PD-AAT-137

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UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
AGENCY FOR INTERNATIONAL DEVELOPMENT
Washington, D. C. 20523

DOMINICAN REPUBLIC

PROJECT PAPER

CDE REVENUE COLLECTIONS

AID/LAC/P-278

Loan Number: 517-W-053
Project Number: 517-0218

UNCLASSIFIED

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION CODE: A (A = Add, C = Change, D = Delete)

Amendment Number

DOCUMENT CODE: 3

COUNTRY/ENTITY: Dominican Republic

3. PROJECT NUMBER: 517-0218

4. BUREAU/OFFICE: Latin America and the Caribbean — 05

5. PROJECT TITLE (maximum 40 characters): CDE Revenue Collections

6. PROJECT ASSISTANCE COMPLETION DATE (PACD): MM 09 DD 30 YY 89

7. ESTIMATED DATE OF OBLIGATION (Under "B." below, enter 1, 2, 3, or 4)

A. Initial FY 86 B. Quarter 1 C. Final FY 86

8. COSTS ($000 OR EQUIVALENT $1 =)

A. FUNDING SOURCE	FIRST FY 86 B. FX	C. L/C	D. Total	LIFE OF PROJECT E. FX	F. L/C	G. Total
AID Appropriated Total						
(Grant)	(500)	(–)	(500)	(500)	( )	(500)
(Loan)	(2,329)	(171)	(2,500)	(2,329)	(171)	(2,500)
Other U.S. 1.						
Other U.S. 2.						
Host Country		400	400		1,600	1,600
Other Donor(s)						
TOTALS	2,829	571	3,400	2,829	1,771	4,600

9. SCHEDULE OF AID FUNDING ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE 1. Grant	2. Loan	D. OBLIGATIONS TO DATE 1. Grant	2. Loan	E. AMOUNT APPROVED THIS ACTION 1. Grant	2. Loan	F. LIFE OF PROJECT 1. Grant	2. Loan
(1) SDA	740-B	825	825	–	–	500	2,500	500	2,500
(2)									
(3)									
(4)									
TOTALS						500	2,500	500	2,500

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each): 660

11. SECONDARY PURPOSE CODE

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)

A. Code

B. Amount

13. PROJECT PURPOSE (maximum 480 characters)

To improve revenue collections of the Dominican Electricity Corporation (CDE) by reducing the number of irregular and fraudulent connections to the system through the institutionalization of a program of inspection and control.

14. SCHEDULED EVALUATIONS

Interim MM 02 YY 87 MM YY Final MM 11 YY 88

15. SOURCE/ORIGIN OF GOODS AND SERVICES: 000 [X] 941 [X] Local [ ] Other (Specify)

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a ____ page PP Amendment.)

Approval of Methods of Implementation/Financing: Tom G. Bebout, Controller

17. APPROVED BY

Signature

Title: Henry H. Bassford, Mission Director

Date Signed: MM 03 DD 03 YY 86

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION: MM 03 DD 19 YY 86

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PROJECT AUTHORIZATION

NAME OF COUNTRY:	Dominican Republic
NAME OF PROJECT:	CDE Revenue Collections
NUMBER OF PROJECT:	517-0218
NUMBER OF LOAN:	517-W-053

1. Pursuant to Section 106 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the CDE Revenue Collections Project for the Dominican Republic involving planned obligations of not to exceed $2,500,000 in loan funds and $500,000 in grant funds over three years from the date of authorization, subject to the availability of funds in accordance with the A.I.D. OYB/allotment process, to help in financing foreign exchange and local currency costs for the project. The planned life of the project is three years from the date of initial obligation.

2. The project consists of technical and commodity assistance to the Dominican Electricity Corporation (CDE) to improve its ability to collect for electrical services through the development and institutionalization of an on-going program of loss detection, reduction and surveillance of electrical connections to the CDE system.

3. The Project Agreement which may be negotiated and executed by the Officers to whom such authority is delegated in accordance with A.I.D. regulations and Delegations of Authority shall be subject to the following essential terms and covenants and major conditions, together with such other terms and conditions as A.I.D. may deem appropriate.

a. Interest Rate and Terms of Repayment

The Cooperating Country shall repay the Loan to A.I.D. in U.S. Dollars within twenty-five (25) years from the date of first disbursement of the Loan, including a grace period of not to exceed ten (10) years. The Cooperating Country shall pay to A.I.D. in U.S. Dollars interest from the date of first disbursement of the Loan at the rate of (a) two percent (2%) per annum during the first five (5) years of the grace period, (b) three percent (3%) per annum during the second five (5) years of the grace period, and (c) five percent (5%) per annum thereafter on the outstanding disbursed balance of the Loan and on any due and unpaid interest accrued thereon.

b. Source and Origin of Commodities, Nationality of Services -- Grant Funded

Commodities or services financed by A.I.D. under the grant-funded portion of the Project shall have their source and origin in the United States or the Dominican Republic, except as A.I.D. may otherwise agree in writing. Except for ocean shipping, the suppliers of commodities or services shall have the United States or the Dominican Republic as their place of nationality, except as A.I.D. may otherwise agree in writing.

Ocean shipping, financed by A.I.D. under the grant-funded portion of the Project, shall, except as A.I.D. may otherwise agree in writing, be financed only on flag vessels of the United States.

c. Source and Origin of Commodities, Nationality of Services -- Loan Funded

Commodities or services financed by A.I.D. under the loan-funded portion of the Project shall have their source and origin in countries

included in A.I.D. Code 941 and the Dominican Republic, except as A.I.D. may otherwise agree in writing. Except for ocean shipping, the supplier of commodities or services shall have as their place of nationality countries included in A.I.D. Code 941 and the Dominican Republic.

Ocean shipping, financed by A.I.D. under the loan-funded portion of the Project, shall, except as A.I.D. may otherwise agree in writing, be financed only on flag vessels of countries included in A.I.D. Code 941 and the Dominican Republic.

d. Conditions Precedent to Disbursement

(1) Disbursement for the Grant. Prior to the disbursement of any grant funds under the Project, or to the issuance by A.I.D. of documentation pursuant to which disbursement will be made, the Cooperating Country shall, except as the Parties may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D.:

(a) An opinion of the legal advisor to the Cooperating Country that the grant portion of the Agreement constitutes a valid and legally binding obligation of the Cooperating Country;

(b) A statement of the name of the person who will represent the Cooperating Country and of any additional representatives, together with a specimen signature of each person specified in such statement;

(c) Evidence that the Commercial Director has been assigned the responsibility of project management and has the necessary authority, staff and budgetary resources to carry out the planned Project activities.

2. Disbursement for the Loan

(a) Prior to the disbursement of any loan funds under the Project, or to the issuance by A.I.D. of documentation pursuant to which disbursement shall be made, the Cooperating Country will, except as the Parties may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D., an opinion of the legal advisor to the Cooperating Country that the loan portion of the Agreement has been duly authorized and/or ratified by, and executed on behalf of the Cooperating Country, and that it constitutes a valid and legally binding obligation of the Cooperating Country in accordance with its terms.

(b) Prior to the disbursement of any loan funds under the Project, or to the issuance by A.I.D. of documentation pursuant to which disbursement shall be made for loss reduction activities, the Cooperating Country will, except as the Parties may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D., a detailed implementation plan covering the publicity campaign and field work, including loss reduction and surveillance.

e. Covenants

The Cooperating Country shall covenant that, except as A.I.D. may otherwise agree in writing:

(1) CDE shall, to the extent possible, utilize existing personnel to carry out the field activities;

(2) CDE shall ensure that adequate human and financial resources are provided for the efficient execution of the program both during the life of the Project and beyond; and

(3) CDE shall, to the best of its abilities, endeavor to collect tariffs from all CDE clients, both during the life of the Project and beyond.

f. Waivers

(1) A.I.D. Markings. Vehicles procured under the Project are exempt from A.I.D. marking requirements.

(2) Micro-Computers. The micro-computers procured under the Project may be of an I.B.M. brand name.

Henry H. Bassford
Director
USAID/Dominican Republic

3/3/86
Date

PROJECT PAPER - DOMINICAN REPUBLIC
CDE REVENUE COLLECTION
(517-0218)

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I. PROJECT RATIONALE AND DESCRIPTION

A. Summary and Recommendations

1. Summary of the Problem

The Dominican Electricity Corporation (CDE) is the nation's sole provider of electricity. Its revenue from the sale of electricity, however, is not sufficient to meet the cost of CDE operations and needed capital expansion. The deficit for 1985 is in the range of RD$400 million despite a substantial increase in the electricity tariff. Resources to cover this deficit come from the regular GODR budget and export exchange tax, thus reducing public resources for other uses.

Difficult economic problems prompted arduous negotiations by the GODR with the International Monetary Fund to meet terms and conditions for a Stand-By Agreement. A major condition in the Stand-by Agreement was the unification of the exchange rate and a reduction of the GODR subsidy to CDE, requiring that CDE purchase petroleum at the free market rate and increase its tariffs to pass on the added cost to the consumer. The GODR took this action on January 23, 1985. From that day forward CDE has paid for petroleum at the free market rate (RD$3.15 = US$1.00 at that time) and has increased tariffs substantially. This higher tariff, in turn, seems to have aggravated CDE'S problem of electricity theft and bill collection.

CDE's financial problems have not been eliminated by the increase in tariffs. The CDE system as a whole suffers from losses of up to 31% from generated power, including line losses, and irregular and fraudulent connections. Current CDE plans include a wide variety of capital investments in new plant construction and repair plus purchase of equipment for transmission and distribution to reduce losses. However, CDE has made minimal investments to reduce the losses from fraudulent connections. An on-going revenue collections program can be established to reduce losses and increase revenues in the short term. The increased revenues collected will contribute to the immediate reduction of the CDE deficit. Moreover, the increases can be achieved with a relatively small investment and maintained over the long period, thus making possible the institutionalization of the program.

2. Brief Description of the Project

The Project proposes to develop within CDE the institutional capability to carry a program of loss detection, reduction and continued surveillance with respect to electrical connections to the CDE system by all client groups: industrial, commercial, and residential. Special crews will be formed, trained and equipped to conduct investigations to determine areas where intensified efforts can be made to reduce thievery, improve collection, and, thus, more effectively increase CDE's cash flow. The USAID supplied

inputs through loan and grant resources will be technical assistance to develop the program and to assist in implementation and evaluation; training courses for the teams and supervisors; and the equipment necessary (meters, recorders and vehicles) for the successful accomplishment of the project.

B. Background

1. Economic Overview and CDE Reform Direction

The D.R. is dependent largely on imported petroleum for its electrical generating system. With the doubling of the oil prices in 1978-79, the cost for the D.R.'s oil imports rose from about US$200 million in 1977 to about US$450 million in 1985. Over 36% or US$162 million of this amount, is utilized by CDE to produce electricity. This fuel cost to CDE represents approximately 21% of the entire value of the Dominican Republic's total exports. Also during this time, the value of the peso, which was pegged at an official exchange rate of RD$1.00 = US$1.00, began a gradual decline in value which became more pronounced over the past two years. During this period (1982-1984), the GODR provided foreign exchange to CDE at the official rate to pay for its petroleum imports. Tariffs to consumers, until the unification of exchange rate, were calculated at the 1:1 rate, which meant that the GODR was, in effect, substantially subsidizing the cost of electricity to consumers. This, together with CDE's inability to collect revenues to cover its expenses, significantly contributed to the GODR's annual deficit. The CDE deficit is estimated at RD$400 million for 1985. The central government transfer to CDE in 1985 is estimated at only RD$50 million. The remaining CDE deficit of RD$350 million is being financed by a temporary surcharge on traditional exports and foreign borrowing. The CDE financial situation in 1986 will deteriorate further because of the proposed reduction in the surcharge. CDE must generate additional revenue in the short term.

2. The Dominican Electrical System

Status of the System: By law, CDE is the sole public electrical utility operating in the Dominican Republic. It is responsibile for producing, transmitting, distributing, and selling electric energy throughout the Dominican Republic as well as the development of the system to meet the country's present and future needs.

Although the CDE generating capability is rated at 1006 MW, actual output is well below this rated capacity, and is currently estimated at less than 600 MW. The demand is met through a generation mix of steam turbines, diesel generators and hydroelectric units. In its effort to meet the demand for electricity, CDE has been forced to operate its thermal power plants at full capacity, allowing practically no shut down for maintenance, and to use expensive jet-gas turbine generation. Hydroelectric facilities are not operable at times or operable at less than total capacity due to low water or irrigation priorities. In addition, CDE capacity must be supplemented with electrical power purchased from outside sources such as the Falconbridge

mining concern. The CDE still often fails to meet demand, which has led to blackouts over extended periods of time for large parts of the service area, including industrial and commercial sectors. In recent months these failures have caused widespread and serious disruptions to consumers and, particularly, to the productive sector.

3. Causes of The Problem

Contributing to CDE's inability to provide an adequate and reliable level of electrical power are: (1) inefficiencies in the power system; (2) inadequate revenue collections; and (3) inadequate administrative and management capacity.

a. System Inefficiencies

Losses resulting from the inefficient generation and distribution system constitute a major, ongoing problem in the country. The system only produces about 59% of its generating capacity due to unforeseen breakdowns, forced maintenance and lack of water for the hydro-plants. Of the electricity generated at least 15% is lost in the transmission and distribution system. A company in the United States, operating under acceptable conditions, would expect to sustain no more than a 10% loss.

b. Inadequate Revenue Collections

According to CDE's report for the year ending 1984, a total of 3.2 billion kilowatt-hours (KWH) of electrical energy was delivered to the system from generation and purchases. Sixteeen percent, or 512 million KWH having a value of RD$103 million were stolen. Also, uncollected user bills amounted to RD$35 million for this period. If these two figures are added together, there was a total loss of revenues of RD$138 million. If all the revenues from the theft of electricity and the uncollected bills could be collected, CDE deficits could feasibly decline by the same amount.

It is obvious that a short term, high impact gain to CDE's revenues can be made by focusing on two areas: (1) reduction in irregular and fraudulent connections and (2) collection of unpaid bills. These two losses are equivalent to more than 28% of CDE's total revenue collections.

If CDE's deficit is to be reduced, CDE must improve revenue collection. Revenue improvement will, once it begins to meet its deficit, enable CDE to overhaul and maintain its plants and make investments in new capacity to cope with increased demand.

c. Inadequate Administrative and Management Capacity

Each of the electrical power generating units operated by CDE represents a major investment. Nonetheless, CDE has not carried out a regular maintenance program due to its financial problems. This implies the

need for an improved management system which is essential if the utility is to meet present and future needs. Such a system would ensure that all parts of the national grid are being supplied with adequate power at all times. This system needs to be developed, including an overall plan for equipment maintenance, repair, overhaul and construction of new facilities. Also, a management system for detecting and controlling irregular connections and monitoring collection of bills is important if progress is to be made in loss reduction. Implementation of such a system would result in less GODR subsidies to CDE and could have an immediate positive impact on CDE's revenues.

4. Response to the Problems

a. Other Donor Assistance

The GODR has received assistance from the World Bank, Inter-American Development Bank, and other countries to deal with the problems confronting CDE. Most of this assistance has been directed toward repair and maintenance of plant and equipment (system inefficiencies). A study, completed by Stone and Webster, serves as the basis for rehabilitation of the plants in the electrical generating system. The first phase, completed in 1983, was a prefeasibility study of the overall work needed. Also, in the same year, the World Bank approved a US$3.8 million loan for engineering studies to rehabilitate existing thermal power generating plants and a feasibility study for a coal terminal at Haina for use by the Itabo I and II plants. The final and major phase will be the complete overhaul of the Haina and Santo Domingo thermoelectric power stations. It will be executed by North American and Italian contractors and financed through commercial loans. This phase would make available another 125 MW of generating capacity at a cost of approximately US$30 million. The Venezuelan and German governments are financing a partial rehabilitation of the electric distribution system of Santo Domingo. Inter American Development Bank is presently financing the Lopez Angostura hydroelectric project. El Salto, Baiguaque and Jamamu are small hydroelectric facilities being financed by German bank credit and the Venezuelan government under the terms of the San José Agreement. The civil works are being financed by CDE.

b. USG Efforts

USAID has made a significant contribution to CDE efforts to improve its administration and management functions through technical assistance and training. Under the Energy Conservation and Resource Development Project, technical assistance has been provided to CDE in eight different management areas. These areas include coal strategy; coal procurement and handling; transmission and distribution engineering; system planning; system protection and maintenance; safety; and, financial reporting.

The USG has also assisted CDE by providing it with emergency electrical generating capacity. In 1977 the USG made available, on a loan basis, the Army Corps of Engineers' (ACE) Power Barge Weber (PBW). The

PBW, located in San Pedro de Macorís, adds 21 MW of additional generating capacity to the system. The GODR requested a second power barge; an agreement to provide the Power Barge Impedance (PBI) was signed in October 1985. The PBI due to arrive in February 1986, with 30 MW of generating capacity, will enable CDE to take individual units at the Santo Domingo Power Plant and at other power plants off line for necessary maintenance and overhaul. Under the local currency program of the 1984/85 PL-480 Title I Program, RD$33.9 million has been provided for emergency repair of power plants at Haina, Barahona, San Pedro de Macorís and various sub-stations. These efforts should result in bringing 250 MW of additional electricity into the power grid in the near term.

Under the AID financed Energy Project cited above, a mini-hydro pilot project is being financed. This could lead to approximately 70 MW of renewable energy. Industrial energy conservation activities were also being carried out including energy audits, pilot conservation projects and credit to business to finance conservation measures.

c. GODR Efforts

The GODR has taken some of the steps necessary to increase CDE revenues through a set schedule of tariff increases. However, given the economic hardship such increases cause to CDE clients, especially residential, it appears both politically and socially unfeasible for CDE to increase tariffs beyond those already scheduled. However, the CDE can cut down on the number of irregular connections and improve bill collections as a means of increasing revenues and reducing its deficit.

