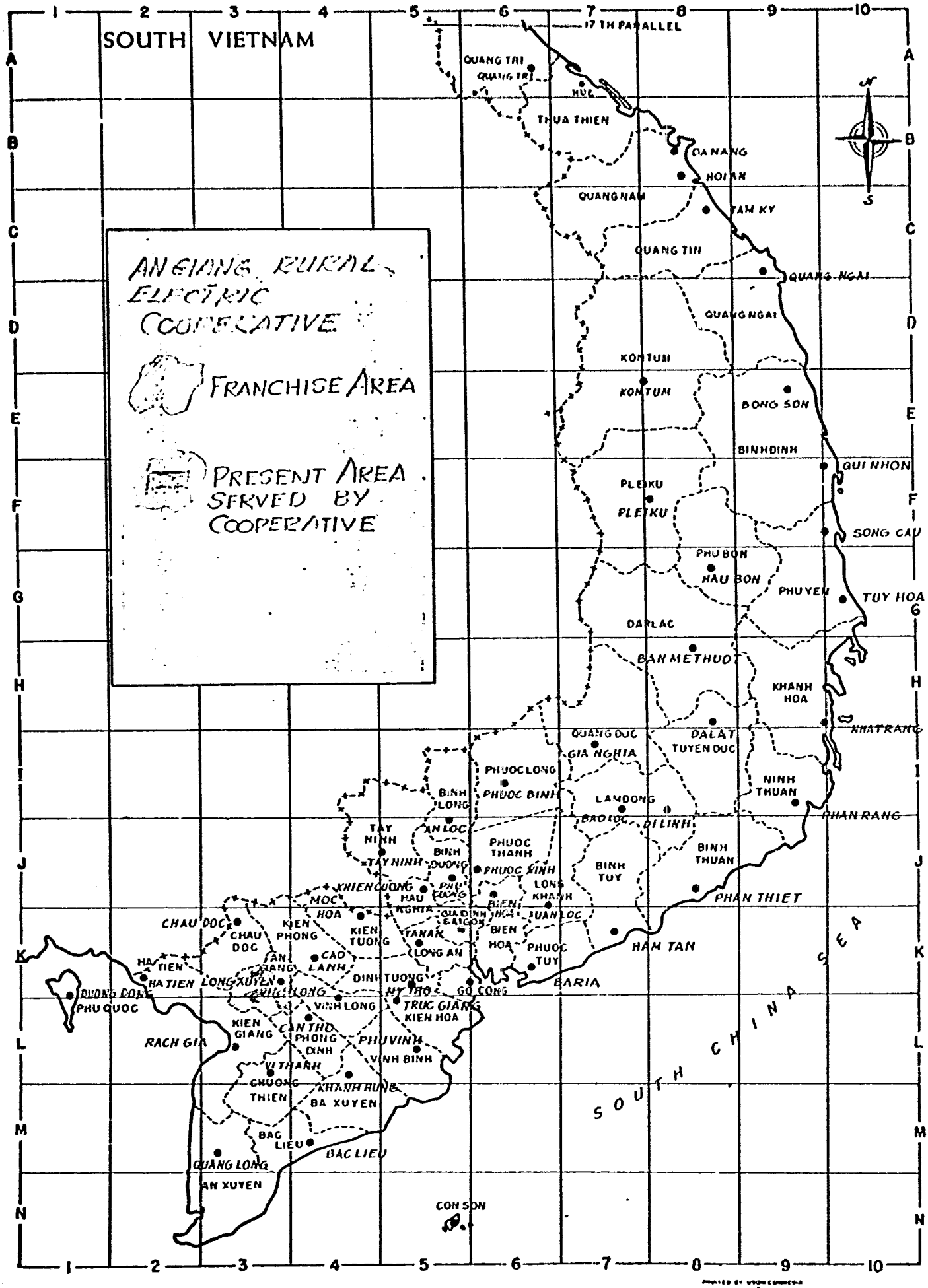
Specialized training in pole climbing was given by NRECA's construction specialist. Classroom sessions were held in building pole top assemblies and field demonstrations were held as frequently as required. The co-op advisor worked closely with the cooperative's construction superintendent in developing procedures and scheduling crew operations.

The number of crews was increased as construction of the main feeder line was started in April of 1968. Special training was provided in handling the larger poles, and use of hole digging and pole setting trucks. Linemen were trained to string wire and to sag and tie the conductor to the insulators.

The assistant manager assumed the responsibilities of line superintendent and developed rapidly into one of the few Vietnamese construction supervisors capable of running a large scale line construction program.

The cooperative had no difficulty in recruiting sufficient men from the local area to fully man their crews, and to allow a constant selection of the better men for regular employment. Contrary to the experience in the other projects, the employees, when trained, remained on the job, even though the rate of pay was somewhat lower than other employers paid in this province. The cooperative construction crews improved the quality and quantity of their work throughout 1968 and 1969, and in March of 1970, were with minor exceptions, completing work to the standards expected of a U.S. utility crew.

The Vietnam Power Company has, on three recent occasions, hired the cooperative crews to build primary and secondary lines in other areas of Vietnam. Maintenance and Operation Personnel were being trained and on June 30, 1970, were competent of handling most required maintenance work. They may, on occasion, require technical assistance from VPC in the operation of special electrical apparatus. Additional training in hot-line work and in the planning of long-range preventative maintenance programs would be highly desirable.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AN GIANG RURAL ELECTRIC COOPERATIVE
FRANCHISE AREA
PRESENT AREA SERVED BY COOPERATIVE
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HUE
THUA THIEN
DA NANG
HOI AN
QUANG NAM
TAM KY
QUANG TIN
QUANG NGAI
KON TUM
BONG SON
BINH DINH
QUI NHON
PLEIKU
SONG CAU
PHU BON
HAU BON
PHU YEN
TUY HOA
DAR LAC
BAN ME THUOT
KHANH HOA
NHA TRANG
QUANG DUC
GIA NGHIA
DALAT
TUYEN DUC
PHUOC LONG
PHUOC BINH
LAM DONG
NINH THUAN
BAO LOC
DI LINH
PHAN RANG
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TAY NINH
BINH DUONG
PHUOC THANH
PHUOC VINH
BINH TUY
BINH THUAN
PHAN THIET
KHIEN LUONG
MOC HOA
HAU NGHIA
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BIEN HOA
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KIEN PHONG
CHAU DOC
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TAN HIEP
CAO LANH
LONG XUYEN
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PHU QUOC
VINH LONG
TRUC GIANG
KIEN HOA
KIEN GIANG
CAN THO
PHONG DINH
PHU VINH
RACH GIA
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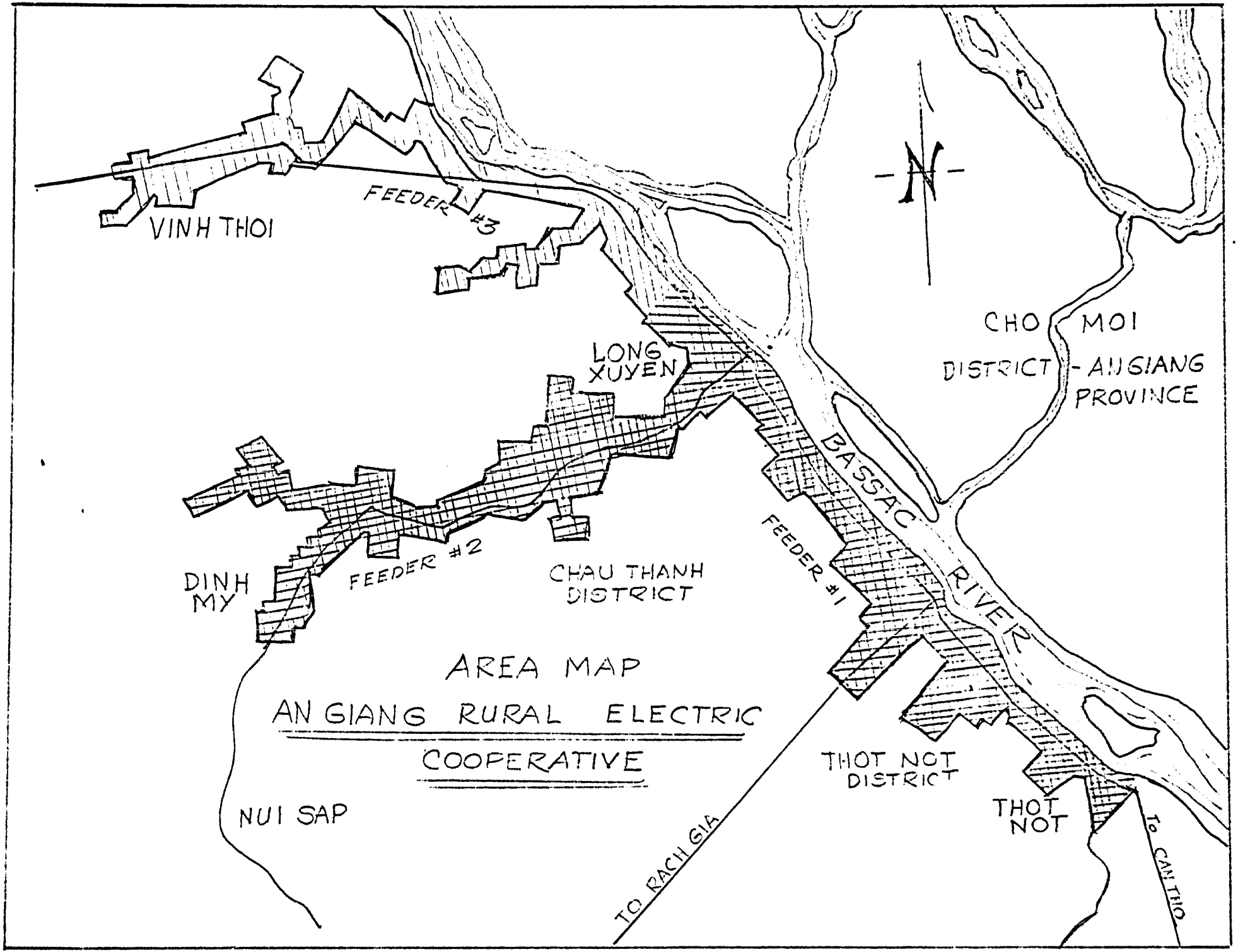
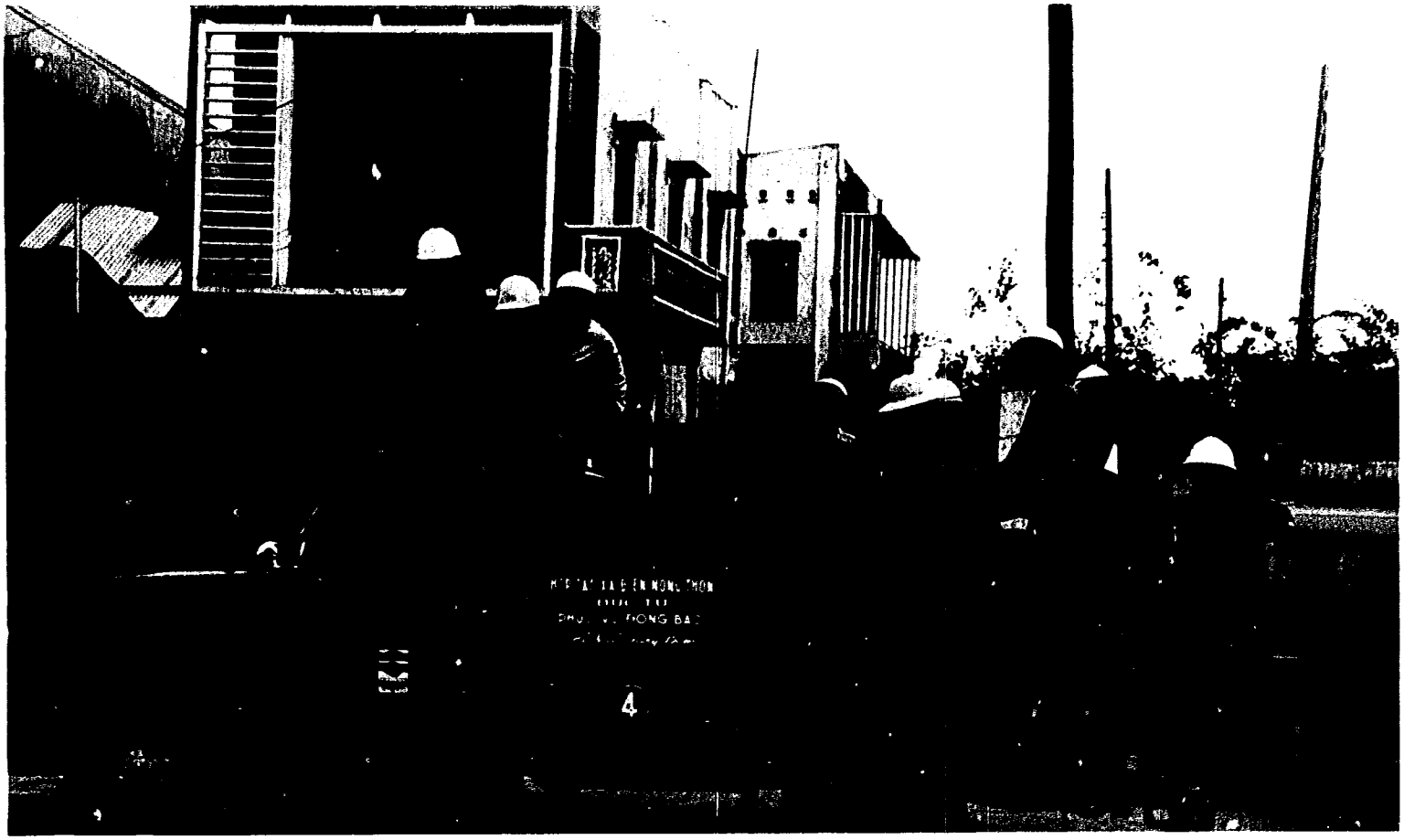

VINH THOI
FEEDER #3
N
CHO MOI
DISTRICT - AN GIANG PROVINCE
LONG XUYEN
BASSAC RIVER
FEEDER #2
DINH MY
CHAU THANH DISTRICT
FEEDER #1
AREA MAP
AN GIANG RURAL ELECTRIC
COOPERATIVE
THOT NOT DISTRICT
THOT NOT
NUI SAP
TO RACH GIA
To CAN THO



A line crew of the Duc Tu Rural Electric Cooperative.

CHAPTER III

DUC TU RURAL ELECTRIC COOPERATIVE

Background

The Duc Tu Rural Electric Cooperative is located on the fringe area of the Saigon-Cholon-Bien Hoa Complex, 20 kilometers east by northeast of Saigon. The franchise area of this organization covers the Duc Tu district of Bien Hoa Province. The Cooperative's office and warehouse is located on National Road 1A in Ha Noi hamlet of Ho Nai Village. The majority of members are located along National Road Number One.

The Duc Tu Electric Co-op was organized and became a legal entity on September 10, 1965, receiving its license to operate as a cooperative on December 8, 1965. The project was initially incorporated to serve 21 hamlets in two villages - Ho Nai and Trang Bom, containing at the time approximately 9,000 households, stores, markets, public buildings, churches, sawmills, textile plants, a hospital, orphanage, schools, and many small and medium sized woodworking and furniture factories.

The cooperative had received over 7,000 paid applications for membership prior to June 30, 1966. Solicitation of memberships was temporarily stopped until major construction started and the cooperative was in a position to render service to their members.

The board of directors acquired from Bien Hoa Province a 40,000 square meter site for their future headquarters buildings. Later through oversight, the GVN included this ground in the area to be used by the U. S. II Field Force. The cooperative's board of directors requested the the U. S. Military to return the land. General Westmoreland declared the ground not to be essential for U. S. Military use and recognized the cooperatives prior rights of ownership. Early in 1970 the cooperative started construction of an office, warehouse and garage on this site.

Seven poles were set in the intersection of Highway 1A and 1 prior to the TET holiday, symbolic of the lines to be constructed soon afterward - Labor was found almost nonexistant and mental patients from a nearby hospital were used to dig the holes. The U. S. Army started construction of a three phase 13200 volt line along Highway 15 to Bien Hoa City. This line occupied the right of way designated for the cooperative's main feeder line. Negotiations were initiated to use the army poles for joint construction. However, the hollow concrete poles were found to be of insufficient strength to carry both electric lines and a communication cable. The construction command then offered to provide approximately 100 wood poles for the cooperative's use, if the line would be constructed on the opposite side of Higheay 1A. Electricity of Vietnam (EOV) had previously

prepared detailed drawings for a three-phase 15 KV line to serve a village on Highway 15. This line was to be located on the opposite side of Highway 1A from the U. S. Military lines. A joint use agreement with EOV was negotiated to provide sufficient pole space for their future line, and EOV's right of way was assigned to the cooperative.

Arrangements were made to obtain the U. S. Army poles required to construct the main feeder line from EOV's Dong Nai substation to the junction of 1A and 1, a distance of 6.3 km. This junction is located in the center of Ho Nai Village and to the west of the center of the Duc Tu Project.

The line was staked by the NRECA chief engineer using the cooperative's foreman and two local employees on the cooperative payroll as a staking crew.

Efforts to obtain the interest of local construction firms capable of this type of construction were not productive. It was then decided by the USAID/ENG. and NRECA that the cooperative should attempt to do the work by hiring and training men in the use of equipment. Specification, materials, and procedures were then undertaken by NRECA's, Mr. Sansing and Mr. Martin. Temporary warehousing space was obtained in Ho Nai and materials were shipped to the project. Vietnam pine timbers were cut to proper dimensions, drilled, and soaked in a penta solution for crossarms.

Construction of this primary feeder line was started on August 6th and completed and ready for energizing on December 12th, 1967. Selection and training of crew personnel was accomplished and by the end of this construction the crews were capable of performing primary line construction.

The greatest problem encountered involved the use of excess property army digging and hauling trucks. The trucks supposedly completely rebuilt prior to shipment from Belgium to USAID for the cooperatives, proved to be unreliable with each unit inoperable several times a week. U. S. Military maintenance crews repaired the units whenever parts could be located.

The U. S. Army agreed to increase the loan of poles from 100 to 800 and later to 2,800. Of this increase an additional 432 were designated for extension of the Duc Tu system. Utilizing these poles, construction of the primary distribution line was started.

Design engineering and field staking were seriously delayed when Lyon Associates encountered considerable difficulty in obtaining GVN's permission to aerial photograph the project and at a later date in obtaining clearance from the censor. Staking of the line west from the junction was started on December 23, 1967.

Construction of lines progressed as fast as staking permitted. Inexperience of the resident engineer in this specific type of staking resulted in much of the line being restaked, and a large number of poles having to be reset.

The Viet Cong's 1968 TET attack on the U. S. II Field Force headquarters, and the ensuing three day firefight across Highway 1A caused considerable damage to the cooperative's main conductor. All phase wires and the neutral on approximately one kilometer of the line required replacement. No poles, hardware or equipment was damaged beyond use. Damage of a less serious nature was sustained in three additional areas. One construction truck and trailer sustained minor damage. All damages were repaired and the line made operable in less than five days.

On April 20th the board of directors of the cooperative resolved to complete the construction by force account.

Construction efforts were concentrated on completing a kilometer and one-half of primary, in each direction from the terminal point of the Dong Nai - Ho Nai feeder line, and the building of all the secondaries and services that could be energized by this primary.

