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Prepared for:

THE HOLDING COMPANY FOR CONSTRUCTION
AND DISTRIBUTION OF ELECTRIC POWER
AND
THE ELECTRICITY DISTRIBUTION COMPANIES
Arab Republic of Egypt

POLICY REFORM AND INSTITUTIONAL DEVELOPMENT ASSESSMENT FOR COMPETITIVE MARKET ADAPTATION OF THE EGYPTIAN POWER SECTOR

VOLUME II: THE HOLDING COMPANY AND THE ELECTRICITY DISTRIBUTION COMPANIES

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FINAL REPORT OF THE POLICY REFORM AND INSTITUTIONAL DEVELOPMENT ASSESSMENT FOR COMPETITIVE MARKET ADAPTATION OF THE EGYPTIAN ELECTRIC POWER SECTOR

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GLOSSARY OF TERMS

SECTION A

GENERAL ACRONYMS & ABBREVIATIONS

ANSI -	American National Standards Institute
BOO -	Build-Own-Operate
BOT -	Build-Operate-Transfer
CAA -	Central Auditing Agencies
CAPMAS -	Central Authority to Planning Mobilization and Statistics
CIDA -	Canada International Development Assistance
CIGRE -	Circuit Integré du Grande Resources Electricité
ECB -	Egyptian Central Bank
EDCO -	Electric Distribution Company
EEA -	Egyptian Electricity Authority
EUSA -	Egyptian Uniform System of Accounts
FATC -	Finance and Administrative Training Center.
FERC -	Federal Energy Regulatory Commission
FPC -	US Federal Power Commission
GAO -	General Accounting Office
GEEC -	General Egyptian Electric Corporation
GNP -	Gross National Product
GOE -	Government of Egypt
HCCDEP -	Holding Company for Construction and Distribution of Electric Power
HCDE -	The Holding Company for Distribution of Electricity
IBRD -	International Bank for Reconstruction and Development
ILO -	International Labor Organization
K&M -	K&M Engineering and Consulting Corporation
LE	Egyptian Pound
MIS -	Management Information Systems
MOEE -	Ministry of Electricity and Energy
NECC -	National Energy Control Center
O&M -	Operations and Maintenance
P&L -	Profit and Loss
PSED -	Private Sector Energy Development
TMDP -	Top Management Development Plan
UN	United Nations
UNDP -	United Nations Development Program
USAID -	United States Agency for International Development

GLOSSARY OF TERMS

SECTION B

TECHNICAL ACRONYMS & ABBREVIATIONS

ACSR -	Aluminum Conductor Steel Reinforced
APPA -	The Anual Peak Profile Analysis
BASIS -	Base
CPR -	Continuous Property Records
DBMS -	Data Base Management System
DSM -	Demand Side Management
ECEP -	Energy Conservation and Efficiency Project
EGEAS -	Computer Program
EHV -	Extra High Voltage
EMTP -	Electromagnetic Transients Simulation
FSA -	Full Supply Agreement
GIS -	Geographic Information System
GRSC -	Growth Rate Specific Consumption
HV -	High Voltage
I&C -	Instrumentation & Controls
IEEE -	Institute of Electrical & Electronic Engineers
kVA -	Kilo Volt Amps
kW -	Kilo Watt
LAN -	Local Area Network
LT -	Low Tension
MT -	Medium Tension
MV -	Medium Voltage
Mva -	Mega Volt Amps
MW -	Mega Watts
NUS -	National Unified System
RATS -	Regression Analysis for Time Series
REA -	Rural Electrification Authority
RPI -	Retail Price Index
RTU -	Remote Terminal Units
SCADA -	System Control and Data Acquisition
VHV -	Very High Voltage
WASP -	A Computer Program for Least Cost System Expansion Planning

PART I: EXECUTIVE SUMMARY

USAID/Office of Energy and Infrastructure and the USAID/Cairo had awarded K&M Engineering and Consulting Corporation this project to perform a Policy Reform and Institutional Assessment of the Egyptian Power Sector under the direction of the Private Sector Energy Development (PSED) program. This part of the report focuses on the distribution subsector which comprises eight Electric Distribution Companies (EDCOs) owned by a holding company under Law 203 of 1991.

USAID has provided funding for various projects in the Electric Power Sector of Egypt for the past 17 years. This sector fell under the jurisdiction of the Ministry of electricity and Energy until the promulgation of Law 203 of 1991 and the moving the eight electric Distribution Companies to a Holding Company, first named "The Holding Company for the Distribution of Electricity", later, several construction companies were added to the Holding Company's portfolio and it was renamed: The Holding Company for Construction and the Distribution of Electric Power, which reports to the Minister of Privatization (originally the Prime Minister). The EEA remains under the Ministry of Electricity and Energy.

USAID funds have contributed to the development of this vital sector of the Egyptian economy and enable it to close the gap between demand and supply with a margin of safety. Over 95% of the Egyptian population now have access to electricity. A recently completed Energy Pricing Strategy Study, also financed by USAID, is being implemented in stages and is providing the EDCOs with increased revenues. These revenues will help finance new investments and enable the EDCOs to achieve a greater degree of financial independence, better planning, and higher productivity.

USAID, with the approval and cooperation of the Ministry of Electricity and Energy and the Holding Company, decided to proceed with an analysis and assessment or the organizational and operational efficiencies of the distribution companies. Such a study will help the Egyptian Electric Power Sector, USAID and the other international financing institutions to develop a set of priorities for the allocation of available financial resources.

The objectives of this study are to assess the current status of the Egyptian power sector and to produce tangible recommendations for achieving a transition of its operation to privatization through:

- Increased operational and financial independence
- Increased operational efficiency
- Improved profitability and return on investments
- Recognition of the customer and the competitive market place as the ultimate commercial concerns

Until the preparation of the draft report, the Charter and By-laws and internal organization structures of some of the EDCOs were not yet available. We however pursued the study through the Holding Company and selected two of the EDCOs for analysis:

The Cairo Electric Distribution Company
The South Delta Electric Distribution Company

The rationale behind the selection was as follows:

- The Cairo EDCO is the largest of the companies and represents 44% of total energy sales in Egypt and about 32% of the total number of customers. Its customer base is mostly urban and industrial.

- The South Delta EDCO is among the smaller companies representing only 8.4% of the total energy sales and 12% of the total number of customers. Its customer base is mainly rural and agricultural.

We believe that this selection provides a good representation of some of the major problems facing all eight EDCOs.

The Executive Summary represents a compilation and summary of the recommendations made in the various chapters of the report. These recommendations are categorized below according to the level of government authority required for their implementation. The classification is as follows:

- EDCOs OPERATIONAL ISSUES

- GOE ISSUES

EDCOs Operational Issues

The recommendations in this category involve changes that the EDCOs management can implement without external permission or supervision. They include:

Legal

- The EDCOs operating under Law 203 should proceed forthwith with the implementation of the changes required to enhance their ability to operate on a commercial basis without necessarily waiting for privatization of their shareholding.

Management Organization

- It is recommended that all procedures, and particularly those relating to organization and personnel, be immediately adapted to the EDCOs' new legal status as private entities.

- Training in general should focus on customer service and the EDCOs commercial objectives and should include all levels of management.

- There should be an in-depth study of personnel requirements by each department in order to ascertain the most efficient way to gradually eliminate over-staffing in some departments and strengthen others with better trained, qualified personnel and improved compensation.

Management Information Systems

- It is recommended that the EDCOs take better advantage of the capabilities of the Al-Ahram computer facility.

- Reliable, computer-based management information systems should be installed at the EDCOs. The system should be comprehensive, supporting administrative, technical, commercial, and financial operations. It is further recommended that the system be developed by an outside MIS consultant using one model EDCO. The effort should be undertaken in cooperation with EDCO's staff to ensure the applicability of the system to the operation of other EDCOs. Moreover, the consultant should train a group of the EDCO's staff to operate and maintain the system. This group can then train the remaining staff of the EDCO as well as implement the system in the other EDCOs. It is our opinion that the Alexandria EDCOs current model should be implemented across the distribution system.

Distribution Systems

- Each EDCO should start programs to evaluate the accuracy of their sales figures, **and** should also work in conjunction with EEA to insure that the energy they purchase is measured properly.

- The EDCOs should begin programs to match their transformers capacities to their actual loads, **and** a clearing house should be established to exchange, among the EDCOs, any transformers left over from the matching programs.

- Least-cost evaluations should be based on marginal costing for energy and free-market prices for the equipment and installations.

- The EDCOs should standardize the procedures for reporting fault rates to enable meaningful comparisons.

- The EDCOs should investigate whether they can implement a policy and a methodology for reporting **the energy that could not be supplied during a fault.**

- The EDCOs having high fault rates, should investigate the causes of the high failure rates in their MV underground cable networks.

- The EDCOs should start using a more sophisticated method of forecasting, based on the statistical billing data available from the Al-Ahram newspaper computers and from input from their industrial customers.

- A study should be carried out to ascertain the maintenance needs of each of the EDCOs, **and** a program should be developed to determine best way of implementing it.

Tariffs

Since the quantity of meters used by the EDCOs is very large, and the meters are a very important part of the customer service system, it is recommended that programs be developed to achieve the following goals:

- Within 3 years, create computerized data bases of all the meters in use by the EDCOs. These data bases should contain information that will allow definite control of the meters (especially for the meter reading process) and should have provisions for the future accounting of their costs and depreciation.

- Transfer all existing meters from the Inventory account they are presently in to a new Asset account which contains meters. This transaction will have no immediate effect on the financial position of the EDCOs but will influence future years' operations since it will add a new depreciation component.

- Begin immediately with the design of the data base systems, and as soon as they are ready, commence capitalizing and depreciating all new meters.

- When the data bases are fully operational, commence entering the existing meters at their replacement cost but consider them to be fully depreciated. This transaction will not affect the financial position of the EDCOs. If the meters were to be shown at their replacement cost, less **presumed** accumulated depreciation, there would be a very large adjustment to the real profit of the Company.

- Begin immediately considering the contribution received from new customers as an income and include it in a special account (which could be called Contributions in Aid of Construction - Meters). It should be noted that usually the balancing account to this transaction is a liability record which accumulates all these contributions and is written-off only by special authorization.

Customer Service

- As a first step, computer terminals tied to the Al-Ahram computer should be provided to EEA and the HCCDEP to enable their staffs to obtain statistical data on the operations of the EDCOs quickly and efficiently.

- The EDCOs should start planning policies and the organization structure for fraud reduction.

- The EDCOs should commence planning the provision of adequate customer service and begin budgeting its requirements.

Meter Reading

- The EDCOs should take immediate steps to relocate **all** meters outside the customers' premises, or provide the means to read meters from outside customer premises.

- The use of the traditional meter reading books should be phased out within six months and be replaced by automated meter reading equipment and/or computer produced lists.

- Meter readings should be validated within two working days of their collection.

- It is recommended that the collection of electricity payments at the customers' premises be phased out within two years and replaced with a system of collection offices where customers pay their bills.

Accounting and Related Issues

- The EDCOs should adopt a specific plan for the automation of their accounting records. Automation should be implemented in phases, in parallel with the manual system before each phase is finalized. The design of the system should take place with substantial managerial and prospective user the distribution sector.

- The EDCOs should prepare annual budgets after guidelines and goals are provided by upper management, beginning at the lowest departmental level. Departmental budgets should contain a level of detail manageable by the department head. Department heads should be provided periodic reports comparing budget to actual performance, and be held accountable for the department achievement relative to the goals set by upper management. Five-year projections should also be prepared each year to plan cash flow, revenue, and financing requirements (see Chapter 11, Business Plan.)

- The EDCOs should conduct a depreciation study to establish depreciation rates more in keeping with the economic consumption of the fixed asset costs.

- The EDCOs should discontinue recording depreciation at 50% of the normal rate after fixed assets have been fully depreciated. This method does not achieve the stated goal.

- Design of a uniform code of accounts that clearly defines the procedures to be followed in handling returns of assets to inventory.

- An intensive training program should be carried out among the management, accounting, financial, and engineering functions of the Companies to instruct their staff in the actual use of the code.

- An Automatic Mapping system should be implemented in at least one EDCO; and (1) an investigation should be carried out to determine what steps must be taken to implement an Automatic Mapping system at the Cairo EDCO (using the existing GIS and MT cable data base).

- EDCOs should immediately begin defining standard designs (units of construction) for the distribution systems and establish a coding system to identify each of the components used in the units of construction.

- EDCOs should start modifying the Work Order system to make it compatible and applicable for computerization.

Business Plan

- It is strongly recommended that the different EDCOs start, as soon as possible, to develop a business plan. The first step will consist of a definition of the "Mission" of each EDCO and the financial objectives it wishes to achieve. The whole exercise of the Business Plan will help to focus the attention at levels through the organization on the direction the enterprise is heading and what objectives are to be achieved. It will integrate the efforts of all the departments and become a yardstick to measure the accomplishments of the organization.

G.O.E. Policy Issues

- Improve collection and reduce receivables generally, and in particular from government entities.

- The establishment of an independent regulatory agency with authority over both public and private electric utilities. This agency would play a leading role in setting transfer prices between EEA and the EDCOs and in determining tariffs to end users.

PART II: PROPOSED IMPLEMENTATION PLAN

In this section we have attempted to integrate and prioritize the many recommendations made in this report. The order of priority is based upon the contribution an implemented recommendation is expected to have on the EDCOs profitability.

To reinforce the implementation plan, and to provide a means to measure its progress by defining milestones, we have selected what we consider to be the eight recommendations (Actions Items) that will either have the greatest immediate impact on EDCO's balance sheet or will make the most immediate contribution to the achievement of significant commercialization, improved service to the public, and increased accountability. In turn this should facilitate the transition to privatization. We believe, these eight recommendations can be achieved within one to three years. The other recommendations contained in this report are tabulated separately in Part I above, and can later be grouped together for simultaneous implementation with the high priority "Action Items", or independently, but still within the three year time frame.

The following action items for the implementation plan can be summarized under two major objectives:

A. IMPROVE PROFITABILITY

[1] Collect Receivables

The financial viability of the EDCOs can only be achieved if bills for the supply of electric energy are collected. Accounts receivable can only be reduced if the various GOE entities (administrations, public sector companies, etc.) are forced to meet their obligations. The EDCOs should be allowed to interrupt service to any customer, private or government, that is delinquent.