The CDE has made some progress in reducing the number of irregular connections. In September 1983, CDE initiated a fraud control program. As a part of this program, full page newspaper ads appeared which described the standards the utility would follow in metered connections and reiterated that the law established legal sanctions for violations including the loss of service, six months to two years in prison and fines up to RD$100,000 for fraudulent connections. As a result, revenue shortfalls due to system losses and irregular connections have decreased from 37.5% in 1983, to 31% in 1984 (15% for line and distribution losses and 16% from irregular connections).

While CDE efforts have been successful, much is left to be done. The CDE's initial effort was aimed at correcting the most glaring and dramatic cases in Santo Domingo. Thus, although a few inspection teams continue to work in Santo Domingo, such activity is needed in the rest of the country and on a more systematic basis. Limited funding prevents these efforts from being carried out, and the unit in charge of this operation lacks staff, equipment, budgetary resources, and the authority to carry out an effective program.

5. Project Rationale

The USAID has four major strategy goals, one of which is to promote the short-term economic stabilization of the Dominican Republic. A major aspect of this is to reduce the GODR public sector deficit. The CDE, as a major contributor to this deficit must look for short term means to increase revenues. There are two ways of collecting revenues: first CDE can raise the cost of electricity to the consumer, or second, it can decrease the number of non-paying consumers. Electricity rates have increased nearly 60% for medium to large consumers since January 1985 and will continue to increase according to a set schedule. It does not appear to be a viable political or socio-economic solution to further increase electricity rates beyond those prescribed at this time. Therefore, the viable alternative is to reduce fraudulent connections and collect from non-paying customers.

The USAID has a strong interest in the Dominican economic stabilization program. Therefore, USAID proposes to assist CDE, in the short-term, to reduce its deficit through the development and institutionalization of a program of detection, reduction, and control of irregular connections and improved bill collection.

C. Detailed Project Description

1. Project Goal and Purpose

The goal of the project is to increase the availability of affordable and reliable energy to all income groups and to reduce the CDE deficit. The purpose of the project is to improve revenue collections by the Dominican Electricity Corporation (CDE) by reducing the number of irregular and fraudulent connections to the system through the institutionalization of a program of inspection and control.

2. End of Project Status and Outputs

The major impact of this project will be to reduce the CDE deficit, in the short to medium term, as improved bill collections and control against theft become an institutionalized aspect of CDE's policy and program. This would result, concomitantly, in a reduction of the need for a GODR subsidy to CDE.

The expected outputs of the project are:

- a strategy and plan for loss detection, reduction, surveillance and collection developed and implemented, focusing on the commercial and industrial users.

- operational crews trained and equipped;

- an improved institutional capacity of CDE to reduce losses through upgrading the service provided by the Commercial Directorate; and

- an improved bill collection system.

At the end of the three year project, we anticipate that a total of 300,000 site inspections will have been made and 120,000 electrical connections rehabilitated. The result will be a reduction of 6 percentage points in the electrical energy lost through fraudulent connections, i.e. from 16% to 10%; and a corresponding increase in CDE revenues of RD$38.8 million over the three year life of the project. The amount of unpaid bills will be reduced from 8% to 5% by the end of the project. It is anticipated that the CDE will maintain the personnel and budgetary resources required to continue with the project's activities, which are estimated to be RD$1.9 million per year.

The A.I.D. contribution will be in the form of a loan in the amount of $2,500,000 and a grant for $500,000. The A.I.D. loan funds will purchase equipment such as special meters and recording devices; finance vehicles, spare parts and maintenance; and fund computer equipment and software. The grant will be used to provide technical assistance and training.

3. Project Description

This relatively simple project has one basic objective: to design and implement a CDE program to improve revenue collections. Most necessary activities associated with this objective have been underway in Santo Domingo for about 15 months with noticeable results. However, under the proposed Project, CDE will be able to undertake a more systematic and expanded approach.

The project will be implemented by the CDE Commercial Directorate, which has overall responsibility for bill collection. Within the Commercial Directorate, the project will be coordinated and supervised by the Commercial Manager for the National District (Santo Domingo and environs). This manager has overall responsibility for all local offices which provide minor repair and bill collection services and supervises several units which will be directly involved with or supporting the project activities including the units responsible for line installation, meter installation, meter reading, information systems (computerized billing) and the department of normalization, servicing the larger industrial and commercial users. (See project organizational chart in Annex 5.)

As the project is intended as a nationwide effort, the commercial managers in the other four zones of the country (north, northeast, south and east) will have responsibility for implementation of activities in those areas but will report to the Commercial Manager of the National

District. The project will begin in Santo Domingo. Once the program is developed and functioning, the knowledge and experience gained in Santo Domingo will be transferred to the other zones of the country where theft is determined to be high. Thus Santo Domingo, which is known to have the greatest amount of losses through irregular and fraudulent connections, will serve as a pilot/test area. Also, because Santo Domingo has the largest number of irregular connections, concentration on Santo Domingo will rapidly increase revenues.

The major project components are loss detection, loss reduction and surveillance. These together with a public relations program, will be carried out as described below.

a. Loss Detection

The first major component will be to identify geographic areas of high potential energy loss due to irregular and fraudulent connections. This will be carried out by the Distribution Engineering Department. The method of detection will be through an input/output analysis. With the special measuring and metering equipment provided by the project, distribution engineers will be able to measure the actual amount of energy that CDE is distributing to a particular geographic area through the electric lines. This "input" can then be compared to the "output" as measured by the individual meters and billings of the CDE clients. If input is greater than output the area will be placed on a prioritized list for further investigation by specially trained crews. Areas showing relatively low loss will be left until a later date. The Department of Distribution Engineering will have responsibility to develop and maintain an up-to-date priority schedule of loss detection by geographic area. They will also continue to monitor an area once it has been rehabilitated to ensure that "input equals output."

b. Loss Reduction

The second component -loss reduction- is at the heart of the project. Once an area has been determined to have a high probability of energy loss through irregular and fraudulent connections, a 5-10 block area will be targeted for further investigation. This investigation will be carried out by specially trained crews. A crew will be made up of four people including a foreman, two linemen and a driver. Each crew will have a specially equipped vehicle and will be able to maintain radio contact both with other crews in the area and the central office. Crews will have computer printouts provided by distribution engineering and other detailed customer use information to assist them in their investigation. Usually more than one crew will be assigned to an area. In order to further identify potential losses in a selected area, an overall visual check will be performed, pole by pole. The crews will be looking for three identifying characteristics of loss and theft: (1) non-metered connections hooked directly into a main transformer line; (2) connections that fully or partially by-pass the meter; and (3) intentionally damaged or otherwise defective or faulty meters.

Once the detailed area investigation is completed, the loss reduction efforts will begin. This refers to any work required by the crew or other CDE departments to provide fully metered and billed electric service to a client. The first priority will be given to bringing non-metered clients into the CDE system. Once a non-metered client is identified, the crew will, at the close of the day, inform their supervisor who will turn the case over to the Department of Meter Installation. This Department will make initial contact with the client to sign a contract. Once the contract has been signed, the crew will install a meter to properly connect the client with the system. Crews will then correct connections that fully or partially by-pass the meters and repair or replace intentionally damaged meters. Unintentionally damaged meters will be reported to the appropriate local office for their repair or replacement. The crew foreman will be responsible for informing the client of any work done to the electrical connection.

As stated previously, loss reduction efforts will begin first in Santo Domingo. The Commercial Manager will be provided with twenty crews which will be divided into two teams in order to simplify and improve supervision. A team will consist of ten crews and a supervisor. The two supervisors will report to the Commercial Manager. The crews will be responsible for all day-to-day field work, including initial client contact, correction of illegal or improper connections, and installation of meters. The crews will report to their supervisors at the end of each day all actions taken by area and for each client. The supervisors will be responsible for daily monitoring, supervision, and preparation of work plans for the crews. Based on these reports, the supervisor will determine what cases are beyond the capacity and resources of the crew. The supervisor will then contact the appropriate CDE office for assistance. The supervisor will transmit to the crew the specialized computer printouts and client information required by the crew, and will prepare for computer storage updated information of loss reduction, i.e., meters installed, repaired, or replaced by area and per client.

For work in the areas outside of Santo Domingo, an additional twenty crews will be required. Ten crews will be assigned to the Santiago area and ten will be used in the remaining urban areas including San Pedro de Macorís, La Romana, Azua and San Francisco de Macorís. Supervision will be provided by the particular area Commercial Manager. These area commercial managers will report the results of their loss detection and reduction efforts to the Santo Domingo Commercial Manager, who will report to the Commercial Director. The CDE General Administrator will be kept abreast of project activities and results by the Commercial Director.

To support the loss detection and reduction program, a specialized computer support system will be developed. Its main purpose is to closely monitor the progress and results of the area rehabilitation efforts. It will be used on a daily basis for scheduling and planning the work of the crews. At the completion of a loss reduction effort, the new billings will be compared to the energy inputs. Once loss reduction activities in an area have

been completed, the computer will be able to periodically measure the difference between "input and output" by area, based on data provided by the distribution engineering department and the billings. It will therefore, become an integral aspect of the on-going surveillance efforts.

c. Surveillance

In order to maintain the level of loss reduction due to irregular and fraudulent connections that has been achieved under the program, continuous surveillance will be required. This will be done by the distribution engineers who will continue to do random input/output analyses of specific areas with assistance from the computerized support system and who will be able to make data comparisons of the end result of loss reduction activities with a new input/output analysis. All 40 crews will be maintained so that if loss is once again detected, they can go back into an area for additional investigation and reduction activities.

To support the surveillance efforts and more importantly, to improve bill collection the local CDE commercial offices will be strengthened. The local offices are responsible for both bill collection and regular customer service work such as setting and removing meters, running service lines, making minor extensions for new service customers, repairing minor storm damage and repairing or replacing minor transformers. Local offices have their own crews to do this routine CDE work. When CDE made an effort to begin a program of loss detection and reduction over 15 months ago, many regular, local office crews were seconded to the effort. As a result, normal work for clients, some of which includes surveillance activities, suffered. All local offices will have at least one crew for routine work. This will require the formation of five additional regular crews for those local offices that do not have a crew.

An initial study of CDE's current procedures will be carried out to determine where improvements can be made to reduce the amount of unpaid bills. Once the study is completed the recommended changes in management procedures will be implemented. This could include periodic review of client accounts, as well as corrected connections in the field. Each connection in an area will be checked by the local office to verify that the client is not in arrears on his/her bill. In the case of arrears, the client will be disconnected and back bills paid before reconnection. Procedural changes in bill collection will be supported by staff training at the local offices. Also each local office will be provided a computer terminal for billing, service complaints, and client information. This will assist in the bill collection efforts and will reinforce normal daily customer service work. Improved local customer service will provide the first line of defense in the ongoing surveillance program, and contribute to a more positive attitude toward CDE and its efforts to improve its operations and financial condition.

Another aspect of the surveillance program will be the work done by the Department of Normalization. Normalization refers to CDE's

efforts to correct fraudulent or other connection irregularities on the part of high electricity users, usually industrial clients. As the meter equipment required to connect these users to the system is more specialized, so is the training in detection and reduction procedures needed to address this client group. Therefore, all cases of irregular connection discovered in an area investigation involving a high KW electricity user will be referred to the Normalization Department. Their specially trained crews will perform the inspection. This Department will also carry out its own investigations within this client group. Where fraud or irregular connections are indicated, steps will be taken to regularize the service connections. These steps include site visit inspections, both announced and unannounced, on-site explanations of problems found to the client, correction of the meter installation, estimates of unmetered KW used, and back billings to recover revenues for electricity not registered on the meters.

The Department of Normalization was organized in December 1983. For the period January 1985 through May 1985, 2,160,000 KWH have been rebilled to high KW users as a result of special investigations. At a rate of 20.1 centavos per KWH, a total of RD$434,160 in revenues were collected from this client group during the five-month period. Under the Project, the efforts to investigate and regularize electricity usage by this group will be intensified and coordinated nationwide.

d. Public Relations Program

An important supporting component of the CDE revenue collections program will be a public relations program. CDE's image as a reliable provider of service has suffered over the years. The reasons for this are varied and widespread. Mainly they relate to the frequent and irritating blackouts that occur, the constant and repeated errors in billing, public awareness that many people are provided service and are not billed, and the dramatic increases in electricity rates to clients since January 1985. Therefore, a comprehensive public information program is required both to improve CDE's image and credibility and to inform the public of CDE's reform initiatives, including revenue collections. The public relations program will consist of three steps: (1) a market research study; (2) a public information campaign; and (3) an employee information and skills training campaign.

The market research study will be carried out by an independent local public relations firm. It will study public attitudes and behavior towards CDE, now and in the future, regarding stricter enforcement of bill collection. The study will determine which media are most effective for public service and information messages, and will look for pockets of support among CDE's varied client groups. It will also examine training needs for CDE personnel, especially for those that, while rehabilitating and regularizing services, directly interact with clients. Based on the results of the market research study, the public and employee information/training campaign will be developed. In all aspects of the study, sex disaggregated data will be gathered in order to assess whether attitudes, responses, and approaches need to be treated differently between men and women.

Pending the findings of the study, the purpose of the public information campaign will be to explain why CDE is conducting this program, and how it will work. The campaign may include T.V. and radio announcements, newspaper advertising, news releases on progress and presentation of information to civic groups. The idea of using a well known and popular Dominican, possibly an entertainer, as a CDE spokesperson will be tested. Also, an effort will be made to get paying clients to report known cases of fraud and irregular connections. The employee information campaign will explain to all employees the purpose and importance of the revenue collection program. Appeals will be made based on the importance of CDE as a provider of a public service. Efforts will be made to reduce instances of CDE employees who knowingly assist a client in an irregular or fraudulent connection.

The skills training program will give CDE crews practice in explaining their work to clients, dealing with various cheat responses, and gaining cooperation for continuing compliance and payment.

4. A.I.D.-Financed Inputs

a. Technical Assistance

The grant will finance a total of 35 person months of technical assistance for a resident advisor (24 person-months) and short-term advisors (11 person-months).

The role of the resident advisor will be to provide advice and general technical assistance in carrying out the primary and supporting project activities. The resident advisor will work closely with the Commercial Manager to design the loss detection, reduction and surveillance system; together, they will oversee its implementation. In this capacity, the advisor will assist the Distribution Engineering Department in the identification of high loss circuits and actual points of theft; will advise and make recommended changes to the employees skills training program and will assist in the development of the IFBs for equipment procurement and the evaluation of the bids. His contract will include procurement services to enable CDE to acquire any additional equipment which is determined as necessary to project implementation. The advisor will review the public relations campaign prepared by CDE and provide comments and recommendations to facilitate project implementation. Finally, the resident advisor will be responsible for arranging for short-term technical assistance requirements and will supervise their activities while in-country.

A total of 11 person months of short-term assistance will be required. This TA will respond to a variety of needs during project implementation. Short-term TA will provide training to the crews in their job duties and responsibilities as outlined in the training program. This will require approximately three person-months. Short-term TA will advise CDE on

improvements or new methods of bill collection and will assist the local offices in the appropriate use of the computer terminals for bill collection and monitoring. Approximately two months of TA has been set aside for this purpose.

On an as-needed basis, TA may be required to assist the crews in the analysis of the most complex of the fraudulent installations such as in the heavily commercial zone of downtown Santo Domingo and in many of the marginal residential/commercial zones. Where appropriate, the TA may assist CDE to prepare design studies and bid documents if it is determined that, due to severe deterioration of the distribution system, small sections may have to be replaced. However, CDE will have to utilize its own resources for distribution system improvement or replacement. Approximately two person-months is available for this purpose.

Short-term TA will be required to assess the need and application for anti-tamper meters. In many cases of theft, it is known ahead of time that vandalism is the problem, not theft by an individual client. In such cases, short-term TA will assess the use of anti-tamper meters and select the most appropriate meter. One person-month has been set aside for this purpose.

Finally, short-term TA will be utilized to assist in project evaluations. These services will be procured under a separate contract. Three person months have been allocated for evaluation.

b. Training

The CDE has already identified some employee training courses which will increase its institutional capability to carry out the project. Typical courses identified to date include:

- Planning for regional management personnel
- Analysis of Billings for commercial management personnel
- Control and Management, Personnel Management and Report Preparation for office chiefs
- Modern Office Techniques, Files Management, Goals and Actions, and Dealing with the Public for commercial office personnel
- Interpersonal Relations and Customer Relations for crews.

The training courses will be provided for all personnel involved in the project and typically will be conducted over two or three days for a total of 12 hours. Course instructors will be CDE commercial office, administrative and technical management personnel and locally-recruited professors and sociologists. A typical course outline as envisioned by CDE is set forth in Annex 6.

The results of the market research study which will be conducted early in the project by a local public relations firm will be used in the development of these and other courses for employee training. The

employee training course content will be coordinated with the public information program which will be developed.

Early in the project, observational visits will be made by CDE personnel to electric utilities in the Caribbean area which have developed successful programs to detect user fraud and to facilitate prompt and accurate response to customer inquiry or complaints. Two such observational trips have been identified. One will be made by CDE distribution engineering, normalization and commercial department personnel to an electric utility in Panama. Observations will be made of the successful methods and procedures being used to measure electric input versus output to detect feeders and/or sections with high probability of fraudulent connections and for corrective measures to be taken. The other trip will be made by CDE commercial department personnel to an electric utility in Puerto Rico. Observations will be made of office procedures and methods, communications, and computer facilities being used to improve customer relations.