The main feeder line was energized on August 14, 1968. The board of directors established a system of priorities for connections to the energized system. Certain churches and public buildings were to be connected first. Several of the churches were beyond the completed section of line, therefore, energization of other members was delayed for several weeks while primary and secondary work was completed.

House wiring demonstrations were conducted by the advisor and a training school for electricians was held. Sufficient competent electricians were attracted to the school to insure that the members' houses could be properly wired in a relatively short period of time. The first meter was energized on October 21, 1968. By December 31, 1968, 2,065 houses had been wired and 767 members were receiving electrical service.

Construction proceeded throughout the year of 1969 with an average of 115 residences, public buildings, stores, and industries connected to the system each week. The year ended with the cooperative serving 6,863 members.

During the first five months of 1970 the rate of construction of lines and the connection of members decreased as a result of the shortage of local currency construction funds, and the transfer of Lyon Associates' resident engineer. Using their accumulated margins and membership funds, the cooperative was able to connect an additional 1167 members. The cooperative on June 30, 1970, had a total connected membership of over 8150.

On June 30, 1970, Lyon Associates engineers had not produced a precise tabulation of total kilometers of line constructed within their engineering contract. A tabulation of the "As-built" staking sheets by the NRECA office staff indicated 182.9 km of line was constructed under the Lyon Associates (PIO/T level) contract, 21.1 km less than the contract required. Although this apparent deficiency was pointed out to Lyon Associates and USAID on numerous occasions, the engineer did not perform the remainder of the work. A cooperative employee was trained by NRECA's advisor to stake the line and prepare construction staking sheets. The cooperative's construction crew continued construction of primary, secondary, and service lines to approximately the 204 kms limit of the engineering PIO/T.

Region III engineering staff prepared plans and specifications for an office building. Under their supervision a contract was let for construction of the facility in March 1970. The cooperative board of directors negotiated a contract to build a warehouse and garage. These structures were nearing completion on June 30, 1970.

Financial Summary

Duc Tu Rural Electric Cooperative
Cost Analysis to March 31, 1970

U. S. DOLLAR COSTS

Engineering - Lyon Associates	$ 127,002.37
Material and Equipment	270,625.46
TOTAL U. S. $ COSTS:	$ 397,627.83
Converted to V. N. $ at 60 to 1 U. S. $	$23,857,670.00

LOCAL CURRENCY COST

Engineering - Lyon Associates	$ 4,756,840
Supervision	75,500
Labor	12,028,703
Poles & Pole Delivery	8,550,685*
Local Material	3,475,229
Gas, Oil, Repairs	940,136
Expendable Tools	534,877
Misc. Construction	154,261
Land & Land Rights	595,813
Stores	1,061,692
Pre-Survey	45,057
Office Supplies	91,456
Office Expense (184.23)	247,500
Office Equipment	42,050
Office Salary	791,877
Office Expense (GA-2)	69,951
Board Expense	138,970
Miscellaneous	801,067
	$34,401,664
Non-Distributed Costs	$ 3,332,571
(Regional CDR - First Quarter 1970)	
TOTAL V. N. $ COSTS:	$61,591,905

Some items of equipment and material on order have not arrived or actual costs have not been received by USAID/VN at the time of this report. The above calculations are as accurate as avilable data allowed, but cannot be considered to be either exact or final.

* Cooperative owes NUEC for pole cost of V. N. $6,227,681.

Board Development

Formal instruction and training for board of directors started soon after the cooperatives' organization. Joint training sessions were held in the cooperative training center at Saigon, utilizing instructors from the Government of Vietnam's Directorate of Cooperatives, USAID's Agricultural Division and NRECA Vietnam team specialists.

These early formalized sessions were well attended and appeared to be quite productive, however, it became apparent that the directors of the Duc Tu project, along with other co-op directors, experienced difficulty in relating the instruction in institutional building to their future organization.

As the war conditions became more serious, directors were unwilling to attend training sessions requiring several days absence from their homes and preferred the day-to-day training provided by the management advisor assigned to their project. It was also easier to understand the specific problems of their area, and with the help of the advisor develop the appropriate action to solve the problem.

Board training was principally conducted by the projects management advisor with frequent assistance being rendered by the team leader at monthly board meetings and upon the board's request. This method was quite successful in that all of the board members received instruction and assistance at regular and frequent intervals. Board and committee meetings were held several times each month and the project coordinator visited with individual members almost daily.

The board members received training in all aspects of board consideration and collectively they have achieved a fair degree of competence as a board. These board members will, given sufficient time and the freedom to develop as individuals, probably become an excellent cooperative board.

The board of directors needs to develop a greater sense of its responsibility to the membership of the cooperative. Careful attention should be given so that the interests of the entire membership are not allowed to become subservient to the interest of an individual or of a minority group. The board should exercise considerable care in the selection of key management employees, and then delegate authority and responsibility to these key management employees. The board needs to establish a salary and wage plan that will attract and keep excellent employees, and to hire the most qualified people they can attract. The board should have additional guidance in delegating authority and in maintaining adequate controls. The board should obtain, on a retainer basis, the services of an attorney and an independent auditor.

Training - Management and Key Staff

The Duc Tu board of directors, contrary to the advice of USAID and NRECA/VN, did not hire a qualified manager and office personnel until late 1968, when the first members were receiving electricity. Training of these individuals at this late date proved to be quite difficult. The project advisor immediately started to shift responsibility of the management of all phases of the cooperative's operations over to the manager, advising and assisting him in every way to develop ability and knowledge of the entire cooperative operations.

Training in every procedure was required as the manager had no prior experience in the operation of an electric system or in the management of any business. The advisor found it necessary to provide assistance in every phase of his development, and at the same time obtain the board of directors' consent to allow the manager to assume responsibility in the areas of management that he had developed competence.

Unfortunately, he was not allowed to exercise this acquired management ability by the board of directors and left the cooperative's employ in September 1969.

The board of directors employed a resident of the project area to be the new manager, whose prior experience was in the district government's office. Management training again had to be provided in every phase of the cooperative's business. At the end of this contract, there exist many phases of management in which the cooperative will experience difficulty.

The cooperative has employed several individuals for the bookkeeper account-office manager position, and in each instance, difficulties in the accounting section made it necessary that a replacement be obtained. Although most of the individuals employed had fair knowledge of accounting procedures, each required detailed instructions and assistance, and none acquired the ability to do their work without close supervision. Insufficient time has elapsed to evaluate the present accountants' ability.

Frequent changes also occurred in personnel employed as billing clerks, meter readers, and collectors. Training of new individuals by other employees was not possible due to the many changes of key management employees and it was necessary for the advisor to help each individual acquire sufficient ability to perform the necessary work.

The cooperative's present office employees are sufficiently trained to perform the routine work required in billing and collecting. Unless skillful supervision is made available at a very early date, their ability

will degenerate to a point where the cooperative may not be able to continue internal operations.

Training - Field Personnel

Training of field personnel was conducted as a continuing program throughout the duration of the contract. The predominate and most successful method of instruction was on-the-job training where the men were taught by example how to perform each step of the required work. Classroom sessions, utilizing blackboard, minature lines, and actual material were held frequently. The classroom work was not effective, primarily as a result of difficulty in correctly translating English to Vietnamese. Many technical terms cannot be translated into Vietnamese in such a way that comprehension is achieved. The translation of a few English words often required minutes of translation with several examples given to illustrate the point in question.

This cooperative has had and will in the future have a very high rate of employee turn over. The project's close proximity to the Bien Hoa Air Base and the Long Binh Command Complex, where thousands of local men are employed at wage scales considerably higher than the Vietnamese industrial scale, very often resulted in men who, having achieved a fair degree of work competence through the cooperative's training program, leaving the project for military support jobs with higher pay and less work.

The cooperative board of directors needs to recognize the necessity of meeting this competition for labor by establishing working conditions that will attract and hold the trained employee, and by paying a competitive wage scale.

It is of interest that the board of directors of the other two rural electric cooperatives, resented the higher level of wages paid by the Duc Tu Project and tried to convince Duc Tu's board that they should reduce the already insufficient wage scale.

The Duc Tu Cooperative, as was the case in the other two projects, had many men drafted by the Army of the Republic of Vietnam (ARVN). Unfortunately, the men who had demonstrated natural leadership ability and developed into fairly competent foremen and crew chiefs, were also the men most qualified to fill non-commissioned officers and junior grade officers positions in the ARVN Forces. As the projects were started recently they were unable to provide the required number of years of payroll records to substantiate a request for cooperative personnel to be drafted in place. The project lost two excellent line superintendents and several very good foremen in the last 30 months.

Training in the manual skills necessary to perform the basic line work was quite successful. The men acquired skills and retained ability considerably faster than had been anticipated by the advisors. The training of supervisors, foremen, and crew chiefs was not as productive; these men achieved the ability and knowledge to perform the tasks but often refused to accept the responsibility for, and to exercise the necessary control over, the men assigned to their crews.

The foreman could not discipline a crew member for poor performance of his work without causing the crew member to lose face. The criticized crew member could arrange to regain face by having the foreman attacked and injured. This was particularly true when the foreman was not a resident of the cooperative's headquarters village.

At the end of this contract, the field construction and operation crews' personnel consisted of over 50 well trained and technically capable individuals. This force is directed by an individual who has been with the cooperative from its inception. He is knowledgeable of the requirements of the cooperative from the standpoint of construction operations and maintenance. His capability of directing and obtaining the foremen and crew chiefs compliance of his directives is limited by the same factors mentioned previously regarding the foreman.

The operations, maintenance and construction crews of this cooperative are well trained and are believed to have the capability of performing all of the maintenance, operations, and construction work required without supervision. They may, on occasion, require minor technical assistance from VPC on the operation of special equipment and electrical apparatus.

Cooperative power lines serve farms and homes like these in the Dalat area.

CHAPTER IV

TUYEN DUC RURAL ELECTRIC COOPERATIVE

Background

The Tuyen Duc Rural Electric Cooperative is located in Vietnam's south central highlands, 230 kilometers northeast of Saigon. The cooperative franchise area includes all of the Province of Tuyen Duc, located outside the city limits of the autonomous city of Da Lat with specified minor exceptions. The cooperative's present headquarters are located in the city of Da Lat. The provincial authorities have provided the cooperative a plot of land located near the Lien Khang airport for a future headquarters building. This site is near the center of the cooperative's membership, 30 kilometers south of Da Lat, on National Highway 20.

This cooperative was the first of the three pilot projects to provide electrical energy to its members and is the only one of the projects to be seriously delayed by the Viet Cong. The cooperative was organized on June 22, 1965, and later that year licensed by the Government of Vietnam. The project was incorporated to serve 95 villages and hamlets with a potential membership of 8,400 farm residences, village stores, public buildings, large plantations, and industrial plants. Over 60% of these potential members paid their membership fee within the year following the cooperative's organization.

In July 1965, Government officials of Vietnam and the USOM Director requested the cooperative to quickly start construction of their system. To implement this request, immediate action was taken by USAID to procure a limited number of poles, and the services of an experienced staking crew to work under the NRECA resident engineer's supervision. The crew was obtained under a USAID contract negotiated with the Thai-American Engineering Company. This crew staked the pole locations on the primary lines from Don Duong to Fimnon, a distance of approximately 30 kilometers. The cooperative hired woodsmen to cut tress and clear the right of way for the line. This advance work was terminated in early January of 1966, when USAID could not supply immediate funding for the pole procurement. In March of 1966, the increased Viet Cong activity in Tuyen Duc Province curtailed travel and work in the cooperative area.

USAID obtained for the cooperative a number of used wood poles, and the U.S. Military airlifted these poles, conductor and other line materials from Bien Hoa to Da Lat. In October 1966, secondary lines were staked in the hamlet of Manline, secondary and service lines were constructed to serve 28 Montagnard houses, their schoolhouse, and a sawmill. The Montagnard's had their houses wired by students in the Da Lat Trade

School and watt hour meters were installed, only to wait many months while Electricity of Vietnam installed a cabina for the 30 KVA transformer substation.

Line construction was immediately started in Phat Chi, a small Catholic refugee village located southeast of Da Lat. The villagers dug the holes and helped set the poles for the secondary lines. Services and meters were installed for all the houses and public buildings. The 30 KV to 220/380 V transformer was installed by the cooperative. The small distribution system was energized on February 8, 1967, and the first Vietnam Rural Electric Cooperative members received electricity.

Construction was next started on the village of Truong Son using poles borrowed from the U.S. Army. The primary line was completed, but security conditions deteriorated to such a degree that it was impossible to develop the secondary distribution system.

The Viet Cong created the first major cooperative outage in Vietnam when they destroyed several of the poles on Electricity of Vietnam's transmission line supplying Phat Chi village. The small cooperative crew assisted EOV's men to rebuild the line and restore service to Phat Chi.

In early December 1967, the cooperative's principle source of power was badly damaged when Viet Cong saboteurs blew up the penstocks of the Da Nhim hydroelectric plant. Engineers estimated repair work would require two years and that the repair could not be started until security in the area was improved.

Officials of Electricity of Vietnam and USAID's Electric Power Section agreed that construction of the cooperative's lines should be continued as EOV then had surplus generating capacity in the Ankoret hydroelectric plant north of Da Lat and on the assurance that USAID would provide an additional 1,200 KW of generation for installation on the cooperative's system.

The board of directors employed local men to be trained for line construction work, and selected Thai Phien, a village located within the semi-secure area surrounding Da Lat, as the best site for this "on-the-job" training. Line construction in Thai Phien was delayed by deterioration of security conditions and difficulties encountered in the transport of poles from Cam Ranh and materials from Saigon. The workmen readily acquired ability to do the required work. One of the men who displayed leadership ability and technical skill was trained to be the cooperative's

line superintendent. Local electricians were given instruction on wiring of the member's buildings and several demonstration houses were wired. The Thai Phien distribution system was energized in November 1968, supplying service to 281 cooperative members.

Construction work was then started on the Con Duong-Fimnon line, and on the 30/15 KV substation in Don Duong. The construction crews were headquartered in the construction area so as to prevent the loss of transportation time and avoid undue exposure to Viet Cong ambush on the highway.

During the first half of 1969, construction work was primarily performed in the village of Don Duong. Work progress was frequently interrupted by the decline in security conditions, right of way problems, and by having to change out many poles as a result of mistakes in field design. By July 1, the construction crews had completed the primary, secondary, and service line for over 1,100 additional members. Work on the Don Duong substation was nearing completion.

The Ankoret hydro plant developed an erosion problem in the tail race section of the plant, which would require extensive rehabilitation work. Until repairs were completed, Electricity of Vietnam would be unable to supply the cooperative's Don Duong substation power requirements.

In late June 1969, the cooperative's trained and quite capable line superintendent was drafted into the Vietnamese Army. Viet Cong activity increased along the Don Duong-Fimnon Highway and several key workers left the construction crew for higher wages paid by a new defense contractor in the Da Lat area. Construction progress and quality of work degenerated rapidly.

The cooperative board employed a manager and an agriculture engineer to be superintendent of the cooperative's operations and construction activities. New workers were hired and intensive training of these men was provided by NRECA's cooperative advisor.

The cooperative persevered throughout the final year of this contract in their efforts to build the cooperative's electric plant, although confronted with the following difficulties:

The manager was discharged and the cooperative's bookkeeper elevated to the position of acting manager. The outside superintendent was later discharged and replaced with a man of less capability. Two resident engineers employed by Lyon Associates were replaced with a man less knowledgeable of existing conditions in Tuyen Duc Province.

The cooperative's vehicles were in very poor condition, frequently out of service, and repair parts were difficult to obtain. The cooperative had no other choice than to lay off most of its employees when construction funds, previously allocated were not released. Later attempts were made to rehire the men when a limited amount of funds were made available.

The cooperative was able to complete the primary line and extend secondary and service lines to an additional 1,100 members.

At the close of this contract, the cooperative was providing service to slightly under 400 members, had completed the primary, secondary and service lines for another 2,200 members, and the required multiphase system to provide energy to the remaining 4,650 potential members included in the cooperative's original design. The same amount of three phase construction is required to serve the PIO/T level of kilometers required in the original design.

This cooperative is in an extremely precarious position, not through particular fault on the part of the cooperative, USAID or NRECA, but principally as a result of the war conditions that damaged not only its wholesale power source but also the morale of its board of directors and its membership.

The success of the cooperative depends to a great extent on the following conditions:

1. That the remainder of funds provided in the 1969 project agreement be immediately released by USAID in order that the cooperative can maintain a small office and maintenance crew and can maintain and safeguard the present office and warehouse facilities, until the time that power is made available to serve the members and create greater operating revenues.

2. That the Government of Vietnam's Ministry of Agriculture will make available the additional 40 million piasters for the period July 1, 1970 - June 20, 1972, as agreed to by the Ministry and the Government of Vietnam in the Project Agreement of 1969.

3. That Electricity of Vietnam promptly install the 1,200 KW of generating equipment, switch gear and transformers provided through USAID, after it arrives in Vietnam.

4. That the cooperative's board of directors will employ a complete and competent management staff. That this staff is given adequate training and guidance in the operations of a cooperative electric utility; and that all of the directors participate fully in the activities of the administrative board.

5. That the Viet Cong does not hinder or take further major action against the cooperative's physical plant, the membership, the employees or the board of directors.

Financial Summary

Tuyen Duc Electric Cooperative
Cost Analysis to March 31, 1970

U.S. DOLLAR COSTS

Engineering - Lyon Associates	$ 150,170.52
Material and Equipment	329,410.26
	$ 479,580.78
Converted to V.N.$ at 60 to 1 U.S.$	$28,774,847.00

LOCAL CURRENCY COSTS

Engineering - Lyon Associates	$ 5,925,877
Supervision	60,833
Construction Labor	8,413,955
Poles and Pole Delivery	7,241,334*
Local Material	1,489,763
Cas, Oil and Repairs	1,161,619
Expendable Tools	186,866
Misc. Construction	106,449
Land and Land Rights	69,539
Stores	2,925,602
Pre-Survey	6,080
Clearing Account	1,321
Office Supplies	125,435
Office Expenses (184.23)	146,715
Office Equipment	33,450
Office Salary	1,796,687
Office Expenses (GA-2)	487,388
Board Expenses	194,898
Miscellaneous	1,166,869
	$31,540,680
Non-Distributed Costs (Regional CDR - First Quarter 1970)	$ 2,770,195
TOTAL V.N.$ COST:	$63,085,722

Some items of equipment and material on order have not arrived or actual costs have not been received by USAID/VN at the time of this report. The above calculations are as accurate as available data allowed, but cannot be considered to be either exact or final.

* Cooperative owes NUEC for pole cost of V.N.$6,459,721.

Board Development

One half of the directors now serving on the Tuyen Duc Cooperative's current board of directors attended the first NRECA Directors School held in Vietnam's Cooperative Research and Development Center. These directors and the directors who at a later date were elected to serve on the administrative board, have received a considerable amount of formal and informal training in the skills required by a director to best serve the interests of the cooperative's membership.

A greater portion of the instruction and guidance provided the directors consisted primarily of the cooperative's NRECA management advisor consulting with the board members during their board and committee meetings, on field inspection trips, and frequently with the individual directors in their home hamlets.

The original board of directors, from the date of organization of the cooperative until TET of 1968, were active in every respect in the affairs of the cooperative. They were enthusiastic about the training they were receiving. They participated fully in the hamlet leader training courses which were held jointly by the Province cooperative advisor and the NRECA advisor.