[2] Reduce Losses

There have been several studies concerning high losses in the distribution system. These losses are due to technical problems, fraud, or other reasons. The EDCOs should start implementing the various recommendations made in this report, including the standardization of transformers.

[3] Improved Metering

A program should be undertaken to either move meters outside of residences or adopt remote reading of meters to improve the meter reading efficiency. This is already being done at the Cairo EDCO.

[4] Develop Improved Forecasts for Energy Sales and Peak Demands

It is essential for the development of a business plan and to provide the funds required for expansion that the EDCOs improve their load forecasting which is also needed as an input to EEA to ensure the availability of required resources. These forecasts should take into account anticipated energy price elasticities, demand side management and energy conservation programs being undertaken by various industries.

B. REORGANIZE AS COMMERCIAL ENTERPRISE

[5] Adopt New Personnel Policies and Compensation Commensurate with Private Enterprise

Now that the EDCOs are relieved of the public sector restrictions on personnel policies and compensation new policies based on delegation of authority, greater responsibility and accountability should be adopted together with improved compensation and incentives tied to results and cost reduction.

[6] Establish Management Training Consistent with Commercial Operations

The EDCOs need individually and maybe collectively establish management training programs to assist their management in focussing more on commercial operation and profitability.

[7] Develop and Implement Business Plan

With the new status of the EDCOs business planning is crucial. No business entity can function effectively without it. This report has attempted to outline the general framework for such a business plan and the steps required to develop it, as discussed in Chapter 11. The EDCOs will need assistance in developing the first such plan.

[8] Establish an Independent Regulatory Framework

This issue was discussed in Chapter 4. As the EDCOs are separated from the MOE, transfer pricing must be independently and equitably decided. Furthermore, electric energy prices will require periodic revision in order to take into account the changing cost structure of the energy sector and the overall economic conditions. Hence, the importance of establishing a mechanism for price revisions.

2 INTRODUCTION AND BACKGROUND

Over approximately the last 17 years, USAID has provided funding to the Electric Power Sector in Egypt for various projects on an ongoing basis. This sector, until recently, came entirely under the jurisdiction of the Ministry of Electricity and Energy (MOEE). The USAID funds have contributed to the development of this vital sector of the Egyptian economy and has enabled it to close the gap between demand and supply with a margin of safety. Over 95% of all urban and rural areas of Egypt are now electrified. A recently completed Energy Pricing Strategy Study, also financed by USAID, is being implemented in stages and is providing the EDCOs with increased revenues that will help finance a larger portion of its new investments, and therefore enable it to achieve a greater degree of financial independence and, consequently, better planning and higher productivity.

Since USAID initiated the various steps that led to the implementation of the study subject of this report, the power section in Egypt was reorganized. The Electric Distribution Companies were removed from the jurisdiction of the MOEE and reorganized under Law 203 of 1991 as a separate corporation reporting to a Holding Company. In turn, the Holding Company is under the jurisdiction of the Minister for Privatization (originally the Prime Minister). Later several construction companies were added to the portfolio of the Holding Company which was renamed the Holding Company for Construction and the Distribution of Electric Power.

USAID, with the approval and cooperation of the Ministry of Electricity and Energy and the Holding Company for Construction and Distribution of Electric Power, is now proceeding with analysis and assessment of the organizational and operational efficiencies of the Egyptian Electric Authority (EEA) and the Electricity Distribution Companies (EDCOs), as well as their respective expansion plans. Such a study will help the Electric Power Sector, USAID and the other international financing institutions to focus on a set of priorities and be able to better allocate the available financial resources.

USAID has entrusted to K&M Engineering and Consulting Corporation (K&M), which manages the Private Power Sector Development program under contract to the Office of Energy and Infrastructure of USAID in Washington DC, the task to carry out this study, which has been named **"POLICY REFORM AND INSTITUTIONAL DEVELOPMENT ASSESSMENT FOR COMPETITIVE MARKET ADAPTATION OF THE EGYPTIAN ELECTRIC POWER SECTOR".**

K&M is involved with several projects in the Egyptian Power Sector, and many of its senior management and staff members have a long association with Egypt and its Electric Power Sector. Furthermore, K&M is involved with efforts in several countries, providing technical assistance in restructuring their power sectors, and developing and adopting new policies to encourage a more commercially- oriented operation of government utilities and increased participation by the private sector. Using the company's experience on these and other related projects, the K&M project team formed to assess the present conditions in the power sector. This review was conducted taking into consideration USAID's, EEA's and the Holding Company

for Construction and Distribution of Electric Power's (HCCDEP) ultimate objective of increasing commercialization and efficiency of operations.

As the K&M team started to gather the information required for the study, the Holding Company for the Distribution of Electricity was still under formation and neither its charter nor the charters of the EDCOs were in their final form. Members of the General Assemblies and Board of Directors were not appointed yet.

Until the preparation of the draft report, the Charter and By-laws of some of the EDCOs were not yet available. We however pursued the study through the Holding Company and selected two of the EDCOs for analysis:

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The rationale behind the selection was as follows:

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We believe that this selection would provide good representation of some of the major problems facing all eight EDCOs.

Undoubtedly the state of flux that existed in 199? in the Distribution part of the Electric Power section of Egypt has restricted the ability of K&M to carry out as complete an analysis as was intended. In particular, the areas of organization structure, planning for the future, etc.

It is important to note that under the present Law 203 the EDCOs are already authorized to operate under conditions similar to the private companies, therefore, this phase in the history of Egyptian electricity distribution sector is a transition towards privatization.

It is felt that the EDCOs require a greater degree of attention and assistance by the GOE and USAID and other donors in the technical management training and financial areas. The objective would be to increase the efficiency of the EDCOs operations, improve the quality and reliability of their service to the consumers and enhance their profitability and financial structure. All these factors would facilitate and accelerate the transition to privatization. It is also felt that the assistance should be tailored to the particular circumstances of each of the EDCOs and therefore, preceded by a more detailed individual analysis.

TABLE 2-1
THE DISTRIBUTION COMPANIES ENERGY PURCHASES, SALES, AND NUMBER OF CUSTOMERS

DISTRIBUTION	ENERGY PURCHASED (G.W.h)	PERCENT OF TOTAL	ENERGY SALES (G.W.h)	PERCENT OF TOTAL	NUMBER OF CUSTOMERS	PERCENT OF TOTAL
Cairo	12884.8	42.8%	11754.6	43.5%	3,441,000	31.3%
Alexandria	3260.5	10.8%	2873.4	10.6%	985,000	9.0%
Canal	3180.6	10.6%	2896.8	10.7%	1,159,000	10.5%
North Delta	2431.9	8.1%	2037.9	7.5%	1,235,000	11.2%
South Delta	2550.1	8.5%	2260.0	8.4%	1,333,000	12.1%
Beheira	1543.8	5.1%	1326.3	4.9%	559,000	5.1%
North Upper Egypt	2129.5	7.1%	1923.5	7.1%	1,284,000	11.7%
South Upper Egypt	2121.6	7.0%	1922.0	7.1%	998,000	9.1%
Total	30,102.8	100%	26,994.5	100%	10,994,000	100%

Source: 1990/1991 Annual Statistical Report, MOEE

2.1 OBJECTIVES AND SCOPE OF THE STUDY

The primary objective of the study is to undertake an assessment of the Electric Power Sector in Egypt in order to provide guidelines and recommendations for the formulation of a plan which will facilitate the necessary growth to meet demand, while maintaining a high degree of financial independence.

The effective implementation of such a plan for the Egyptian Power Sector should result in nine commercially-oriented operations and a reduced dependence on GOE funds and grants for financing of system expansion.

The study shall also attempt to identify specific areas of assistance which would facilitate the optimization of the EEA and Distribution Companies' operations. Specifically,

- Increase Operational Efficiency;
- Improve Returns On Investments and Profitability;
- Increase Operational and Financial Independence.

In order to accomplish these objectives, the study will encompass technical, financial, organizational, commercial and legal aspects of the EEA and the EDCOs, as shown in Table 2-1. The following sections describe the overall scope of this work in detail.

2.1.1 General Requirements

2.1.1.1 Review of Existing Laws, Policies, Procedures and Regulations

The K&M project team shall provide a comprehensive review of the issues, opportunities, and impediments which affect the energy sector to determine if change could be made to increase interest and investment in the power sector. This would include but not be limited to:

REGULATORY FRAMEWORK: The K&M project team shall investigate the present Egyptian regulations concerning the generation, transmission and distribution of electric power in Egypt and identify any restrictions or limitations to these activities.

The K&M project team shall investigate the need to establish a Governmental institution with regulatory jurisdiction over utilities and would exercise responsibilities in determining the reasonableness of rates, quality of service and utility operations for all utilities.

3 OVERVIEW OF LEGISLATION GOVERNING ELECTRICITY DISTRIBUTION IN EGYPT

3.1 BACKGROUND

3.1.1 Prior to 1948

Prior to 1948, the supply of electricity in Egypt was partly assumed by the Government of Egypt through its Ministry for Municipal and Village Affairs, and partly by private utility companies under concession agreements with the Government of Egypt.

The concession for the greater Cairo area was in the hands of the Lebon Company (French), while the suburb of Heliopolis and the electrified mass transportation systems throughout the city and its suburbs (Tramway and Metro systems) were served by The Egyptian Electricity Company, a subsidiary of the Belgian developers of Heliopolis.

Alexandria was served by the Alexandria Lebon Company. The Suez Canal area that came under the jurisdiction of the Suez Canal Company was served by that company, while the balance of the requirements of the three cities of Port Said, Ismalia and Suez was supplied by diesel power plants operated by the Ministry of Municipal and Village Affairs.

Some of the energy supplied in the Delta by the Ministry of Municipal and Village Affairs was purchased from the Ministry of Public Works, Mechanical and Electrical Department, which operated some generating plants in the Delta and in Upper Egypt interconnected by H.V. 33/66 KV transmission lines. The initial objective of these plants and transmission lines was to serve the pumping stations for irrigation and drainage purposes.

3.1.2 From 1948 to 1964

Both the Lebon Company in Alexandria and the Egyptian Electricity Company in Cairo were nationalized between 1946 and 1964. The general framework for the distribution of electricity in Egypt was maintained.

In 1948, upon expiration of the Lebon concession for the city of Cairo, the Egyptian Government took over the role and responsibility of the company and formed the Cairo Electricity and Gas Administration, as a separate entity under the Ministry of Public Works.

In 1959, the Egyptian Government sequestered the Egyptian Electricity Company together with all other Belgian assets in Egypt following the rupture of relations with Belgium over the Congo-Lumumba affair.

In 1961, the government nationalized the Lebon Company in Alexandria and the Egyptian Electricity Company. Thus, for the first time in Egypt's recent history, all electricity production, transmission, and distribution came under government ownership.

In 1962, Law No. 3 was promulgated, creating the "Electricity Committee", under the National Council for Economic Development to coordinate and rationalize the electric power sector in Egypt. This was the precursor to the creation of a Ministry for Electricity.

In 1964, Presidential Decree No. 1301 was issued, forming a new cabinet under the newly-adopted constitution of March 25, 1964, and establishing Ministry of Electricity and Energy.

Following the creation of the system of General Authorities, under Law No. 60 of 1963, Presidential Decree No. 1472 of April 20, 1964, established the Egyptian General Authority for the Production and Transmission of Electricity under the Ministry of Electricity and Energy (See Volume I for details).

On that same date, two other Presidential Decrees were issued establishing the Egyptian General Authority for the Distribution of Electric Energy, and the Egyptian General Authority for Executing Electrical Projects, both also under the Ministry of Electricity and Energy.

3.2 SIGNIFICANT LEGISLATION AFFECTING ELECTRICITY DISTRIBUTION

3.2.1 The Egyptian General Authority for The Distribution of Electric Energy

This Authority was established by Law No. 1473 of 1964, with responsibility for the distribution of electricity and its sale to consumers throughout Egypt. This Authority came under the jurisdiction of the Ministry of Electricity and Energy and was managed by a Board of Directors who collectively acted as Chief Executive Officers. All Board decisions required approval from the Minister.

3.2.2 The Egyptian General Authority for Electricity

This Authority was established under Law No. 3726 of 1965. It was given responsibility over all electricity generation, transmission, and distribution in Egypt. It consolidated functions under the jurisdiction of the Minister of Electricity and Energy.

3.2.3 The Rural Electrification General Authority

This Authority was established by Law No. 470 of 1971, to carry out electrification projects for areas not under the jurisdiction of any of the EDCOs. This Authority reported to the Minister of Electricity and Energy.

3.2.4 The Rural Electrification Authority

Simultaneously with the establishment of the EEA in 1976 (see Volume I), Law 27 established the Rural Electrification Authority (REA) with the objective of modernizing and developing the electrification of rural areas. The Law stipulated that the REA would build electric lines and systems at low, medium and high voltage into 66 kV. The Authority is managed by a Board of Directors, a Chairman, the Minster of Electricity and Energy. Operation of the rural system was the responsibility of the different distribution companies included.

3.2.5 The Public Sector's Authority for the Distribution of Electric Power

The Authority for the Distribution of Electric Power was established by Law No. 423 of 1983 under the Ministry of Electricity and Energy. It owned 100% of the nation's seven distribution companies. The Authority's mission was to supervise the seven regional distribution companies covering Cairo, Alexandria, the Delta, Beheira, Canal, South Upper Egypt and North Upper Egypt. Today, there are eight distribution companies, reflecting the split of the Delta Company into North Delta and South Delta.

The Authority was managed by a Board of Directors appointed by a Presidential Decree upon recommendation by the Minister of Electricity. The composition of the Board was as follows:

- A maximum of five members from among the Presidents of the EDCOs;
- A maximum of four members with the necessary expertise and qualifications required for the supervision of the EDCOs in "administrative, organizational, technical, financial, economic and legal affairs";
- One member representing the workers union.

There was no restriction to the appointment of non-government persons;

3.2.6 The Holding Company for the Distribution of Electricity

In an effort to reorganize the Distribution Subsector and move it closer to privatization, Law No. 203, 1991 changed the Authority for the Distribution of Electric Power to the Holding Company for the Distribution of Electricity. EEA remains as a minority shareholder in these EDCOs, with ownership varying from 9% to 20%. These participation represented shaped EDCO liabilities to EEA for equity shares in the companies.