Other training requirements may become evident as the project proceeds and as a result of the long term and short term technical assistance which is provided. Such training may involve visits by specialists, for instance, in measuring meter and customer meter calibration, testing and repair, to give short training courses to CDE personnel.

c. Equipment Procurement

The third key input is equipment. Three major categories of equipment have been identified as necessary for the efficient and effective implementation of this project. They are: 1) vehicles, 2) measuring devices and instruments, and 3) computer systems and software. (See Annex 7 for details.)

1. Vehicles

Intensive field work is an integral part of this project. Presently, CDE maintains a transportation fleet for its normal daily operation of the electrical power system. However, the present fleet is insufficient to meet the needs of this project and would hamper normal CDE operations.

Based on an analysis of the number of crews (40) and the transportation requirements of the supervisory personnel and commercial offices, 50 special purpose utility-type vehicles will be procured. Each truck will be provided with a radio. In addition, 19 special radios will be procured to facilitate communication by the local managers with the truck fleet.

To assure availability and reliability of these vehicles, procurement of sufficient spare parts for maintenance and repair of the vehicles, has been included in the project. Provision for a separate parking

area has also been made, so that these vehicles will not be diverted to non-project purposes. Based on the discussion contained in the Social Soundness Analysis, a waiver for markings for the vehicles has been requested. (Also see Section III C.)

2. Measuring Devices and Instruments

The most important technical activity during this project is measurement of "input" and "metered output" of electrical power and energy. Meters and recorders are required for the connection of users to the electrical system. Provision for procurement of meters for both loss detection and normalization efforts has been made. Multi-phase meters and recorders are required for measurement of distribution level voltages. Also, special instruments, such as underground cable locators for detecting unauthorized customer hookups will also be procured.

Recently, there has been considerable interest in the U.S. in developing low-cost devices with indicators which provide a visible tampering check to the meter reader. A sampling of such devices as they become available will be purchased for testing and evaluation of their suitability for use by CDE.

3. Computer Systems and Software

The improvement in CDE's revenue collection requires additional computer software and hardware. CDE already has five remote terminals at bill collection centers which are connected to the mainframe IBM computer. They have a software package which can perform billing analysis. The capability to detect fraudulent use as well as improve bill collection through fast and accurate billing analysis and customer reports is essential for all the commercial division offices of CDE. In order to provide this capability, procurement of 20 similar additional terminals is included in this project.

Also, two microcomputers and software will be procured under this project. The Distribution Planning and Engineering department will use one microcomputer system for performing engineering analysis of the distribution system. The second microcomputer system will be used by the project management staff of CDE for monitoring and controlling the fieldwork. A waiver for proprietary procurement of IBM-PC's has been requested. (See Section III C.)

In summary, with the new computer systems, software and accessories, CDE will be able to perform the following functions essential to the success of the project: monitor and control the field work; conduct billing analysis of customer records; provide better customer services; and do engineering analysis of the distribution system.

II. COST ESTIMATES AND FINANCIAL PLAN

A. Narrative

The total cost of this three year Project is $4,600,000. The AID contribution to the project is $2,500,000 in loan funds and $500,000 in grant funds. The GODR contribution is $1,600,000 or the equivalent of approximately RD$4,800,000 (at US$1.00 = RD$3.00).

Table 1 shows the source and use of AID and GODR funds to the project. Table 2 shows the projected use of these funds by year.

1. AID Costs

a. Equipment ($1,978,000 - Loan)

Procurement of computers, measuring devices, and vehicles will be performed by CDE through host country contracting. A detailed listing of equipment to be procured is provided in Annex 7. In addition, $271,000 (or RD$813,000) is budgeted for reimbursement to CDE to cover operation and maintenance costs related to this equipment.

b. Public Relations Campaign ($300,000 - Loan)

A total of $300,000 will finance the public relations campaign including the market research study and public relations and employee campaigns. The use of either a U.S. firm or local firm is contemplated to carry out activities under this activity.

c. Training ($150,000 - Grant)

Approximately $100,000 will be used to provide trainers and training materials for project personnel through CDE contracts with US firms. This training will be conducted in-country. In addition, approximately $50,000 is budgeted for observational site visits.

d. Technical Assistance ($320,000 - Grant)

A total of $320,000 will be used to cover the costs related to the resident advisor (24 person months) and short-term advisors (11 person months).

e. Evaluation/Audit ($30,000 - Grant)

Two evaluations and one non-federal audit will be undertaken during the life of the project, at an estimated cost of $30,000.

f. Contingencies ($222, 000 - Loan)

A total of $222,000 is included as contingencies.

2. GODR Contribution

a. Operation & Maintenance

The GODR will contribute the local currency equivalent of US$500,000 (about RD$1,500,000) for the operational costs including gasoline of the vehicles to be procured under the project.

b. Public Relations Campaign

The GODR will contribute the equivalent of $100,000 in local currency to assist in carrying out the public relations campaign. It is anticipated that this contribution will be in the form of an in-kind contribution from the CDE Public Relations Department through the provision of staff and staff time in the implementation of the campaign.

c. Personnel

The CDE contribution of the equivalent of $1,000,0000 in local currency will cover costs of personnel required to implement the project. As most personnel are already on-board this will be mostly an in-kind contribution.

TABLE 1

SUMMARY FINANCIAL PLAN
CDE REVENUE COLLECTION PROJECT
(US$ 000)

Use of Funds	Source of Funds						
	AID				GODR	TOTAL	
	Loan		Grant				
	FX	L/C	FX	L/C		FX	L/C
1. EQUIPMENT							
Computers	212	-	-	-	-	212	-
Measuring Devices	160	-	-	-	-	160	-
Vehicles	1,335	-	-	-	-	1,335	-
Operation & Maintenance	100	171	-	-	500	100	671
2 PUBLIC RELATIONS CAMPAIGN	300	-	-	-	100	300	100
3. TRAINING	-	-	150	-	-	150	-
4. PERSONNEL	-	-	-	-	1,000	-	1,000
5. TECHNICAL ASSISTANCE	-	-	320	-	-	320	-
6. EVALUATION/AUDIT	-		30	-	-	30	-
7. CONTINGENCY	222	-	-	-	-	222	-
TOTAL	2,329	171	500	-	1,600	2,829	1,771

TABLE 2
FINANCIAL PLAN BY YEAR
CDE REVENUE COLLECTION PROJECT
(US$ 000)

	YEAR 1			YEAR 2			YEAR 3			
	AID		GODR	AID		GODR	AID		GODR	TOTAL
1. EQUIPMENT	Loan	Grant		Loan	Grant		Loan	Grant		
Computers	212	-	-	-	-	-	-	-	-	212
Measuring Devices	100	-	-	60	-	-	-	-	-	160
Vehicles	1,000	-	-	335	-	-	-	-	-	1,335
Operation & Maintenance	40	-	100	80	-	200	151	-	200	771
2. PUBLIC RELATIONS CAMPAIGN	200	-	-	50	-	75	50	-	25	400
3. TRAINING	-	60	-	-	80	-	-	10	-	150
4. PERSONNEL	-	-	300	-	-	350	-	-	350	1,000
5. TECHNICAL ASSISTANCE	-	100	-	-	150	-	-	70	-	320
6. EVALUATION/AUDIT	-	-	-	-	15	-	-	15	-	30
7. CONTINGENCY	-	-	-	100	-	-	122	-	-	222
TOTAL	1,552	160	400	625	245	625	323	95	575	4,600

B. Methods of Implementation and Financing

Table 3 below illustrates the methods of implementation and financing to be utilized. These are the preferred methods of financing under the Administrator's Payment Verification Statements and represents no deviation from the Mission's general assessment of financing policy and procedures. Therefore, no futher justification of the methods of financing is required.

TABLE 3
METHODS OF IMPLEMENTATION AND FINANCING

TYPE OF ASSISTANCE METHOD OF IMPLEMENTATION	METHOD OF FINANCING	APPROXIMATE AMOUNT (000's US$)
1. COMMODITIES		
Host Country Contract (Contract for Commodities)	Direct L/Com	1,707
2. SERVICES		
TA Direct Contract(Non-profit or Profit Contractor)	Direct Payment	620
Direct Contract(Non-profit or profit Contractor)	Direct Payment	30
Direct Contract(Profit or Non-profit Contractor)	Direct Payment	271
3. TRAINING		
Placed by S&T/IT or TA	Direct Pay	50
Host country contract(Non-profit or Profit Contract)	Direct L/Com	100
4. CONTINGENCY		
N/A	N/A	222
TOTAL		3,000

Approximately 4 host country contracts are planned within this project. CDE has demonstrated the institutional capacity and experience to successfully contract for goods and services using good commercial practice. For example, CDE performed a large number of contracting actions under Project 517-0144, Energy Conservation Project. Those contracts were for similar types of technical assistance, commodities and training planned under this project. Because of USAID's staff/administrative restraints, and because of CDE's demonstrated contracting abilities, host country contracting is preferred.

The USAID, in all contracting actions, will encourage to the maximum extent possible, the participation of small business, small disadvantaged business, and women-owned business concerns in project activities as prime contractors or subcontractors, even in such cases where the contracting will be undertaken by the host country.

III. IMPLEMENTATION PLAN

A. General Plan and Responsibilities

1. Implementation Plan

The project activities are scheduled to take place over a three year period. Approximately three-fourths of the AID Project funds, however, will be disbursed during the first year for the procurement of vehicles and equipment and to finance the public and employee information campaign. These inputs must be provided prior to implementation of the loss reduction activities. (See Annex 10 for a detailed implementation network).

The following is the estimated implementation schedule for the Project:

1.	Project Agreement signed	January 30, 1985
2.	Begin Identification of Areas	March 1, 1986
3.	Publish RFTP for TA	March 1, 1986
4.	Publish IFB for Primary Equipment Procurement	March 30, 1986
5.	Conditions Precedent for Grant Met	February 28, 1986
6.	Conduct Market Survey	April 15, 1986
7.	Receive and evaluate TA proposals	May 30, 1986
8.	Contract for TA	June 30, 1986
9.	Receive and Evaluate Primary Equipment Bids	June 30, 1986
10.	Resident Advisor Arrives	August 1, 1986
11.	Primary Equipment Contracts Signed	August 30, 1986
12.	Training Program Approved	September 15, 1986
13.	Public Relations Program Begins	October 15, 1986
14.	Equipment Arrives	November 1, 1986
15.	Loss Reduction Activities Begin	November 15, 1986
16.	Mid-Term Evaluation	March, 1987
17.	TA Completed	September, 1988
18.	EOP Evaluation	February, 1988
19.	PACD	September 30, 1989

2. USAID Monitoring

USAID Project monitoring will be the responsibility of the Capital Resources Office, Energy Division. Their role in project implementation will be primarily to assist and guide the GODR implementing agency, CDE, in carrying out the Project. In the case of the several host country procurements USAID wil' provide assistance as necessary to assure

compliance with AID Handbook regulations and approve key procurement steps. Such assistance will be carried out through the USAID Project Officer and, indirectly, through the technical assistance contracts. As CDE already has experience in AID project implementation and has acquired some familiarity with USAID technical personnel and AID regulations, project monitoring will be relatively straightforward.

With respect to evaluations and audits, the USAID will be responsible for management of these important but relatively infrequent tasks, although CDE personnel will be involved in each of them and any subsequent actions.

3. CDE Roles and Responsibilities

The CDE will carry out the bulk of project implementation activities. The major procurement actions for goods and services will be host country contracts. A resident advisor will be provided to CDE and such services will be managed by the utility.

Important support will be provided by CDE's existing and relatively well-staffed public relations office. The primary project activities to detect and reduce the actual fraudulent connections will be carried out by CDE technicians.

B. Evaluation Plan

Two project evaluations will be conducted; one intermediate evaluation on or about February, 1987, and one final evaluation, near the end of the project on November 30, 1988.

The intermediate evaluation will address the following issues:

1. Effectiveness of the procedures utilized to reduce theft and increase revenue collections.
2. Effectiveness of the training program.
3. Effectiveness of the intensive public and employee information program.
4. Early results of increased revenue directly attributable to the project.

The final evaluation will be conducted near the completion of the project and will focus on:

1. The adequacy of the training program and the information campaign.
2. The effectiveness of the procedures used to carry out the field activities.
3. Institutional and technical capabilities of CDE to carry on the project.
4. The results of the program in terms of project purposes and EOPS.

C. Negotiating Status, Conditions, Covenants and Waivers

1. Negotiating Status

The project concept is based on a proposal originally developed by the CDE. The final design and intensive review was carried out with close collaboration between the USAID Project Committee and CDE representatives. Therefore, at present, the project design is well known and agreed to by the General Administrator of CDE and key staff of the Commercial Directorate, the main implementing entity within CDE. The project has also been discussed with the Technical Secretariat of the Presidency. The General Administrator has expressed his commitment to ensuring prompt Congressional approval of the loan portion of the project.

2. Conditions and Covenants

In order to allow grant-funded activities to proceed, conditions precedent will be clearly defined for both the loan and the grant.

a. Initial Conditions Precedent to the Grant

i. An opinion of the legal advisor to the Cooperating Country that the grant portion of the Agreement constitutes a valid and legally binding obligation of the Cooperating Country.

ii. A statement of the name of the person who will represent the GODR and a specimen signature of each person specified in such statement.

iii. Evidence that the Commercial Director has been assigned the responsibility of project management and has the necessary authority, staff and budgetary resources to carry out the planned activities.

b. Initial Condition Precedent to the Loan

i. An opinion of the legal advisor to the Cooperating Country that the Agreement has been duly authorized and/or ratified by, and executed on behalf of, the Cooperating Country and that it constitutes a valid and legally binding obligation of the Cooperating Country in accordance with all of its terms.

c. Condition Precedent to Loss Reduction Activities

i. A detailed implementation plan covering the publicity campaign field work including loss reduction and surveillance.

d. Covenants

The following covenants will be included in the Project Authorization and Agreement:

i. The CDE shall covenant that, to the extent possible, existing personnel will be utilized to carry out the field activities.

ii. The CDE shall covenant that the human and financial resources are provided to ensure the efficient execution of the program both during the time period specified in the Agreement and beyond.

iii. The CDE shall covenant that it will endeavor to, during the life of this Project and beyond, collect tariffs from all CDE clients.

3. Waivers

a. Marking Requirements

It is A.I.D. policy that all A.I.D. financed equipment and materials be suitably marked to identify them as U.S. foreign assistance. Under this project a large number of vehicles (50) will be purchased for use by the crews in their daily implementation of project activities. These crews and vehicles will be highly visible in the community. The social soundness analysis discusses CDE's current public image and the negative feeling on the part of some clients to CDE's efforts to increase revenues through increases in electricity tariffs, improved bill collection procedures and rehabilitation of irregular and fraudulent connections. In part, this negative feeling will be the focus of the public relations campaign. However, implementation of this project will still cause, to some extent, resentment on the part of those clients who have not paid in full for electricity usage and will be compelled to pay as their connections are regularized. It has been determined that the marking of project vehicles with the AID clasped hand emblem may direct unnecessary anger of those clients at the U.S.G. Therefore, a request has been made by CDE to waive the AID marking requirements. The Project Committee concurs with this recommendation. The vehicles will, however, be marked with appropriate CDE emblems. AID Handbook 1-B, Chapter 22, Section D. states that a waiver of AID marking requirements may be issued by the Mission Director on a finding that the appearance of the A.I.D. emblems on commodities would produce adverse reactions. A waiver of the marking requirements for the vehicles has been included in the Project Authorization.

b. Proprietary Procurement

A waiver for proprietary procurement for the purchase of the micro computers is requested. The purchase of the IBM-PC(AT), is requested on the basis of compatibility with equipment on hand. The CDE is

now utilizing an IBM Mainframe computer and has just purchased an additional IBM Mainframe to upgrade the existing system. The IBM-PC(AT) will be utilized in conjunction with this mainframe computer in the loss detection activities being carried out by the Distribution Engineering Department. The second micro-computer will be utilized for project monitoring and management. The total value of the procurement is estimated to be $50,000. Handbook 11 Chapter 3 Section 2.2.5 states that the purchase by brand name may be justified on the basis of compatibility with equipment on hand. As the CDE already has and IBM Mainframe computer solely for the use of the Engineering Department, the purchase of IBM-PCs to carry out the required engineering analysis is justified on the basis of compatibility with equipment on hand. Under AID redelegation of authority to the field No. 23.6, dated November 2, 1984, the Mission Director has the authority to waive competition under Borrower/Grantee contracts provided the procurement is less than $1 million and meets the required justification in Handbook 11. Therefore this procurement of 2 IBM-PC(AT)s with an estimated value of $50,000 is within the Mission Director's authority to approve. A waiver to this effect has been included in the Project Authorization.

IV. SUMMARY OF ANALYSES

A. Financial Analysis

A major reason for CDE operating deficits is in the large amount of electricity it distributes to various users for which it does not collect. The current CDE electricity loss is estimated at approximately 31% of total production, of which 15% is through internal and line losses and 16% through fraudulent and irregular connections. To improve internal and line losses, CDE will require a large investment in transmission lines and associated equipment. However, CDE should be able to reduce fraudulent and irregular connections in a short period of time with a relatively small investment. This project is aimed at reducing the fraudulent and irregular connections by 6 percentage points during the three year project period. It is projected that during the second year the loss will decline by 2 percentage points and during the third year it will drop by additional 4 percentage points.

This financial analysis assumes that the project is successfully implemented as described and that the 6 percent recuperation would be maintained for at least 7 years after the project is completed. For simplicity the residual stock value of the project equipment is assumed to be zero. While total cost of the project over the 10 year period is $9.18 million (using the current exchange rate of RD$3.00 = $1.00), total increase in CDE revenues due to the project is estimated at $107.5 million over the 10 year period.