Committee training courses were developed by the NRECA staff for the Financial Management and for the Construction and Operations Committees. These initial training courses were held in Saigon and three members of the cooperative's board attended each training course.

NRECA's management advisor conducted additional committee training courses for the remainder of the contract. The participation of the committee members was initially very good, but in later months diminished, apparently due to increased Viet Cong activity in the area.

The NRECA power use and member relations consultant met with the Board's Utilization and Member Education Committee and with the cooperative's employees. The consultant's recommendations were well received and will be implemented when the cooperative's lines are energized.

The NRECA accounting consultant met with the office employees and with the secretary of the board of directors. This board member was receptive to the recommendations and indicated the recommendations would be implemented when the cooperative was in full operation.

The development of a good administrative board in this cooperative was a difficult task. Many of the problems encountered in this cooperative were not common to the other two projects. From early in 1969 through the present time, these board members found it necessary to consider the possibility of Viet Cong intervention in their personal lives as well as in the operations of the cooperative. The Viet Cong's strong offensive during February 1969, further inhibited the directors' actions.

The attendance of the directors at board and committee meetings declined sharply following the 1968 offensive and the effectiveness of later training was limited primarily to the directors living near Da Lat.

The board members could not safely establish a routine pattern of activity for the membership, the cooperative employees or for the board of directors. Board members living outside the immediate area of Da Lat would not attend regular board meetings scheduled for the same day each month nor meetings in which advance notice of time and place had been given. The provincial authorities would not allow large gatherings that could cover the infiltration of Viet Cong into Da Lat, and would also provide a target for Viet Cong terrorists.

Several of the board's officials left the cooperative's service area and this valuable training and experience was lost. There remained little opportunity to adequately develop the enthusiasm and ability of the new directors who replaced these original board members.

Security conditions in Tuyen Duc Province prevented the cooperative from holding an annual meeting in either 1968 or 1969. Five of the directors' terms of office had expired in 1968, and an additional five in 1969, leaving only five who were legally elected by the membership. After considerable persuasion by the NRECA staff and USAID's project manager, the board organized and held a cooperative annual meeting on January 21, 1970. A full board of directors were legally elected by the duly authorized representatives of the membership.

Half of the fifteen members of the board of directors have received sufficient training to understand the duties and responsibilities of the administrative board. These men, with the assistance of the GVN's Tuyen Duc Province cooperative advisor and with proper advice and assistance from the National Union of Electric Cooperatives, can develop the other directors into an adequate board.

It is extremely doubtful that this can be done until after power is made available for the major portion of the system and the cooperative is in operation.

The GVN could appoint a project superintendent with full authority to complete the planned construction and to employ a full management and clerical staff. This project superintendent would turn over the project to the board of directors upon completion of his work and upon proper evidence of the board's competence to direct the management of the cooperative in the best interest of its membership.

Training - Management and Key Staff

The training of a manager and key staff personnel for Tuyen Duc Electric Cooperative has been frustrating. The cooperative board of directors participated in management selection interviews in September 1965, but did not hire a manager until February 1967. This manager was not well qualified for the position and realizing this, resigned in June of 1967.

Over a year later, the board in September 1968, reluctantly hired a second manager who was recommended to them by the National Union of Electric Cooperatives. This manager resigned in January 1969.

On July 2, 1969, the Board employed its third manager. This individual had prior top management experience in private business and appeared to be an excellent choice for the position. The manager, with the assistance and advice of the NRECA advisor, immediately started to develop a management staff. Unfortunately a question arose regarding possible misappropriated cooperative property, equipment, and employee labor for personal use, and he was discharged by the board of directors in late August 1969.

The office manager then served as acting manager until March 1970, when he was appointed manager of the cooperative.

Each of these managers received intensive on-the-job training. Each one responded to this training, and given time, would have developed a fair degree of competence in their work. None of the managers achieved sufficient competence to be delegated full management responsibility by the board of directors.

This cooperative has read meters, billed, and collected from a few members since early in 1967. They have had a number of employees for each position and with the exception of the present manager, none have proven capable or desired to perform the work beyond the minor clerical job assigned. Training in billing, collecting, and minor accounting was provided through NRECA/VN's administrative assistant, who later became general manager of NUEC. Records of the cooperative's financial

transactions have been kept current, although not often in the method prescribed by the uniform system of accounts.

The manager and his billing staff attended the NUEC sponsored school held in Long Xuyen. NRECA staff members participated in the presentation of electric cooperative accounting requirements.

NRECA's accounting consultant worked with the manager and the four office employees of the cooperative. These employees have some capability but none have been employed for a sufficient period of time to acquire a reasonable degree of competence.

The management and office staff will require much assistance in the near future if this cooperative is to be successful.

Training - Field Personnel

The construction of the first two small hamlet distribution systems was accomplished by the NRECA engineer, and his interpreter with the assistance of the local inhabitants. The USAID hired interpreter demonstrated considerable ability and it was contemplated he would later become the cooperative's engineer-line superintendent. This became impractical when he was discovered to have extorted money from the membership.

The cooperative started recruiting men in April 1968 for construction of the cooperative facilities in Thai Phien. A qualified line superintendent was employed and all field employees were given intensive training. The majority of the employees were quite capable with the direct supervision of the superintendent in building the cooperative system.

A number of these men, however, left the cooperative's employ when it became necessary for the construction crew to stay in Don Duong during the week. New men were employed and again trained.

The line superintendent resigned in March 1969, and a suitable replacement was not located until August 1969. This man, an agricultural engineer, was not only capable of directing the construction work, but also would be of great value to the cooperative in developing agriculture oriented use of electricity.

Special training courses were conducted during this period, using a small line constructed on the cooperative headquarter's grounds. Chalk board instruction was followed by actual demonstrations on how each job was to be accomplished. Monday morning refresher classes were held.

In late September, the board of directors released the line superintendent because he had not properly reported the manager's suspected misuse of the field employee time.

The board employed a less qualified superintendent in November 1969. This superintendent, after slowly acquiring some knowledge of the requirements of the position, resigned on April 30, 1970.

No replacement for the line superintendent had been employed by the cooperative prior to the departure of the NRECA's Tuyen Duc advisor.

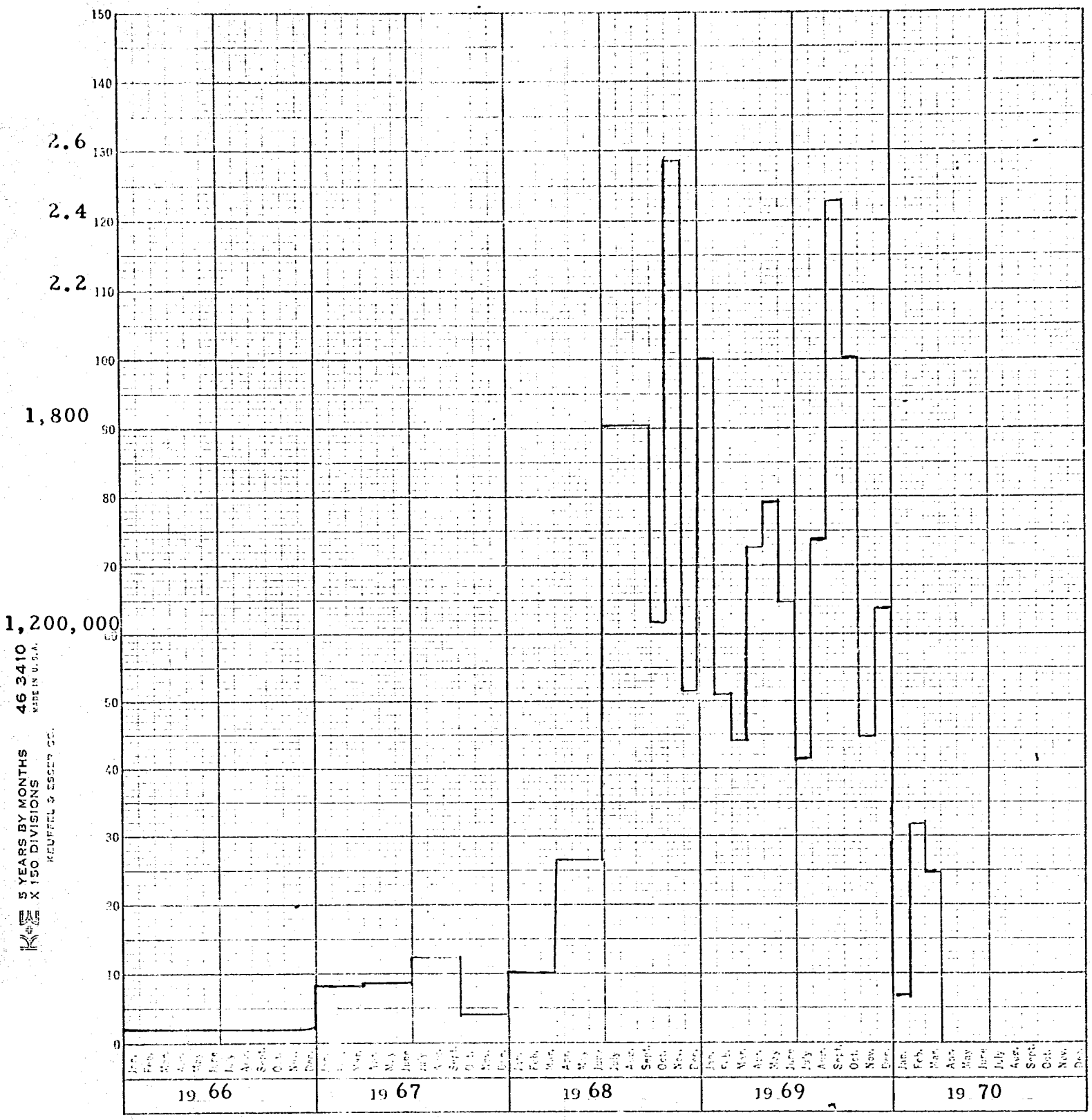
The cooperative linemen are fairly well trained in doing construction work. They have little experience in maintaining hot lines. Courses in basic hot line maintainance were conducted in 1968. This training was given on the cooperative's only energized high voltage multiphase and single phase lines serving Thai Phien. These linemen later left the cooperative for higher paying military contractor jobs.

All of the skilled construction employees will have to be terminated by the cooperative unless additional funds provided in the 1969 project agreement are released by USAID/VN and the additional funding by the Ministry of Agriculture provided by the same project agreement are made available.

The field personnel with exception of the line superintendent position, were adequately trained to perform their work on June 30, 1970.