3.2.7 The Holding Company for the Construction and Distribution of Electric Power

In May 1993, a merger was made between the Holding Company for Construction and the Holding Company for Distribution of Electricity, which now controls the following entities:

- The eight Electric Distribution Companies;
- Three Construction Companies related to the electric power sector;
- One Manufacturing Company related to the electric power sector;
- Four Construction Companies not related in any direct manner to the power sector.

The function and implications of the new Holding Company have not yet been fully assessed. However, this consolidation cannot avoid distracting the attention of the management of the Holding Company from the management of the Electric Distribution Companies.

4 LEGAL ISSUES

4.1 CURRENT STATUS

Law No. 12 of 1976 established the Egyptian Electricity Authority and granted it exclusive right to the production and generation of electrical power, its transportation to different parts of Egypt, and its distribution to consumers.

Law 12 of 1976 was amended in 1983 to remove the electricity distribution function from EEA, and in 1984 the Law was amended again to remove the exclusivity granted to EEA for the generation of electricity. Private generation of electricity has therefore become legally permissible, and several industrial projects were able to establish their own generating plants.

Distribution of electricity is currently taking place through the Holding Company for Construction and the Distribution of Electrical Power whose subsidiaries, formerly public sector companies, are located in regions to serve all parts of Egypt. According to Article (16) of Law 203 of 1991, it is possible for private entities (or persons) to own up to 49% of the subsidiaries of holding companies. Such ownership will not result in having such companies fall outside Law 203. However, if the percentage of private ownership exceeds 49% such company shall no longer fall under the ambit of Law 203, but shall become subject to the regular Companies Law, as part of Law 159 of 1981.

These Electric Distribution Companies could possibly also generate their own electric power, since EEA's exclusivity has been removed, or they could contract for energy from other sources.

4.2 LIST OF LAWS REVIEWED

We have reviewed the following Laws:

- Law 12 of 1976, establishing the Egyptian Electricity Authority.
- Law 36 of 1984, amending Law 12 of 1976.
- Law 203 of 1991, organizing the Public Works Sector and its Executive Regulation.

In addition to the above Laws, we have also reviewed:

- By-laws of the Holding Company for Distribution of Electricity.
- By-laws of the affiliates of the Holding Company for Distribution of Electricity.

4.3 A FRAMEWORK FOR PRIVATIZATION

As the decision by GOE has already been made to prepare the EDCOs for privatization by setting them up as joint stock companies under the jurisdiction of a Holding Company as per Law 203 of 1991. There appears to be no legal impediment to commercial operations of these distribution companies under their present status. Article 6 of Law 203 clearly indicates that Law 48/1978 concerning public sector employees does not apply to companies organized under Law 203. Furthermore, Article 7 of the same Law mentions equal status for operation of companies under Law 203 and those under the Companies Law 159.

Therefore, internal operational as well as policy reforms should take place forthwith in order to improve the profitability of the EDCOs and consequently making them more attractive to potential purchasers. The privatization process does not have to occur in one stroke; shares in the companies can be sold gradually to individuals, investment companies, or others.

As stated previously, once the private shareholders ownership exceeds 49%, these companies will be considered private and fall under the Companies Law.

4.4 THE REGULATORY FRAMEWORK

4.4.1 The Need for Regulation

When pursuing a plan to commercialize and eventually to privatize either all or part of its utility system, a government should institute public regulation of utilities as an integral part of that plan. The purpose of such regulation is not to exert government control over utility operations, but to act as the necessary substitute for the discipline of the competitive marketplace that will be developing over time. As competitive markets develop, regulation can and should be reduced.

THE REGULATORY FRAMEWORK

Glossary of Terms and Definitions

Cost of Service -	To the total cost that a utility incurs in providing service to its customers and it includes an allowable return on invested funds
Cost of Service Regulation -	The examination of all costs a utility incurs and the determination that such cost will or will not be included in the rates the utility is allowed to charge its customers
Indexing -	Tying the electric energy rates to a recognized index such as the "Cost of Living Index"
Performance Agreement -	Both parties to an agreement negotiate goals to be achieved within certain time frames, at certain costs i.e., establish standards of performance
Performance Regulation -	The negotiation of the Performance Agreement related to operational and services standards
User Fees -	Fees paid to the GOE by the regulated utilities (EEA, EDCOs, etc.)

The economic regulation of utilities must exist whenever the level of competition is insufficient to prevent the abuse of either "natural" or "de facto" monopoly power that utilities can exert.

"Natural" monopoly power exists whenever there is a single producer who has some key advantage and is therefore always able to produce a product at a lower cost than anyone else. In the case of electric utilities, natural monopoly power has accrued in the past primarily as a result of the huge capital investments needed to build the required facilities. Such huge capital costs act as significant barriers to entry into the business by would-be competitors. A "de facto" monopoly exists whenever end-point consumers do not have real choices because of, for example, the limitations of current technology or

the high cost of alternatives that put them beyond the means of most consumers. At the present time in Egypt, both EEA and the EDCOs are monopolies de facto.

Recently, changes in utility technologies, as well as changes in the ways economic activities can be organized in a global economy, have been creating much broader opportunities for competitive entry into the electric power business. Over time, such changes will have the cumulative effect of transforming both the structure of the power sector and the nature of its public regulation as well. Already some argue that electric power generation is no longer a true "natural" monopoly because of the increasing economic feasibility of small-scale generation facilities. There is also growing recognition that traditional utility regulation needs to be restructured in light of the increasing number of competitive opportunities for power generation and delivery through innovative power transactions which eliminate de facto monopoly.

Worldwide, many utility systems are moving either from full regulation to mixed regulation and competition (as the U.S. is now doing) or from government ownership to mixed regulation and competition (as the U.K. is doing and Egypt intends to do). Despite the fact that the starting points of these reforms are so different, the policy objectives being pursued appear to be quite similar.

The central purposes of the current evolution toward systems that mix together regulation and competition are to:

- Assure greater operating efficiency,
- Enhance the effectiveness of both public and private investment, and
- Improve the performance of the power sector as a whole in line with global economic realities and each country's specific development policies and priorities.

Economic regulation of utilities is always a balancing of consumer interests on the one hand and producer needs on the other hand. In the course of privatization, establishing a predictable and transparent regulatory framework is one of the necessary first steps in attracting private investment into the electric power sector, both initially and on a sustained basis over time. A predictable and transparent regulatory framework is one that clearly delineates its objectives and principles, its operating policies, and its decision process and criteria.

4.4.2 Traditional Utility Regulation

4.4.2.1 The Regulatory Board and its Primary Responsibilities

Utilities in a market-based economy are normally regulated by an independent, professional regulatory agency, commission, or board (the "Regulatory Board").

The Regulatory Board is composed of several members either elected or (most usually) appointed for multi-year, staggered terms. The Regulatory Board normally has independent authority to hire and fire its own professional staff as well as technical experts and advisers.

The primary responsibilities of the Regulatory Board are to:

- Protect consumers' interests by setting fair prices for "captive" customers, i.e. those end users of electric services who do not have competitive choices,
- Monitor and enforce service standards, and
- Ensure a stable business environment that will allow the utility to attract capital investment over time.

The scope of the Regulatory Board's authority is usually quite broad. Such authority is set out by the government and also mandates that the regulated utility will be required to provide service to the public. Because of the requirement to serve, the Regulatory Board has a responsibility to provide the utility a process of regulation that should allow the utility to operate efficiently and profitably. A Regulatory Board makes findings and issues decisions that, for example, limit a utility's ability to:

- Raise capital;
- Locate and construct facilities;
- Access specific consumer markets;
- Acquire or dispose of assets;
- Change its corporate structure;
- Set tariffs for different types of customers;
- Establish certain internal operating rules; and
- Earn a profit.

4.4.2.2 How Regulators Set Rates

Historically, traditional utility regulation has worked best when a boom in utility service expansion and increased per capita consumption have occurred at the same

time that significant and consistent technology-driven improvements in productivity have caused a steady decrease in the real price of electricity. In such circumstances, the key decisions of the Regulatory Board are how to redistribute the productivity gains by lowering the real prices consumers pay for electricity. When costs and prices are going up steeply and steadily, on the other hand, the flaws of after-the-fact (based on historical data) traditional utility regulation become much more apparent and more politically sensitive.

In setting the rates a utility is allowed to charge its customers, the Regulatory Board first determines the total amount of revenues a utility will need to collect in order to cover all its costs to provide service. This amount is called the "Cost of Service." This normally includes the utility's most recent actual operating expenses plus an allowable return on the invested capital that forms a utility's rate base.

The Regulatory Board next determines how much of the total required revenue each customer class should pay, based on some combination of economic and (often implicit) social criteria. Based on this and estimates of expected average consumption levels, the Regulatory Board then derives a price per kwh applicable to each customer class.

Changes in fuel costs are usually passed on to the customers as they occur and frequently appear as such on the customers bills. There are numerous theories and technical arguments about the best methods regulators can use to determine what a fair return on investment is under current conditions, how total revenue requirements should be calculated, and how rates should be designed to meet economic, social, and environmental goals.

4.4.2.3 Current Efforts to Reform Traditional Regulation

In recent years, customers, regulators and utility managers have become increasingly disillusioned with Cost of Service Regulation, but for different reasons:

- Customers argue that Cost of Service Regulation does not provide adequate incentives for a utility to keep its costs down by increasing capital and labor productivity.

- Utility managers argue that Cost of Service Regulation has become confiscatory and a disincentive for capital investment and innovation.

- Regulators argue that the system has become excessively complex, adversarial, and time consuming without commensurate benefits.

The dissatisfaction expressed by all parties has led to reforms and some noteworthy experimentation with "Indexing," an innovative variation of Cost of Service Regulation. With Indexing, the regulators' decisions shift from a primary focus on determining the amount of profit they allow the producer to earn to a primary focus on the price that the utility's customers pay.

Indexing thus represents an important change in the philosophy and focus of traditional regulation and rate-making. Indexing changes the focus of both regulators and utility managers from inputs to outcomes.

Under Cost of Service Regulation, regulators look at each expenditure after-the-fact and decide if it was "just and reasonable," "prudently incurred," and therefore "allowable." They then, in essence, sum all these allowable costs and add what they determine to be an allowable profit margin.

Under Indexing, regulators first set an allowable base revenue requirement, usually using the same process and techniques they use to determine a utility's Cost of Service, which includes a fair rate of return or profit. The indexed rates are periodically reviewed and the base is adjusted as necessary. The major innovation comes next when the regulators pick a relevant price index to which they peg future changes in rates in such a way that it creates an incentive for efficiency, productivity, and cost reduction. This is most frequently referred to as the "RPI-X" formula, now in use in the U.K., Chile, and elsewhere. (RPI stands for Retail Price Index and X stands for a deflator factor set by the regulators.)

Utility rates are thus "indexed" and allowed to rise as other consumer prices rise, but never by as much as the full amount. This creates, therefore, a built-in incentive for a utility to do better than the performance of the price index. If through productivity innovations a utility can reduce it costs below the prices it is allowed to charge, it can keep the difference as increased profit for some period of time. On the other hand, increases in cost will also have to be absorbed for some period of time until the next periodical review of the index .

Under traditional Cost of Service Regulation, in contrast, all such gain or cost would be quickly passed back to the consumers. Indexing thus creates a "win-win" opportunity -- both consumers and producers can be made better off through lower prices and higher profits than under more traditional Cost of Service Regulation.

Even under Indexing, however, after a set period of time (5 years, for example) regulators will eventually pass back such gains to consumers. This occurs when, again using traditional Cost of Service methods and current data, the regulators

"true-up" and reset the utility's allowable revenue base to which they will apply the price index when they want to set new rates.

4.4.3 Performance Regulation

4.4.3.1 How Performance Regulation Works

As the worldwide electric power sector is evolving toward greater competition and more privatization, there is increasing interest in the use of Performance Regulation. While the public policy objectives of this type of regulation are much the same as Cost of Service Regulation, the underlying philosophy of how best to achieve those objectives is different.

Traditional Cost of Service Regulation works by placing full reliance on the regulators' ability to make after-the-fact judgements on each expenditure that a utility has made. Performance Regulation, in contrast, works by placing more reliance on clear, specific, before-the-fact incentives for the utility to meet the financial, operational, and economic goals that the regulators set for it.

Indexing, described above, is just one example of placing greater reliance on the use of direct incentives to affect utility performance, although Indexing focuses on just one measured goal--the final price to the customer.

Performance Regulation spells out specific, measurable expectations for utility performance, monitors that performance, and holds the utilities accountable for results. A key to its success is an adequate management information system. The goal of this type of regulation is to drive the continual improvement in the operational and financial performance of utilities, starting from each utility's current levels of performance.

Performance Regulation encourages and rewards utility managers who shift from a "cost-plus" to a "cost-minus" style of operating, those managers who continuously search out and find more effective ways to do more at less cost. Performance Regulation seeks to reduce both short term costs through cost control measures and long term costs through innovation and cost-effective investment.

4.4.3.2 Use of Negotiated Performance Agreements

The key to Performance Regulation is a negotiated Performance Agreement that sets forth a framework for accountability including specific performance targets, rewards if targets are met, and sanctions if targets are not met.

Over time, regulators can allow greater managerial autonomy as they gain experience with the most effective ways to define and enforce accountability and as managers develop a "track record" of continually improving performance.

Performance Agreements can be established between the Regulatory Board as one party and EEA, the Holding Company, or individual EDCOs as the other party. They can also be designed and used internally by EEA, the Holding Company, or individual EDCOs with:

- Their suppliers, including future private power suppliers,
- Their own managers and employees, and
- Any of their customers who are large enough or well organized enough to exercise market power. This could include the EDCOs as customers of EEA.

One of the prime benefits of using Performance Agreements is that they clarify intentions, goals, and objectives. Confusion over these essentials has proved to be a continuing problem during transitions to commercialization and privatization. Performance Agreements also set forth the obligations of both parties, the responsibilities and authority of each, specific rewards and sanctions, and the particular physical and financial indicators that will be used to measure performance.

Performance Agreements are a systematic way for regulators and utilities to identify opportunities for performance improvement, set priorities based on cost effectiveness, to develop and implement action plans to capture the savings, and to monitor results and adjust plans and priorities accordingly.