The financial internal rate of return of the project is estimated at around 254%, clearly indicating a large financial gain. Even if we assume that CDE did not maintain the loss recuperation after the third year, the project is still financially rewarding because the IRR for the first three years is 211%. Furthermore, the ratio of the Present Value of Benefits to that of Costs discounted at 15% is 8.7, indicating a large profitability. Thus, this project is financially sound and rewarding. (See Annex 8 for calculations of costs and benefits).

Since the financial rate of return is extremely large, there is little value in performing an ordinary sensitivity analysis. Instead, a minimum rate of return analysis was carried out. This analysis indicates the minimum amount of CDE revenue increase that is required to make the IRR equal to 15%. Assuming that this increase occurs during the second year and that CDE continues to collect this additional revenue for the remaining 8 years, the analysis shows that the required minimum revenue increase should equal to $ 1.24 million. Thus, in order to be financially worthwhile, CDE must reduce fraudulent and irregular connections by 0.6 percentage points in year 2 and continue its surveillance to maintain the lower level of losses for the next 8 years. Most experts agree that CDE will accomplish much more than the required minimum.

B. Economic Analysis.

A high financial return to CDE does not necessarily mean an equally high return to the Dominican economy. Because of built-in distortions with regard to foreign exchange, interest, and minimum wages, economic benefits and costs can be significantly different from the financial benefits and costs.

In order to analyze the economic rate of return of the project, shadow prices for labor, interest and foreign exchange must be used to convert existing financial data. Shadow prices are used as follows:

- Shadow Price for Labor: RD$ 9.31 day/person (8 hours) for skilled worker.

- Shadow price for international loan : Prime rate + 1.38 = 10.88%.

- Shadow Price for Dollar: RD$ 3.85 = US$ 1.00.

Using these shadow prices, economic revenues and costs were calculated from the financial data (See Annex 8). While economic revenues show less than financial revenues due to the higher economic value of foreign exchange, economic costs tend to rise due to higher interest payments and skilled worker wages.1/ The economic internal rate of return is 212% and 165% for the 10 year and 3 year periods respectively. Obviously the project is highly beneficial for the Dominican economy. The minimum increase of the CDE revenue that would make it worthwhile for the Dominican economy to undertake the project is $ 1.30 million or equivalent or a reduction of 0.8 percentage points of fraudulent and irregular connections during the second year of the project.

If this reduction is maintained during the remaining years, the economic internal rate of return would be 15%. Obviously the project is highly profitable for the Dominican economy. (See Annex 8 for Cost/Benefit Analyses).

C. Institutional Analysis

The CDE is a state-owned corporation which is responsible for all production, transmission and distribution of electricity. It establishes its own operation and expansion programs. The electricity tariff is determined by a Board of Directors, whose chairman and six other members are appointed by the President of the Dominican Republic. The General Administrator is also appointed by the President for an indefinite period of time and therefore may be removed from office at any time during performance of his functions.

1. Charter and Finances

CDE, formerly owned by its investors, became an autonomous public utility institution in 1955, under Law No. 4115. The Corporation was invested with all legal prerogatives and its own capital fund to produce, transmit and distribute electric energy to the entire country. The original capital fund was provided by the Dominican government. In successive periods, however, bonds were issued and loans were negotiated to pay for new power plants, line improvement and other energy investments.

The CDE's total annual budget for 1985 is approximately RD$912 million, of which RD$503 million is for fuel, RD$103 million for personnel and operations, RD$103 million for debt financing and repayment and RD$203 for construction and expansion projects. The CDE finances these expenses through sales of electricity, external and internal financing including loans from Venezuela and Mexico, and subsidies from the central government. The CDE currently has about 5,400 salaried employees.

2. Organizational Structure

The CDE consists of six Departments which report directly to the General Administrator, as shown in Annex 5. The primary responsibilities of each Department are listed below.

1/ The recent increase of the minimum wage to RD$250 per month makes the shadow wage of skilled workers smaller than the current wage. Although this would tend to reduce shadow wage costs somewhat, the impact on IRR calculations would be very small.

Engineering-Scheduling: design and construction of thermal plants, transmission and distribution networks and associated substations. Studies of non-conventional energy sources, load forecasting, development of short, medium and long range transmission, distribution and generation expansion plans.

Production: Operation and maintenance of generating plants, including fuel procurement.

Operations: Operation and maintenance of transmission and distribution networks and substations; operation of load dispatch; and control of the communications system of CDE.

Hydroelectric Development: Programming, design, and construction of hydroelectric plants.

Commercial: Invoicing and collection of payments for electric services provided by CDE and installation, administration, supervision and control of electric meters.

Administration: Financial management and accounting; direction and coordination of general company support services; transportation, purchasing, supply; personnel administration.

3. Impact of Project Activities

The CDE will not engage a significant number of new personnel under this project. Most will be recruited by transferring them from other departments, and we estimate that CDE will not be hampered by this action. To ensure that no significant additional CDE personnel are hired as a result of this project, a covenant will be included in the Agreement which limits this from happening.

The CDE entity that will be most directly involved in implementation of this Project will be the Commercial Department. The Commercial Managers will have the heaviest work load, assisted by the Divisions of Normalization, Meter Installation and Reading, Information, and Distribution Engineering. Prior to the start of loss reduction activities, the Commercial Department will need to carry out an intensive employee information campaign regarding the nature and objectives of the program of those who need to be informed about the aims of the program and to develop their skills in working with CDE clients.

Intensive training of the crews, supervisors, as well as the directors of the program will have to be conducted. A basic conclusion of our analysis to date is that the implementation of this program will not markedly affect the daily routine of the CDE Commercial Department and that such changes as will be required will be guided and adjustments made with the help of the planned technical assistance and training activities to be provided under the Project.

At this time we cannot predict how this project will affect the operational relationships and resource allocations between the Commercial Department and those units of CDE that will have to support the program, especially those concerned with meter installation, vehicle maintenance, data processing, etc. Technical advisors on the project will be available to help CDE managers focus on these questions during the project startup phase, to monitor conflicts or problems, and to help develop solutions, as the program becomes operational. However, these units do have an ongoing relationship and while the workload will increase during the life of the project, these units should be able to absorb the increased responsibility.

CDE is an organization that is in a state of chronic semi-crisis, as it attempts to meet a multitude of demands, some of them conflicting, with insufficient operating and capital resources. It is therefore highly likely that this project will interject yet another strain on the organization, and that action will be needed to assure that the project receives the necessary support. A condition precedent to disbursement has been included to ensure budgetary and staff support.

D. Social Soundness Analysis

1. General

The current image of CDE is not good. Standing at the cashier's window or the complaint window in any local office in the company, one is readily made aware that many customers resent their high bills and CDE's efforts to reduce theft and to collect unpaid bills. The CDE has had to increase rates this past year by 50% for larger residential, commercial and industrial customers because of the GODR's decision to unify the rate of exchange for all transactions. This significantly increased CDE's cost for fuel and CDE is now increasingly passing these higher costs on to its customers through a phased program of electricity tariff increases. The current situation is not unlike the situation that existed in the United States before the mid 1970's, when Americans were accustomed to inexpensive electricity and therefore wasted considerable amounts. In like fashion, Dominicans have not paid much attention to conserving energy or their billings for electricity until recently.

In recent months, the CDE has issued news releases attempting to explain the company's problems. The President of the country has also made major speeches on behalf of CDE. On June 10, 1985 CDE began a survey to inventory CDE users. The survey questionnaires are being conducted by CDE social workers through door-to-door interviews of approximately 300,000 CDE clients in the Santo Domingo area. The activity is scheduled to last 12 months and to lead to a more equitable distribution of rates and billings. While the publicity and other efforts underway by CDE will undoubtedly have some beneficial effects, it has not yet markedly altered client attitudes. Many customers pay their bills late -or not at all- and steal electricity in order to keep bills low.

Many people will understand that users, as well as CDE, will gain in quality of service and other benefits they receive through improving CDE's revenue collections by the activities outlined in this project. At the same time, there will be others who will complain and reject the logic of the program. A number of clients will want to continue paying low rates for electricity while utilizing as much electricity as they want, simply because that's what they've paid in the past and do not want to change now. In order to avoid such a negative attitude on the part of user groups, an extensive information program should be developed and implemented prior to and during the loss reduction activities.

2. Recommendations

a. Public Information Campaign

This campaign should be addressed to all users to let them know what will be done, why, and how it is to be carried out. The program should also be addressed to the CDE employees themselves to enable them to be fully informed on revenue collection to be able to explain the program and its purpose to clients and to develop skills to approach and work with clients, especially those who may resist the loss reduction program.

The campaign should be conducted by CDE with the assistance of a public relations firm with intensive use of TV, radio and newspaper spots, bulletins, posters, etc. to advise the public what CDE is doing in the various sectors to improve service. Qualified spokespersons should be utilized to make presentations to various civic groups to help improve the public attitude toward CDE. CDE personnel should be properly trained to respond to customers' questions and to advise customers on how to cut down on electricity costs while emphasizing the need to reduce theft and collect bills. This, along with the public information program, will improve customers' attitudes towards CDE and improve the Company's image.

In order to guide CDE in its informational campaign and training activities, an attitudinal survey will be conducted early in the project by personnel trained in survey or market research.

b. Use of Isolated Area Rehabilitation Approach

The systematic method by which theft will be identified and customers rehabilitated is central to the approach and success of this project. High loss areas will be identified by the CDE's Department of Distribution Engineering and assigned priority attention for rehabilitation work. If CDE does encounter difficulties with clients in the area during correction of illegal connections, the situation can be more readily dealt with because of the limited number of such clients involved in a given operation. Eventually, cooperation will be encouraged by peer pressure from customers of nearby areas that have been previously rehabilitated.

c. AID Publicity

The general provisions of A.I.D. Agreements require that AID be given appropriate publicity for the financing of project activities and procurement. This requirement includes marking of all project vehicles with the A.I.D. emblem and project number. The general provisions state that this identification may be waived under special circumstances. In view of the obvious attitudinal problem by a substantial percentage of users (an estimated 16% of the electricity being stolen) we recommend that this identification requirement be waived for project vehicles. Other appropriate marking, however, identifying the vehicles with the project or CDE should be followed.

3. Conclusion

There are definite attitudinal problems that CDE will have to deal with during the project. They are among the causes of the basic problem being dealt with, namely the theft of electricity. CDE as an institution is dedicated to building good relations and communications with the public. The Company has exhibited considerable good judgement and restraint as an institution during the past year by providing reasoned responses to public criticism, widely publicized explanations of its difficulties and failures, and, when possible, advising the public beforehand concerning time and location of area blackouts.

Combining the systematic area rehabilitation approach with the supporting information campaign (guided by the results of an attitudinal survey conducted early in the project) will improve the chances that CDE will be successful in its loss reduction program.

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project
From FY 86 to FY 88
Total U.S. Funding: $2.5 million (L)
$0.5 million (G)
Date Prepared : October 22, 1985

Project Title & Number: CDE Revenue Collections, 517-0218

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
A.1 Goal To increase the availability of affordable energy to all income groups and to reduce the CDE deficit.	A.2 1. Reduction in the CDE deficit by RD$38.8 million.	- CDE records - Public notices - Published rates and publically distributed billings	A.4 - Continued political stability. - No major disasters occur. - Increased revenues are not diverted to other GODR sectors or activities.
B.1 Purpose Improve revenue collections by the Dominican Electricity Corporation (CDE) by reducing the number of irregular and fraudulent connections to system through the institutionalization of an ongoing program of loss detection and control.	B.2 End of Project Status 1. Annual revenues increased by RD$38.8 million. 2. 300,000 inspections made. 3. 120,000 connections rehabilitated. 4. GODR maintaining personnel and budget adequate to continue CDE project. 5. Electricity lost through irregular connections reduced by 6 percentage points. 6. Reduce amount of unpaid bills from 8% to 5%.	B.3 - Project Reports. - CDE budget. - CDE Operations Records.	B.4 - Continued political and administrative support. - Public support for corrective measures.
C.1 Outputs 1. Increase in the institutional capacity of CDE to reduce losses through the Commercial Directorate (CD). 2. Operational crews established and trained. 3. Strategy and plan for loss detection, reduction and surveillance developed. 4. Improved bill collection system.	C.2 Output Indicators 1. Office within the CD to monitor brigade activities staffed with manager, 1 computer operator, 2 clerks, and 1 secretary. Office in Santiago similarly equipped. 2. 45 brigades of 4 persons each and 2 brigade team supervisors, plus local managers. 3. Implementation strategy, public and employee information program and work plans developed. 4. Local offices equipped with computer terminals and staffed with trained personnel.	C.3 - Site inspections. - CDE reports and monthly computer runs. - Coordinator reports. - TA reports.	C.4 - Client acceptance of corrective measures. - Oil prices will remain stable.
D.1 Inputs 1. Equipment and Maintenance 2. Public Relations 3. Technical Assistance 4. Training 5. Personnel 6. Evaluation/Audit 7. Contingency	D.2 Budget ($000) LOAN / GRANT / GODR 1,978 / - / 500 300 / - / 100 - / 320 / - - / 150 / - - / - / 1,000 / 30 / 222 / 2,500 / 500 / 1,600	D.3 - CDE records. - Shipping invoices. programs. - TA contracts - Training plans and - Site inspections.	D.4 - Funding availability by USAID and GODR. - Availability of tools and equipment.

5C(1) - COUNTRY CHECKLIST

Listed below are statutory criteria applicable generally to FAA funds, and criteria applicable to individual fund sources: Development Assistance and Economic Support Fund.

A. GENERAL CRITERIA FOR COUNTRY ELIGIBILITY

1. FAA Sec. 481; FY 1985 Continuing Resolution Sec. 528. Has it been determined or certified to the Congress by the President that the government of the recipient country has failed to take adequate measures or steps to prevent narcotic and psychotropic drugs or other controlled substances (as listed in the schedules in section 202 of the Comprehensive Drug Abuse and Prevention Control Act of 1971) which are cultivated, produced or processed illicitly, in whole or in part, in such country or transported through such country, from being sold illegally within the jurisdiction of such country to United States Government personnel or their dependents or from entering the United States unlawfully? — No

2. FAA Sec. 620(c). If assistance is to a government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) the debt is not denied or contested by such government? — No

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3. FAA Sec. 620(e)(1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities? — No

4. FAA Sec. 620(a), 620(f), 620(D); FY 1985 Continuing Resolution Sec. 512 and 513. Is recipient country a Communist country? Will assistance be provided to Angola, Cambodia, Cuba, Laos, Syria, Vietnam, Libya, or South Yemen? Will assistance be provided to Afghanistan or Mozambique without a waiver? — No

5. FAA Sec. 620(j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction by mob action of U.S. property? — No

6. FAA Sec. 620(l). Has the country failed to enter into an agreement with OPIC? — Yes

7. FAA Sec. 620(o); Fishermen's Protective Act of 1967, as amended, Sec. 5. (a) Has the country seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters? — No

(b) If so, has any deduction required by the Fishermen's Protective Act been made?

8. FAA Sec. 620(q); FY 1985 Continuing Resolution Sec. 518. (a) Has the government of the recipient country been in default for more than six months on interest or principal of any AID loan to the country? (b) Has the country been in default for more than one year on interest or principal on any U.S. loan under a program for which the appropriation bill (or continuing resolution) appropriates funds? — No

9. FAA SEC. 620(s). If contemplated assistance is development loan or from Economic Support Fund, has the Administrator taken into account the amount of foreign exchange or other resources which the country has spent on military equipment? (Reference may be made to the annual "Taking Into Consideration" memo: "Yes, taken into account by the Administrator at time of approval of Agency OYB." This approval by the Administrator of the Operational Year Budget can be the basis for an affirmative answer during the fiscal year unless significant changes in circumstances occur.) — Yes

10. FAA Sec. 620(t). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption? — No

11. FAA Sec. 620(u) What is the payment status of the country's U.N. obligations? If the country is in arrears were such arrearages taken into account by the AID Administrator in determining the current AID Operational Year Budget? (Reference may be made to the Taking into Consideration memo.)

The country is current on its U.N. obligations

12. FAA Sec. 620A; FY 1985 Continuing Resolution Sec. 521. Has the country aided or abetted, by granting sanctuary from prosecution to, any individual group which has committed an act of international terrorism? Has the country aided or abetted, by granting sanctuary from prosecution to, any individual or group which has committed a war crime?

No

13. FAA Sec. 666. Does the country object, on the basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. who is present in such country to carry out economic development programs under the FAA?

No

14. FAA Sec. 669, 670. Has the country, after August 3, 1977, delivered or received nuclear enrichment or reprocessing equipment, materials, or technology, without specified arrangements or safeguards? Has it transferred a nuclear explosive device to a non-nuclear weapon state, or if such a state, either received or detonated a nuclear explosive device? (FAA Sec. 620E permits a special waiver of Sec. 669 for Pakistan.)

No

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15. ISDCA of 1981 Sec. 720. Was the country represented at the Meeting of Ministers of Foreign Affairs and Heads of Delegations of the Non-Aligned Countries to the 36th General Assembly of the U.N. of Sept. 25 and 28, 1981, and failed to disassociate itself from the communique issued? If so, has the President taken it into account? (Reference may be made to the Taking into Consideration memo.) — No

15. FY 1985 Continuing Resolution. If assistance is from the population functional account, does the country (or organization) include as part of its population planning programs involuntary abortion? — N.A

16. FY 1985 Continuing Resolution Sec. 530. Has the recipient country been determined by the President to have engaged in a consistent pattern of opposition to the foreign policy of the United States? — No

B. FUNDING SOURCE CRITERIA FOR COUNTRY ELIGIBILITY

1. Development Assistance Country Criteria

FAA Sec. 116. Has the Department of State determined that this government has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, can it be demonstrated that contemplated assistance will directly benefit the needy? — No

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2. Economic Support fund Country Criteria

FAA Sec. 502B. Has it been determined that the country has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, has the country made such significant improvements in its human rights record that furnishing such assistance is in the national interest?