TUYEN DUC

RURAL ELECTRIC COOPERATIVE

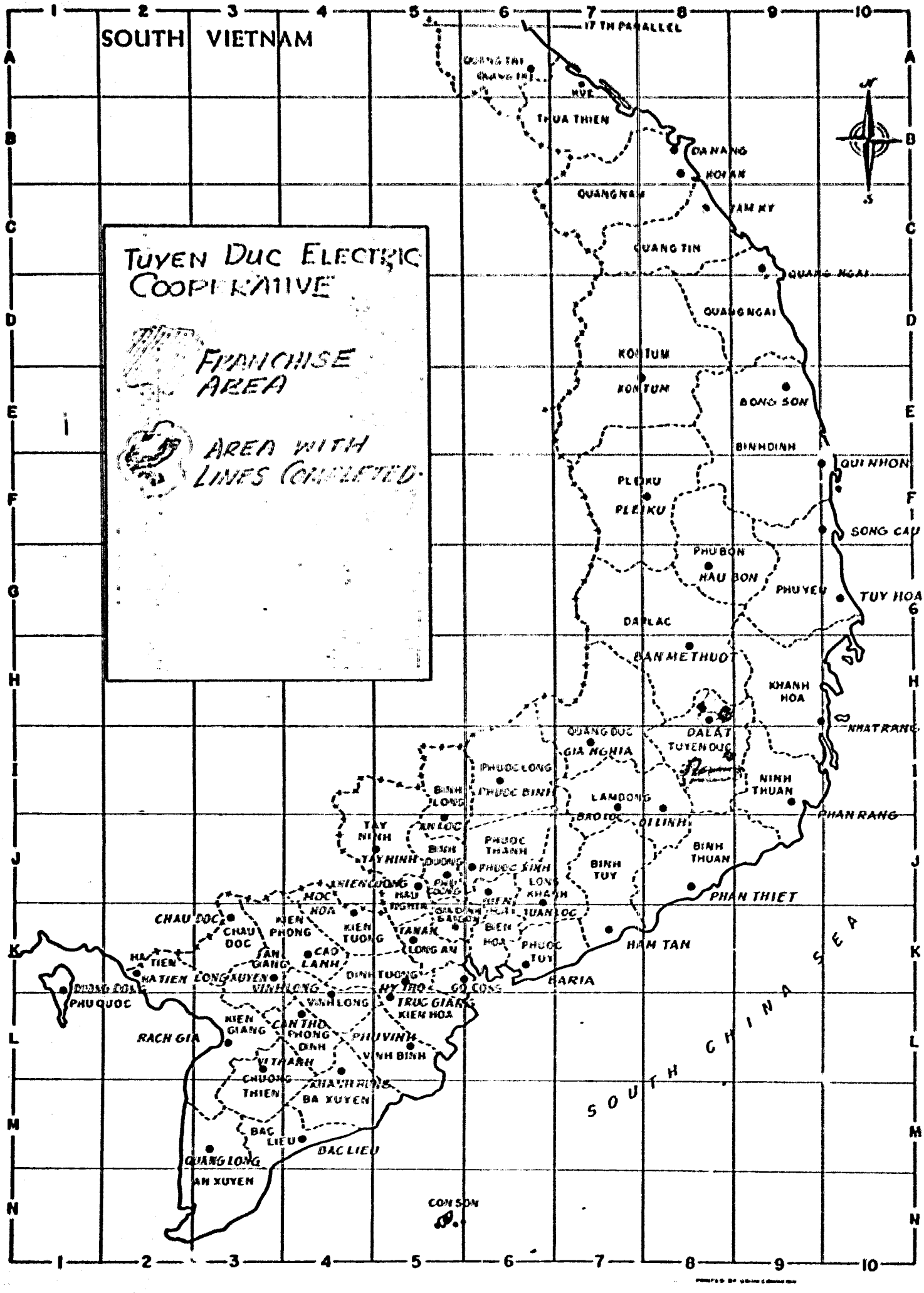


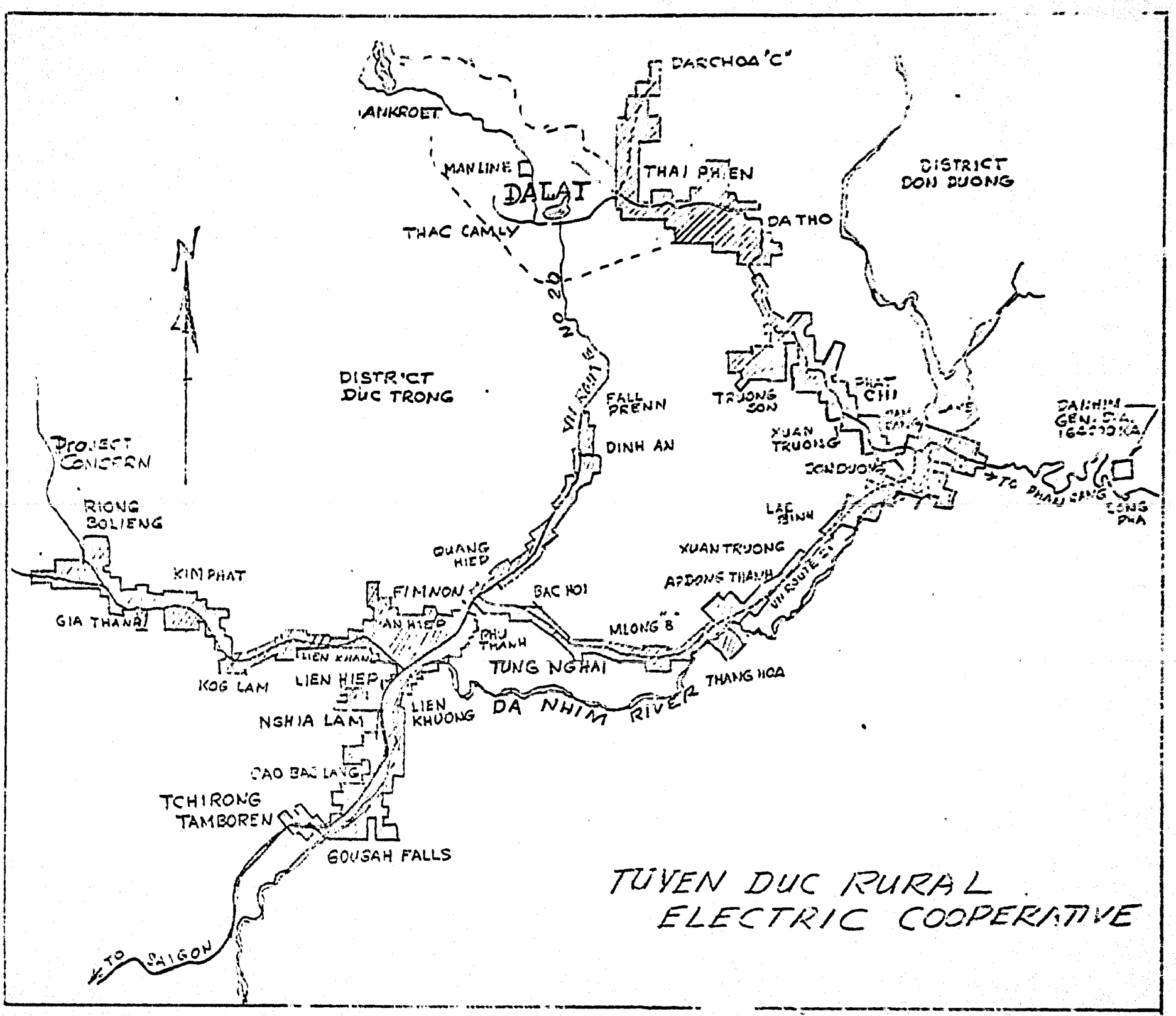
An Giang Rural Electric Co-op

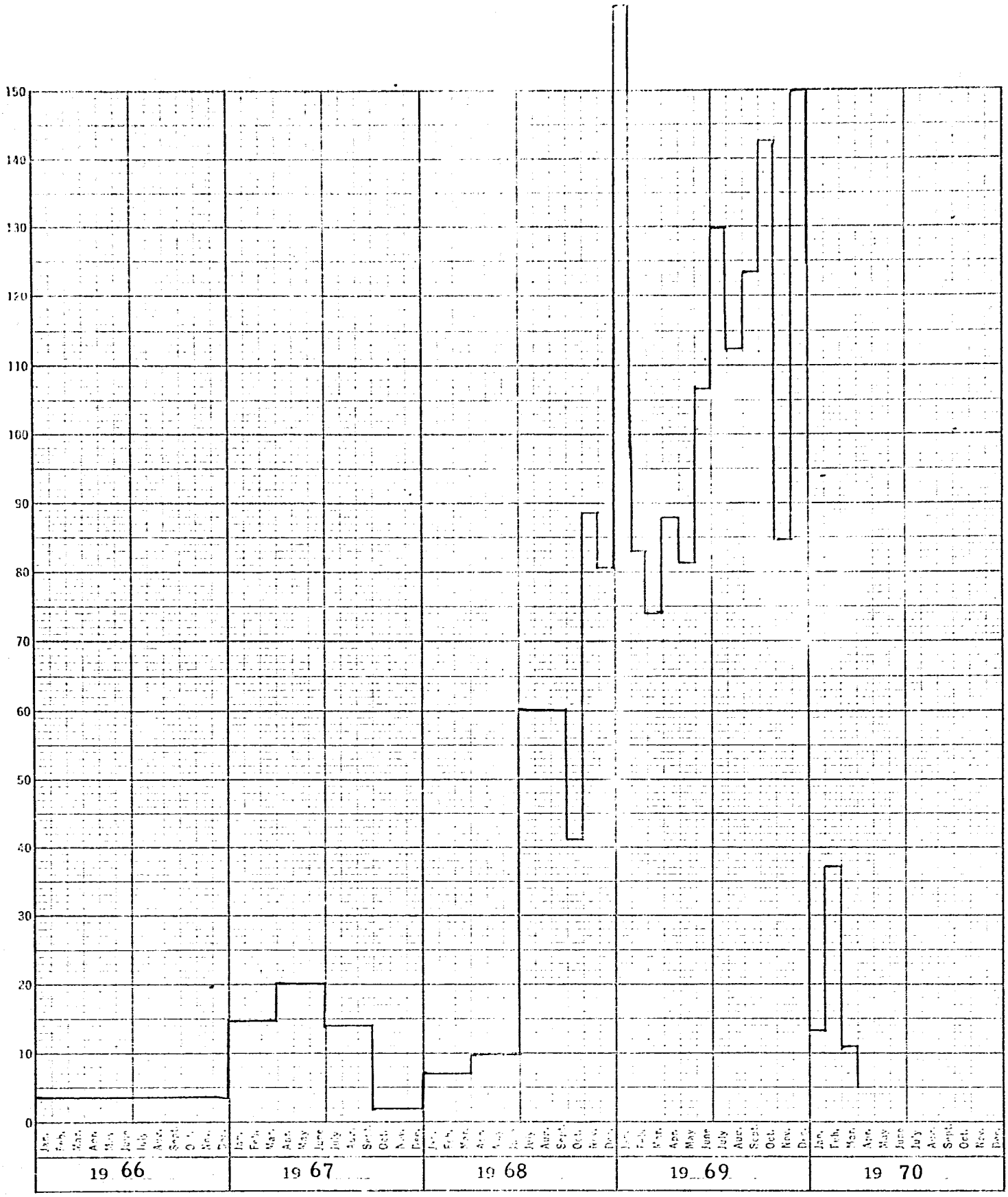
Piaster Expenditure Per Month

AN GIANG

GENERATION STATION


SOUTH VIETNAM
17TH PARALLEL
QUANG TRI
HUE
THUA THIEN
DA NANG
HOI AN
QUANG NAM
TAM KY
QUANG TIN
QUANG NGAI
KONTUM
BONG SON
BINH DINH
QUI NHON
PLEIKU
SONG CAU
PHU BON
HAU BON
PHU YEN
TUY HOA
DAR LAC
BAN ME THUOT
KHANH HOA
NHA TRANG
DALAT
TUYEN DUC
QUANG DUC
GIA NGHIA
PHUOC LONG
PHUOC BINH
BINH LONG
LAM DONG
BAO LOC
DI LINH
NINH THUAN
PHAN RANG
BINH THUAN
PHAN THIET
HAM TAN
BINH TUY
AN LOC
TAY NINH
BINH DUONG
PHUOC THANH
PHUOC TUY
LONG KHANH
BIEN HOA
GIA DINH
SAIGON
TAN AN
LONG AN
MOC HOA
KIEN TUONG
KIEN PHONG
CHAU DOC
HA TIEN
AN GIANG
CAO LANH
LONG XUYEN
DINH TUONG
MY THO
GO CONG
VINH LONG
TRUC GIANG
KIEN HOA
PHU QUOC
RACH GIA
KIEN GIANG
CAN THO
PHONG DINH
PHU VINH
VINH BINH
VI THANH
CHUONG THIEN
KHANH HUNG
BA XUYEN
BAC LIEU
QUANG LONG
AN XUYEN
CON SON
SOUTH CHINA SEA
TUYEN DUC ELECTRIC COOPERATIVE
FRANCHISE AREA
AREA WITH LINES CONNECTED.


DARCHOA 'C'
ANKROET
MANLINE
DALAT
THAI PHIEN
DISTRICT DON DUONG
THAC CAMLY
DA THO
NO 20
DISTRICT DUC TRONG
FALL PRENN
TRUONG SON
PHAT CHI
DINH AN
XUAN TRUONG
DON DUONG
PROJECT CONCERN
RIONG BOLIENG
KIM PHAT
QUANG HIEP
FIMNON
BAC NOI
XUAN TRUONG
APDONG THANH
GIA THANH
AN HIEP
PHU THANH
MLONG B
LIEN KHANG
KOG LAM
LIEN HIEP
TUNG NGHAI
THANG NGA
LIEN KHUONG
DA NHIM RIVER
NGHIA LAM
CAO BAC LANG
TCHIRONG TAMBOREN
GOUGAH FALLS
TO SAIGON
TUYEN DUC RURAL ELECTRIC COOPERATIVE

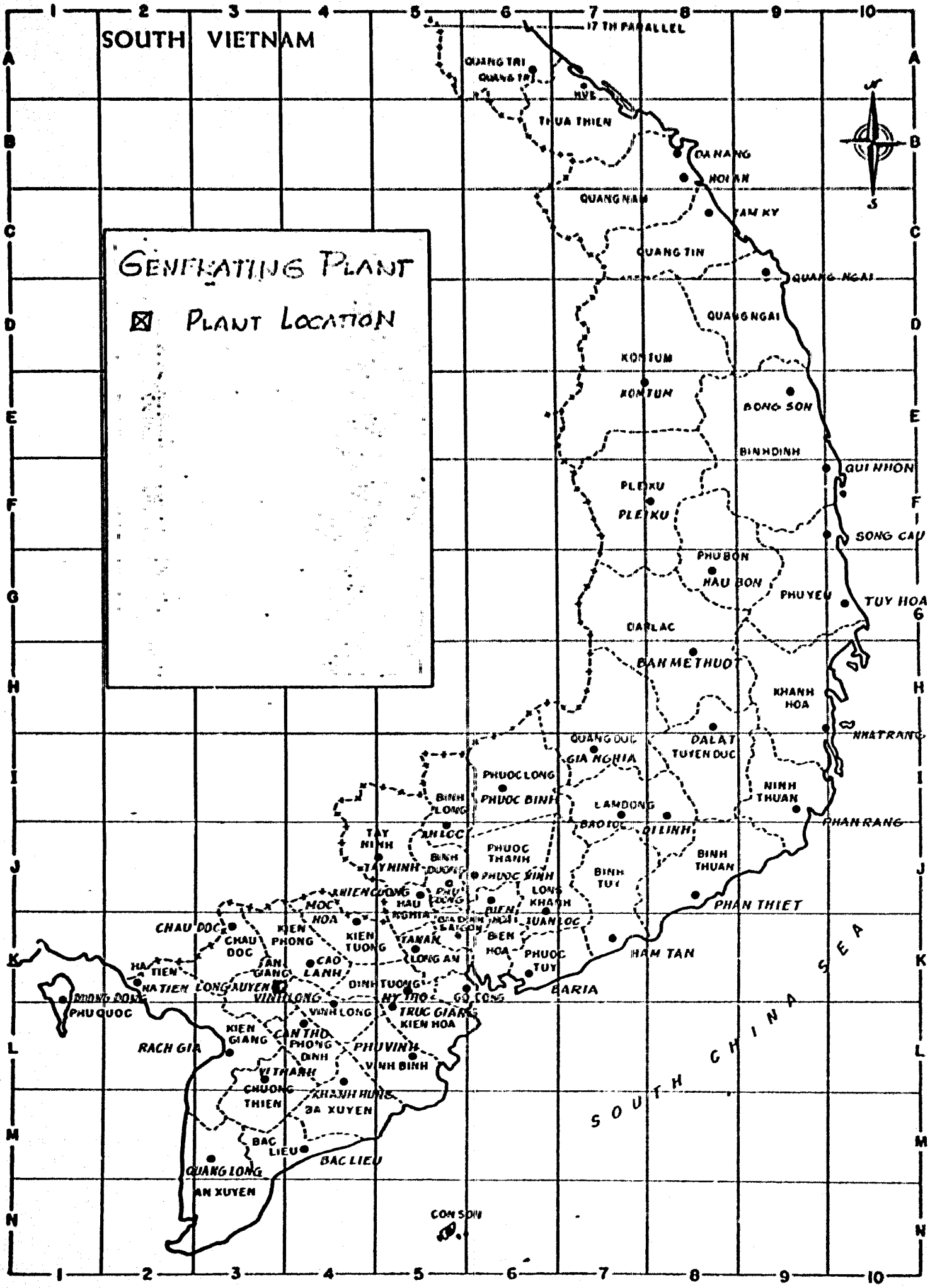


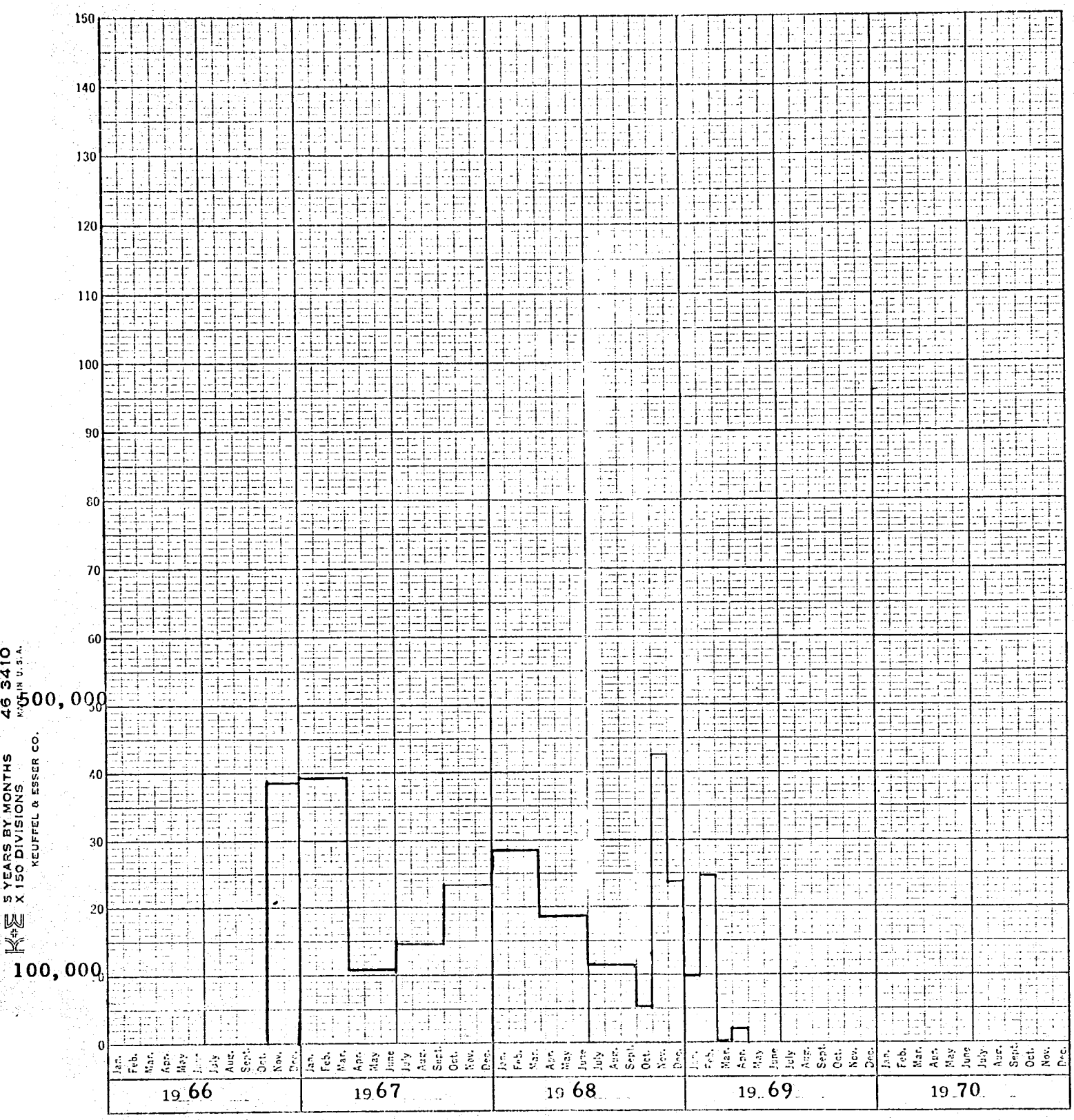
5 YEARS BY MONTHS
X 150 DIVISIONS
KEUFFEL & ESSER CO.
MADE IN U.S.A.
46 3410

Tuyen Duc Electric Co-op

Piaster Expenditure Per Month

POLE TREATING PLANT


SOUTH VIETNAM
GENERATING PLANT
PLANT LOCATION
17TH PARALLEL
QUANG TRI
HUE
THUA THIEN
DA NANG
HOI AN
QUANG NAM
TAM KY
QUANG TIN
QUANG NGAI
KONTUM
BONG SON
BINH DINH
QUI NHON
PLEIKU
SONG CAU
PHU BON
HAU BON
PHU YEU
TUY HOA
DARLAC
BAN ME THUOT
KHANH HOA
NHATRANG
QUANG DUC
GIA NGHIA
DALAT
TUYEN DUC
PHUOC LONG
PHUOC BINH
BINH LONG
LAMDONG
BAO LOC
DI LINH
NINH THUAN
PHAN RANG
TAY NINH
AN LOC
PHUOC THANH
BINH DUONG
PHUOC BINH
BINH TUY
BINH THUAN
PHAN THIET
MOC HOA
CHAU DOC
KIEN PHONG
KIEN TUONG
TANAN
LONG AN
BEN HOA
PHUOC TUY
HAM TAN
HA TIEN
AN GIANG
CAO LANH
HA TIEN
LONG XUYEN
VINH LONG
DINH TUONG
MY THO
GO CONG
BARIA
PHU QUOC
TRUC GIANG
KIEN HOA
KIEN GIANG
CAN THO
PHONG DINH
PHU VINH
RACH GIA
VINH BINH
VI THANH
CHUONG THIEN
KHANH HUNG
BA XUYEN
BAC LIEU
QUANG LONG
AN XUYEN
CON SON
SOUTH CHINA SEA