Regulators can tailor Performance Agreements to areas that are of special interest as long as it is kept in mind that the production and delivery of electricity is an integrated system. Special focus on just one or a few performance indicators in isolation can lead to unintended consequences.

Examples of performance indicators which could be tracked include:

- Average age of accounts receivable,
- Lapsed time for meter hook-up or change out,
- The frequency and duration of service interruptions,
- Financial ratios,

- Employment targets over time,
- Scheduled and unscheduled down times,
- Reliability,
- Heat rates, etc.

The effectiveness of Performance Agreements depends on:

- The reasonableness of the target for improvement in terms of both level and schedule,
- The scope and dependability of management information systems,
- The accuracy of projected economic and financial variables, and
- Most important of all -- the enforcement of sanctions.

Performance Agreements, under a variety of names, have been used by France with the Electricité de France since the 1960's and in several Francophone countries since then. Lessons from these countries include the following:

- Performance Agreements work best at achieving the objectives if they are short, simple, and flexible.
- The process of negotiating Performance Agreements is a key benefit for both parties, especially in the area of clarifying intentions, goals, and expectations.
- Performance Agreements will be effective only if their provisions for recourse and enforcement are real.
- Any performance obligations made by the Government as part of a Performance Agreement must be tied to the Government's budget.

4.4.4 A Conceptual Framework for Utility Regulation in Egypt

4.4.4.1 The Independence of Egypt's Regulatory Board

Commercializing EEA, encouraging independent power supplies to sell into the Egyptian grid, and eventually privatizing the EDCOs will require Legislation to establish a regulatory agency.

The regulatory entity that the Government establishes should be an independent board composed of no less than three and no more than seven members who are appointed by the Prime Minister for fixed but staggered terms.

In order to prevent conflicts of interest, or even the appearance of conflicts of interest in a system evolving away from full government ownership, there should be clear separation of the different and potentially conflicting roles of the government as owner or stockholder of utility assets and the government as regulator of utilities. Therefore, the Regulatory Board should be created separate from the Ministry of Electricity and Energy.

Although independent, the Regulatory Board should be held accountable to the government through the Board's authorizing legislation, its annual budget appropriations, and review of its audited accounts. A Regulatory Board should also be held accountable to the government and the public for its specific decisions through the decision documents it issues and the process used for review and recourse.

Funded primarily through "user fees" assessed by a simple formula, the Regulatory Board should have authority to hire and fire its own professional staff of qualified economists, accountants, engineers, and lawyers. User fees are a toll or a charge to be paid by each utility to the government to be used exclusively to pay for the operation of the Regulatory Board. User Fee levels should be adjusted periodically to reflect budget requirements. The amount of these fees are a cost of the electricity service of the utility and are ultimately paid by the customer. The staff's internal expertise and experience can be augmented by external technical experts and advisors during the initial phases of transition to commercialization and eventually privatization. The Regulatory Board members and the Board's staff could be trained initially through a series of programs involving selected regulatory experts from the U.S., U.K., France, Chile, Argentina, and other countries that are successfully reforming their regulatory frameworks and processes.

As a necessary precondition of effective regulation of privately owned utilities, the Government should articulate a clear legal framework for utility regulation which sets forth the Government's obligations to investors who own or operate EDCOs or certain private power projects, for timely authorizations or approvals of financing and access to foreign exchange, for repatriation of profits when applicable, and for security against expropriation.

4.4.4.2 The Functions of Egypt's Regulatory Board

The Regulatory Board's primary functions should be to:

- Regulate those utility activities that have natural or de facto monopoly characteristics until sufficient competition evolves to assure a functioning market which can eventually substitute for full regulation;

- Ensure coordinated, adequate, and reliable electric services throughout Egypt;

- Issue service franchises and specify service obligations and standards;

- Establish initial transfer prices between EEA and the several EDCOs and a process for their periodic revision to reflect changing costs and economic conditions;

- Set rates for the various customer classes on a centralized basis;

- Monitor the quality of electric services delivered to customers on a decentralized basis;

- Design and oversee a strategy for phasing-in tariff reform to eliminate cross subsidies consistent with established fiscal, economic, and social objectives and national development goals;

- Promote and oversee the development of the wholesale market and phase-in of competition throughout the sector where feasible;

- Establish clear guidelines, rules and incentives to provide a stable regulatory environment that will attract investment capital to the Egyptian power sector.

- Centralize or coordinate key approvals a utility company would need to operate in Egypt including those for changes in corporate structure and ownership after initial privatization, access to capital and foreign exchange, and access to necessary facilities and land;

- Collect and disseminate information about the sector's performance and development of the markets for power and electric services;

- Review the level of efforts and results of utility conservation and least-cost planning, system design and maintenance practices, and financial planning;

- Design the rules for power pooling, dispatch, transmission access, and wheeling;

- Provide an effective, efficient forum for adequate public participation that reduces the need for formal litigation and adversarial proceedings.

4.4.4.3 The Principles, Policies, and Process of Egypt's Regulatory Board

To the extent feasible, the Regulatory Board should operate under the principles of Performance Regulation as the preferred method of attaining the public policy objectives of utility regulation. To do so, the Regulatory Board must be vested with sufficient authority and use effective means to enforce accountability on the part of utility managers, including rewards and sanctions.

The Regulatory Board should use direct and clear incentives that are designed whenever possible to make the economic interests of consumers and suppliers coincident and therefore reduce the need for continuous oversight or constant "second-guessing" of utility managers by utility regulators.

The Minister of Privatization should make the negotiation of an initial Performance Agreement between the purchaser of an EDCO and the newly created Regulatory Board an important factor to consider in addition to price in the Government's selection of the initial purchaser of utility assets.

Performance Agreements between the EEA and the Regulatory Board and between the EDCOs and the Regulatory Board should be based on 3-5 year strategic business plans prepared and submitted to the regulatory Board for review and approval.

These initial Performance Agreements should focus on outputs and outcomes where possible and on minimizing the cost of inputs where outputs and outcomes cannot be measured well enough yet. They should include, at a minimum, specific benchmark and performance targets for:

- Customer service indicators,
- Information systems,
- Power quality and reliability,
- Employee productivity,
- System operations (including decreasing losses and increasing load factors),
- Cost of capital,

- Cost of power and energy,
- Price targets by customer class, and
- Profitability.

The EEA and the EDCOs should be encouraged to apply the same type of Performance Agreements with its managers and employees as well as with its suppliers, which in the case of the EDCOs would include EEA.

Performance Agreements between the EEA and the Regulatory Board and between the EDCOs and the Regulatory Board should specify the rewards for meeting the performance targets and the sanctions for not meeting the targets. Likewise, the Performance Agreements between the utility and its managers and employees and its suppliers should also specify rewards and enforceable sanctions.

4.4.5 Framing the Policy Debate

There must be extensive policy discussions preceding the structuring of the Regulatory Board. Some of the key points for discussion in the policy debates about the nature and scope of appropriate and effective utility regulation in Egypt's changing economic environment should include the following observations based on experience with various regulatory frameworks in other countries.

1. The government's public policy goals of regulation must be specified clearly at the beginning of the debate. These usually include the objectives of assuring:
   - A safe and reliable supply of electricity adequate for economic and industrial development consistent with Government policies and plans,
   - Universal service at acceptable price levels, any subsidiaries required should be clear and identified,
   - Efficiency in the absence of sufficient competition to result in market discipline,
   - Financial performance of utilities sufficient to attract investment capital,
   - Sector performance that fits with economic, social, and political realities.

2. The trend to separate and encourage competitive generation, transmission, and distribution is clear and continuing.

3. The trend away both from rigid regulatory processes and from centralized planning is also clear and continuing. Preference is turning away from direct control and after-the-fact regulation and toward more competition, greater reliance on incentives, and increased accountability through performance assessment.

4. There is no universal, optimal regulatory framework that will guarantee success in meeting all of a country's public policy objectives. While it is important to learn from various models around the world, each country's unique combination of economic, political, cultural and social factors must be taken into account in designing the regulatory framework which best fits its internal conditions.

5. There is no such thing as a perfect market in the real world, nor is there such thing as a perfect regulatory scheme that can substitute for it. It is therefore misleading to compare outcomes expected either from theoretically perfect competition against the known flaws of imperfect regulation, or, on the other hand, outcomes expected from theoretically perfect regulation against the known flaws of a competitive marketplace.

   The challenge is to find the right balance, the right type and amount of regulation, as increasing competition and reliance on market discipline becomes more practical in each of the segments of the business, from generation to distribution. Too much regulation itself results in inefficiencies and discourages the emergence of competition; too little regulation can result in pricing abuse of captive customers.

6. Commercialization and even privatization by themselves will not necessarily result in maximum efficiency unless accompanied by an appropriate regulatory framework. Such a framework is one that does not reward cost-plus inefficiencies but does encourage the emergence and spread of competition through all parts of the system that no longer operate as "natural" monopolies.

7. Subsidies that are large, widespread, and embedded in tariffs create distortions in the marketplace and will discourage private investment.

   Subsidies that the government decides should be continued for social and political reasons -- those needed, for example, by low-income consumers (often called "life-line rates") and in rural areas -- could have fewer adverse consequences if handled in a more direct manner.

One way to make subsidies less distorting would be a direct payment by the government to compensate the utility for the services that the utility delivers below its actual costs to low-income and rural customers at the government's request. Such an attempt to eliminate the distorting effects of subsidies, but not their benefits to individual groups of customers, is being considered by the Government of Pakistan as part of its move to privatization.

4.5 SUMMARY OF RECOMMENDATIONS

4.5.1 Law 203

The EDCOs operating under Law 203 should proceed forthwith with the implementation of the changes required to enhance their ability to operate on a commercial basis without necessarily waiting for privatization of their shareholding.

4.5.2 Regulatory Framework

It is recommended that:

- The Government of Egypt create a Regulatory Board of five members appointed from existing government entities and the private sector by the Prime Minister to serve staggered six-year terms;
- This Regulatory Board be independent and operate by majority vote.
- The Regulatory Board hire its own small technical staff of qualified engineers, economists, accountants, and lawyers. The Board and staff should participate in training programs with regulatory experts from countries that are successfully reforming their regulatory frameworks and processes.
- The Regulatory Board design its policies and procedures to use wherever possible direct, performance-based incentives and negotiated Performance Agreements to achieve its public policy objectives.
- The Egyptian Electricity Authority and the EDCOs use Performance Agreements throughout their operations, including with their own managers, employees and suppliers.
- In view of the ultimate objectives of the current economic reform efforts, the Regulatory Board should be designed to accommodate the privatization of generation and transmission of electricity should the Government decide to pursue this objective at a later date.

5 MANAGEMENT AND ORGANIZATION

5.1 PRESENT ORGANIZATION

When this study began in the middle of March 1993, the Electric Distribution Sector was organized as follows:

- The Holding Company for Distribution of Electricity (HCDE);
- Eight subsidiary regional Electricity Distribution Companies (EDCOs) in which the HCDE held from 80% to 90% of the shares, representing the value of the assets transferred from EEA to the EDCOs. The balance of the shares are owned by EEA.

Since then, HCDE was merged with another holding company, and its name changed (as of May 1993) to The Holding Company for Construction and the Distribution of Electric Power (HCCDEP). The subsidiaries of HCCDEP now include:

- Eight EDCOs;
- Three electric sector-related construction companies;
- One electric power sector manufacturing company;
- Four construction companies unrelated to the power sector

In view of the transitional character of the HCCDEP, we have not attempted to analyze in depth the organizational or human resource aspects of the distribution sector. Such an analysis can be undertaken this in Phase II of the study.

5.2 REPORTING PROCEDURES

The eight EDCOs report to the HCCDEP, but their results are not consolidated. Only the dividends paid to the Holding Company are reported in their financial statements.

As will be explained later, the Holding Company plays a major role in the negotiations of the electricity purchase price from EEA for the EDCOs.

5.3 HUMAN RESOURCE MANAGEMENT

Due to the fact that the EDCOs were until recently under the Ministry of Electricity, their personnel policies, compensation policies and recruitment practices followed closely EEA's model described in Volume I. Since the EDCOs are now subject to the new rules and regulations for the Egyptian public sector companies, new policies and procedures should be

adopted. We understand that new policies and procedures have been drafted and await the Board of Directors' approval. However, it is expected that the new draft will still closely resemble the public sector's existing policies and procedures.

It is recommended that all procedures, and particularly those relating to organization and personnel, be immediately adapted to the EDCOs' new legal status as private entities.

As of 1992, the distribution sector in Egypt employed over 61,000 people, to serve a total of 11 million customers -- an average of 179 customers/employee. However, this ratio varies from one EDCO to another, with the Cairo EDCO having the highest ratio (229) and the Canal EDCO the lowest (119). On the basis of power produced per employee, Cairo EDCO has the highest ratio (792 MWh/employee), and South Upper Egypt and EDCO the lowest (243 MWh/employee).

While the study team feels that there is over-employment in the EDCO's, it is not possible to pass a definitive judgment without a detailed analysis of the operation of each EDCO as to the appropriate degree of automation and procedural changes. Adoption of the recommendations in the following sections of this report should, over a period of time, increase overall productivity. Table 5-1 provides a comparison of two EDCOs, with Los Angeles Water & Power Company serving a large urban population.

5.4 TRAINING

The Holding Company and the EDCOs have, over the years, adopted training as the way to develop their required human resources. At present, the distribution sector in Egypt operates six training centers in Ismalia, El Minia, Alexandria, Asswan, Dakki, and Tanta. There is also a new training institute that is currently under construction in Cairo. Training is also provided at the EEA training centers. Various grants and loans have been obtained from USAID and IBRD for enhancing the technical and administrative capabilities of the Holding Company and EDCOs personnel.

Training courses are also being prepared for the top management of the Holding Company and the EDCOs. We believe that this is one area where more emphasis should be given, as the EDCOs enter a new phase in their mission where profitability will be a major requirement. Training should be oriented more towards improving customer service and achieving the commercial objectives of the EDCOs.