No

5C(2) PROJECT CHECKLIST

Listed below are statutory criteria applicable to projects. This section is divided into two parts. Part A. includes criteria applicable to all projects. Part B. applies to projects funded from specific sources only: B.1. applies to all projects funded with Development Assistance loans, and B.3. applies to projects funded from ESF.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE? HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PROJECT?

A. GENERAL CRITERIA FOR PROJECT

1. FY 1985 Continuing Resolution Sec. 525; FAA Sec. 634A; Sec. 653(b).

   (a) Describe how authorizing and appropriations committees of Senate and House have been or will be notified concerning the projct; (b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or nor more than $1 million over that amount)?

   The Project was not included in the FY86 C.P. A Congressional Notification was prepared and sent to the Congress on Nov. 1, 1986.

2. FAA Sec. 611(a)(1). Prior to obligation in excess of $100,000, will there be (a) engineering, financial or other plans necessary to carry out the assistance and (b) a reasonably firm estimte of the cost to the U.S. of the assistance?

   a. No

   b. There is a reasonably firm estimate of the cost to the U.S. of the assistance.

3.	FAA Sec. 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?	N.A
4.	FAA Sec. 611(b); FY 1985 Continuing Resolution Sec. 501. If for water or water-related land resource construction, has project met the standards and criteria as set forth in the Principles and Standards for Planning Water and Related Land Resources, dated October 25, 1973, or the Water Resources Planning Act (42 U.S.C. 1962, et seq.)? (See AID Handbook 3 for new guidelines.)	N.A
5.	FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed $1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability effectively to maintain and utilize the project?	N.A
6.	FAA Sec. 209. Is project susceptible to execution as part of regional or multilateral project? If so, why is project not so executed? Information and conclusion whether assistance will encourage regional development programs.	The project is not susceptible to execution as part of a regional or multi-federal project.

7. FAA Sec. 601(a). Information and conclusions whether projects will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; and (c) encourage development and use of cooperatives, and credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.

e. Project will improve efficiency of Dominican Electricity Corporation and reduce Governme subsidies.

8. FAA Sec. 601(b). Information and conclusions on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).

Procurement for equipment and techni assistance will be from U.S. sources

9. FAA Sec. 612(b), 636(h); FY 1985 Continuing Resolution Sec. 507. Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized in lieu of dollars.

Local currency will be utilized in th Project to meet the costs of the Project.

10. FAA Sec. 612(d). Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release?

No

11. FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise?	Yes, competitive selection procedures will be utilized
12. FY 1985 Continuing Resolution Sec. 522. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity?	N.A.
13. FAA 118(c) and (d). Does the project comply with the environomental procedures set forth in AID Regulation 16. Does the project or prograam taken into consideration the problem of the destruction of tropical forests?	N.A.
14. FAA 121(d). If a Sahel project, has a determination been made that the host government has an adequate sysem for accounting for and controlling receipt and expenditure of project funds (dollars or local currency generated therefrom)?	N.A.

15. FY 1985 Continuing Resolution Sec. 536. Is disbursement of the assistance conditioned solely on the basis of the policies of any multilateral institution?

No

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

a. FAA Sec. 102(b), 111, 113, 281(a). Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, spreading investment out from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using the appropriate U.S. institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions; (c) support the self-help efforts of developing countries; (d) promote

c. The project will support the self-help efforts of the D.R. by institutionalizing a system of surveillance and monitoring of Revenue Collection, reduce fraudulent connections to the electric system and increase the number of bill paying customers.

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the participation of women in the national economies of developing countries and the improvement of women's status, (e) utilize and encourage regional cooperation by developing countries?

b. FAA Sec. 103, 103A, 104, 105, 106. Does the project fit the criteria for the type of funds (functional account) being used?

Yes. 106

c. FAA Sec. 107. Is emphasis on use of appropriate technology (relatively smaller, cost-saving, labor-using technologies that are generally most appropriate for the small farms, small businesses, and small incomes of the poor)?

N.A.

d. FAA Sec. 110(a). Will the recipient country provide at least 25% of the costs of the program, project, or activity with respect to whch the assistance is to be furnished (or is the latter cost-sharing requirement being waived for a "relatively least developed country)?

Yes. The country will contribute 35% of the Project's costs.

e. FAA Sec. 110(b). Will grant capital assistance be disbursed for project for more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing, or is the recipient country

N.A.

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"relatively least developed"? (M.O. 1232.1 defined a capital project as "the construction, expansion, equipping or alteration of a physical facility or facilities financed by AID dollar assistance of not less than $100,000, including related advisory, managerial and training services, and not undertaken as part of a project of a predominantly technical assistance character."

f. FAA Sec. 122(b). Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth?

Yes. The project will promote self-sustaining growth of the Electricity Corporation improving revenue collections, institutionalization of surveillance system and fraud reduction.

g. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civil education and training in skills required for effective participation in governmental processes essential to self-government.

The Project will train CDE personnel in support of Project activities in order to develop and maintain a program of electricity theft reduction thereby encouraging the institutional development of CDE.

Development Assistance Project Criteria (Loans Only)

a. FAA Sec. 122(b). Information an conclusion on capacity of the country to repay the loan, at a reasonable rate of interest.

Considering current economic situation, the country will be able to repay the concessional loan.

b. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete with U.S. enterprises, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan?

N.A.

3. Economic Support Fund Project Criteria

a. FAA Sec. 531(a). Will this assistance promote economic and political stability? To the extent possible, does it reflect the policy directions of FAA Section 102?

N.A.

b. FAA Sec. 531(c). Will assistance under this chapter be used for military, or paramilitary activities?

c. FAA Sec. 534. Will ESF funds be used to finance the construction of, or the operation or maintenance of, or the supplying of fuel for, a nuclear facility? If so, has the President certified that such use of funds is indispensable to nonproliferation objectives?

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d. FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made?

5C(3) - STANDARD ITEM CHECKLIST

Listed below are the statutory items which normally will be covered routinely in those provisions of an assistance agreement dealing with its implementation, or covered in the agreement by imposing limits on certain uses of funds.

These items are arranged under the eneral headings of (A) Procurement, (B) Construction, and (C) Other Restrictions.

A. Procurement

1.	FAA Sec. 602. Are there arrangements to permit U.S. small business to participate equitably in the furnishing of commodities and services financed?	Yes
2.	FAA Sec. 604(a). Will all procurement be from the U.S. except as otherwise determined by the President or under delegation from him??	Yes
3.	FAA Sec. 604(d). If the cooperating country discriminates against marine insurance companies authorized to do business in the U.S., will commodities be insured in the United States against marine risk with such a company?	N.A.

4.	FAA Sec. 604(e); ISDCA of 1980 Sec. 705(a). If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? (Exception where commodity financed could not reasonably be procured in U.S.)	N.A.
5.	FAA Sec. 604(g). Will construction or engineering services be procured from firms of countries which are direct aid recipients and which are otherwise eligible under Code 941, but which have attained a competitive capability in international markets in one of these areas? Do these countries permit United States firms to compete for construction or engineering services financed from assistance programs of these countries?	No
6.	FAA Sec. 603. Is the shipping excluded from compliance with requirement in section 901(b) of the Merchant Marine Act of 1936, as amended, that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S. flag commercial vessels to the extent such vessels are available at fair and reasonable rates?	No

7. FAA Sec. 621. If technical assistance is financed, will such assistance be furnished by private enterprise on a contract basis to the fullest extent practicable? If the facilities of other Federal agencies will be utilized, are they particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs? — Yes

8. International Air Transportation Fair Competitive Practices Act, 1974. If air transportation of persons or property is financed on grant basis, will U.S. carriers be used to the extent such service is available? — Yes

9. FY 1985 Continuing Resolution Sec. 504. If the U.S. Government is a party to a contract for procurement, does the contract contain a provision authorizing termination of such contract for the convenience of the United States? — Yes

Construction

1. FAA Sec. 601(d). If capital (e.g., construction) project, will U.S. engineering and professional services be used? — N.A.

2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable? — N.A.

3. FAA Sec. 620(k). If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U.S. not exceed $100 million (except for productive enterprises in Egypt that were described in the CP)? — N.A.

C. Other Restrictions

1. FAA Sec. 122(b). If development loan, is interest rate at least 2% per annum during grace period and at least 3% per annum thereafter? — Yes

2. FAA Sec. 301(d). If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights? — N.A.

3. FAA Sec. 620(h). Do arrangements exist to insure that United States foreign aid is not used in a manner which, contrary to the best interests of the United States, promotes or assists the foreign aid projects or activities of the Communist-bloc countries? — Yes

4. Will arrangements preclude usen of financing:

   a. FAA Sec. 104(f); FY 1985 Continuing Resolution Sec. 527. (1) To pay for performance of abortions as a method of family planning or to motivate or coerce persons to practice — Yes

50

abortions; (2) to pay for performance of involuntary sterilization as method of family planning, or to coerce or provide financial incentive to any person to undergo sterilization; (3) to pay for any biomedical research which relates, in whole or part, to methods or the performance of abortions or involuntary sterilizations as a means of family planning; (4) to lobby for abortion?	Yes Yes Yes
b. FAA Sec. 620(g). To compensate owners for expropriated nationalized property?	Yes
c. FAA Sec. 660. To provide training or advice or provide any financial support for police, prisons, or other law enforcement forces, except for narcotics programs?	Yes
d. FAA Sec. 662. For CIA activities?	Yes
e. FAA Sec. 636(i). For purchase, sale, long-term lease, exchange or guaranty of the sale of motor vehicles manufactured outside U.S., unless a waiver is obtained?	Yes
f. FY 1985 Continuing Resolution, Sec. 503. To pay pensions, annuities, retirement pay, or adjusted service compensation for military personnel?	Yes

5

g.	FY 1985 Continuing Resolution, Sec. 505. To pay U.N. assessments, arrearages or dues?	Yes
h.	FY 1985 Continuing Resolution, Sec. 506. To carry out provisions of FAA section 209(d) (Transfer of FAA funds to multilateral organizations for lending)?	Yes
i.	FY 1985 Continuing Resolution, Sec. 510. To finance the export of nuclear equipment, fuel, or technology or to train foreign nationals in nuclear fields?	Yes
j.	FY 1985 Continuing Resolution, Sec. 511. Will assistance be provided for the purpose of aiding the efforts of the government of such country to repress the legitimate rights of the population of such country contrary to the Universal Declaration of Human Rights?	Yes
k.	FY 1985 Continuing Resolution, Sec. 516. To be used for publicity or propaganda purposes within U.S. not authorized by Congress?	Yes

Corporación Dominicana de Electricidad

REPUBLICA DOMINICANA
AÑO DE LA
SUPERACION NACIONAL

RECEIVED
OCT 24 10 02 AM '84

NUM. 2217

Sr. Philip R. Schwab
Director
U. S. AID Mission to
Dominican Republic
César Nicolás Penson
Ciudad.-

Estimado señor Schwab:

Por la presente tenemos a bien solicitar de esa institución asistencia técnica y financiera para el Programa de Reducción de Pérdidas de la CDE.

A partir de septiembre de 1983 la CDE emprendió un intenso programa con el objetivo de disminuir las pérdidas por utilización fraudulenta de energía. Las pérdidas totales estaban en un 41.8% en junio de 1983 y actualmente se encuentran en 31.2%. Por otra parte, el índice de cobros por energía pasó de 77.57% en 1982 a 80.20% en 1983; aumentando a 86.93% en 1984.

Sin embargo, consideramos que debemos hacer grandes esfuerzos para cumplir la meta de llevar las pérdidas a 25 y 20% en los próximos años 1985 y 1986. Por lo tanto, tal como se discutió en nuestra conversación del año pasado, agradeceríamos mucho poder contar con la ayuda de esa institución para este Programa, ya sea mediante consultores, equipos de medición y de transporte.

Muy atentamente,

Ing. Marcelo Jorge Pérez
Administrador General

ACTION CRD
DATE DUE 11-2-84
DIR
DD
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CCN
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MGT
HAN
TDD
EDU
CHRON

MJP/mrr

cc: Director Comercial
Crédito y Financiamiento

Corporación Dominicana de Electricidad

REPUBLICA DOMINICANA

Núm. 0213

Señor
Philip R. Schwab,
Director de la
Agencia Internacional para
el Desarrollo,
SU DESPACHO

23 ENE. 1984

REF: Su comunicación del 23 de diciembre, 1983.

Estimado Sr. Schwab:

Por este medio le expresamos nuestro agradecimiento por la colaboración que nos ofrece para el plan para reducir pérdidas atribuibles a conexiones irregulares.

El programa global para reducción de pérdidas incluye la revisión de los servicios industriales, comerciales y residenciales, así como también la revisión de los equipos de medición de energía enviada a redes de transmisión y distribución, según el documento anexo.

En la actualidad se trabaja en el área de consumidores industriales, consumidores comerciales de la zona de Santo Domingo y consumidores del Gobierno.

Sería sumamente importante la ayuda del AID para ampliar la cobertura de estos programas ya que como es de su conocimiento nuestros recursos disponibles están a niveles críticos.

Consideramos que esta ayuda podría materializarse en la siguiente forma:

-Asistencia técnica de 24 hombres meses (2 expertos)

-50 000 contadores

-50 equipos de medición

-20 camionetas

Muy atentamente,

Ing. Marcelo Jorge Pérez
Administrador General

MJP
BT/mp

ACTION: CRD
DATE DUE 2-3-84
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34

A

Annex 4

AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

LAC/DR-IEE-85-56

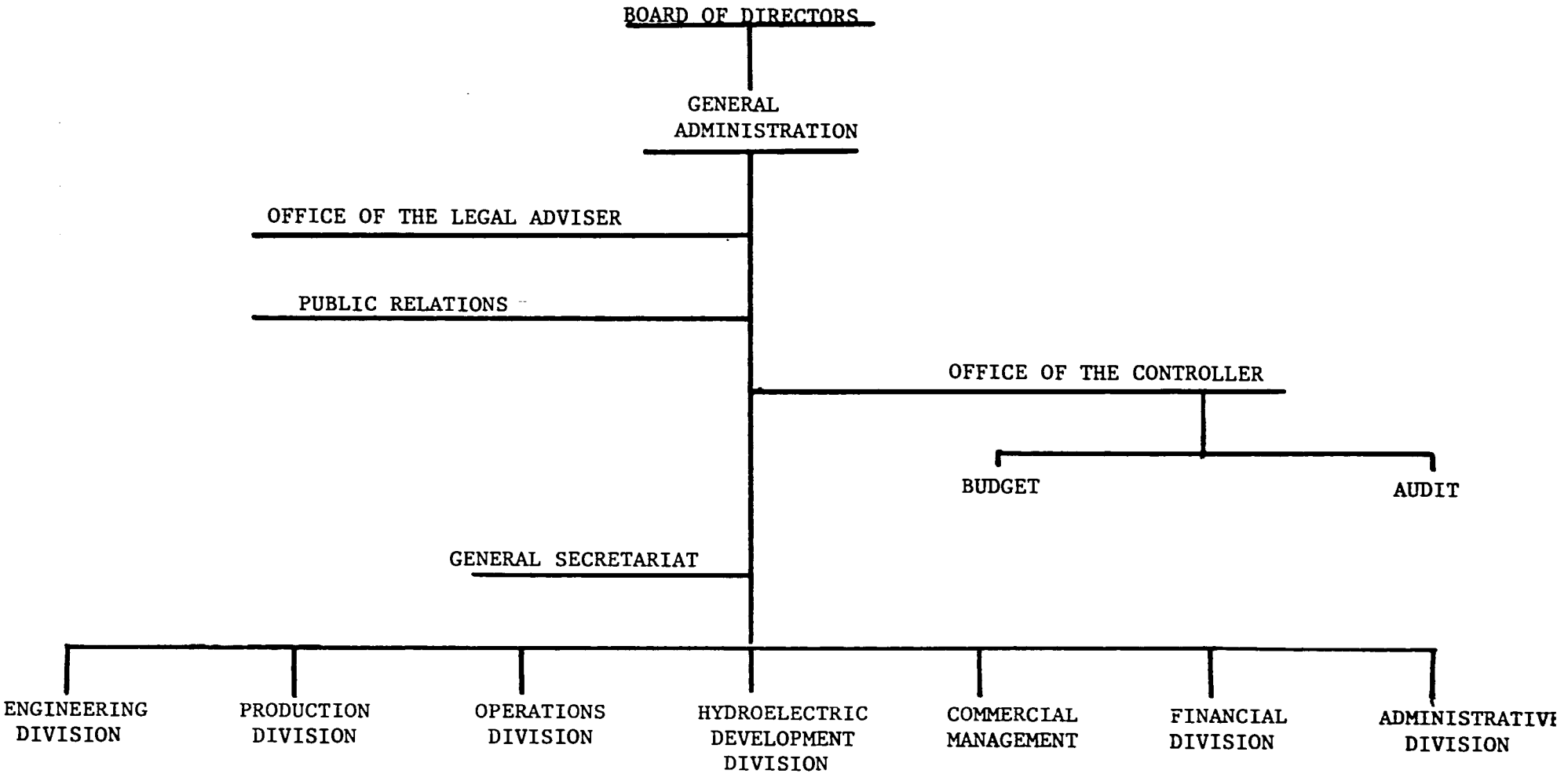
ENVIRONMENTAL THRESHOLD DECISION

Project Location	:	Dominican Republic
Project Title and Number	:	Improved CDE Revenue Collections 517-0218
Funding	:	$2,500,000 (L) $500,000 (G)
Life of Project	:	Three years
IEE Prepared by	:	William Smith USAID/Santo Domingo
Recommended Threshold Decision	:	Negative Determination
Bureau Threshold Decision	:	Concur with Recommendation
Comments	:	None
Copy to	:	Henry H. Bassford, Director USAID/Santo Domingo
Copy to	:	William Smith, USAID/Santo Domingo
Copy to	:	James Talbot, USAID Port au Prince
Copy to	:	Eric Zallman, LAC/DR/CAR
Copy to	:	IEE File