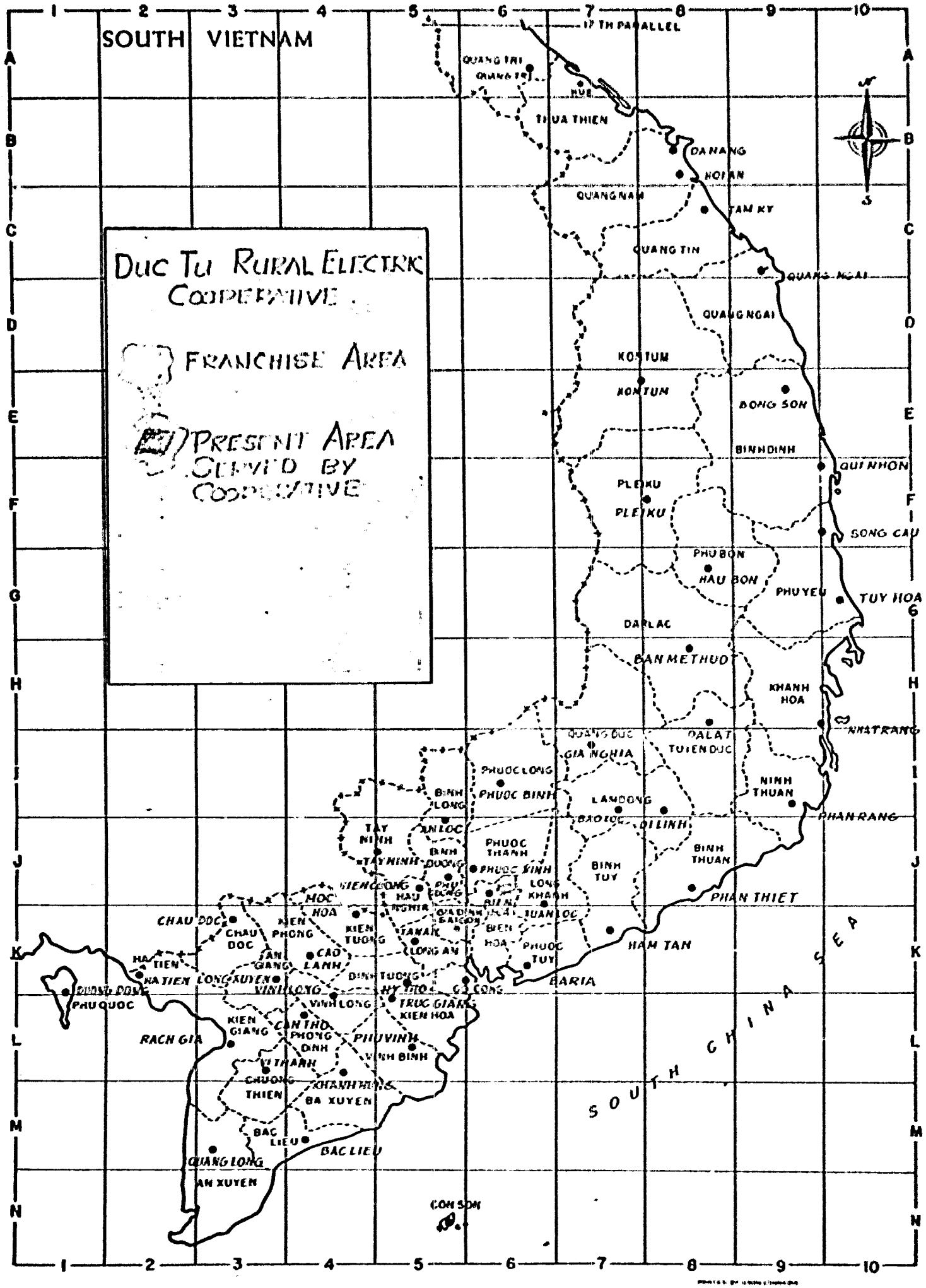
An Giang Power Plant

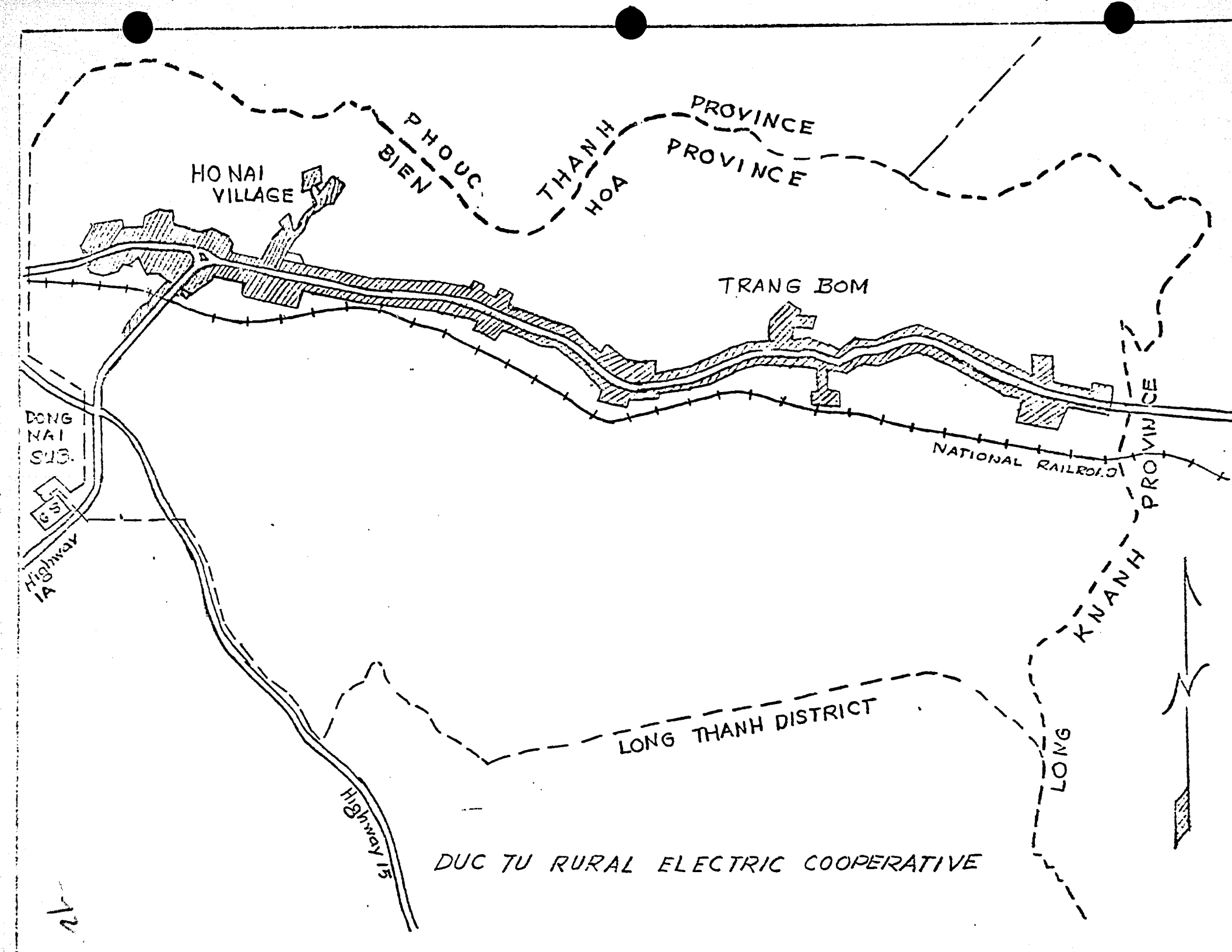
Piaster Expended Per Month

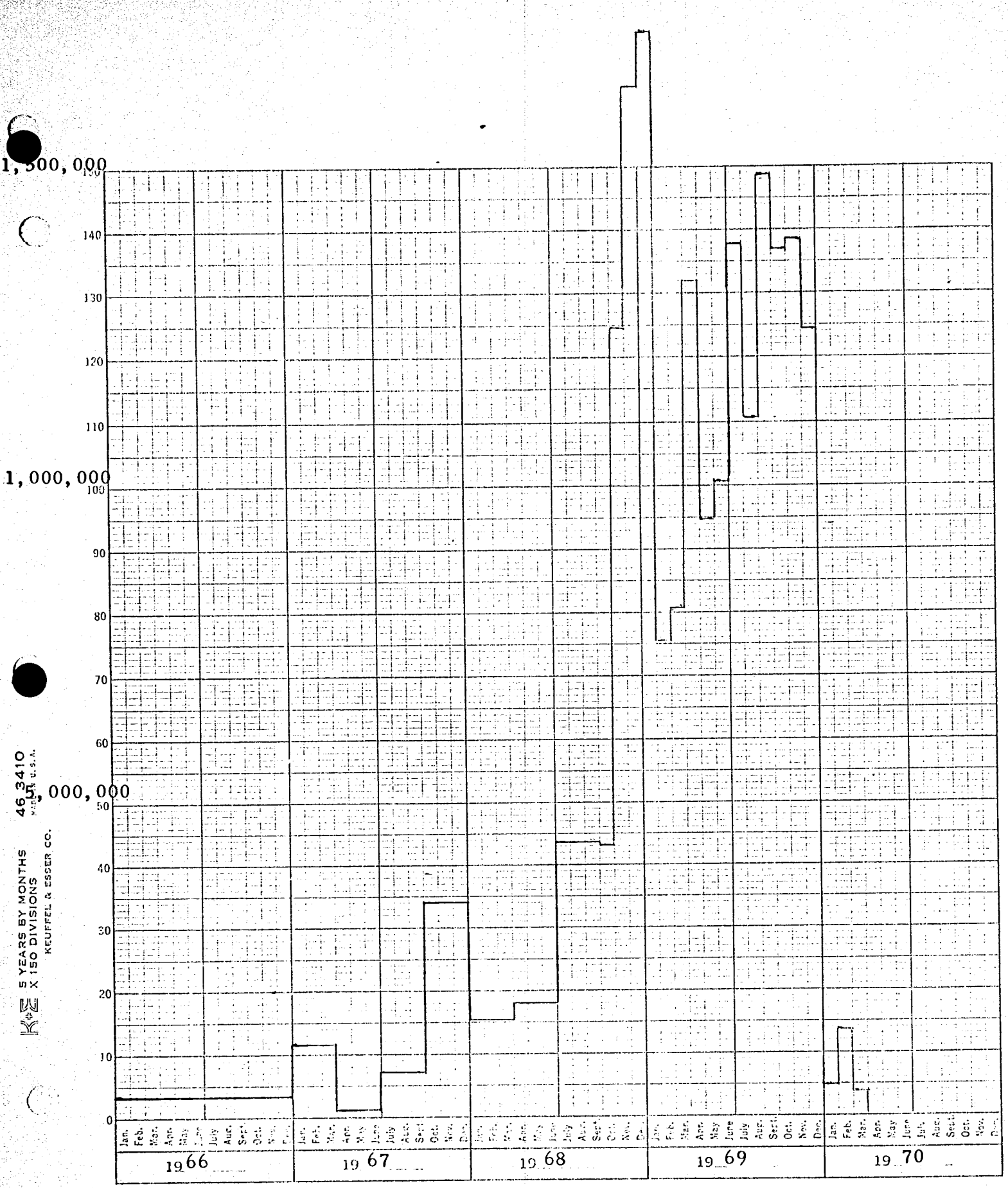
69

DUC TU RURAL ELECTRIC

COOPERATIVE


SOUTH VIETNAM
DUC TU RURAL ELECTRIC COOPERATIVE
FRANCHISE AREA
PRESENT AREA SERVED BY COOPERATIVE
17TH PARALLEL
QUANG TRI
HUE
THUA THIEN
DA NANG
HOI AN
QUANG NAM
TAM KY
QUANG TIN
QUANG NGAI
KONTUM
BONG SON
BINH DINH
QUI NHON
PLEIKU
SONG CAU
PHU BON
HAU BON
PHU YEN
TUY HOA
DAR LAC
BAN ME THUOT
KHANH HOA
NHA TRANG
QUANG DUC
DALAT
TUYEN DUC
GIA NGHIA
PHUOC LONG
BINH LONG
PHUOC BINH
LAM DONG
BAO LOC
DI LINH
NINH THUAN
PHAN RANG
TAY NINH
AN LOC
BINH DUONG
PHUOC THANH
PHUOC VINH
BINH TUY
BINH THUAN
PHAN THIET
HAU NGHIA
LONG KHANH
XUAN LOC
BIEN HOA
HAM TAN
CHAU DOC
AN PHONG
KIEN TUONG
TAN AN
LONG AN
PHUOC TUY
BA RIA
HA TIEN
AN GIANG
CAO LANH
DINH TUONG
MY THO
GO CONG
LONG XUYEN
VINH LONG
TRUC GIANG
KIEN HOA
PHU QUOC
KIEN GIANG
CAN THO
PHONG DINH
PHU VINH
VINH BINH
RACH GIA
VI THANH
CHUONG THIEN
KHANH HUNG
BA XUYEN
BAC LIEU
QUANG LONG
AN XUYEN
CON SON
SOUTH CHINA SEA


PHOUC BIEN
THANH HOA
PROVINCE
PROVINCE
HO NAI VILLAGE
TRANG BOM
DONG NAI SUB.
G S
NATIONAL RAILROAD
PROVINCE
KNANH
LONG
LONG THANH DISTRICT
Highway 1A
Highway 15
DUC TU RURAL ELECTRIC COOPERATIVE



Duc Tu Electric Co-op

Piaster Expenditure Per Month

13

CHAPTER V

AN GIANG POWER PLANT

Background

The agreement between the Governments of the Republic of Vietnam and the United States provided that as a portion of the Rural Electric Cooperative Project, a 2500 KW generating plant would be installed in the city of Long Xuyen to produce electric energy for the An Giang Rural Electric Cooperative.

This agreement stipulated that the plant would be constructed by the cooperative, and upon its completion would be transferred to Electricity of Vietnam for operation and ownership.

The agreement further provided: that EOV would assume responsibility for the repayment of the plant's total cost, that their repayment would be made into a rural electric cooperative revolving fund, that any surplus generating capacity could be used to meet the energy requirement of the city of Long Xuyen, that the requirements of the cooperative would have priority over these city requirements, and that Electricity of Vietnam would provide additional generating capacity, whenever necessary, to satisfy the cooperative's increasing loads.

Pacific Architects and Engineers (PA&E) were contracted by USAID/VN to provide the required engineering, design and supervision services for the plant construction. This plant design included two 1500 KW diesel electric generating units, a two unit standard generator control cabinet, metal clad switch-gear, a 6,000 KVA transformer station and all necessary equipment and materials required to inter-connect the existing Societe Centrale D'Eclairage et D'Energie (SCEE) generating plant in Long Xuyen to the new plant's busbar.

Representatives of EOV, USAID/VN's Electric Power Section, PA&E, and NRECA's staff selected a portion of the existing SCEE plant property as the optimum location for installation of the plant. However, EOV and provincial authorities were unable to secure SCEE's permission to utilize this portion of the existing plant property for the remaining 18 months of SCEE's franchise.

A site adjacent to the SCEE plant was then investigated, and after lengthy negotiations with provincial authorities and several individuals holding certain color of title rights to the ground, this land was acquired by the cooperative in November 1966. It was not vacated and available for full development until May of 1967.

USAID/VN acquired two 1500 KW self-contained GM diesel electric generating units, a two unit control cabinet, a 4800 KVA transformer, and miscellaneous substation material. This equipment originally purchased by AID/W for Nigeria, was immediately available and its acquisition would avoid the long lead time required for USAID/VN to procure similar units. The plant components were received in Vietnam on May 22, 1967, and stored in EOV's Thu Duc Steam Plant Compound pending site acquisition and development. The control cabinet and one of the generating units were found to have sustained concealed damage in shipment. This damage was reported by shipsmate on arrival in Vietnam. The units were inspected by General Motors technicians and necessary repair parts were ordered by USAID/W.

PA&E prepared purchasing data for the remaining plant material and equipment and USAID/VN instigated procurement procedures for the metal clad switch gear and the inter-connection transformer.

The portion of the plant site located next to the access road, and not occupied by buildings was cleared of vegetation, filled and compacted. This work was performed by the An Giang Cooperative force account crews under the supervision of the NRECA advisor. Full operations were completed on December 31, 1966.

The generating plant components were shipped from Thu Duc to Long Xuyen on February 10, 1967. Off loading of the 54 ton generating units, and setting them in position on the restricted plant site, without the use of suitable heavy material handling equipment, proved quite difficult.

The original planning for use of this site had contemplated placing the generating units on the river side of the plant site. However, with the anticipated difficulty of moving the units to the river location and the possibility of further delay in obtaining full use of the remainder of the property, a decision was made to install these units on the access road side of the plant site. PA&E then prepared final plans and specifications to implement this decision.

The metal clad switch gear and inter-connection transformer was received in Saigon and shipped to the plant site at a later date. All components were positioned on the site, concrete cable trenches completed and cables installed by the cooperative force account crew.

A contract for the civil work on the remaining plant site was awarded to a Vietnamese contractor. This civil work included fill and compaction, river bank ripraping, preparation of the fuel oil storage tank ground, the revetments for the fuel storage tanks and the construction of a pump house.

Work required for the fuel storage and supply system was not included in the contract, at the request of EOV. This work, including two fuel storage tanks, supply pipe lines, pumps and a fuel barge unloading dock, will be provided at a later date under Vietnam Power Company's (VPC formerly EOV) contractual arrangements with its fuel oil supplier. Barge delivery of larger quantities of oil will enable VPC to obtain fuel oil for considerably less than the present cost of fuel oil delivered by truck from the supplier's Can Tho depot. VPC's fuel oil supplier installed three temporary storage tanks for initial plant operations.

The plant was placed in full operation on February 4, 1969, and has operated since that date.

The initial off peak demand of the combined An Giang Cooperative and VPC's Long Xuyen distribution systems was insufficient for the stable operation of a 1500 KW unit, necessitating the use of the inefficient small generators in the old plant. The increasing loads of both distribution systems indicate this off peak load will reach a level by December 1970, to make it practical to run one of the more economical 1500 KW units on a 24 hours per day schedule, avoiding present interruptions of service encountered when the load is shifted from one plant to the other.

Complete coordination of generating plant operations and the An Giang Cooperative's distribution system sectionalizing apparatus had not been achieved on June 30, 1970. Although a sectionalizing study, including coordination between relaying at the power plant and the oil circuit recloser on the cooperative system, clearly established the compatibility of the devises used and the possibility of full sectionalizing coordination.

Review of the cooperative's designed sectionalizing system indicated that the oil circuit reclosers could be temporarily replaced with units of lower trip ratings for the cooperative's load building period. These units were replaced. More realistic relay settings, with time delays matching those of the sectionalizing devices of the cooperative system will need to be accomplished by VPC at the power plant if they are to deliver satisfactory service to the cooperative - a service to which they are committed and to which the cooperative is entitled.

The use of electricity by the members of An Giang Electric Cooperative and the Long Xuyen customers of Vietnam Power Company will increase very rapidly as long as the retail kilowatt hour rates charged these users are commensurate with justified costs of generation. Vietnam Power Company is committed to provide the required additional generating capacity, in sufficient time, to prevent a power shortage in the area.

Present loads are approaching, if not exceeding the firm capacity of this plant and additional generating units should be planned for installation within the next two years.

Financial Summary

Generating Plant Investment Costs
Paid by the An Giang Rural Electric Cooperative

U.S. DOLLAR COSTS

Engineering (PA&E)	$ 14,650.00
Equipment and Material	
Generators and control cabinet, 4800 KVA transformer, switch and misc.	$ 490,738.95
Metal clad switchgear, 750 KVA transformer, conductor and misc.	$ 76,615.00
TOTAL U.S.$ COST:	$ 582,003.95
Converted to V.N.$ at 60 to 1 U.S.$	$34,920,237.00

LOCAL CURRENCY COSTS

Site Acquisition	$ 670,746
Site Improvement, Labor & Material	2,259,575
Pump Bldg., Tank Site Improvement	1,205,762
Labor Installation, Gen. Units	968,577
Labor Installation, Control & Switchgear	384,536
Local Material, Adm. & O.H.	722,551
Initial Trial Run Fuel	35,000
	$ 6,246,747
TOTAL V.N.$ COST:	$41,166,984

Cost data shown is as accurate as available data made possible, and may be subject to minor changes upon final USAID audit of material costs.

Pole Treating Plant operated by the National Union of Electric Cooperatives, near Phan Rang. It supplies poles to the rural electric cooperatives in Vietnam. The plant manager and NRECA's chief of party, Hugh Bush, may be seen at left.

CHAPTER VI

POLE TREATING PLANT

Background

Preliminary investigation of the feasibility of establishing a rural electric cooperative in Tuyen Duc Province also revealed the existence of extensive tracts of pine pole timber in the mid-highland regions of Vietnam.

The USAID Mission Director requested that a forestry specialist make an in-country study of the various species of trees to ascertain if suitable timber was available to manufacture utility poles, to investigate the market for treated wood products in Vietnam, and providing the wood was found to be suitable and the market adequate to support a pole treating plant, to advise the Mission of the type of pole treating plant that should be procured.

AID/W procured the services of a timber products specialist through an inter-agency agreement with the United States Department of Agriculture. This specialist spent the month of July 1966, making a thorough investigation of the timber stand, and of the feasibility of building and operating a treating plant under the conditions existent in Vietnam.

The timber products specialist found the Vietnam species of pine tree corresponds closely in strength and treatability to the Southern Yellow Pine of the United States and there exists in Vietnam an extensive market for utility poles, wood ties, freshwater piling, decking, timbers, and lumber chemically treated to prevent decay and insect damage. The specialist recommended the installation of a treating plant and drying kil He later changed this recommendation to a larger capacity plant without the drying equipment in order to concentrate the plant facilities in one location.

USAID/VN in December 1965, initiated procurement of the plant equipment and technicians to train the plant operating personnel. The plant equipment contract was awarded in March 1966, by GSA to the Wood Treating Chemicals Company (WTCC). This purchase contract included the services of two supervising erection engineers for a period of five months each.

A plant site was acquired near Trap Cham in Ninh Thuan Province. This site is near the underdeveloped seaport of Phan Rang on the South China Sea, providing for the import of raw materials, shipment by water of treated products to all parts of Vietnam and export to foreign countries The site is adjacent to the National Railroad's Trap Cham-Da Lat spur

line allowing rail transportation of logs from the forests directly to the plant and on the main north-south line of the railroad for shipment of treated products throughout Vietnam. The three pilot rural electric cooperative projects formed the National Union of Electric Cooperatives (NUEC) to own and operate the completed plant.

An engineering contract was executed on June 30, 1966, between USAID/VN and Pacific Architects and Engineers to provide the required plans and specifications for the plant site development, the required equipment foundations and plant structures.

The WTCC plant erection supervisor arrived in Vietnam on August 1, and the second engineer arrived October 31, 1966. PA&E's plans were reviewed by the WTCC supervisor and several changes were made in the plans to reduce initial cost. In mid-September 1966, USAID's Electric Power Section assigned WTCC's supervisor broad supervisory powers for all matters pertaining to the Pole Treating Plant.

The plant equipment was loaded on the freighter, "Island Mariner" in New Orleans on June 20, and arrived in Saigon harbor, October 20. The ship's cargo sustained major losses from pilferage while docked in Indonesia. The extent of these losses were not determined at this time, as the equipment was unloaded onto barges and then loaded on the coastal steamer, "Bente Bovig", for trans-shipment to Cam Ranh. At Cam Ranh, the plant equipment was transferred to barges to be towed to Phan Rang and delivered to the plant site. The U.S. Logistical Command, through an error in their orders, unloaded the material at Cam Ranh Bay. The steam generator, treating cylinders, and storage tanks were left on the beach below the high tide level and were badly damaged by salt corrosion. The steam generator was damaged beyond use by improper lifting. Many barrels and crates of equipment were damaged by fresh water flooding of the storage area, and the majority of the chemical was water damaged and lost. Military records did not reveal the storage location of a number of items and part of the shipment was lost.