TABLE 5-1
TOTAL EMPLOYMENT IN ELECTRICITY DISTRIBUTION HOLDING COMPANY & EDCOs - 1991

	Engineering	Technical	Comm & Finance	Adminis-tration	Legal	Medical	Services	Total	Millions of Customers	Energy Sold (GWH)	No. of Customer/ Employee	MWh/ Employee
Holding Company	30	41	50	33	10	-	11	175	-	-	-	-
Cairo EDCO	441	4,793	7,450	1,454	26	28	692	14,842	3.4	11,754	229	792
Alexandria EDCO	559	3,058	2,878	1,115	18	-	139	7,767	1.0	4,873	129	627
Canal EDCO	344	3,794	2,587	1,503	19	3	991	9,233	1.1	2,897	119	314
North Delta EDCO	183	2,960	1,716	793	8	2	319	5,981	1.2	2,037	201	341
South Delta EDCO	249	3,705	2,503	1,249	14	3	239	7,962	1.3	2,260	163	284
Behaira EDCO	156	1,069	1,848	476	9	-	434	3,992	0.7	1,326	175	332
North Upper Egypt EDCO	132	4,442	649	37	15	-	189	5,777	1.3	1,423	225	246
South Upper Egypt EDCO	158	3,222	1,176	664	21	2	615	5,862	1.0	1,422	171	243
TOTAL	**3,030**	**21,115**	**22,353**	**7,497**	**146**	**38**	**2,233**	**61,591**	**11.0**	**26,995**	**179**	**438**

Table 5-2
COMPARISON BETWEEN
CAIRO, EDCO / SOUTH DELTA EDCO / LOS ANGELES WATER & POWER

DESCRIPTION	CAIRO EDCO	SOUTH DELTA EDCO	LOS ANGELES WATER & POWER
Number of Customers	3,400,000	1,300,000	1,368,000
Energy Sold (GWh)	11,754	2,260	21,260
Number of Employees	14,842	7,962	8,000
Number of Customer/Employee	229	163	171
Energy Sold/Employee (MWh/Employee)	792	284	2,658

5.5 AL-AHRAM COMPUTER FACILITY*

Currently, there are two computer systems in the Al-Ahram facility used for bill production at the distribution companies throughout Egypt. The first system is an IBM Series 9 mainframe located in Cairo and serving the Cairo, Upper Egypt, Lower Egypt, Canal, South Delta, and North Delta EDCOs. The second system is an IBM 4381 mainframe located in Alexandria and serving both the Alexandria and Bahaira EDCOs. These two systems are not interconnected, which prevents consolidation of electricity consumption data in either system. Hardcopies of data are usually transferred from the Alexandria Al-Ahram facility to the Cairo facility in order to be entered into the computer as needed. Both facilities, however, are capable of storing two years' worth of statistical information which can be used to produce a variety of monthly, customized reports for the EDCOs' review. The actual billing information is sent by each EDCO to Al-Ahram by hardcopy. Al-Ahram facility staff then enters the data to produce reports to be sent to the responsible EDCOs for verification. These reports list each individual customer containing such information as customer type, meter-reading, consumption, electricity rate, total consumption to date, due balances, average consumption, average balance, deferred payments, advance payments, and taxes. The computer automatically marks data which seems incompatible with the previous months' data. Such data would be likely to be erroneous due to inaccurate meter reading or errors committed during data entry. Ideally, each EDCO reviews these reports and verifies the data which was flagged by the computer before final bills were produced. In practice, however, EDCOs do not seem to do that, relying, instead, on the customer to complain of any inaccuracy in billing.

*Al-Ahram Computer is a computer service bureau subsidiary of Al-Ahram Newspaper.

Moreover, the Al-Ahram facilities can produce Management Reports from the wealth of information stored in the system. They are currently testing a new on-line Management Information System consisting of 61 terminals to be installed throughout the Alexandria EDCO. The system can produce specific reports on each sub-region within the EDCO's service region. The system capable of producing a variety of management reports, including:

- Residential Customer Meter Status Graph (closed/out-of-order/Normal/Final)
- Comparison of Monthly total sales, net sales, accounts receivable, and due payment
- Comparison of Monthly Meter status Graph
- Number of Customers per Meter Status per month
- Comparison of Monthly total number of bills, net amount of bills, accounts receivable, and due payment
- Distribution of Residential Customers over Tariff brackets
- Distribution of Residential Customers over Consumption brackets
- Comparison of Monthly distribution of Customers over Tariff and consumption brackets
- Collected/Uncollected bill comparison per month

All these reports and graphs are available on-line and are constantly updated as monthly billing information is keyed into the system. Al-Ahram hopes that if the system is successful, the remaining EDCOs will implement it as well.

It is recommended that the EDCOs take better advantage of the capabilities of the Al-Ahram computer facility.

5.6 THE HOLDING COMPANY FOR CONSTRUCTION AND DISTRIBUTION OF ELECTRIC POWER (HCCDEP) AND THE ELECTRIC DISTRIBUTION COMPANIES (EDCOS)

There is very little in the way of automation being contemplated by either the Holding Company or the individual EDCOs. The Al-Ahram system being beta tested in Alexandria represents a breakthrough in providing vital information to management on a timely basis. However, this system is hardly adequate for optimizing the internal operations of the EDCO or for accurate internal data processing to manage, monitor, and evaluate current operations properly. There are no systematic ways of cross-checking inter-divisional data, or even inter-departmental data. It was observed that data on the same subject can differ from department to department. This creates confusion not only within the EDCO, but also in other organizations or institutions that rely on the EDCO's information for their work. Furthermore, it represents a double obstacle to privatizing the EDCOs: First, lack of up-to-date information on the performance and operations of EDCOs may force EDCO management to be reactive rather than non-reactive. Naturally, this method of trouble-shooting wastes resources and reduces operating efficiency. Second, valuation of the

individual EDCOs may become a colossal undertaking without sufficient accurate information. It would be to the EDCOs' advantage to know the full status of their operations in order to negotiate favorable terms with potential buyers and investors.

It is strongly recommended that reliable, computer-based management information systems in the individual EDCOs be installed. The system should be comprehensive, supporting administrative, technical, commercial, and financial operations. It is further recommended that the system be developed by an outside local or foreign MIS consultant using one model EDCO. The effort should be undertaken in cooperation with the model EDCO's staff to ensure the applicability of the system to the operation of EDCOs. Moreover, the consultant should train a group of the EDCO's staff to operate and maintain the system. This group can then train the remaining staff of the EDCO as well as implement the system in the other EDCOs. It is our opinion that the Alexandria EDCOs current model should be implemented across the distribution system.

5.7 SUMMARY OF RECOMMENDATIONS

(a) It is recommended that all procedures, and particularly those relating to organization and personnel, be immediately adapted to the EDCOs' new legal status as private entities.

(b) Training in general should focus on customer service and the EDCOs commercial objectives and should include all levels of management.

(c) There should be an in-depth study of personnel requirements by each department in order to ascertain the most efficient way to gradually eliminate over-staffing in some departments and strengthen others with better trained, qualified personnel.

(d) Reliable, computer-based management information systems in the individual EDCOs should be installed. The system should be comprehensive, supporting administrative, technical, commercial, and financial operations. It is further recommended that the system be developed by an outside local or foreign MIS consultant using one model EDCO. The effort should be undertaken in cooperation with the model EDCO's staff to ensure the applicability of the system to the operation of EDCOs. Moreover, the consultant should train a group of the EDCO's staff to operate and maintain the system. This group can then train the remaining staff of the EDCO as well as implement the system in the other EDCOs. It is our opinion that the Alexandria EDCOs current model should be implemented across the distribution system.

6 DISTRIBUTION SYSTEMS

EDCOs receive most of their energy from 66/12 kV substations in the EEA system. In some remote locations local generation may supplant energy normally provided by the national, unified system.

6.1 GENERAL DESIGN CHARACTERISTICS

The 12 kV Medium Tension (MT) systems are usually supplied from double ended substations with a bus for each transformer and several feeders emanating from the bus. The busses are interconnected through a tie breaker. (Transformer sizing is discussed in Chapter 10 of Volume I.) Often, each of the feeders supplies a switching station (switchboard) with a similar bus configuration. This results in a very reliable but expensive system, with very high transformer losses.

The 220/380 Volt Low Tension (LT) systems are usually supplied by oversized transformers. There appears to be considerable duplication of MT lines, at least in areas where they are on poles and are therefore visible.

MT distribution may be through three-phase cables and/or overhead lines. LT distribution is mainly through three-phase cables and/or distribution lines, but may be through single phase branch lines, particularly in rural or low income areas.

6.2 LOSSES

6.2.1 Losses Calculated from Energy Delivered and Sales

In 1991/92 the EDCOs' sales totalled 26 994.5 GWh, while EEA reported selling to them 31 512 GWh. This corresponds to losses of 14.3%, calculated on the amount of energy received (losses would be 16.7%, if calculated on the energy sold) . This figure should be taken as only an indication of actual losses. Whereas figures are available to calculate the losses of each EDCO, at this time we believe it would be prudent to look further into the data used in the calculations.

In a separate report to EEA it has been pointed out that sales by EEA to the EDCOs are possibly understated. Also, in Chapter 6, it is pointed out that there may be discrepancies in the figures provided for the EDCOs' sales to the public.

Since the formula for calculating losses is:

$$\text{Losses} = \frac{\text{Energy delivered by EEA - Sales to Customers}}{\text{Energy delivered by EEA}} \times 100$$

Any small discrepancy in sales data will result in large fluctuations in calculated losses. For example, if actual energy delivered were 2% higher and actual sales were 2% lower than reported, the losses for the EDCOs would be 16%, instead of 14.3%. This difference in loss figures is roughly equal to the output of a 100 MW generator.

Care should therefore be taken in consideration and calculation of losses until energy delivered and sales figures are reliable.

6.2.2 Losses Calculated from Circuit Constants

Several studies of losses have been carried out on representative areas served by different EDCOs to determine their technical losses (not including errors in billing and fraud). These studies indicated that losses should be much lower and pointed out areas where loss reduction could be effectively carried out relatively inexpensively.

While these studies are very useful in pointing out areas where improvements can be made, they cannot be very precise in quantifying the losses. The main reason for this imprecision is that the calculations for the energy losses rely on knowing the shape of the representative daily load curve of all distribution loads. The load curve used in the studies is based on some measurements, but these are far from being sufficient in number to constitute a statistically valid sample; thus there may be considerable errors in the estimate of the actual technical losses. It should be further pointed out that the load of any distribution system is constantly fluctuating. Thus a measurement taken in one instance may not be at all representative of the situation two minutes after.

In conclusion, until EEA implements accurate methods to measure the electricity sold to the EDCOs, and until the EDCOs manage to improve the accuracy of their billings, evaluation of the real value of losses will remain imprecise. However, losses should nevertheless be calculated periodically in order to compare them to those in former periods and determine if the trend is changing.

It is recommended that each of the EDCOs start programs to evaluate the accuracy of their sales figures and that they also work in conjunction with EEA to insure that the energy they purchase is measured properly.

6.3 EQUIPMENT

A great variety of equipment is employed, and its characteristics vary considerably depending on its age and origin. However, there are some common traits among equipment types that should be compared and analyzed. The purpose of this section is to present some of the characteristics of the equipment currently in use or of equivalent design.

6.3.1 Distribution Transformers

The transformers currently in use are 12/.4 kV, three phase, in sizes ranging from 25 to 1000 kVA. The no-load (iron) losses in these transformers are slightly lower, and the total losses (at full load) are slightly higher, than the corresponding losses of equivalent North American transformers built to ANSI standards. Table 6-1 compares the typical losses of Egyptian and North American transformers. Losses are shown in Watts (W) per kVA to allow for the fact that the standard capacities of the two types of transformers are not always the same. The capacities are shown on the equivalent three-phase rating (North American transformers are built as single-phase units and a three-phase transformer was assumed to be made up of three single-phase units).

TABLE 6-1
TRANSFORMER LOSSES

kVA Range	Egyptian Design		American Design	
	No Load	Total	No Load	Total
	W/kVA	W/kVA	W/kVA	W/kVA
45-50	5.60	24.00	6.00	25.67
51-75	3.57	25.00	5.52	24.12
76-150	3.60	20.00	5.04	17.84
151-225	3.00	19.38	3.44	17.57
226-300	2.40	18.17	3.60	16.50
331-500	2.00	15.60	3.16	15.50
501-1000	1.75	13.50	2.61	14.32

6.3.2 Meters

The meters used in Egypt are built to IEC standards and are not weatherproof. Meters built to North American standard C.12 are much more rugged, more precise, and can carry a much wider range of currents than IEC meters; furthermore they are weatherproof. Preliminary indications are that the cost of the two types of meters would be equivalent.

One of the characteristics that should be analyzed in these meters are their voltage coil losses. Meters produced in Egypt have a 2 Watt loss, whereas the equivalent U.S. built meter has a loss range of 0.89 to 1 watt. This difference might appear insignificant, but when it is realized that there are 10 million meters in Egypt, the 1-watt difference is 50% and represents about 87,500 MWh per year, which is roughly equal to the output of a 10-MW generating unit.

6.3.3 Insulated Cables

Recently installed insulated cables use cross-linked polyethylene insulation. Older cables had paper insulation with a lead jacket. The conductors are usually aluminum but copper is also used. Usually the cables are directly buried except where they cross streets, in which case they are contained within a plastic conduit. Both types of cables are found in existing installations.

In 1991/92 the MT cables used by the EDCOs represented 59% of all MT lines and 31% of all LT lines. Some of the EDCOs, however, have much different ratios of buried cable to overhead line ratios. For example, the ratios for the Cairo EDCO were 80% and 91% respectively.

6.3.4 Overhead Lines

The MT lines appear to have been built in accordance with similar standards throughout the EDCOs inspected. However, we noticed that the construction and condition of the LT lines varied considerably from place to place.

6.4 LOADING AND LOSSES

Several studies have been performed to attempt to optimize the design of the distribution systems. Optimization of a distribution system is very difficult to attain because every part of the system has widely different and fluctuating loads. Therefore, what is optimal for one condition will not be so in the next instant due to loan fluctuation.

The first endeavor of these studies was to determine the loading conditions of representative feeders which may lead to increased losses or inefficient investment. The conditions identified were:

- Unbalanced distribution transformer phase loads.
- MT feeders and the distribution transformers operating at a fraction of their rated load.

The studies also noted inadequate methods of joining conductors as a factor which could lead to increased losses and a reduction in the systems availability.