James S. Hester Date AUG -9 1985

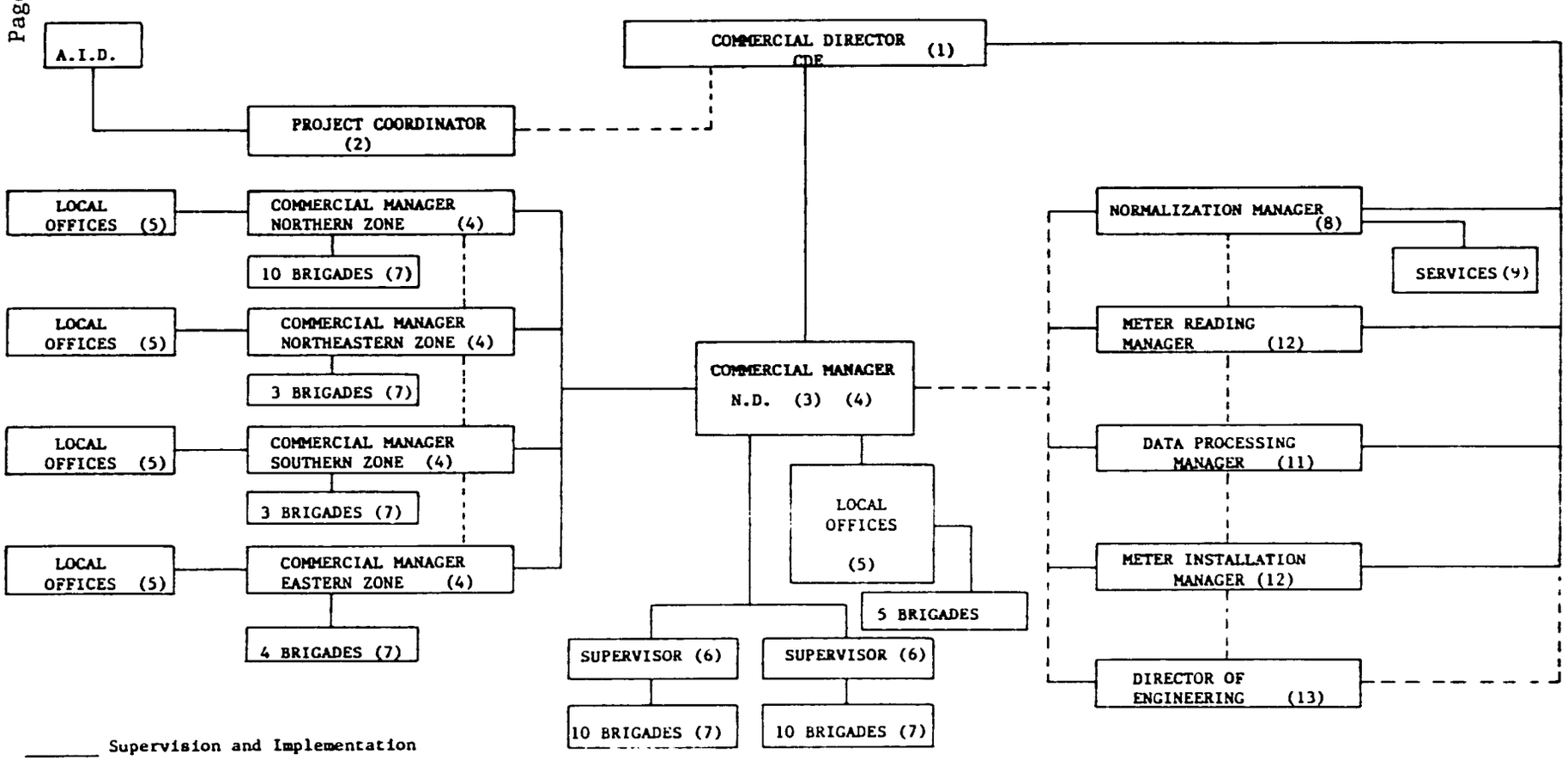
James S. Hester
Chief Environmental Officer
Bureau for Latin America
and the Caribbean

DOMINICAN ELECTRICITY CORPORATION



ORGANIZATION CHART

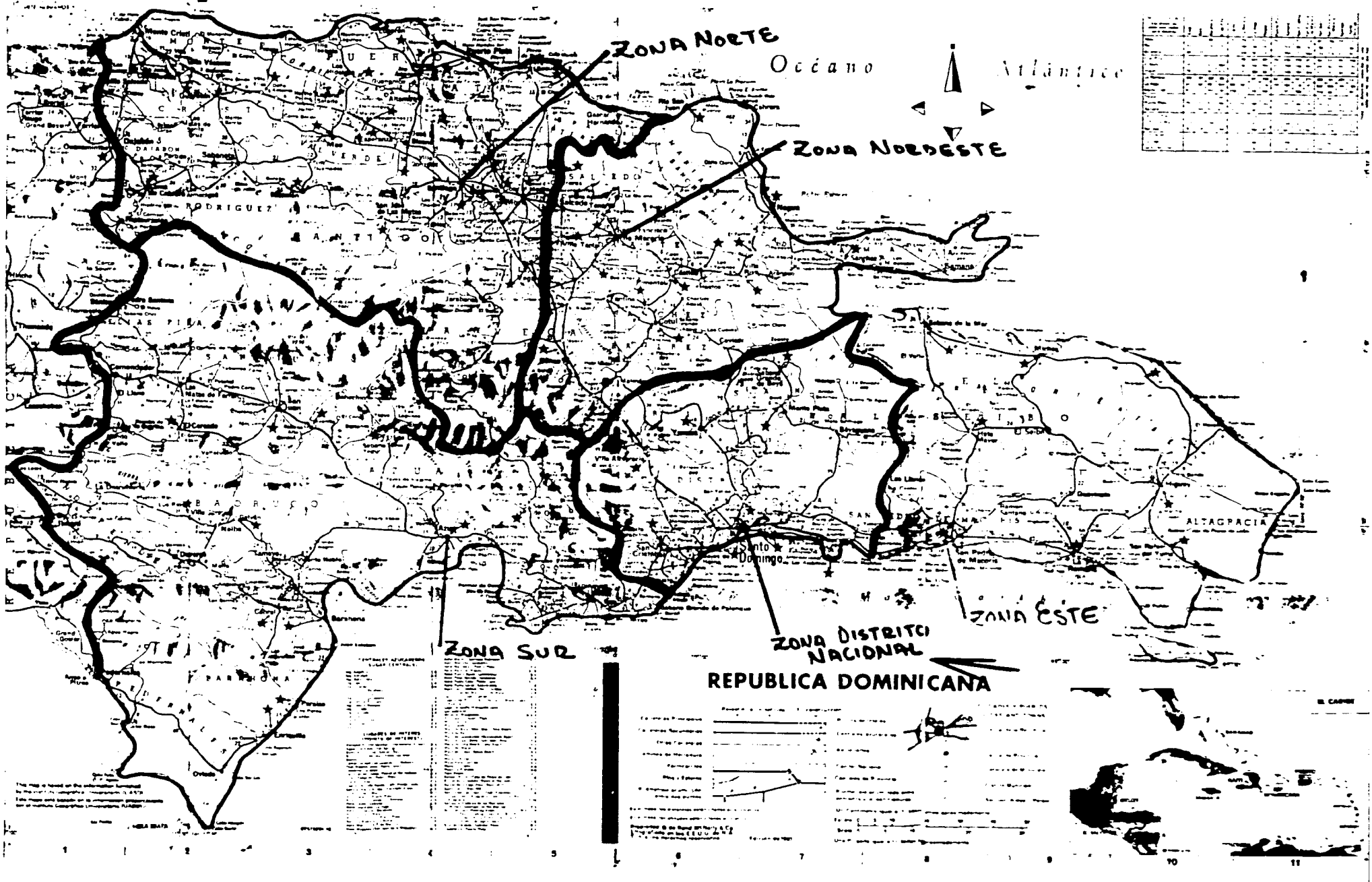
CDE REVENUE COLLECTION PROJECT



_____ Supervision and Implementation

------- Coordination

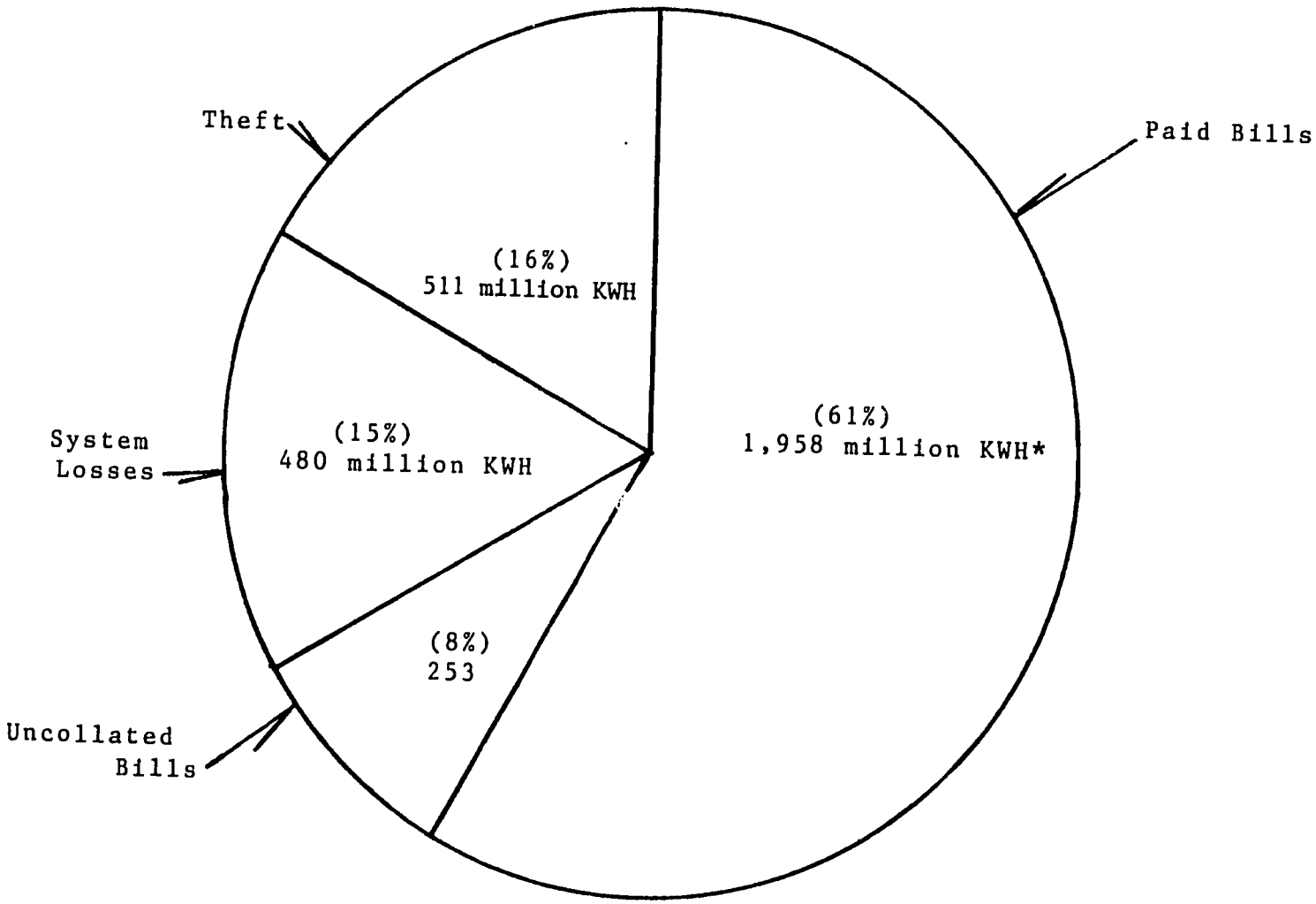
1. Project Counterpart
2. Project Coordinator
3. Project Manager and Business Manager in charge of commercial accounts
4. Manager of Project Activities in zone indicated and Business Manager in charge of commercial accounts
5. Existing Office which provides normal client service
6. Direct Supervisor of 10 project brigades
7. Brigades which will reduce theft
8. Office responsible for corrections to connections for large users
9. Teams which correct connections of large users
10. Manager of meter reading
11. Manager of the data processing system
12. Manager of meter installations
13. Director who is responsible for identifying and prioritizing the circuits on which the brigades will concentrate


ZONA NORTE
Océano
Atlántico
ZONA NORDESTE
ZONA SUR
ZONA DISTRITO NACIONAL
ZONA ESTE
REPUBLICA DOMINICANA
ALTAGRACIA

Oficinas Comerciales

CORPORACION DOMINICANA DE ELECTRICIDAD

	Teléfono
Gerencia Comercial Distrito Nacional	533–3211
Sucursal Comercial No. 1	533–2533
Sucursal Comercial No. 2	688–7363
Sucursal Comercial No. 3	685–6434
Sucursal Comercial No. 4	565–2535
Sucursal Comercial No. 5	594–6919
Sucursal Comercial No. 6	589–4562
Sucursal Comercial No. 7	594–6926
Sucursal Comercial No. 8	565–3012
Sucursal Comercial No. 9	566–1393
Sucursal Comercial No. 10 (Monte Plata)	
Sucursal Comercial No. 11 (Villa Mella)	
Sucursal Comercial No. 12 (Haina)	
Sucursal Comercial No. 13	
Sucursal Comercial No. 14 (Villa Altagracia)	
Sucursal Comercial No. 17 (Boca Chica)	523–4212
Sucursal Comercial No. 18 (San Cristóbal)	528–3045
Gerencia Comercial Zona Norte	582–2012
Sucursal Comercial No. 30 (Santiago)	582–2012
Sucursal Comercial No. 31 (Santiago)	583–5097
Sucursal Comercial No. 32 (Santiago)	582–3920
Sucursal Comercial No. 35 (Puerto Plata)	586–2521
Sucursal Comercial No. 37 (La Vega)	573–2358
Sucursal Comercial No. 38 (Jarabacoa)	5742
Sucursal Comercial No. 39 (Constanza)	2710
Sucursal Comercial No. 40 (Moca)	
Sucursal Comercial No. 42 (Valverde Mao)	572–3220
Sucursal Comercial No. 43 (Santiago Rodríguez)	
Sucursal Comercial No. 44 (Monte Cristy)	597–2212
Sucursal Comercial No. 45 (Dajabón)	
Gerencia Comercial Zona Nordeste	588–2347
Gerencia Comercial No. 36 (Bonao)	525–3252
Gerencia Comercial No. 41 (Salcedo)	
Gerencia Comercial No. 46 (San Fco. Macorís)	588–2347
Gerencia Comercial No. 47 (Cotuí)	2455
Gerencia Comercial No. 48 (Pimentel)	
Gerencia Comercial No. 49 (Nagua)	584–2257
Gerencia Comercial No. 50 (Samaná)	
Grencia Comercial Zona Sur	521–3271
Sucursal Comercial No. 70 (Baní)	522–3210
Sucursal Comercial No. 71 (Azua)	521–3271
Sucursal Comercial No. 72 (Barahona)	524–2246
Sucursal Comercial No. 73 (San Juan de la M.)	
Sucursal Comercial No. 74 (Duvergé)	
Sucursal Comercial No. 75 (Pedernales)	
Sucursal Comercial No. 76 (San José de Ocoa)	
Sucursal Comercial No. 77 (Neyba)	
Sucursal Comercial No. 78 (Las Matas de Farfán)	
Gerencia Comercial Zona Este	529–3621
Sucursal Comercial No. 90 (San Pedro de Mac.)	529–3521
Sucursal Comercial No. 91 (La Romana)	566–2341
Sucursal Comercial No. 92 (Higüey)	554–2227
Sucursal Comercial No. 93 (El Seybo)	552–3460
Sucursal Comercial No. 94 (Hato Mayor)	221
Sucursal Comercial No. 95 (Sabana de la Mar)	
Sucursal Comercial No. 96 (Miches)	