The plant was delivered to Phan Ranh Bay and off-loaded on March 10, 1967. Losses in transit from pilferage and damage were estimated by WTCC to exceed $100,000.00.

The final plans and specifications for a site improvement contract were completed by PA&E in September 1966. After negotiations with the Officer in Charge of Construction and RMK, the principle American contractor in Vietnam were unproductive, USAID/VN's Contract Office awarded a contract to Linder, Cox and Hacker, a local construction firm,

for the site improvement work. Construction started on January 1, 1967, and was not fully completed until late 1968.

In mid-May of 1967, Linder, Cox and Hacker had completed the installation of plant equipment foundations and the WTCC erection engineers were able to start installing the equipment. Piping of the plant equipment was substantially completed on January 1, 1968.

Procurement procedures for replacement of the plant equipment and material lost or damaged in shipment were started in March 1967. However, purchase authorization was not released until February 1968. Replacement of pipe, pipe fittings, valves and structural steel were purchased locally through OICC (Officer in Charge of Construction), the major oil companies, and Vietnamese merchants.

Land was leased in the vicinity of Da Lat for a pole concentration yard. Cutting and hauling contracts were negotiated by NUEC to provide the raw timber for the poles. A long term contract between the Government of Vietnam, its Directorate of Forestries and NUEC was drafted and negotiations of this document were carried on throughout the remainder of this contract. Licenses were granted to NUEC for small quantity cutting priviledges, whenever logs were required.

Responsibility for USAID supervision of the construction of the pole treating plant was shifted from the Electric Power Section to Regional Engineering in October 1967.

Contracts were negotiated with the National Railroad for construction of the plant siding track, and with the French owned Phan Rang electric utility (SIPEA) for plant electric service.

The plant started testing operations in late September 1968, with the treating of crossarms and log skids required for the plant framing yard. The first poles were treated late in October and delivered to the Tuyen Duc and Duc Tu projects.

The monthly production of treated poles increased slowly as the plant operators became more experienced and missing control components of the plant were obtained and installed. The plant production in the early months of 1970, had failed to exceed 25% of the plant capability. This failure can be attributed to several problems confronted by the board of directors and management of the National Union of Electric Cooperatives:

1. The presence of Viet Cong forces in the forests has, at numerous times, prevented timely and orderly cutting of the trees.

2. The necessity of using less dependable and higher cost trucking contractors, rather than the planned railroad transportation for hauling the logs from the forests to the treating plant. The use of the railroad facilities became impossible when repeated Viet Cong attacks on the train and sabotage of bridges and tracks forced the railroad to stop operating its spur line to Da Lat.

3. The lack of suitable pole handling equipment at the plant site has prevented optimum production. This equipment was specified in the original plant proposal for procurement by USAID/VN. Although on several earlier occasions the equipment was requested, it was not until June 1969, that the PIO/C was approved and the equipment ordered. Delivery cannot be expected earlier than late 1970. Requisitions for laboratory apparatus and materials, processing control equipment, and replacement of basic chemicals were equally delayed - all preventing increased production of poles.

4. The failure of NUEC to provide and retain a competent plant manager. The board of directors of the National Union of Cooperatives effectively delegated full responsibility for the plant's operation to their general manager. The general manager employed, on three occasions, a plant manager, but did not delegate proper authority and control of plant personnel to that individual. The employment of each of these plant managers was terminated by NUEC's board of directors when the plant manager displayed conflicting ideas and ideals of proper physical operation and financial management to those held by NUEC's general manager. The first two plant managers employed were considered by the O&M team advisors and by the NRECA staff to possess good plant managerial potential. The plant accountant was appointed acting manager, and on June 30, 1970, was serving in this position.

The treating plant facilities are well designed and constructed. The equipment is modern and efficient and the labor is well trained and competent of performing all of the variety of work required to produce high quality poles.

The cutting and transportation of a sufficient number of logs to allow the plant to operate at full capacity, although somewhat difficult due to Viet Cong interference, can be accomplished.

The board of directors should employ a plant manager who is responsible to the board for all operations of the pole treating plant, from the cutting of timber to the delivery of the treated product to the customer. The general manager of NUEC should provide the plant manager with back-up assistance in negotiations with the various ministries of the Government of Vietnam, and assist the board of directors to properly appraise the plant manager's performance, promote future development of the industry, and maintain the operation in such a way as to best serve the interest of NUEC's membership.

Financial Summary

U.S. DOLLAR COSTS

Engineering - PA&E	$	14,740.00*
Construction - Linder, Cox & Hacker		72,000.00*
Equipment & Material		
Plant and Erection Supervision	$	331,276.36
Incinerator		41,403.44
Chemical Solvent		6,640.63
Replacement of Parts lost in transit		30,029.55*
Tools & Replacement Parts, PIO/C, est.		85,100.00*
Fork Lift, PIO/C, est.		30,500.00
Spare Parts, PIO/C, est.		2,400.00
Replacement of Penta, lost in transit		38,646.00
Laboratory Chemicals, PIO/C, est.		2,350.00
Feasibility Study Cost		5,000.00**é
Pole Plant Advisor - PA&E		90,000.00
TOTAL U.S.$ COST:	$	750,085.98
Converted to V.N.$ at 60 to 1 U.S.$		$45,005,159.00

* USAID/VN may not include in plant repayment requirements.

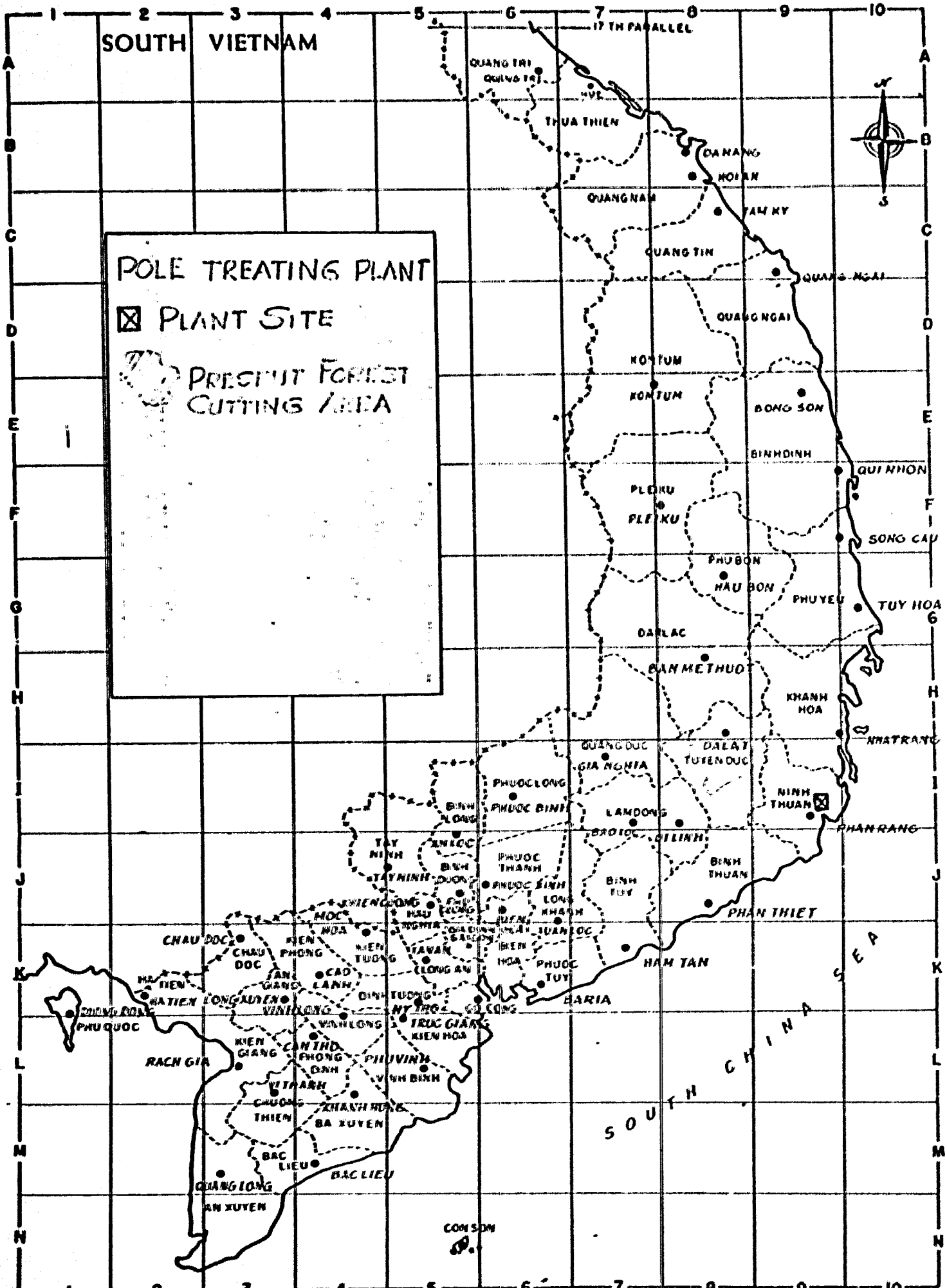
** Per USAID-GVN Agreement, not charged to PTP Project. Items noted PIO/C, est. were either not received or costs not available on June 30, 1970.

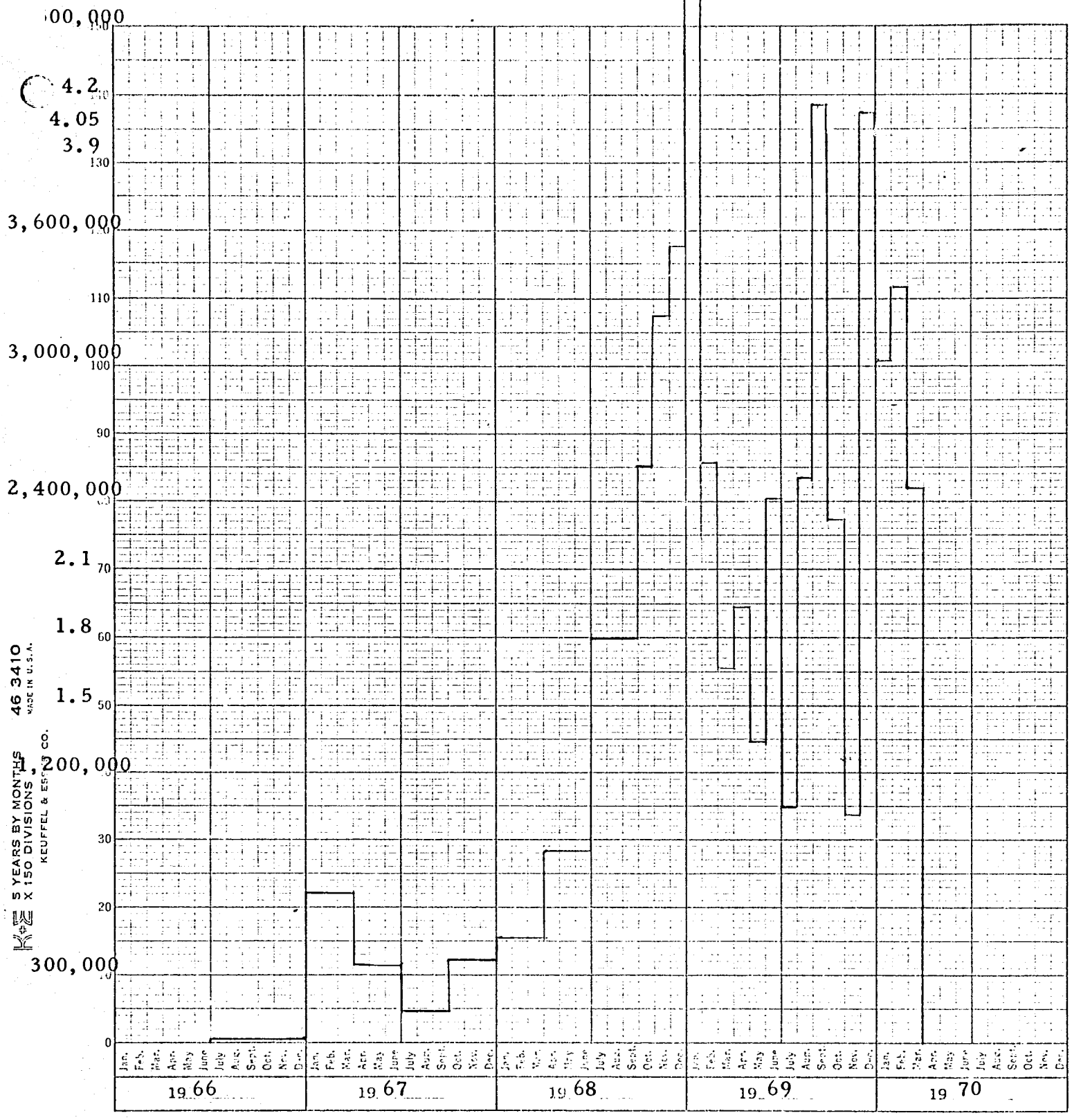
LOCAL CURRENCY COSTS

Plant Investments	
Land Rights and Improvements	$ 539,014
Structure Labor	1,864,838
Structure Material	1,642,368
Structure Misc. Costs	1,652,045
Erection Equipment Labor	2,016,298
Local Material, Erection	1,143,370
Erection Misc. Cost	926,121
Salary, Management	440,427
Office Expense	122,731
Board Expense	105,043
Contract Site Improvement	6,098,600
Contract Fence	2,307,840
TOTAL PLANT INVENTORY:	$18,858,695
Operations (as of March 31, 1970)	
White Wood	$13,092,434
Hauling to PTP	3,535,277
Treating Oil	6,246,893
Power Bill	620,766
Maintenance	551,464
Labor	4,335,232
Salary	2,953,825
Office Expense	1,436,121
Board Expense	2,428,608
Miscellaneous	8,425,410
TOTAL OPERATIONS:	$43,626,030
Total Local Currency Loan Funds Expended for PTP:	$62,484,725
U.S. DOLLAR COST CONVERTED TO V.N. $	$45,005,159
Less cost of material replacement	$ 5,714,760
Less cost of PA&E and LC&H	5,804,400
Less cost of advisor service	5,700,000
Sub-Total of Foreign Exchange Costs:	$27,785,999
V.N.$ of Loan Fund Piasters for Plant	18,858,695
Total Plant Cost in V.N.$	$46,644,694
V.N.$ of Loan Fund Piasters for Operations:	$43,626,030
TOTAL:	$90,270,724

Final analysis of Operation Costs may reveal items that should be capitalized as part of the initial plant investment cost.

Some items of equipment and material on order have not arrived, or actual costs have not been received by USAID/VN at the time of this report. The above calculations are as accurate as available data allowed, but cannot be considered to be either exact or final.


SOUTH VIETNAM
POLE TREATING PLANT
PLANT SITE
PRESENT FOREST CUTTING AREA
17TH PARALLEL
QUANG TRI
THUA THIEN
DA NANG
HOI AN
QUANG NAM
TAM KY
QUANG TIN
QUANG NGAI
KONTUM
BONG SON
BINH DINH
QUI NHON
PLEIKU
SONG CAU
PHU BON
HAU BON
PHU YEN
TUY HOA
DAR LAC
BAN ME THUOT
KHANH HOA
NHA TRANG
QUANG DUC
GIA NGHIA
DALAT
TUYEN DUC
PHUOC LONG
PHUOC BINH
NINH THUAN
LAM DONG
BAO LOC
DI LINH
PHAN RANG
BINH LONG
AN LOC
TAY NINH
PHUOC THANH
BINH DUONG
BINH TUY
BINH THUAN
PHAN THIET
HIEU HOA
LONG KHANH
XUAN LOC
CHAU DOC
KIEN PHONG
KIEN TUONG
TAN AN
LONG AN
BIEN HOA
PHUOC TUY
HAM TAN
HA TIEN
AN GIANG
CAO LANH
LONG XUYEN
DINH TUONG
MY THO
VUNG TAU
BARIA
PHU QUOC
VINH LONG
TRUC GIANG
KIEN HOA
KIEN GIANG
CAN THO
PHONG DINH
PHU VINH
RACH GIA
VINH BINH
VI THANH
CHUONG THIEN
KHANH HUNG
BA XUYEN
BAC LIEU
QUANG LONG
AN XUYEN
CON SON
SOUTH CHINA SEA



Pole Treating Plant

Piaster Expenditure Per Month

NATIONAL UNION OF

RURAL ELECTRIC COOPERATIVES

CHAPTER VII

NATIONAL UNION OF ELECTRIC COOPERATIVES

The National Union of Electric Cooperatives (NUEC) was organized on October 15, 1965, and received a Government of Vietnam license to operate as a cooperative organization on December 22, 1965.

A translation of the Bylaws of NUEC reveal this cooperative was created to coordinate and promote activities of its members including the:

"1. Supply of electric power to its members.

2. Purchase, manufacture, production and supply of equipment and electrical appliances.

3. Management of a pole treating plant and all other wood product plants.

In general, it will act on all necessary activity regarding electricity. The members of NUEC shall be rural electric cooperatives having their headquarters within the Republic of Vietnam, and these members pledge to purchase all equipment, material and electrical appliances through the Union. The members shall utilize equipment supplied by and all of the services and necessary facilities made available by the Union. NUEC shall enjoy a percentage on the given services which will be determined by the board of directors according to each case."

The expenses of NUEC operations are charged; first, to the individual cooperative utilizing specific services, second; to the pole treating plant for management expense; and the remainder is prorated to the three distribution cooperatives, according to the number of members connected to each system.

The board of directors of NUEC appointed Phan Van Tri, NRECA/VN's Administrative Assistant, a USAID direct hire Vietnamese to serve as their temporary manager, and on August 15, 1967, employed the individual as the general manager of NUEC. Mr. Tri has a long experience record with USAID in the field of cooperative training and in teaching accounting procedures.

Prior to becoming officially NUEC's general manager, Mr. Tri, had with the assistance of NRECA/VN's team leader and country engineer, translated into Vietnamese the U.S. Federal Power Commission's Uniform System of Accounts as adapted for rural electric cooperatives, and in July 1967, had established the accounting systems in each of the distribution projects. The training and supervision of the cooperative accounting personnel was continued as a portion of the service rendered by NUEC to the member distribution cooperatives.

The members of NUEC's administrative board hold regular meetings with the majority of the directors attending and participating in the board decisions. USAID and NRECA personnel invited to attend NUEC's earlier board meetings, were favorably impressed with the professional manner in which the meetings were conducted.

During the past year, NUEC's administrative board and management appeared, by their actions, to consider the Union as being a superordinate organization; this consideration has hindered the development of a strong administrative board and management in the distribution cooperatives.

NRECA believes that NUEC should reassess its purposes and place a greater emphasis on efforts to solve the basic problems experienced by the pole treating plant and on the development of a comprehensive Republic of Vietnam sponsored rural electrification program.

As owner and operator of the pole treating plant, the NUEC administrative board and management should:

1. Employ a competent pole treating plant manager and delegate the responsibility of plant operations and personnel to this manager. Obtain from the Ministry of Agriculture the license to cut logs in the large tract of the forest that the Directorate of Forestries previously agreed to establish for the sole use of the pole treating plant.

2. Obtain from the Ministry of Economy the end user-importer license the Government of Vietnam previously agreed to provide NUEC. The only license issued to date provides for the import of one commodity on a one time basis and required NUEC to use the services of an importer brokerage.