6.4.1 Unbalanced Loads

Unbalanced loading of MT three-phase distribution systems feeding LT customers (which usually have single-phase loads) is an inevitable condition due to the random characteristics of the single-phase loads. It is therefore not unusual that a circuit will be balanced one moment and be unbalanced the next.

Some EDCOs have embarked on programs to reduce the unbalanced loads to approximately 15%, which is a sound goal. However, it should be remembered that core type three-phase transformers may have difficulty in handling a 15% unbalance at full load.

6.4.2 Under-loaded Transformers

Some EDCOs are planning programs to replace under-loaded transformers with smaller units. The implementation of these programs should have a dramatic effect in reducing losses. However, it should be realized that the changeover is going to result in the interested EDCOs having to purchase small transformers, and being left with a relatively substantial number of large capacity transformers in stock. Perhaps a mechanism could be established to find a market with other EDCOs for these excess transformers, so that the change-over will also reduce the required investments.

It is recommended that all EDCOs be encouraged to begin programs to match their transformers to their actual loads and that a clearing house be established to exchange among the EDCOs any of the transformers that may be left over in the process.

6.4.3 Under-loaded Feeders

Under-loaded feeders exhibit fewer losses than more heavily loaded equivalent circuits. Thus, there is an advantage to operating existing feeders at small loads. However, it is usually not the least cost solution to oversize new feeders (except to accommodate anticipated future growth) because it requires a larger investment than needed in the short term.

Designing feeders to be under-loaded results in an undue number of circuits being constructed in the service area. For example, in the Delta region it is not uncommon to see up to four MT lines running parallel to each other, the two outside ones being at the most 300 m apart. This is not only an unneeded investment, but it is also an inefficient use of rights-of-way and land.

6.4.4 Improper Connections

The study pointed out the existence of many improper connections between conductors. It was reported that most of these joints were made by twisting the two wires together, instead of using suitable pressure-type (screw) or compression-type (with high-pressure

tool) connectors. The results of this practice are high losses at the joint and consequent heating of the joint that eventually results in the conductors melting and separating, thus interrupting service.

6.5 ECONOMIC EVALUATION

In the optimization studies mentioned above, several economic evaluations were made to reach the recommended optimized designs. However, these evaluations were based on subsidized prices and therefore their results are open to questioning.

It is recommended that all least cost evaluations be based on marginal costing for energy and free market prices for the equipment and installations.

6.6 RELIABILITY

We would expect the reliability of distribution systems to be high for four reasons: i) the proliferation of duplicate feeds in the MT network; ii) the over-sizing of the equipment; iii) the low incidence of lightning in Egypt; and iv) the fact that most of the MT lines run perpendicularly to, or away from highways and roads (thereby reducing the probability of vehicles hitting them).

TABLE 6-2
FAULT RATES
1990/91

Description	Fault Rate 100/(unit)	Rate
MT Underground cables	100/km	32.9
MT Overhead lines	100/km	15.3
LT Underground cables	100/km	29.5
LT Overhead lines	100/km	30.6
Distribution Transformers	100/trafos	11.6

Table 6-2[1] shows the fault rates for 1991/92. Even though these rates appear high, before making a judgement it would be prudent to investigate if all the EDCOs follow the same rules to calculate the rates. In addition, it should be determined if the fault rates, as stated, are really indicative of the actual system. For example, if a transformer failed three times within a day for 10 minutes each time, and supplied only one small customer, would the statistics consider these failures as contributing to the failure rate the same way as one transformer failing once for three days and feeding ten large customers? - a more frequent manner of showing fault rates is as kVA-hours lost i.e., for how many hours was a given kVA (peak) load interrupted.

[1] Data obtained from Egyptian Electricity Distribution Holding Company "Annual Statistical Report" 1990/91

It is recommended that the EDCOs investigate if each is following the same procedures to report fault rates. It is also recommended that the EDCOs investigate whether they can implement a policy and a methodology for reporting the energy that could not be supplied during a fault rather than only the failure of an installation or equipment.

Table 6-2 shows a very unusual statistic: the fault rate is higher for the MT underground cables than for the MT overhead lines. The Alexandria and Cairo EDCOs had the highest fault rates. Since underground systems are normally justified because of their higher reliability, this statistic could indicate a serious deterioration of the underground systems, either through aging of the insulation or because of improper connections. (See 6.4.4).

It is recommended that the EDCOs, particularly those having high fault rates, investigate the reasons for the high failure rates in their MT underground cable networks.

6.7 EXPANSION PLANS

We could not identify any formalized expansion planning nor load forecasting at the EDCOs. The only forecasting we could detect was sales projections for each EDCO, for the next year. This forecasting is performed mainly by assuming a percentage rate of increase, rather than by projecting sales, customers, and specific consumption, and fitting them to econometric models.

It is recommended that the EDCOs start using a more sophisticated method of forecasting, based on the billing statistical data available from the Al-Ahram newspaper computers. This forecasting should at least compare growth in sales, as obtained from projecting historical sales data, with the consumption trends (number of customers times the average monthly consumption of these customers). Forecasting should also try to separate all one-time (non-recurring), identifiable large projects from consumption trends.

Budgeting for expansion distribution systems expansion plans is a difficult task unless the measures suggested in Section 9.3 of this report are implemented.

6.8 MAINTENANCE

A complete assessment of maintenance is difficult to achieve until a very thorough investigation of all the EDCOs' practices is carried out.

From visits to the Cairo and South Delta EDCOs, however, it appears that the maintenance process was not a formalized and programmed operation, except for certain operations such as meter testing. We did not notice the existence of special facilities or procedures available for the maintenance functions, such as: i) special vehicles outfitted for maintenance; ii) properly designed maintenance shops (for example, at the Cairo EDCO headquarters, the meters must be carried through three flights of stairs to reach the meter shop); iii) well trained, well equipped maintenance crews; iv) scheduling for routine and emergency maintenance; etc.

It is recommended that a study be conducted to ascertain the maintenance needs of each of the EDCOs and a program be developed to determine the best way of implementing it.

6.9 SUMMARY OF RECOMMENDATIONS

(a) Each EDCO should start programs to evaluate the accuracy of their sales figures, and should also work in conjunction with EEA to insure that the energy they purchase is measured properly.

(b) The EDCOs should begin programs to match their transformers' capacities to their actual loads, and a clearing house should be established to exchange any transformers left over from the matching programs among the EDCOs.

(c) Least-cost evaluations should be based on marginal costing for energy and free-market prices for the equipment and installations.

(d) The EDCOs should standardize the procedures for reporting fault rates in order to allow meaningful comparisons.

(e) The EDCOs should investigate whether they can implement a policy and a methodology for reporting the energy that could not be supplied during a fault.

(f) The EDCOs having high fault rates should investigate the causes of the high failure rates in their MT underground cable networks.

(g) The EDCOs should start using a more sophisticated method of forecasting, based on the statistical billing data available from the Al-Ahram newspaper computers, and on input from their industrial customers.

(h) A study should be carried out to ascertain the maintenance needs of each of the EDCOs, and that a program should be developed to determine best way of implementing it.

7 TARIFFS

In the following section we discuss means of improving the design and application of tariffs. We will not, however, review the pricing of electricity, since such a latter is not in our scope of work.

7.1 CROSS-SUBSIDIES

The tariff structures used in Egypt for some time include several types of cross-subsidies. These subsidies range from transfers between the customers grouped within a type of service, to assistance from one company to another.

Even though the Distribution Companies (EDCOs) have not been part of EEA for several years, a number of cross-subsidies between companies was always implied in their financial structure. Because end-user tariffs are determined on the national level, adequate revenue is not necessarily perceived by each Company due to the different consumption patterns among their customers. Historically, the price of the energy delivered to the EDCOs was varied by EEA to adjust for shortfalls in revenue caused by circumstances beyond the control of any given EDCO. This procedure was easier to carry out when EEA and the EDCOs were under the jurisdiction of the Ministry of Electricity.

GLOSSARY OF TERMS

Cross-Subsidy
A subsidy from a category of accounts to similar accounts in the same category of accounts, in order to cover shortfalls of revenue.

Subsidy
Funds from one account or groups of accounts that are transferred to other accounts to cover shortfalls of revenue. The transfer of funds may be inherent to the way the revenue requirements are established.

Transparent Subsidy
A subsidy that is clearly identified and quantized to provide relief to a recipient.

In addition, tariffs have generally been applicable to a specific group of customers, regardless of where they are located in Egypt, or characteristics of their loads. Since location may bring about a considerable difference in the cost of serving individual customers, there has been another implied cross-subsidy by certain customers to other customers within the same tariff group, but served at different locations. Furthermore, periodic tariff increases were designed to provide an average price for the customers in one group, while actual prices changed considerably depending on the consumption range of a given customer. This constitutes the existence of a cross-subsidy within the same tariff group. The application of uniform tariffs on a national basis means that it is difficult to identify the source or the recipient of a subsidy.

When responsibility for the distribution of electricity was transferred to the Holding Company for Construction and Distribution of Electric Power (HCCDEP), which does not report to the Minister of Electricity, the cross-subsidies described above ceased to be applicable on a national

basis, and it became necessary to devise means to distribute the subsidies on a regional basis. The method used for this purpose makes it possible to identify the companies that provide or receive the subsidy, but does not show outright the amount of the subsidies. The present procedure is described below.

7.2 PRICE OF ENERGY DELIVERED BY EEA TO THE EDCOs AND ALLOCATION OF PRICES TO THE EDCOs FOR PURCHASED ENERGY

EEA delivers energy to the EDCOs at numerous delivery points. For tariff purposes, the sum of these deliveries is considered to be a single purchase by HCCDEP and is priced at a rate per unit of energy (kWh), regardless of the amount purchased or the demand it imposes on the EEA system. The price of the HCCDEP purchase is renegotiated periodically between the two parties involved and does not necessarily reflect the cost to EEA of providing this energy.

After the price between EEA and the HCCDEP is established, HCCDEP and the EDCOs agree on the tariff that will be applied to each EDCO, in accordance with the ability of each of the companies to obtain revenue from the particular mix of customers they serve. At the end of the period of applicability of the tariffs, adjustments are made to take into account any differences between the forecasted and actual sales revenues for each EDCO. This procedure allows to identify the value of the subsidies received by each EDCO, but does not readily identify how much of the amount paid by each customer goes to, or is subsidized by, these cross-subsidies.

This process of assigning different purchased energy prices to each EDCO amounts to having the customers of some individual companies subsidize other companies. The individual customers, however, do not know the extent of their contribution to one or more groups of customers in other EDCOs.

It should be pointed out that the current method used to measure the cross-subsidy required by each of the distribution companies does not necessarily include a complete assessment of the rate of return to be produced by each company.

7.3 PROPOSED SIMPLIFICATION OF THE IDENTIFICATION OF THE CROSS-SUBSIDIES

The cross-subsidies would be easier to identify and would be more fairly applied using the method explained in the hypothetical example in Table 7-1.

It is assumed that only two of the four companies (Companies B and C) being considered require subsidies. (The determination of the magnitude of these subsidies is beyond the scope of this discussion). The contribution of each customer of each Company is directly proportional to the energy he uses. The unit price (L.E./kWh) of the contribution is the same for all customers: the total amount of the subsidies divided by the total sales. Note that the customers of Companies B and C contribute to the subsidy their companies receive.

TABLE 7-1
ALLOCATION OF CROSS-SUBSIDIES
TO DISTRIBUTION COMPANIES

		Subsidy	
Distribution Company	Sales GWh	Required L.E.x1000	Actual L.E.x1000 (c)
Company A	537.2		1 788
Company B	123.6	3 034	411
Company C	89.3	55	297
Company D	178.2		593
Total	(a) 928.3	(b) 3 089	3 089
(c) = ((a)/(b)) x Sales			

This method has the following advantages:

- It would distribute the burden of providing the subsidy evenly through all the customers in Egypt, thus removing any element of discrimination, and

- It would identify in the Income Statements the subsidies received by the respective EDCOs, thus providing a basis to calculate their return, regardless of the source of revenue

In order induce the companies to operate in an efficient manner it would be essential that the subsidies be less than the amounts actually required, otherwise there would be no incentive towards a least-cost operation.

It is recommended that a method similar to the one explained above be implemented to adjust for the price of the energy purchased by the EDCOs from HCCDEP. The adoption of this method would require the establishment of a special fund to administer the corresponding revenue and payments and a modification of the billing programs to include the contributions to be paid by each customer.

7.4 TARIFF STRUCTURES -- RESIDENTIAL AND COMMERCIAL

TABLE 7-2
RESIDENTIAL AND COMMERCIAL TARIFFS

Old Structure		New Structure	
Description	Piaster/kWh	Description	Piaster/ kWh
Residential(Monthly)		Residential(Monthly)	
First 100 kWh	3.00	First 50 kWh	4.70
From 101 to 200 kWh	4.50	From 51 to 200 kWh	6.50
From 201 to 350 kWh	6.50	From 201 to 350 kWh	8.00
From 351 to 500 kWh	7.50	From 351 to 650 kWh	11.00
From 501 to 650 kWh	10.00	From 651 to 800 kWh	17.00
From 651 to 800 kWh	12.00	From 801 to 1000 kWh	18.00
From 801 to 1000 kWh	14.00	Above 1000 kWh	20.00
From 1001 to 2000 kWh	16.00		
From 2001 to 4000 kWh	17.50		
Above 4000 kWh	18.50		
Commercial		Commercial	
First 100 kWh	4.50	First 100 kWh	10.00
From 101 to 200 kWh	6.50	From 101 to 250 kWh	15.00
From 201 to 350 kWh	9.80	From 251 to 600 kWh	20.00
From 351 to 500 kWh	13.00	From 601 to 1000 kWh	21.00
From 501 to 1000 kWh	15.00	Above 1000 kWh	23.00
From 1001 to 2000 kWh	18.50		
From 2001 to 4000 kWh	21.00		
Above 4000 kWh	23.00		

The Residential and Commercial tariffs applicable to the EDCOs' customers were modified on July 1, 1992. Table 7-2 compares the old and new structures. The modifications were carried out to increase the tariffs in accordance with the steps agreed upon with the World Bank. Simultaneously with the increase, the structure of the tariffs was simplified by reducing the number of steps. Further decreases in the number of steps are planned for future revisions.

The price increases were not uniform over the full consumption range. The average increases for Residential and Commercial customers were 48% and 56%, respectively.