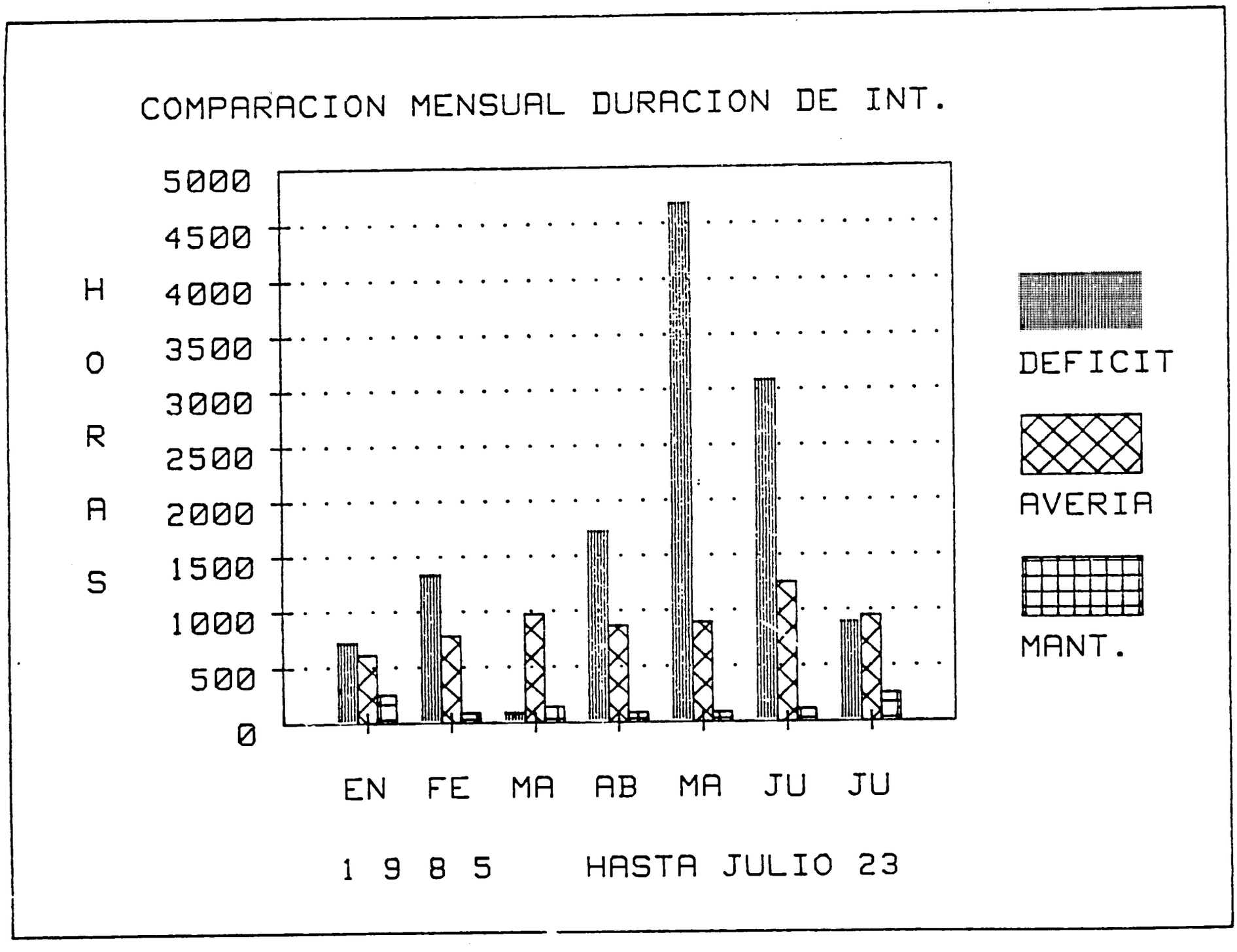
3,202 million KWH**

ACCOUNTING OF ELECTRICAL ENERGY DELIVERED TO THE SYSTEM

1984

* $\frac{\text{RD\$265,923,000 Billed}}{\text{RD\$ 0.1358/KWH}}$ = 1,958 million KWH

** 2,210 million KWH were billed


COMPARACION MENSUAL DURACION DE INT.
HORAS
5000
4500
4000
3500
3000
2500
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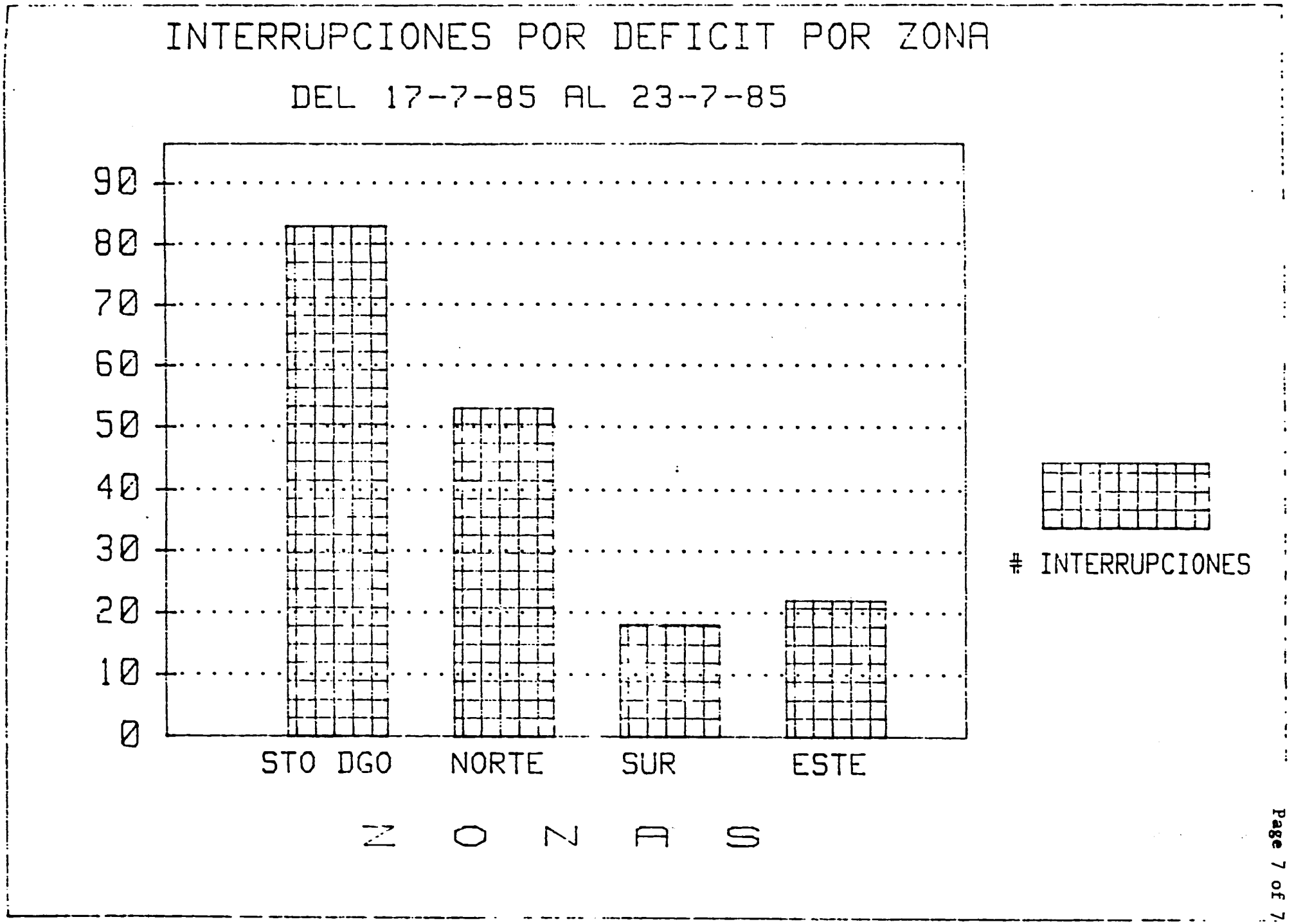
EN FE MA AB MA JU JU
1 9 8 5 HASTA JULIO 23
DEFICIT
AVERIA
MANT.

19


INTERRUPCIONES POR DEFICIT POR ZONA
DEL 17-7-85 AL 23-7-85
90
80
70
60
50
40
30
20
10
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STO DGO
NORTE
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ESTE
Z O N A S
INTERRUPCIONES

12

TYPICAL TRAINING COURSE OUTLINE

DEALING WITH THE PUBLIC

Purpose

a) Describe the importance and purpose of properly dealing with the public.

b) Motivate the trainees by impressing upon them the benefits and advantages of good public relations.

c) Orientation of assigning work and its dynamics.

d) Training on the use of personnel.

e) Share/exchange experience with those who work with the public.

Course Level

This course is designed for customer services employees and others who deal with the public.

Course Duration

The course will be given in 12 hours over a period of 2 days. Hours will be 8:00 a.m. to noon and 2:30 p.m. to 6:00 p.m.

Practical Exercises

There will be a practical exercise given in each subject. Each commercial office will be responsible for coordinating with the course instructor the results of each practical exercise.

Course Entrance Requirements

All CDE personnel who deal with the public, especially those employed in the commercial offices.

Course Diploma

CDE will award, during a graduation exercise, a certificate to each employee who has demonstrated ability to deal with public in the area of customer services in the commercial offices.

DEALING WITH THE PUBLIC

PROGRAM OF INSTRUCTION

HOURS	SUBJECT	INSTRUCTOR
First Day		
8:00 - 9:30 a.m.	Communications	Sociologist
10:00 - 11:30 a.m.	Group Dynamics	Sociologist
12 Noon	Lunch	
2:00 - 3:30 p.m.	Communications	Sociologist
4:00 - 5:30 p.m.	Group Dynamics	Sociologist
Second Day		
8:00 - 9:30 a.m.	Group Standards/Relations and Management of the Group	Commercial Manager - North Zone
10:00 - 11:30 a.m.	Group Standards/Relations and Management of the Group	Commercial Manager - North Zone
12 Noon	Lunch	
2:00 - 3:30 p.m.	Public Management	Business Manager
4:00 - 5:30 p.m.	Public Management	Business Manager

65

EQUIPMENT PROCUREMENT PLAN

Vehicles. Fifty (50) trucks will be purchased for this project. These trucks will be utility service type vehicles with 3/4 to 1 ton chassis, enclosed two-row cab and pickup body with side-mounted lockable compartments and drawers and a top-mounted extension ladder rack, similar to the service trucks used by CDE. There will be a need for two different sizes, namely, a regular size and a smaller size truck, the smaller size truck being required for use in alleys, congested streets and certain rural areas. The truck size mix is to be determined. The type and source of truck will be standardized to minimize cost of procurement and maintenance and repair. The Transportation Department of CDE, having procured similar trucks, will prepare the specifications. Procurement will be from U.S. suppliers.

Meters and Recording Instruments.
A list of instruments and meters to be furnished is included in the Annex. CDE will prepare specifications for procurement. Any assistance required for selection and application of these meters and instruments will be furnished under the short term technical assistance.

CDE may have a need for meter testing, calibration and repair facilities in connection with this project. Usually, operating electric utilities have such facilities. The extent of CDE capabilities for this type of work and the question of whether supplemental resources are needed has not been determined at this time. This aspect will be reviewed during the course of this project and appropriate steps will be taken to resolve any difficulties in equipment and facility availability, as well as any specialized training requirements. Meanwhile, project funds earmarked for equipment operation and maintenance may be utilized for such service.

Computer Systems and Accessories. The procurement involves purchasing the following:

- 20 remote terminals
- 2 microcomputers and accessories
- software

Remote Terminals. The responsiblity for procuring, installing and testing of the 20 remote terminals will be with the Computer Department of CDE. The compatibility of the terminals with the computer, the protocol and communications system are best handled by the Computer Department staff. CDE is also considering a new position of manager for data base control, which should provide further support to the commercial divisions as well as in the implementation of the remote terminals. The location of terminals will be determined in consultation with the commercial divisions.

At the beginning of this project, the Computer Department Manager will prepare the specification for the 20 remote terminals.

Microcomputers. The responsibility for specifying two microcomputer systems and associated software will be with the Distribution Engineering Department. The CDE staff in this department has the capability to discharge this responsibility.

Most of the software available in the market for distribution system applications are suitable for IBM manufactured microcomputers. Even though software originally designed to run on one type of computer can be adopted/changed to run on another type of computer, the cost of these conversions exceeds any savings resulting from purchase of non-compatible hardware. Hence, it is recommended that an IBM brand name microcomputer be procured. Moreover, IBM microcomputers are presently being utilized under the financed Energy Conservation Project, including a component being implemented by CDE. Results have been very satisfactory. Also, because of high obsolescence in computer technology development, the latest available model, namely IBM-AT, will be purchased. In order to assure higher availability of the computer systems, both computer systems will be identical. A brief requirement for the microcomputer systems is given in the Annex on Procurement.

Software. Necessary software to assure effective utilization of the microcomputers will be procured during this project. The microcomputer software to be procured will consist of four categories:

- Project control and monitoring program
- General utility type programs
- Distribution planning and engineering applications
- Distribution system operations applications

A detailed list of computer programs for procurement is included in the Annex.

The general utility type computer programs will be procured along with the IMB-AT microcomputer system as a single package, since these programs are commercial types and need no special training.

The software for the remaining categories will be obtained either under one contract, or on separate contracts. These software packages are listed in the Annex. The Distribution Planning and Engineering application program will require a maximum of five (5) days for installation and training. CDE will require technical assistance for preparing specifications for the software under these three (3) categories, as well as selecting suitable software. Specialist assistance in installation and training in the use of these software packages will be included in the purchase contract.

A Requirement Summary

of

Microcomputer System

Two identical systems, with each system consisting of the following:

- Brand Name: IBM-AT with 768K and capable of expansion of memory
- Disk Drive with 1.25MB Floppy Disks (if IBM-PC computers are presently in use, then compatible disk drive will be specified).
- Hard disk with 20MB with provision for tape backup
- Enhanced Graphics-Monochromatic colour monitor
- Compatible Dot Matrix Printer, 132 character-wide
- Modem
- Floppy Disk and backup tape supplies
- Voltage regulator (s)
- Connecting Cables

For one microcomputer system for the Distribution Engineering Department, a plotter such as HP-7475 will be obtained.

Recommended Software Packages

Some of the software listed here are tradenames and some are generic.

The tradename programs are listed in here, because they are considered to be the most suitable for the purposes of this project.

1. General utility type programs:

- Symphony or Lotus 1-2-3 (Spread Sheet)

- DBase-3 (database management)

- Word Star (Word Processor)

- Cross Talk (Program for connecting to other computer systems)

- Fortran Compiler (this program is required for only one microcomputer system to be used by Distribution Engineering).

2. Distribution Planning and Engineering applications. This program package distribution feeder analysis will have the following features:

- Basic Language

- User Friendly Software with heavily prompted input procedures and "Menu" driven and interactive edit capabilities.

- Load flow report
  - Voltage profile
  - Line loadings
  - System losses
- Short-circuit report
  - Phase-to-phase
  - Phase-to-ground
  - Minimum fault (per REA standards)
- Data base
  - Two types of customers (regular and demand-metered)
  - In-line transformers and regulators
  - Capacitors
  - Conductor file
  - Pole configuration file
  - Cable file
- Load spreading
  - Calculates distribution of regular customer load on feeder
  - Disk storage and feeder information
  - Feeders of 400 sections and nodes possible
  - Precise numerical calculations.

3. Distribution System Operations Applications. The generic software for the operations include the following:

- Trouble Call Management and Outage Analysis, which is sometimes called Customer Interruption Analysis
- Line Hazard Management (tree trimming, cable splicing, etc.)
- Transformer Load Management

4. Project Control Monitoring

- A project cost and schedule monitoring software
- A software package with capability to maintain files and process information for detection, investigation, normalization and surveillance.

METER REQUIREMENTS

Single Phase KWH Meters with D-73 Pulse Initiator

QUANTITY	DESCRIPTION	CIRC.	CLASS	T.A.	VOLTS	TYPE*	CPR
2	Self-contained	2W	100	15	240	IW70SA	10.00
3	Self-contained	3W	200	30	240	IW70S	10.00
2	Self-contained	3W	320	50	240	IW70S	10.00
2	Self-contained	2W	100	15	120	IW70SA	10.00
2	Transformer Rated	3W	10	25	240	IW50A	10.00

*Based on GE Catalog

METER REQUIREMENTS

Poly Phase KWH Meters with D-72 Pulse Initiator

QUANTITY	DESCRIPTION	CIRC.	CLASS	T.A.	VOLTS	TYPE*	CPK
3	Bottom connect. Transformer Rated	4W	10	2.5	240	Y	8
3	Bottom connect. Transformer Rated	3W	-	-	480	Delta	8
2	Bottom connect. Transformer Rated	4W	10	2.5	240	Y	8
2	Bottom connect. Transformer Rated	4W	200	30	120	Y	10
2	Self-contained	4W	200	30	240	Y	10

RECORDING METERS

QUAN	DESCRIPTION
30	Esterline Angus (previously General Electric Co.) Type CF-1 Model CF-1 Model CF1VBL2-1IN portable AC recording voltmeter, inkless type. Range: 0-140/280 V Scale: 0-140-280 Chart Drive: 120V, 60 Hz., with speed of 1 in./hr. Separate connections for measuring circuit and chart drive.
30	Esterline Angus (previously General Electric Co.) Type CF-8 Model 225605CJDK-AVV portable AC recording Watt-Var Meter, inkless type, 1-phase, 2-wire. Rating: Volts: 120 - 240 Amps: 2.5/5 Scale: 0-500 Chart Drive: 120V, 60Hz., with speed of 1 in/hr.

Supplied with Sangamo dual range splitcore current transformer Part No. 72360-002, rated 200/400:5 amps, window opening 2.37".

Quantum Code E.I.S.: Model 633/VA-1, E.I.S. Inc., Eston Model 633, Type VA-1, AC clamp ammeter and volt-ammeter, range: 175/350/700 volts AC; 10/25/100/250/1,000 amps AC; with leads and carrying case.