3. Endeavor to obtain from the Government a country-wide permit for transporting raw poles and treated products in order to avoid the time consuming process of obtaining permits from each province for shipment of logs or treated products.

4. Develop, with the Directorate of Forestries, efficient, accurate and timely methods of determining the charges for the logs NUEC's contractors cut.

5. Investigate and develop improved and more economical means of transporting raw logs and treated timber products.

6. Develop suppliers of accurately sawn timber and lumber suitable for treatment.

7. Develop a merchandising system for treated timber products.

8. Establish clear cut goals and objectives for the future operations of the pole treating plant.

As the service organization for the present and future rural electric cooperatives, NUEC's administrative board and management should:

1. Assist and coordinate activities of the member systems in political representation and action for recognition of the role and needs of the area coverage cooperative electrification program.

2. Provide central services in the fields of insurance, management training, public relations, etc., at the request of the members whenever such a central program can be more effective and more economical than a series of independent local programs, or can effectively supplement local efforts.

3. Assist the Ministries of Agriculture, Rural Development, Public Works and other Government subdivisions to establish and staff a Vietnam Rural Electrification Administration. The inclusion of NUEC, a non-government concern, as a member of the Cooperative Control Commission (CCC) negated the possibility of this body developing into a functional government organization.

4. Establish release procedures and obtain from the Ministry of Agriculture the $10,000,000 V.N. in 1970, $20,000,000 V.N. in 1970, and $10,000,000 in 1972, provided in the Project Agreement of 1969. Establish a capital funding plan for future rural electric cooperatives.

5. Investigate and establish with Vietnam Power Company and other Governmental agencies a plan to provide wholesale power to the cooperatives based on actual production and transmission costs. The Government could consider rebating fuel oil taxes paid by VPC for production of energy distributed to rural residents.

6. Establish member education programs to promote the safe use of electricity in the homes and on the farms.

7. Promote training programs for cooperative employees to be conducted by the personnel of the Cooperative Research and Training Center and by the Vietnam Power Company in certain technical areas, and by specialists from the more developed countries in the areas of cooperative management, accounting, consumer services and other special fields.

CHAPTER VIII

VIETNAMESE INTEREST IN EXPANSION OF THE COOPERATIVE RURAL ELECTRIC PROGRAM

NRECA/VN received many delegations of Vietnamese from non-metropolitan areas of Vietnam requesting assistance in the establishment of a rural electric cooperative in their provinces. A number of these delegations were interested in the small generator type of electrification for a limited number of consumers. However, many had visited the pilot rural electric cooperatives and recognized the economic as well as social benefits which will rapidly develop in these three projects and were anxious to immediately organize a cooperative system.

NRECA's team members explained the pilot project nature of NRECA's Task Order and gave the delegations information regarding size, cost, required infrastructure and legal requirements. The delegations were then referred to the appropriate GVN authorities.

Delegations from twelve provinces representing fourteen potential cooperative areas with a population of approximately 750,000 rural Vietnamese had developed their initial planning to the extent that it was evident a viable electric cooperative could be established in their areas.

The Cho Moi District area of An Giang Province was investigated by NRECA staff members on several occasions and basic data was obtained to make a feasibility study at a later date. The potential cooperative would include all of the area between the Bassack and Mekong Rivers in An Giang Province, amounting to 32,959 square kilometers with a total population of 150,000 inhabitants. The potential membership of the island cooperative will exceed 27,000.

A 3,000 KW or larger generating plant would be required to serve the area until the Vietnam Power Company builds the transmission line from Saigon to Can Tho.

The potential industrial loads would consist of rice mills, food processing plants and clay products plants. The major load in agriculture would be for irrigation and discharge pumping. This area has a very high degree of security as it is the headquarters of the anti-communistic, militant Hoa Hoa Buddhist Sect.

The An Giang Province Authorities are very interested in obtaining electrical service there - the only part of their Province that cannot be served by the An Giang Rural Electric Cooperative.

One of the original sites investigated in depth by the Phase I, II and III NRECA teams was the rural area surrounding Nha Trang in Khanh Hoa Province. The potential project was deemed to be feasible by the Phase III Study Team, but was not included as one of the original pilot projects due to the lack of security in approximately half of the proposed cooperative area. Security has now been established and a viable cooperative could be established to serve 10,000 members.

Ninh Hoa in Khanh Hoa Province - This area is partially served by a Farmer Association Electric System and considerable interest has been evidenced to enlarge the service area and rehabilitate the existing system. Potential Membership: 4,000 to 5,000.

Phan Rang in Ninh Thuan Province - This area could now be developed into a fair sized cooperative and would provide energy for irrigation of the large tract of agricultural land developed by the Vietnamese Government. Over 5,000 rural establishments would be served in this area.

Rural villages in Vinh Long Province near Can Tho have requested assistance in organizing a cooperative to distribute electricity now available from Vietnam Power Company in Can Tho. A potential membership of 8,000 to 10,000 could be served.

Rural fishing hamlets between the villages of Ha Thien and An Binh in Kien Giang Province on the Gulf of Siam are developing small generator supplied systems but recognize the limitations of their electric supply and distribution system and desire to combine into a large cooperative of 6,000 plus members.

The Khanh Hung area of Ba Xuyen Province has for several years requested assistance in establishing a large cooperative. In 1966 and 1967, a sample membership drive indicated 10,000 to 12,000 rural Vietnamese desired electrical service. Strong support was given to this proposed project by the local Chinese businessmen of Khanh Hung.

Two separate areas in Dinh Tyong Province are working with small generator supplied cooperative systems and desire to expand their service to all of the rural communities in the province.

A rural area near Tan An in Long An Province produced considerable quantities of fresh vegetables for the Saigon market and these rural farmers are quite interested in forming a cooperative to furnish power for sprinkling systems.

A number of villages along National Road #1, in Long Khanh Province have combined in an effort to supply their electrical requirements. The U.S. Military Forces have assisted the villagers and requested assistance in forming a rural electric cooperative.

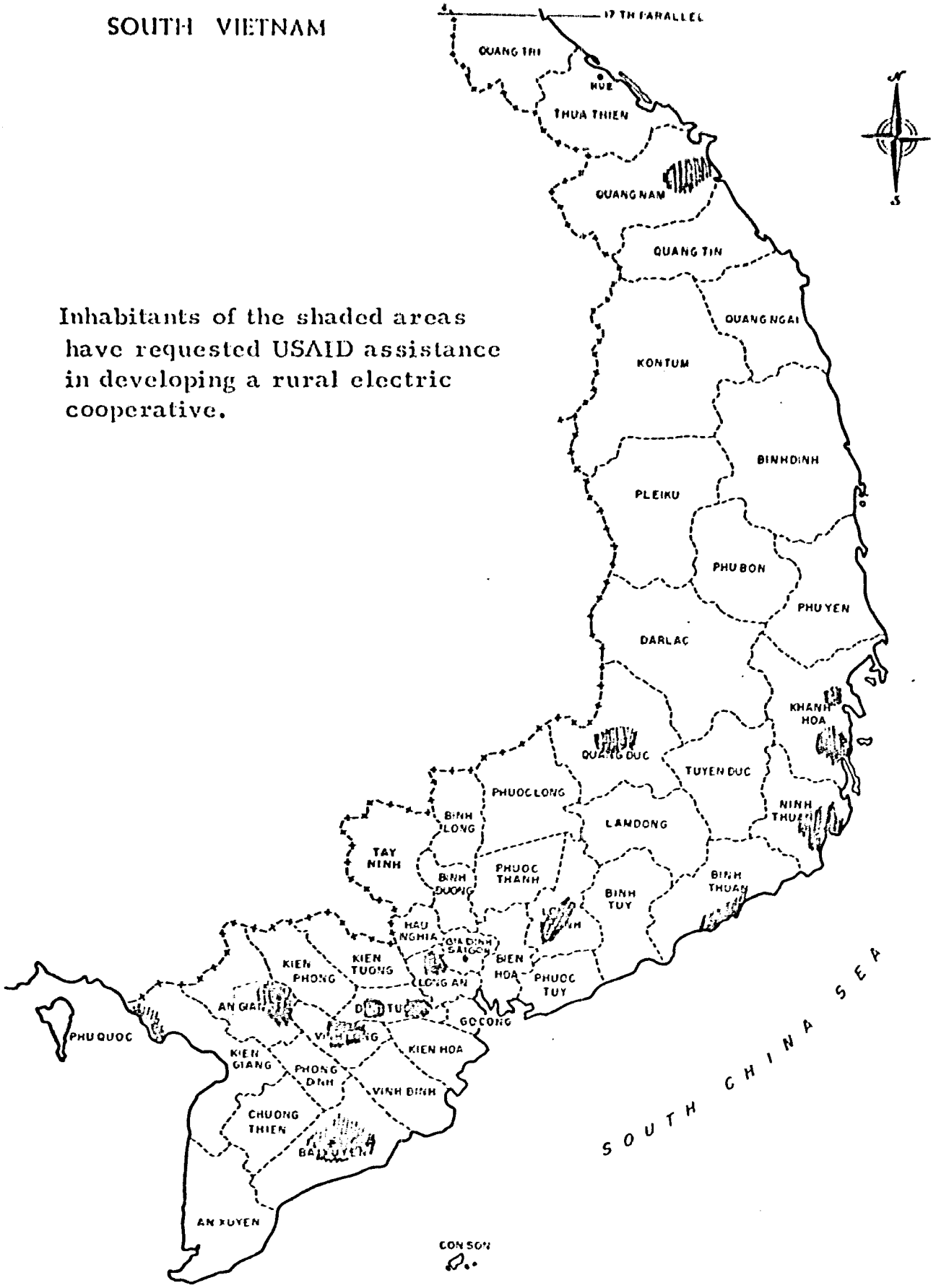
A large delegation from the Thu Bon River area, between the Nong Son Coal Mines and the Coastal village of Hoi An, have developed plans for a rural electric cooperative system with considerable potential industrial load. Vietnamese engineers engaged in planning an industrial complex in the Nong Son area promoted this endeavor several years ago.

The residents of villages near Hoa Da and Phan Thiet in Binh Thuan Province have actively promoted the establishment of an electric cooperative to provide electricity for food processing plants and refrigeration in support of their large fishing industry.

Villagers in Quang Duc Province requested assistance in establishing cooperatives to supply electricity for saw mills and wood working plants.

SOUTH VIETNAM

Inhabitants of the shaded areas have requested USAID assistance in developing a rural electric cooperative.



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APPENDICES

APPENDIX I

ENGINEERING

An Giang Rural Electric Cooperative, Distribution Line
Contract No. AID 430-2912 (Lot I) PIO/T 430-295-3-70250
Lyon Associates
Letter Contract dated August 15, 1967

Tuyen Duc Rural Electric Cooperative, Distribution Line
Contract AID 430-2912 (Lot II) PIO/T 430-295-3-70250
Lyon Associates
Letter Contract dated August 15, 1967

Duc Tu Rural Electric Cooperative, Distribution Line
Contract No. AID 430-2912 (Lot III) PIO/T 430-295-3-70251
Lyon Associates
Letter Contract dated August 15, 1967

Three PIO/T's were executed by USAID/VN on January 27, 1967, to provide funds to finance a contract or contracts with an engineering firm or firms to provide the engineering services required by the pilot rural electric cooperatives.

Nine architectural and engineering firms submitted Letters of Interest in one or more of the proposed A&E contracts. USAID established a selection panel to evaluate the capabilities and proposed method of procedure detailed in the A&E Letters of Interest. The selection committee ... nominated Lyon Associates and two alternate firms for contract negotiations with USAID/VN's Contract Service Office.

After a preliminary investigation, and in the interest of expediency, the Contract Service Office, on August 15, 1967, issued a Letter of Contract to Lyon Associates, Inc. to enable this firm to start providing the engineering services required on the three pilot systems. On October 21, 1967, the Contract Service Office issued a supplemental letter providing for progress payments to the engineering contractor. The actual contract with Lyon Associates was not executed until late in 1968.

The contract with Lyon Associates enumerated in detail the services to be rendered by the engineer and their responsibilities in connection with these services, including the pre-construction work of system design, preparation of plans and specifications, estimated total construction and material lists, and preparation of bid forms to procure competitive bids for award of a construction contract.

The contract required Lyon Associates to render diligently and competently all of the engineering services, necessary or advisable for expeditious,economical and sound design and construction of each project, including but not limited to the following:

I. During Pre-Construction Period

A. Make complete field inspection and investigation to determine the most economical and practicable location of proposed lines.

B. Prepare and submit to the cooperatives, USAID and NRECA/VN for approval:

1. Key maps showing general line location phasing and major topographical features.

2. Detail maps showing proposed line location, consumer location, sectionalizer and transformer location.

3. Special drawings detailing unique construction requirements.

4. Unit drawings.

5. Complete plans and specifications.

6. Other documents required to obtain competitive construction bids for the award of a construction contract.

7. Lists of required materials.

8. Accurate estimates of unit quantities for use in bid forms based on the staking of 20% of each construction project.

C. All engineering data required for procuring necessary or desirable permits, licenses, franchises and authorizations from public bodies.

D. Prepare and package for distribution to prospective bidders the plans, specifications and construction drawings together with all necessary forms and construction contract documents.

E. (Pertained to USAID's procurement of competitive bids and award of contract.)

F. Required contractor to prepare details for construction contract amendments.

G. (Pertained to owner's and USAID's responsibility to provide, to the contractor, certain project data.)

II. Staking Provisions

A. Staking to be started upon receipt of owner's certification that permits were obtained, and should continue in such a manner as not to retard construction progress.

B. Staking shall be done in a thorough and workmanlike manner, according to the applicable codes and the plans and specifications, etc.

C. Prepare and maintain and revise staking sheets and structure material lists.

D. Prepare and submit to the cooperative, USAID/VN and NRECA, VN reports showing quantity, kind, and extended total of all units of construction of each portion of line to be released to the construction contractor.

E. Maintain a competent resident engineer at the site of each project at all times when staking is being performed.

III. Supervision and Inspection

A. Supervise construction of the project and make diligent effort to insure the expeditious and economical construction thereof, in accordance with the terms of the construction contracts, etc.

B. & C. (Pertained to measuring and reporting ground resistance and recommending changes in grounding procedures.

D. Maintain a competent resident engineer at the site of each project during the entire construction period. Maintain one or more inspectors on project when construction units are being installed. Cause the

construction contractor to correct immediately all defects in workmanship or materials, and report any deficiencies to NRECA/VN.

E. (Pertained to radio interference and correction thereof.)

F. The contractor shall have a resident engineer present during final inspection of completed construction.

G. Insure expeditious and economical construction in accordance with the construction contracts.

H. Certify monthly billings by the construction contractors prior to payment by the cooperatives or USAID.

I. Maintain at the site of each project, a cumulative inventory of all units of construction incorporated in each project.

J. (Pertained to procedure of energizing sections of the project.)

K. The obligations and duties to be performed by the contractor under this contract shall be performed by persons qualified to perform such duties, efficiently, etc.

A provision was also included in the contract for the A&E firm to operate the USAID rural electric cooperative staging warehouse.

The services to be provided by the engineer were to be completed by January 31, 1969, for a total payment not to exceed U.S. $43,453.23, plus V.N. $13,538,101 of local currency. Subsequently, amendments to this contract extended the completion and termination date to June 30, 1970, and increased the U.S. dollar payment to $543,453.28 and V.N. $19,000,000.

The engineering contractor was apparently not able to employ qualified personnel with adequate background experience in distribution system design and construction. Such attempted procedures as making final line design and layout on maps produced from aerial photographs and preparing the staking sheets from these maps were not successful. Maps did not provide distinction between residences and associated service buildings, did not identify suitable points of attachment to buildings, did not

give sufficient terrain identification to specify required pole heights, did not identify property lines and passageways and generally resulted in the need for a complete redesign in the field to match existing conditions.

Since the construction was carried out completely by force account procedures rather than by construction contract as initially intended, the engineer was not required to produce documents for awarding construction contracts. Attempts to provide adequate supervision of construction under the force account construction procedure proved to be almost impossible because of the dispersion of the crews and the lack of authoritative control.

At the end of the contract period, the system staking, particularly on the Tuyen Duc system, had not been completed. Corrected maps and corrected staking sheets for much of the work that had been accomplished had not been completed or made available, and the partial summaries and tabulations of the work accomplished left the systems on June 30, 1970, without adequate basic records from which to proceed to set up basic accounting and engineering records.

Statistical records for this report are necessarily based on the partial engineering records available along with the best possible estimates in areas where no engineering data was provided.

APPENDIX II

ENGINEERING

An Giang Power Plant
Contract No. AID 430-1369, PIO/T 430-295-3-60217
Pacific Architects and Engineers (PA&E)
Dated March 11, 1966

This contract provided certain engineering services in connection with the supervision of construction and initial operation of the diesel electric power plant near Long Xuyen. The scope of work included:

1. Preparation of plans and specifications for procurement of material and equipment.

2. Necessary site improvement and design of equipment foundation.

3. Preparation of plans, specifications and bidding documents for selection of a construction firm to construct the plant.

4. Design of interconnection to the adjacent power plant - preparation of bid documents and engineering supervision of construction.

5. Engineering supervision of construction of plant, substation and connections; and place the plant in full operation.

6. Arrange with unit manufacturer to provide operator training, and occasional visits and checks during the first 60 days of operation.

The contract was limited to twelve (12) months duration and the fixed price was $14,650.

The contractor completed Items 1 through 3 and the design portion of Item 4, included in the contract scope of work. The contractor was unable to perform the work included under Items 5 and 6 of the scope of work within the time limitation of the contract, as the plant site was not fully available and the major components of the plant were not on site until the last month of the contract.

The supervision by PA&E was therefore limited to the site preparation work on approximately one-third of the area included in the plans and specifications.

The remainder of the supervision of the force account construction and of a site preparation contract awarded by the An Giang Cooperative was provided by the resident NRECA/VN engineers working under the direction of USAID/VN's Electric Power Section.

APPENDIX III

ENGINEERING

Pole Treating Plant
Contract No. AID 430-1765, PIO/T 430-295-3-60296
Pacific Architects and Engineers (PA&E)
Dated June 30, 1966
Amended on January 23, 1967

This contract provided certain engineering and construction supervisory services in connection with the erection of a pole treating plant.

The scope of work included:

1. Preparation of plans and specifications for site improvement, including grading and clearing of site, roadways, roadway surfacing work area and work area surfacing, railroad spur and related drainways.

2. Layout footing, walls and related concrete work according to plans and specifications of the pole plant manufacturer.

3. Design and layout two (2) pole frame type buildings and one (1) cement block office and warehouse building.

4. Design and layout of well pump and water distribution system and the required waste lines.

5. Design and layout electrical distribution system including security lighting.

6. Prepare specifications and bidding documents for selection of a construction firm and supervise the selected contractor to perform work included in Items 1 through 5, until this work is approved.

7. Prepare and arrange detailed requirements for unloading and transporting all plant material from Cam Ranh Bay to the Phan Rang site.

The contract was limited to three (3) months duration and a total cost not to exceed $19,184. The method of payment for services was specified to be on a unit price of $436 per day.

The terms of the contract relating to time and method of payment were unrealistic and the contract was amended on January 23, 1967, and made retroactive to September 30, 1966.

The amendment provided that the services would be for a period of seven months from the date the original contract was signed, that a lump sum payment of $14,740 would be paid upon completion of the plans, specifications and design, and that payment for field supervision would be provided at the rate of $103.00 per day. The total limitation of contract cost was increased to $19,905.