For example, the tariff for residential customers increased 75% for 100 kWh, 47% for 250 kWh, and 34% for 500 kWh.

7.5 TARIFF STRUCTURES -- LARGE CUSTOMERS NOT IN FREE ZONES

The tariffs were restructured considerably on July 1, 1992. Table 7 3 compares the new structure with the old.

The tariffs applicable to large customers are structured so that customers with a peak load above 500 kW, in addition to a charge for the energy they consume (kWh), are also charged on their peak power requirement (demand charge). The purpose of a two-part tariff is to send signals to the customer to utilize the resources of the electric system efficiently. Thus, a high energy charge will give the customer an incentive to conserve kWh whereas a large demand charge will give an incentive to control the peak power requirements by proper management of how the equipment is used (for example by not running two large machines simultaneously). Energy conservation, especially in industry, is a long term proposition since it usually requires the installation of energy saving devices - which are expensive and are not always cost effective. Power management in industry is a short term measure, often not requiring additional equipment - but it may have a substantial effect in the requirement of peaking units by the generation utility (EEA).

Ideally, the demand charge should reflect the fixed costs of providing service, the energy charge and the variable costs. For the typical electric utility, the financial costs are the highest component of the total, followed by the cost of fuel. Since the financial costs are fixed, it follows that the demand charge should also be high and that the energy charge should reflect the incremental cost of fuel plus the variable portion of operating and maintenance expenses. For example, the demand charges of utilities that manage to design their tariffs to reflect the breakdown of fixed and demand charges range from US$ 15 to 250, depending on the type of customers, the service voltage, and the particularities of the tariff regulatory environment.

TABLE 7-3
TARIFFS APPLICABLE TO LARGE CUSTOMERS

Old Structure		New Structure		Increase
Description	P/kWh	Description	P/kWh	%
Housing Companies				
All Customers	6.00	All customers	9.00	50.0
Medium and Low Voltage				
Demand >500 kW		Demand >500 kW		20.0
Demand Charge /kW	680.00	Demand Charge /kW	730.00	
First 1000 kWh/kW	14.71	All energy	15.53	
Next 500 kWh/kW	13.84			
Next 1000 kWh/kW	12.07			
Next 1000 kWh/kW	10.37			
Next 1500 kWh/kW	7.88			
> 5000 kWh/kW	6.73			
Demand <500 kW		Demand <500 kW		
Agriculture-Private & Investment		Agriculture-Private & Investment		
First 70 000 kWh	7.37	All consumption	10.00	42.0 Priv. & Invest. 41.0 Public
Next 100 000 kWh	6.02			
Above 170 000 kWh	5.73			
Industry-Private & Investment		Other Purposes		
First 70 000 kWh	10.21	Industry	18.00	100.0
Next 100 000 kWh	8.34			
Above 170 000 kWh	7.94			
Other Purposes				
First 70 000 kWh	16.94	Other purposes	18.00	120.0
Next 100 000 kWh	13.85			
Above 170 000 kWh	13.15			

If the public is to respond adequately to the signals that are included in a two-part tariff, it is advisable to address the following issues prior to implementing any major changes:

a) *Define what factors should be influenced by the tariff. Some of these factors could be: i) reducing the system peak, ii) improving the power factor, iii) inducing energy conservation (short or long term), etc.. This includes the possibility of using time-of-use or seasonal rates.*

b) *Determine the desirability of maintaining tariffs based on energy only, even to very large customers.*

c) *Decide the form of "ratcheting" the maximum demand charge (i.e. by contract, a percentage of the maximum demand read in the last 11 months, etc.).*

d) *Investigate whether the existing 500 kW demand limit between rate schedules is adequate for present-day needs.*

e) *Determine which parameters are to be measured and the metering schemes that would best suit the purposes of the tariff.*

7.6 TARIFF STRUCTURES -- LARGE CUSTOMERS IN FREE ZONES

The tariffs for customers located in Free Zones are shown in Table 7-4. All these tariffs have demand and energy components, and therefore they can be used to send signals to the user. Since the demand charges are relatively low, the same limitations outlined in paragraph 7.5 apply.

7.7 DISTRIBUTION OF CONSUMPTION (kWh) AMONG CUSTOMER CATEGORIES

Although every EDCO has a different mix of customer categories, we selected the Cairo Company as representative of the typical consumption pattern. The 1990-91 data (Figure 7.1) shows that residential customers represented the largest category, closely followed by public sector industries. It should be pointed out that, because of the 1992 tariff modifications, similar data for 1991-1992 would show different groupings and relative market shares for the classifications other than residential and commercial.

7.8 THE DILEMMA IN THE RESIDENTIAL TARIFF

It is reported that revenues from the residential tariff have increased to only about half of the levels agreed upon with the World Bank. The reason for this is that the majority of customers have consumption rates below 100 kWh/month. For social reasons it has been decided that the tariff applicable to these customers should be kept low. This means that the price of the first blocks of the tariff must also be kept low. However, because all customers have consumption within these first blocks, their bills will also reflect the lower price. Indications are that because

TABLE 7-4
TARIFFS APPLICABLE TO LARGE CUSTOMERS IN FREE ZONES

Old Structure		New Structure		Increase
Description	P/kWh	Description	P/kWh	%
Very High Voltage				
Demand P/kW	899.00	Demand P/kW	899.00	-11.7
Energy P/kWh	5.75	Energy P/kWh	4.95	
High Voltage				
Demand P/kW	939.00	Demand P/kW	939.00	33.1
Energy P/kWh	6.69	Energy P/kWh	9.51	
Medium and Low Voltage				
> 500 kW		> 500 kW		
Demand P/kW	1663.00	Demand P/kW	1663.00	20.6
Energy P/kWh	10.26	Energy P/kWh	13.19	
< 500 kW		< 500 kW		
Demand P/kW	416.00	Demand P/kW	416.00	21.6
Energy P/kWh	13.18	Energy P/kW	17.60	

more than half of the total consumption is billed at these low rates, prices for consumption above 100 kWh would have to be increased by over 100% to yield the desired level of revenues.

Table 7-5 analyzes the distribution of consumptions of residential customers in Egypt for September 1992. No major differences were noticed in the distributions between months, even during the hot months when a considerable shift of consumption patterns due to air conditioning would be expected.

Table 7.5 shows 61.9 % (Column (5)) of the customers have consumption of up to 100 kWh/month (Column (2)). These customers consume only 19.8 % (Column (8)) of total residential usage. However, 53.0 % (Column (11)) of the kWh billed are invoiced at prices that correspond to the consumptions from 1 to 50 kWh/month (4 Piastres/kWh) and from 51 to 100 kWh/month (6.5 Piastres/kWh). In contrast, customers consuming in excess of 1000 kWh pay 20 piastres/kWh.

TABLE 7-5
FREQUENCY DISTRIBUTION OF CONSUMPTIONS
RESIDENTIAL CUSTOMERS SEP/92

Consumption		Customers			Monthly Consumption			Billings In Block		
(1) From kWh/M	(2) To kWh/M	(3) In Range x1000	(4) In Range %	(5) Cumulative %	(6) In Range GWH/M	(7) In Range %	(8) Cumulative %	(9) In Range GWh	(10) In Range %	(11) Cumulative %
0	0	1,363	14.6	14.6	0.000	0.0	0.0	0.000	0.0	0.0
1	50	2,492	26.8	41.3	61.235	5.7	5.7	334.066	31.4	31.4
51	100	1,913	20.6	61.9	149.316	14.0	19.8	230.845	21.7	53.0
101	150	1,366	14.7	76.6	170.316	16.0	35.8	142.624	13.4	66.4
151	200	864	9.3	85.9	152.106	14.3	50.0	88.227	8.3	74.7
201	250	455	4.9	90.8	101.700	9.6	59.6	53.641	5.1	79.8
251	300	285	3.1	93.8	79.141	7.4	67.0	36.477	3.4	83.2
301	350	153	1.6	95.5	49.680	4.7	71.7	24.762	2.3	85.5
351	400	108	1.2	96.6	40.868	3.8	75.6	18.623	1.7	87.3
401	500	122	1.3	98.0	55.144	5.2	80.7	25.368	2.4	89.7
501	600	56	0.6	98.6	31.164	2.9	83.6	16.606	1.6	91.2
601	650	17	0.2	98.7	11.164	1.0	84.7	6.690	0.6	91.8
651	700	15	0.2	98.9	10.741	1.0	85.7	6.139	0.6	92.4
701	800	21	0.2	99.1	16.353	1.5	87.2	9.659	0.9	93.3
801	900	15	0.2	99.3	12.881	1.2	88.4	7.908	0.7	94.1
901	1000	13	0.1	99.4	12.143	1.1	89.6	6.128	0.6	94.6
1001	1500	27	0.3	99.7	33.167	3.1	92.7	18.882	1.8	96.4
1501	2000	11	0.1	99.8	18.693	1.8	94.5	10.302	1.0	97.4
2001	2500	6	0.1	99.0	12.353	1.2	95.6	6.276	0.6	98.0
>	2500	10	0.1	100.0	46.721	4.4	100.0	21.553	2.0	100.0
Totals		9,302	100.0		1,064.965	100.0		1,064.965	100.0	

7.9 ANOMALIES IN RESIDENTIAL CONSUMPTION PATTERNS

The frequency distribution displayed in Table 7-5 highlighted two very unusual facts:

7.9.1 Zero Consumption

Fourteen and a half (14.5%) percent of the customers have zero (0) consumption. Supposedly these are <u>not</u> customers for whom the consumption could not be read (according to the computerized data processing rules). It is claimed that these are unoccupied dwellings or the residences of people on vacation. Possibly a small proportion of the above figure may be represented by the last group, and there may be a small percentage of dwellings that are actually unoccupied.

In order to obtain reliable data on this group of customers we suggested to the HCCDEP that the computer select a number of random samples [1] of these customers to allow examination of a representative sample.[2]

7.9.2 High Consumption

Only 1.1% of customers consume in excess of 700 kWh/month (Deducting Column (5) from 100%). Usually it is assumed that 700 kWh/month indicates that the resident has at least one air conditioner functioning.

7.9.3 Preliminary Analysis

Similar surveys in other countries have shown a great variety of causes for this type of data, ranging from stopped meters to non-existent customers. Upon correction of the contributing causes, sales statistics changed considerably.

As an indication of the effect of the normalization of this anomaly, we have considered a hypothetical scenario in which 2% of the zero-consumption customers really do have zero consumption, and the remaining 12.5% are distributed among the other consumption groups in proportion to the number of customers they contain. This resulted in a 3.1% increase in billed kWh. The kWh billed at the unit prices applicable to the first 100 kWh increased from 53% to 57% of the total billings. The customers with consumption in excess of 700 kWh/month increased slightly from 1.1% to 1.3%. Whereas no claim is made as to the accuracy of the hypothetical case, it would be prudent to evaluate the contents of the statistical data in order to avoid serious errors in forecasting revenues.

It is recommended that HCCDEP obtain and evaluate the contents of the monthly frequency distributions of consumptions for residential and commercial customers. This information is available on-line from the Al-Ahram newspaper computer. Similar information pertaining to the individual distribution companies should also be evaluated by the respective distributors.

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[1] It was suggested that the computer count how many of these customers have zero consumption for 3 or more consecutive months. If this number is large, then take 400 random samples from this group and investigate each.

[2] Subsequent studies carried by 8 EDCOs showed that 10% of the meters actually had zero consumption. Of these customers, it is reported that: i) 75% were unoccupied houses, ii) 5% of the meters needed maintenance, iii) 6% of the meters needed adjustment; and iv) the remaining were still being investigated. We have not had an opportunity of evaluating the soundness of the studies.

7.10 POSSIBLE SOLUTIONS TO THE RESIDENTIAL TARIFF DILEMMA

As seen above, it is difficult to increase revenue received from the residential customers unless the prices for the first blocks of consumption are increased considerably. Due to the "inverted" structure of the existing tariff, (unit prices increase as the consumption increases) such a rate increase would greatly affect small users, but not so much the larger users. Thus it seems that some form of subsidy must be given to the small users.

The operative question is how to identify the consumption of small users. This is the most practical way to quantify the corresponding subsidy. Two scenarios are given below to illustrate some of the concepts and methods that could be used. For discussion purposes only, we use 100 kWh/month as the separation point between subsidized and non-subsidized customers. We are not concerned here with the source of the subsidy.

7.10.1 Direct Credit

This scenario assumes that the prices for the first 100 kWh/month of all customers are increased to levels that will assure adequate revenues. Each of the low-consumption customers will have to apply for and be issued a credit voucher to be applied to the payment of his bill. Note that if the customer's consumption exceeds the 100 kWh/month limit, it will be automatically reflected as a higher bill, to which a fixed credit is applied. In theory, this method is simple, but the administrative processes required to determine what persons should be eligible for the credit vouchers combined with the task of issuing such vouchers could become prohibitive.

7.10.2 Separate Rate Schedules

This scenario considers that all customers with consumptions below 100 kWh/month are subject to a favorable "social" tariff, which is considerably lower than the "residential" tariff. At the existing rates, the revenue from such "social" customers represents about 15% of the revenue from the whole residential group.

Under this scenario, assume that stiff penalties would be applied if the consumer consumes more than 100 kWh/month. In some places, the tariffs state that "social" customers who exceed the limit for two consecutive months (or maybe as stringent as any two months in a year) are permanently removed from the social tariff. In order to implement this type of control, it is essential that meter reading and computerized customer records be accurate.

Under such a scenario, a slight increase in the "social" tariff could be applied without too much user inconvenience.

7.10.3 The Provision of High Efficiency Light Bulbs to Small Users

Under this scenario, the provision of high-efficiency light bulbs to small consumption users, free of charge, is proposed. Cooking and clothes ironing are done primarily with kerosene appliances in this customer class, and there are no refrigerators. This would reduce consumption to less than half of its current level, and therefore the rate could be doubled without increasing the billing to these customers.

This scenario would imply a subsidy, which would be the cost of the high-efficiency light bulbs. Pricing of the second block of consumption (which would include the customers with small refrigerators, fans, and electric irons) may be difficult to establish because it could represent a large increase in the bill of customers in that consumption block.

It is recommended that a scheme be developed to identify small residential consumers, in order that their billing can be separated from that of other consumers. This would allow an increase of the prices of the first steps of the respective tariff.