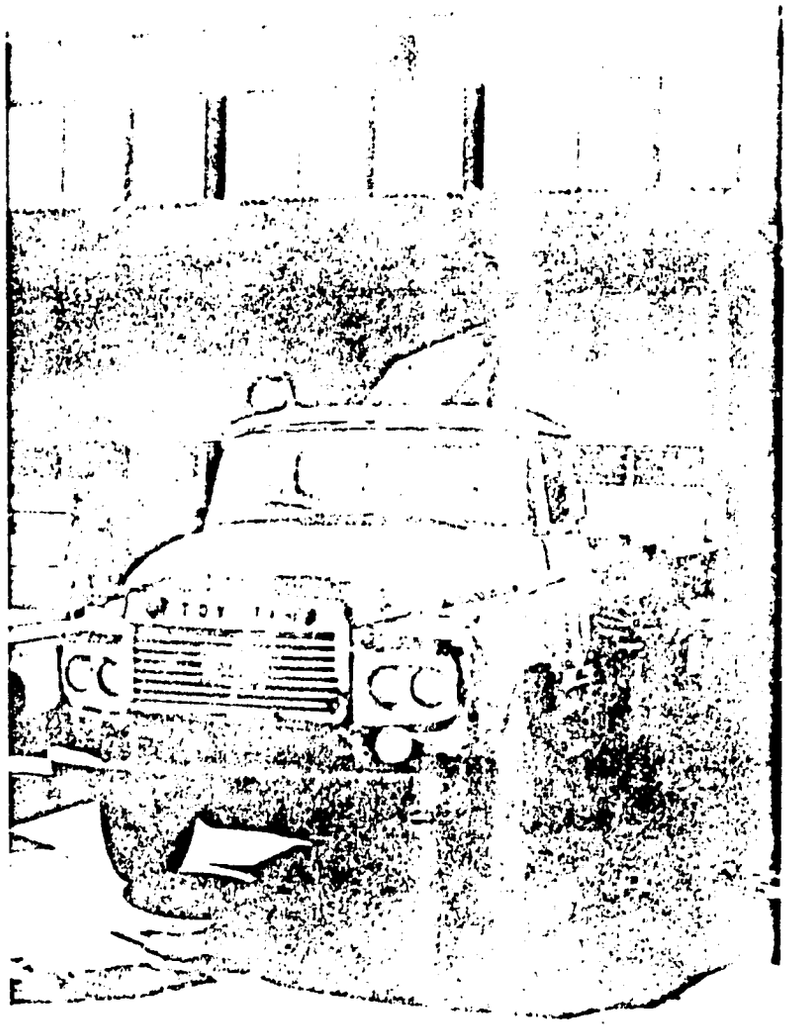
Same as item No. 2 except 3-phase, 4 wire, similar to model 225645CJEB-AVV complete. With extension leads and hook-on current transformers for use on 12.5KV distribution circuits.

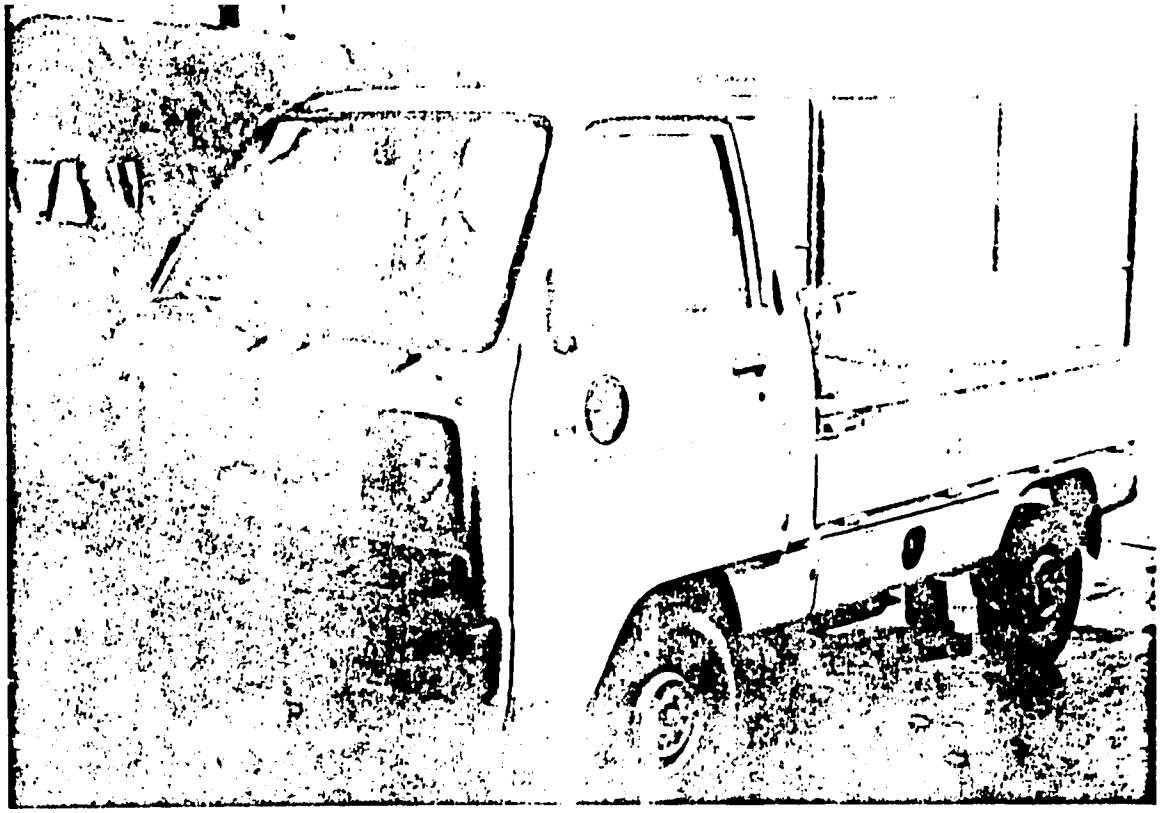
NECESSARY EQUIPMENT FOR NORMALIZATION SERVICE

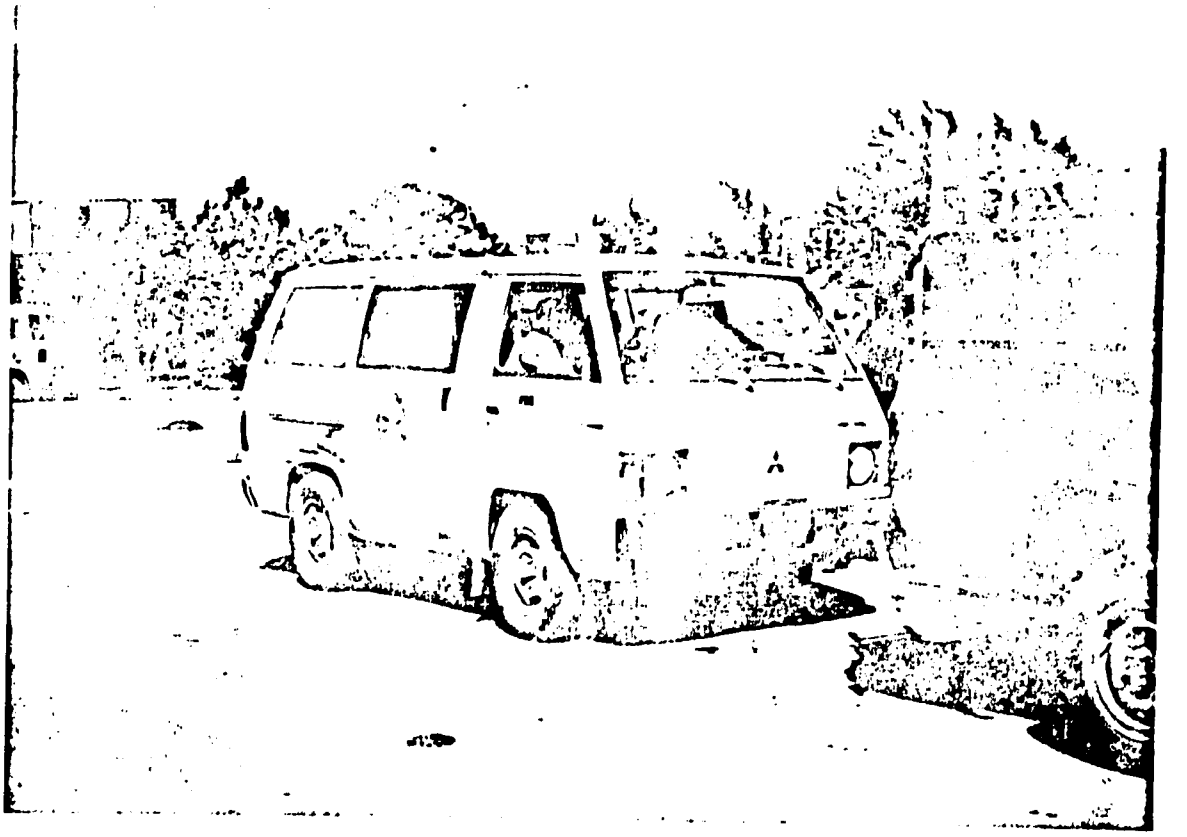
QUANTITY	DESCRIPTION
5	Potential and Energy Analyzers (similar to DRANETZ series 808) 2 units for Santo Domingo 1 unit for Santiago 1 unit for San Pedro de Macorís 1 unit for Azua
50	Multimeters with multiple ranges
10	Stopwatches
6	Phasemeters
7	Arithmetic Calculators
2	Underground cable locators

INTEGRATED DEMAND AND ENERGY RECORDERS

QUANTITY	DESCRIPTION
15	Potential and current transformers of metering accuracy for measurements at 12.5KV primary side of distribution transformers







• FINANCIAL AND ECONOMIC ANALYSIS

Data used in calculating costs and benefits were based on the 1984 total electricity generation of 3,202 million Kwh and an average tariff for the same year of RD$ 0.202/Kwh. The revenue gain in year 2 and 3 due to the project is estimated at $4.3 and $12.9 million respectively.

Concept	YEAR 1	YEAR 2	YEAR 3
Loss Recuperation Rate	0%	2%	6% (2%+4%)
KWH recuperated (In millions)	0	64.04	192.12
Increased revenues or Benefits(000)	0	RD$12,936	RD$38,808
or (000)	0	$ 4,312	$12,936

Initial investment costs are estimated at $ 2.11 million in year 1, $1.55 million in year 2, and $ 1.04 million in year 3. Total annual recurrent cost of $ 0.64 million is needed to maintain the 6 percentage points loss recuperation during 7 years after the completion of the project. Recurrent costs are personnel, office space and equipment, and fuel and related vehicle costs. Furthermore, a 6% annual depreciation has been added for trucks and major equipment, and a 2% yearly interest rate was charged during the grace period.

COST/BENEFIT ANALYSIS
(In millions of $)

Concept	YEARS 1	2	3	4	5	6	7	8	9	10
Revenues	0	4.31	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9
Costs	2.11	1.55	1.04	0.64	0.64	0.64	0.64	0.64	0.64	0.64
Net Revenues	-2.11	2.76	11.86	12.26	12.26	12.26	12.26	12.26	12.26	12.26

IRR (10 years) = 254.1%

IRR (3 years) = 211.3%

PV of Benefit (at 15%) = $ 54.08 million

PV of Cost (at 15%) = $ 6.24 " "

$$\frac{\text{PV of B}}{\text{PV of C}} = \frac{54.08}{6.24} = 8.7$$

PV of Benefit (at 20% disc) = $ 44.84 million

PV of Costs (at 20% disc.) = $ 5.73 million

$$\frac{\text{PV of B}}{\text{PV of C}} = \frac{44.84}{5.73} = 7.8$$

COST/BENEFIT ANALYSIS
(In millions of US$)

Concepts	YEARS 1	2	3	4	5	6	7	8	9	10
Economic Revenues	0	3.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4
Economic Costs	2.02	1.54	1.12	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Net Revenues	-2.02	1.86	9.28	9.67	9.67	9.67	9.67	9.67	9.67	9.67

IRR (10 years) = 211.8%

IRR (3 years) = 162.0%

PVB at 15% discount = $ 43.52

PVC at 15% = $ 6.50

PV of B / PV of C = $43.52 / $ 6.50 = 6.69

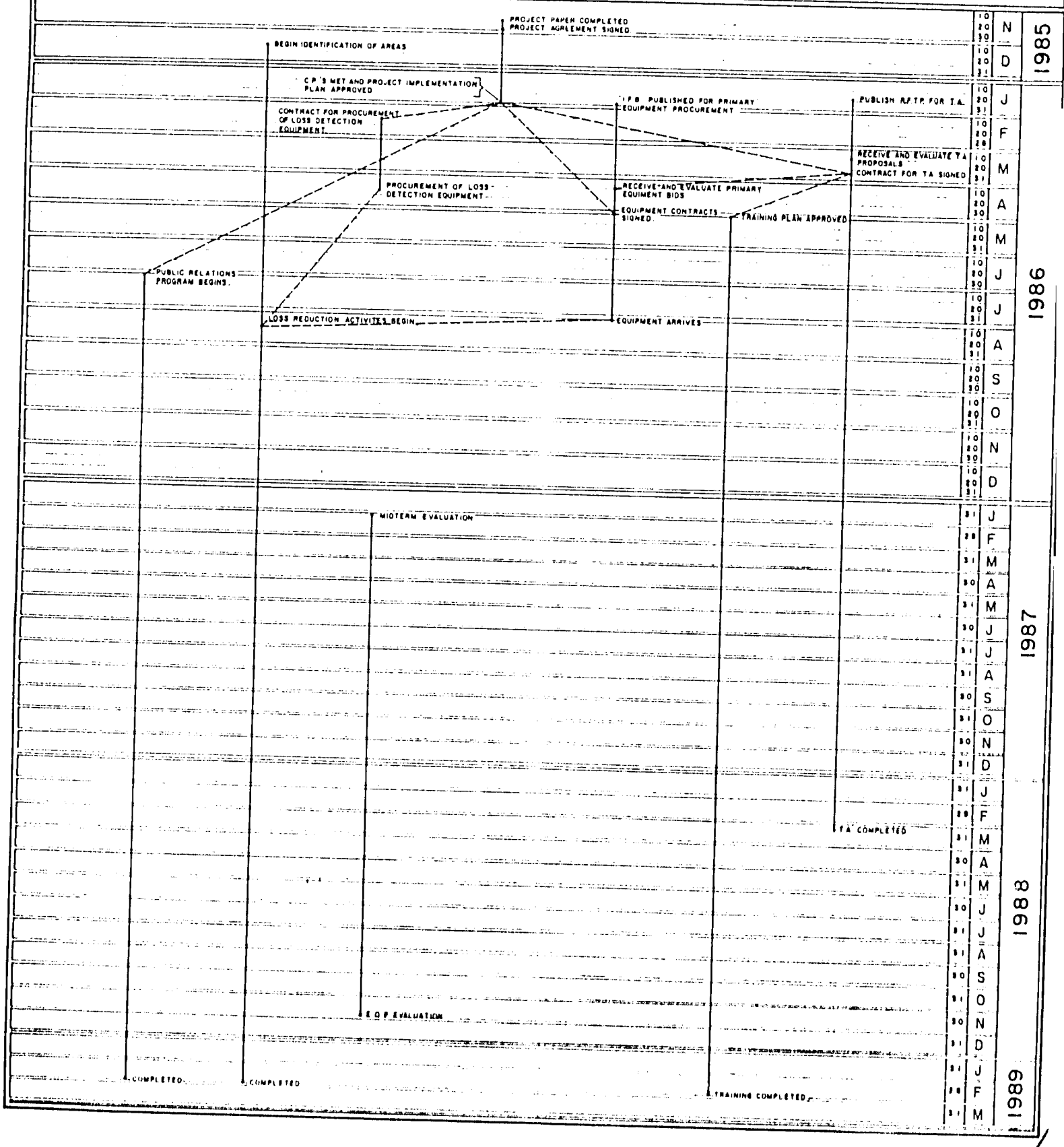
PVB at 20% discount = $ 36.09

PVC at 20% = $ 5.91

PV of B. / PV of C. = $ 36.09 / $ 5.91 = 6.11

DETAILED COST ANALYSIS
(US$)

	GRANT	LOAN	GODR
I. EQUIPMENT			
A. Computers			
1. 20 computer terminals in local offices for coordination with Project and to adequately handle customer questions	-	180,000	-
2. 2 micro computers	-	32,000	-
B. Measuring Devices			
1. Special recording meters and equipment needed by the Planning Department to isolate areas for area rehabilitation	-	100,000	-
2. Meters and other equipment needed by the Department of Normalization to support Project efforts	-	60,000	-
C. Vehicles			
1. 50 trucks with repair parts and work radios	-	1,290,000	-
2. 19 special radios for trucks for local managers to coordinate work in their areas	-	45,000	-
D. Operation and Maintenance			
1. Office equipment	-	8,000	-
2. Office materials ($3,000/yr - 3 yrs)	-	9,000	-
3. Vehicle storage yard-nights ($2,000/yr - 3 yrs)	-	6,000	-
4. Fencing a yard office and other security provisions for vehicle and equipment storage yard	-	40,000	-
5. Maintenance of trucks and other equipment - 3 yrs.	-	208,000	-
6. Gasoline, oil and operational requirements for truck - 3 yrs.	-	-	500,000

	GRANT	LOAN	GODR
II. Public Relations Campaign			
A. Market Research Study	-	50	50
B. Public Information Campaign	-	200	-
C. Employee Information/Training	-	50	50
III. Training			
A. Qualified trainers. Equipment, illustrations and models for project personnel and employee training	100,000	-	-
B. Observational site visits	50,000	-	-
IV. Personnel			
All personnel on trucks, supervisions and managers total of 202 personnel - 3 years	-	-	1,000,000
V. Technical Assistance			
Short term and long term advisors	320,000	-	-
VI. Evaluation/Audit	30,000	-	-
VII. Contingencies	-	222,000	-
TOTAL	500,000	2,500,000	1,600,000

IMPLEMENTATION NETWORK SCHEDULE