The contract, as amended, terminated on January 30, 1967.

The contractor completed the work required in Item 1 through Item 5, and the preparation of specifications and bidding documents included under Item 6 of the scope of work. The contractor was unable to complete the supervision work required under Item 6 within the time limitation of the amended contract. The contractor did not provide the service anticipated under Item 7 of the scope of work.

The contractor's design, plans and specifications and bidding documents were satisfactory. PA&E's supervision of the construction contraction for the period covered by this contract was insufficient and incomplete. After the termination date of the PA&E contract, supervision of the construction, contracting was partially provided by the Wood Treating Chemical plant erection personnel and later by USAID Regional Engineering staff. NRECA staff engineers provided the preliminary site survey, assistance in equipment selection, and on special occasions made necessary inspections to provide data for USAID's Electric Power Section reports.

APPENDIX IV

EXCERPTS FROM THE REPORT OF CLYDE AULTZ MANAGEMENT CONSULTANT

The letter of Dr. Thomas Venables, NRECA, to Mr. Alf Carroll, USAID, dated January 22, 1970, contains the proposed activities of the Specialist-Management Consultant during his one and one-half man months in the Republic of Viet Nam. Essentially, these activities were to be:

1. One week in each cooperative

2. A general review of:

   a. Declared Objectives and Goals
   b. Established Policies and Procedures
   c. Existing Organizational Structure
   d. Present Internal Policies
      - Personnel
      - Wage and Salary
   e. Current Rate Structure
   f. Maintaining of Operating Records

3. Training Week - Institute or Seminar Type Training in Cooperative Principles

4. Board-Manager Relations

   a. Functions of the Board of Directors
   b. Functions of the Manager

4. Organization Principles

5. Management Functions

   a. Planning
   b. Organization
   c. Staffing
   d. Directing
   e. Controlling

6. Board Functions

   a. Pianning
   b. Legal

c. Trusteeship
d. Requirements
e. Controls

7. Assignment of Responsibilities for Changes Needed.

An Giang Co-op, Long Xuyen

This co-op has an excellent board and good management. Both Mr. Chuan, the Manager and his Assistant Manager, Mr. Suoi, are fluent in English - a number of the directors also understand English well.

On the first day of the visit, I spoke to an all-employee meeting along with the Manager. The president of the Board, Mr. Tan, was present also. I presented the good wishes of our U.S. cooperatives and tried to explain to these employees the difference in being employed by a cooperative. Questions were asked for and Mr. Nho, the line superintendent, asked, "When would they be able to serve Feeder #3?" Mr. Sansing, NRECA advisor, made the explanation that it was impossible under the present project. Another question came relative to giving training to the Supervising (Audit) Committee of the Cooperative. I told them this would be done by the Accounting Specialist during his three months in Viet Nam.

In three days at An Giang Co-op, I made a study of the organization. I interviewed the management and supervisory employees, observed the facilities and reviewed the existing policies, procedures and work assignments. I then wrote a report to the manager and board and prepared proposed organization charts to be used when the construction period ended. The manager and assistant manager worked diligently at translating my report so it was ready at the time on Friday at the end of the following week that was reserved for this presentation.

The institute was given on Tuesday through Friday - morning and afternoon sessions. It was well attended. A total of nineteen people, including 12 directors and two supervisory committee members and five members of management. Most of the attendees were present the full four days - mornings and afternoons.

We covered all of the material which we had translated for the sessions, except for Case IV and the Exercise in Developing Policy. In addition, one session was used to educate the directors in the characteristics of the utility industry with its large fixed investment and declining costs with greater use of existing facilities. This was done to emphasize my

proposal that they undertake a sales program and hire another or promote another specialist to work with Mr. Diep, their excellent member and public relations man, to promote the use of more electricity.

The co-op at An Giang has excellent probability of success. Though it has many temporary problems in regard to flow of loan funds and firm power supply, it has a fine core of able directors, well selected ... employees and able management.

Duc Tu Cooperative at Ho Nai, Duc Tu Province

I interviewed the manager and key employees and later observed operations and reviewed records. An all-employee meeting was held. At the class on Tuesday, eight directors including four officers, were present; the succeeding days found six to eight directors in the class plus the manager for part of the time. A total of nine directors attended at any one time - two of them only for one session.

This institute was a disappointment; as there was little English ability among the directors, we had to depend on our interpreter exclusively. The cases did appeal to them and simulated their conditions very well. However, not only did we not get as much material covered as at An Giang, what we did cover was not in very great depth. It is apparent that there is a different background among directors at Duc Tu as well as a less experienced and effective management. On the other hand, the density of the consumers per kilometer produces a net margin according to 1969 figures. The co-op is very happy with its present NRECA advisor, Mr. Shoff. He has done much to train them to assume responsibilities.

My observations of the organization continued during the afternoons. Unfortunately, the language barrier and the busyness of the manager and his limited staff did not permit an in-depth study. A report was made to the board and manager on the 20th.

The Duc Tu Cooperative should succeed despite its many problems and weaknesses. What it needs most, in the opinion of this observer, is a sense of identity as a cooperative. This will be difficult to achieve in this urban oriented resettlement area. It is desirable that the co-op employ a strong member and public relations person with an understanding of and devotion to the cooperative philosophy.

Tuyen Duc Cooperative, at Da Lat

This cooperative is in a precarious position because it has power supply only for some 385 members and is not likely to secure more power for many months unless some is diverted from other distributors by Viet Nam Power or some emergency generation source is secured. Naturally, this means the financial condition is very troublesome.

Despite these facts, there seems to be optimism around. An annual meeting was held in January - some new directors were elected as well as present ones re-elected. The directors met in class with me, mornings and afternoons - Tuesday through Friday. Although the interpreter service was the weakest of all three co-ops, we did get some assistance from the secretary of the board, Mr. Hung and Mr. Tri, the General Manager of the National Union of Electric Cooperatives. We think the case discussions went well and the situation was ripe for the materials. During the week, the board held an official meeting and confirmed the appointment of their acting manager, Mr. Ho, set the third Tuesday of each month as regular board meeting date and appointed five board committees as suggested earlier by Mr. Bush. A schedule of training meetings for these committees had already been set up by Mr. Wolfe, the NRECA advisor. Mr. Wolfe seems to have a good relationship with the board and management.

A general meeting of employees was held. We did the best we could to build morale and identification with the co-op. However, it must look pretty hopeless to employees - failure to get paid on time, some Viet Cong activities which hampers efficiency of operations; and of course, disgruntled members waiting for power.

There was little that could be planned in organization for the Tuyen Duc Cooperative. They are in a holding operation. They need to hold their skilled people until the power supply problem is solved. Mr. Tri of NUEC says that NUEC and its pole treating plant, and the other two cooperatives will help Tuyen Duc and keep it alive. My own belief is that a Power Supply Committee of NUEC should make an effort, assisted by some friends with influence, to cut some red tape, get some emergency power diverted, get a temporary source of some power and expedite the repair of the hydro facilities which have been damaged. I do believe that waiting until 1971 for power is going to destroy the chances to build a successful co-op and this is a case where the Government of Viet Nam needs to act.

I do not think one could find a co-op with more dismal prospects. Yet this observer came away with a feeling that there was an organization consisting of member support - a reasonably good board and some managerial talent. With help and luck, this co-op can succeed.

General

So far as improvement in future projects of this nature in Viet Nam or other countries, we should have learned some lessons. The following are the highlights of impressions gained by the consultant. They are all hindsight discoveries, of course.

1. The organization of the effort to establish rural electric cooperatives needs to be simplified, cleared of obstacles to decision making and actions. Responsibility and authority need to be defined and delegations to agencies and contractors need to be clear cut. Where several agencies are to work together, some position or agency with power to see that coordination proceeds must be set up. Presumably, this would be in the host country's government agency most concerned with the project's success.

2. Technical advisors in the field should avoid over-control, should give recognition and understanding to local culture and practice to the greatest extent possible without jeopardizing the objectives and required results of the project. The directors and management of local cooperatives should be brought into the decision making for their new institution as early as possible.

APPENDIX V

EXCERPTS FROM THE REPORT OF LOWELL ENDAHL NRECA SPECIALIST IN CONSUMER SERVICES AND MEMBER RELATIONS

The purpose of my assignment to the three electric cooperatives in Vietnam was to:

1. Provide as much "on-the-spot" assistance as possible in formation of member relations, community and electrical load development programs and give guidance in planning future efforts.

2. Review current staffing and policies related to public relations, member education, power marketing, and consumer services and consult with the manager on possible improvements.

3. Assist the manager in preparing and presenting program plans to the board, if desired, and in working with the employees on the importance of improving service to member and role of employees in developing greater electrical usage and better member and community relations.

4. Explore possibilities for united programs by rural electric cooperatives in Vietnam, in fields of public relations - sales and member education.

I found the rural electric system staff members in each of the systems very cooperative and interested in member relations and load development programs. The idea of implementing such programs seemed to be well accepted. However, only one of the cooperatives, An Giang, has a staff member to conduct such programs. All three electric cooperatives need to begin work immediately on member relations and marketing if the cooperatives are to progress. All have low kwh consumption and all need to give much more attention to member and public information programs.

Individual reports and recommendations have been prepared for each system because each has its own unique problems.

The NRECA-USAID rural electrification team members, Hugh Bush, Ray Shoff, Dean Wolfe and Louis Sansing, were very helpful in supplying

information making it possible to arrange meetings and generally paving the way to accomplish the most in the least possible time.

It is unfortunate that the NRECA team will not be able to stay beyond the June deadline. My work in Vietnam would have been much more effective if there had been someone on each co-op staff to be involved in planning and to carry out recommendations. Also, it would have been most desirable to have our team members on hand to assist and encourage them in further development of their programs.

The country of Vietnam has tremendous potential - a rich agricultural area, great industrial possibilities, and a recreation area that could be profitably developed. With an electric cooperative in each of these potentially profitable areas, there is no doubt that the cooperatives can succeed - if the people and officials in government are determined to make it so. And properly developed, the cooperative approach to member involvement in the affairs of the business can be an effective demonstration of democracy in action and could pave the way for a better understanding of the democratic form of government.

APPENDIX VI

EXCERPTS FROM THE REPORT OF JOHN BEAR NRECA ACCOUNTING SPECIALIST

My observations in accounting records at the three cooperatives revealed a general pattern quite similar despite variations in detail records and in the qualifications of accounting personnel. These observations have been noted in preliminary reports covering the visits. The points of similarity may be summarized briefly as follow:

1. Meter reading, billing and collecting, similar both in procedure and detail records. On none of the cooperatives did accounts receivable ledgers contain credit postings or balances, only monthly readings and billings.

2. No general ledgers had been maintained.

3. No procedures had been established for plant accounting or control of electric materials.

4. Cash receipts and disbursements had been recorded together in a manner which did not provide a basis for general ledger posting nor control of the asset. Also, the cooperatives had not adopted the practice of depositing all cash receipts in a bank and issuing checks in payment of most obligations. On the contrary, it appeared that all managers had been making payments directly from cash receipts without in all cases obtaining receipts to support the payment.

In each of the cooperatives, requirements for a double entry accounting system were explained through interpreters to available personnel. At An Giang and Tuyen Duc, the managers participated in these discussions, both professing to understand and appreciate the need for the accounting procedures described. From feed-back through the interpreters, it was apparent at each of the cooperatives that heavy reliance had been placed on guidance from Mr. Tri, NUEC Manager, in accounting matters and it is expected this will continue to be so.

Following the initial visits at Duc Tu and An Giang Electric Cooperatives, journal forms were prepared for use by the cooperatives. The need for and use of these entries as a basis for double entry ledger accounting had been explained to cooperative personnel and were subsequently discussed with Mr. Tri, who agreed on their suitability for use by the cooperatives. The latter assured me the forms would be printed and made available for use by the cooperatives.

A work order procedure was subsequently prepared in the Saigon office and presented to cooperative personnel at Duc Tu and An Giang Electric Cooperatives. Copies of written procedures in Vietnamese translation were furnished all the distribution cooperatives and Mr. Tri.

Although no special arrangements were made for discussion of accounting matters with the boards of directors, at both An Giang Electric Cooperative and Tuyen Duc Electric Cooperative, board meetings were held during my visits to the cooperatives. I was introduced to the directors at these meetings and on invitations, discussed briefly the importance of accounting records. An outline of cooperatives accounting needs was also prepared for use by Mr. Lorenzen in his scheduled meetings with directors during the course of the NRECA team's conferences at the three distribution cooperatives. This outline included basic accounting requirements, (a) for plant investment, and (b) for operations, also, a discussion of personnel functions required for maintaining the cooperatives accounting records and controls.

Copies of the above mentioned outline and other accounting materials developed for the Vietnamese cooperatives have been included in the files of the NRECA task force and distributed to each cooperative directly or through Mr. Tri. These include suggested journal entries to record plant costs for the three distribution cooperatives. Data for these entries were assembled by team members from records obtained from the files maintained by Mr. Tri, from USAID files and from other sources. They were unaudited and were not verified by me but, having observed some of the work in compiling the data, it is my view that the accounts reflect with reasonable accuracy values received by the three distribution cooperatives for plant construction either through advance of funds and materials through USAID or from contributions. However, it must be recognized that revisions may be required in the event substantial errors may be disclosed in further review or audit. For example, the amounts shown in recording a contribution of aluminum poles by USAID was based on the reported costs to USAID and substantially exceed the cost of wood poles of similar dimensions and service value.

The NRECA team devoted much time and effort during the period of my assignment in attempting to prepare the cooperatives management and accounting personnel to meet future responsibilities in the operation of the cooperatives.

Mr. Tri acknowledged the urgent need of the cooperatives for continued accounting assistance and concurred in a suggestion that NUEC might employ a qualified practical accountant to furnish such assistance. It is my opinion that without further competent assistance it is unlikely that any of the cooperatives will establish effective accounting records and controls.

APPENDIX VII

OBSERVATIONS BY L.M. LORENZEN ADMINISTRATION, MANAGEMENT AND ENGINEERING SPECIALIST

During May and June of 1970, I observed in the field what had been accomplished in the rural electrification program in Vietnam, participated in training programs for members of boards of directors and key staff personnel on the pilot systems, and tried to evaluate the continuing needs to firmly establish the pilot program and make it a firm base for a total area coverage electrification program.

I have been closely associated with back-stopping the NRECA field specialists working in Vietnam and have visited the project area in 1967 and in 1968, prior to the visit in May and June of 1970.

With rich agricultural lands, abundant forest areas and other natural resources, along with an excellent and capable human resource, Vietnam stands out as a land of excellent potential and abundant opportunity.

With its total commitment to the military conflict, the Government of Vietnam has not been in position to organize and provide a total strong central support and coordination which will eventually be necessary to carrying out a total electrification program.

Largely because of the military conflict, the program and the new electrification institutions have repeatedly faced almost insurmountable obstacles ranging all the way from procurement and delivery of materials and retaining qualified staff personnel in key positions, to security and invasion in their service areas, and the impossibility for the Government to divert sufficient attention from the military to give adequate central support and coordination to the electrification program.

During my visit, meetings were held with each of the boards of directors for final review of their responsibilities, and discussion of their opportunities to be of service to their people.

These meetings were coordinated closely with final assistance in accounting, operation and maintenance practices, consumer service program development and guidance to effective management, all under the direction of qualified specialists.

Much of the benefit of early training has been lost to the co-ops as key people have been called into military service or attracted to other

positions. Nearly all material used in the training programs has however, been translated to Vietnamese and left with the cooperatives for further review and as an aid to future training programs within their own systems.

Members and potential members of the electric cooperatives have shown terrific enthusiasm and good participation.

Boards of directors elected by the members have demonstrated real dedication even to the extent of exposing themselves to personal risk, in the performance of their duties as directors.

Employed personnel have shown exceptional ability to learn, and determination to do good work once adequately trained.

With qualified guidance from NRECA specialists and others, the local people have actually built their own systems, good systems by any standard of comparison.

At June 30, electric service was being delivered to about 18,500 meters, which would mean service to more than 100,000 people. Considering prevailing conditions, this achievement has been a most significant one.

Even with this success, the local people in the program will be the first to recognize that they are not yet complete professionals. Even after poles and wire are in place, an accounting must be maintained and properly interpreted to guide the system's future.

I consider it essential that every new system established should receive competent guidance and assistance through at least one full accounting year after they get into full operation, including preparation and interpretation of year end reports, before we leave them essentially on their own with only occasional short term specialized guidance.

The cooperative rural electrification program in Vietnam is off to a good beginning to opening a new social and economic opportunity for all of the people of Vietnam through their own efforts. For full accomplishment of this program we recognize certain ingredients over and above the enthusiasm of the people to be essential:

1. A proper political climate with strong continuing support, including favorable legislation, and coordination of the program in the central Government.

2. A continuing source of long term loan funds at reasonable cost.

3. Employment of professionally qualified management personnel on the systems.

4. An adequate source of wholesale power at reasonable cost.

5. Sound, economical design standards, and standardization of design.

6. An effective consumer service - power use program to, assist the consumer to make productive and economical use of electricity to improve production and income as well as to better his living conditions.

7. A continuing educational program to promote cooperation and understanding.

The Central Government Agency charged with responsibility for directing the total electrification program will, in addition to housekeeping, personnel and local functions, perform essentially the functions listed below under five suggested organizational units:

I. Office of the Administrator

A. Policy and Program Formulation: Formulates long-range and current policies and plans for the administration of the program.

B. Executive Direction: Directs the Administration of the program and administrative functions necessary to meet agency requirements.

C. Maintain favorable relations with agency to which attached and with legislative and executive branches of the appropriate governmental bodies.

D. Administers information services to provide information to the public concerning the program.

II. Loans Officer

A. Appraises loan applications and prepares loan recommendations.

B. Provides advice and assistance to organization and potential borrowers concerning loans.

C. Develops proposed policies, standards, and procedures concerning loans.

III. Engineer Officer

A. Responsible for engineering activities related to design, construction, operation and maintenance of borrowers systems, including equipment, materials, plans and specifications, and contracts associated with distribution, transmission, communication, buildings and structures, generation, and maintenance equipment such as line trucks, etc:

1. Develop policies;

2. Develop standards;

3. Develop procedures;

4. Conduct engineering studies and investigation including long-range engineering planning;

5. Obtain market and price information;

6. Review and approve of technical aspects and cost estimates;

7. Approve advance of funds;

8. Act as consultant to organization and borrower.

B. Evaluate proposed acquisitions and recommend appropriate action.

C. With assistance from other organizational units has primary responsibility for wholesale power negotiations, procurement, and development.

IV. Management Officer

A. Provide advice and assistance to organization and borrowers on general management activities.

B. Develop proposed policies, standards and procedures concerning general management.

C. Responsible for power use and load promotional activities and educational activities pertaining thereto.

D. Responsible for development, analysis, and approval of retail rate schedule.

E. Responsible for labor relations.

F. Responsible for safety and job training.

V. Finance Officer

A. Responsible for development of uniform system of accounts, work order procedure, etc.

B. Administer internal loan accounting program.

C. Develop and maintain records and statistics.

D. Responsible for administering a program for billing and collection from the borrowers.

E. Responsible for audit of borrowers' expenditure of loan funds.

F. Act as a consultant to agency and borrowers on matters relating to accounting.

There can be flexibility in assigning activities to organizational units but some provision must be made for all activities.