7.11 OTHER CHARGES INCLUDED IN THE ELECTRICITY BILLS

HCCDEP invoices its customers for services that are not considered part of the normal tariff, and it acts as a collection agency for charges or taxes destined to several government agencies. On the average, these extras in the monthly bill represent approximately 4% of the total invoiced. Since some of the charges are flat fees, their effect will be felt more by small consumers.

The following types of items are billed separately:

- Stamps on consumption
- Fee to cover cost of invoicing
- Publicity (communications) tax
- Stamps on contracts
- Stamps on receipts
- Meter rental
- Sanitation services fee
- Stamps towards broadcasting
- Governorate stamps
- Fee for development

7.12 CLASSIFICATION OF RESIDENTIAL AND COMMERCIAL CUSTOMERS

There may be cases when it is difficult to ascertain to which tariff category a customer belongs. This is particularly true of activities carried out in the homes of low income customers. For example, if a customer has a sewing machine in his/her dwelling and takes in occasional tailoring jobs, is it a commercial activity? Who is going to carry out this determination? Is the trouble and time expended worthwhile? Are opportunities for collusion between the customer and the person making the determination?

All utilities face these types of questions. HCCDEP and EEA have established a committee that studies these cases and issues directives, whenever necessary.

Many utilities have found that an easier solution is to have the residential and commercial tariffs coinciding, at least for low consumption, and to increase the commercial rates faster than the residential for those usages that would be characteristic of medium-sized commercial establishments. Such medium sized commercial establishments are usually easily identifiable because they normally require some kind of a license to operate.

For the sake of expediency, we recommend that HCCDEP examine the possibility of having the same prices and blocks for small consumption (for illustrative purposes we will mention 250-400 kWh) in the Residential and Commercial tariffs. This policy could also be extended to small artisans that are presently listed as industrials.

7.13 CONTRIBUTIONS IN AID OF CONSTRUCTION

These are payments that new customers make in order to be connected to the electric system and receive service. It is not necessary that these payments be equal to the amount actually spent by the utility to connect the customer. Contributions in Aid of Construction should affect tariffs, in as much they are considered a revenue or a component of the rate base. There are two methods by which to account for these contributions:

7.13.1 Current Revenue

The payments are considered as current revenue, and the equipment and installations that are provided to connect the customer are capitalized at their actual cost.

This is the most common method. It has the advantage that the corresponding assets, are not differentiated from the rest of the utility's assets and they are depreciated and maintained as is the rest of the equipment.

The main disadvantage of this method is that revenue may increase disproportionately if there is a very large group of customers incorporated during the year.

7.13.2 Net Capitalization

The assets corresponding to the connection fees are capitalized at their actual cost less connection. This has the disadvantage of distorting the depreciation rates. Also, there is the possibility of having negative value assets, when the contribution is larger than the cost of the asset. This method also distorts the continuous property records since there may be two or more identical assets priced at different prices.

7.14 ACCOUNTING METHODS USED BY THE EDCOs TO REGISTER CONTRIBUTIONS IN AID OF METER CONSTRUCTION

Indications are that the EDCOs use a variation of the second method above to register the contributions that a new customer is expected to pay when provided a new service. The meters are not shown in the accounts because it is considered that, since the customer paid their full value, they do not belong to the utility. These procedures have a marked influence in the tariffs because they should represent a revenue or a capitalization that forms part of the rate base.

The above policies establish that the EDCO is responsible for the replacement or repair of any installed meters that fail. Stock meters are accounted for as inventory. Customers pay a monthly "meter charge" which is meant to cover maintenance and recalibration costs for the meter, but it is not clear whether these costs may also cover the wiring to the meter.

This method has the following disadvantages:

- No recognition is given in the asset accounts for the value of the meters, and therefore there cannot be a good control of these devices. It should be borne in mind that the replacement cost of all the meters used by the EDCOs should exceed LE 800 - 1000 million!

- There is no assurance that the initial cost of the meters matches the contribution paid by the customers, nor that the monthly charge reflects the maintenance and recalibration expenses. What treatment is given any differences in these values?

7.15 SUMMARY OF RECOMMENDATIONS

Since the quantity of meters used by the EDCOs is very large, and the meters are a very important part of the customer service system, it is recommended that programs be developed to achieve the following goals:

a) Within 3 years, create computerized data bases of all the meters in use by the EDCOs. These data bases should contain information that will allow definite control of the meters (especially for the meter reading process) and should have provisions for the future accounting of their costs and depreciation.

b) Transfer all existing meters from the Inventory account they are presently in to a new Asset account which contains meters. This transaction will have no immediate effect on the financial position of the EDCOs but will influence future years' operations since it will add a new depreciation component.

c) Begin immediately with the design of the data base systems, and as soon as they are ready, commence capitalizing and depreciating all new meters.

d) When the data bases are fully operational, commence entering the existing meters at their replacement cost but consider them to be fully depreciated. This transaction will not affect the financial position of the EDCOs. If the meters were to be shown at their replacement cost, less presumed accumulated depreciation, there would be a very large adjustment to the real profit of the Company.

e) Begin immediately considering the contribution received from new customers as an income and include it in a special account (which could be called Contributions in Aid of Construction - Meters). It should be noted that usually the balancing account to this transaction is a liability record which accumulates all these contributions and is written-off only by special authorization.

8 CUSTOMER SERVICE SYSTEMS

The methods used by the EDCOs to read meters, calculate bills, distribute bills and collect from the customers are all based on a software system developed and operated by Al-Ahram newspaper. However, the detailed procedures used by each of the Companies may differ.

The existing software is a comprehensive system with many very sophisticated features. However, these features are currently under-utilized. The result of this under-utilization is slowness in handling information pertaining to meter reading, billing, and collection. The system currently in use is essentially manual and lacks the controls and statistics expected of most customer service systems.

GLOSSARY OF TERMS

Book
A listing of all the customers known to exist in a "route". The traditional book contains a page for each customer. Computer-produced lists show several customers in each page, listing information required to locate the customer and providing space for the readings and information to be provided by the reader. There are also devices that store and display electronically such information. Usually utilities try to conform books so that each can be read during a normal day's work.

Customer Service System
The accumulation of procedures, processes, facilities, computation programs, and trained personnel designed to provide service to the utility's customers. The main components of the system are: i) incorporation of new customers, ii) meter reading, iii) bill preparation and distribution, iv) collection of bills, and v) removal of customers that no longer exist.

Route
An arrangement, preferably in a logical sequence by location, of all customers within a pre-determined area.

Validation
The process of checking the information being processed by a computer and the identification of the data that do not meet the check criteria.

A formidable data base of statistical data could be accessed through the Al-Ahram computers, but very few of the staff in the EDCOs and EEA are aware of the existence of such information.

Some EDCOs believe they should have their own computers and customer service systems and claim that the fees charged by Al-Ahram are not reasonable. Since there is no clear understanding of what is expected from the system, a thorough investigation should be carried out to determine what should be done to improve the utilization of existing facilities and to modify existing procedures in order to produce a highly efficient Customer Service System.

8.1 METER READING PROCESS

8.1.1 Location of Meters

Since the majority of the meters are located **inside** the customer's premises, the meter reader must gain access to these premises in order to read it. If nobody is at the location, or the people inside do not want to allow the meter reader in, it often becomes necessary for him to return several times before a meter reading is obtained. This feature reduces the efficiency of meter reading and delays the billing process.

Most distribution utilities install their meters outside the customers' premises, either in common areas of the buildings (where there may still be difficulty in accessing the meter), or on an outside wall where there is free access at all times (the latter system is universally employed in North America and many Central and South American countries)

8.1.2 Registration of Meter Readings

The EDCOs visited use the traditional "books" to register meter readings. This type of "book" has serious disadvantages: i) it is bulky, requiring considerable storage space, ii) it requires cumbersome administrative systems to control the issuance and storage of the books, and iii) because it stores the readings for several months of service, it provides the means for unscrupulous meter readers to "invent" readings, without going to the customers' premises.

Prior to starting the scheduled reading of a route, the Al-Ahram computer prepares a list of the customers on that route. In this list there are several columns where the reader should record the meter reading directly, and also any other pertinent comments. However, the EDCOs have chosen to transfer the meter readings that are written in the "book" to these lists and then send the lists to the Al-Ahram for key-punching. At different EDCOs, different methods are used to send the information to the Al-Ahram computer center. For example, the South Delta Company transfers the actual meter readings to the lists and sends all lists together to the newspaper monthly whereas the Cairo company uses the lists to transfer the readings from the book, calculate consumption, average consumptions, and then check them against the month's consumption. The calculated consumption is then used by the computer to prepare the bills. These efforts are usually unnecessary. The computer can automatically calculate most of these figures, saving a significant amount of time and effort.

8.1.3 Validation of Readings

The computer performs up to four runs of validations, returning a list of all cases which have not met the test criteria to the EDCO concerned. The only way to check a reading that has been rejected by the computer is to send a reader to verify the meter reading in person. Not only is this an expensive practice, but it is meaningless if a long period has elapsed between the original reading and the time of the check (the meter may have registered considerable consumption by then without any means of reconciling the results). In such cases, the billing is held up while invalid verification results are sent back and forth.

8.1.4 Quantity of Daily Meter Readings

A meter reader is expected to read approximately 90 - 100 meters in urban areas daily. Additionally, the reader must continue trying to take readings from meters that were inaccessible in previous days. If a meter reading cannot be obtained after a pre-established number of days (the exact number is determined by each Company), the bill is estimated in accordance with the established customer's average consumption.

8.1.5 Identification of Meters

Usually utilities assign a unique, easily read, set of digits to each meter. This is the best means available to the reader to ensure that he is reading the correct meter. This feature is currently not available in Egypt.

8.1.6 "Missing" and "Extra" Meters

A very important feature of a good meter reading process is the control of "missing" or "extra" meters. A "missing" meter is one which is identified in the route lists but cannot be found in the field. An "extra" meter is one that is found in the field but is not accounted for in the route list (some utilities use the opposite definition). Control of missing and extra meters is the best way to detect if the billing records reflect customers that really exist. Unfortunately this type of control cannot currently be carried out in Egypt because the meters cannot be identified by a unique number and is not feasible to enter every dwelling in order to insure that there is a meter there. Furthermore, the Cairo Company concedes that it takes approximately four months from the time service is provided to a new customer for the customer to appear on the billing lists.

8.2 POSSIBILITY OF LOCATING THE METERS OUTSIDE THE CUSTOMER'S PREMISES

The issue of locating the meters outside the customers' premises could be solved in several ways. The relocation of meters to the exterior of dwellings would improve the reading process. However, prior to selecting which options are better, due consideration should be given to the costs, avoidance of losses, and the possibilities of fraud reduction associated with each possibility. Some issues central to such a selection are discussed below.

8.2.1 Relocate the Meter on the Outside Wall

Meters could be installed in the front box (located on an outside wall of each dwelling) that either contains or is supposed to contain a set of fuses wired to the supply side of the meter. This is probably the least costly alternative. It does, however, have the

following disadvantages: i) the losses of the riser conductors from the building supply to the meter must be absorbed by the EDCO; ii) the EDCO is responsible for any maintenance to be performed on said risers; and iii) it would be relatively easy to carry out fraud in the risers.

Arguments could be raised that this relocation would subject the meters to vandalism. This is a very remote possibility, especially if sturdy meters are installed. The North American design of meters is very difficult to vandalize and there are hundreds of thousands of them operating successfully in outdoor installations.[1]

8.2.2 Automated Meter Reading

The Cairo Company has procured a system which permits meter reading by plugging an electronic device into an outlet located outside the customer's premises. This device requires that a special transducer be installed in the meter and that a special shielded cable be run from the meter (which remains inside the customer's premises) to the outlet. A special reading device (which can be used also to record readings manually from conventional meters) is also required.

This system has the following disadvantages: i) the costs of the transducer, special cable, and outlet are probably higher than the cost of rewiring the meter and installing it on an outside wall (see 8.2.1); ii) the EDCO must absorb the losses of the conductors up to the meter; iii) the EDCO is responsible for the maintenance of the conductors up to the meter and of the shielded cable; and iv) there is ample opportunity for the consumer to carry out fraud on the meter, special shielded cable, and the conductors feeding the meter which are located inside the premises.

With this alternative, the issue of vandalism is irrelevant because the customer would be responsible for such occurrence. However, because the meter reader would not need to enter the customer's premises, there would be an added incentive for the customer to carry out fraud in the electric installations within his premises.

8.2.3 Relocate Meter in a Location at Ground Level

In most cases this option would be very expensive given current meter installations because it would require considerable rewiring. However, this option would be very practical if it were required for all new buildings. (note that some of the older buildings in Cairo were wired in this manner).

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[1] For additional information see "Guidelines for Utility Customer Management and Metering", The Word Bank, 1991, Pages 119, 133-134 and 138

The main advantages of this option would be: i) the losses to be absorbed by the EDCO do not include the risers to the customer's premises; ii) the EDCO is not responsible for the maintenance of the risers; and iii) the probability of fraud by the customers is reduced considerably. The possibility for vandalism would be slightly increased, but, as explained in 8.2.1, it would be very remote.

8.3 PRODUCTION OF BILLS

Under the present system, bills are calculated and printed by the Al-Ahram newspaper computer services. The input sent by the EDCOs may be the meter reading or may be the consumption figure that was calculated manually by individual EDCOs, and shown on the respective computer-produced listing of the customers in each route. Some EDCOs send input information monthly, while others send it daily. The information is key-punched by the Al-Ahram data processing staff and sent to the computers for processing. Up to four validation runs are made prior to printing the bills, but no actual information could be obtained as to how effective this process is. The bills are printed in one of three Al-Ahram locations, depending on the proximity of the recipient EDCO.

The EDCOs interviewed reported a remarkably low quantity of complaints on the bill's accuracy. It is possible that customers would rather pay what they consider a high amount than spend a lot of time at the EDCO's offices trying to obtain an adjustment.

8.4 DISTRIBUTION AND COLLECTION OF BILLS

The process of distributing and collecting bills differs among the various EDCOs. We will consider the procedures used by two of the EDCOs as indicative of the overall procedure.

8.4.1 Cairo Company

There are approximately 2000 bill collectors, divided among 25 offices. Clerks are responsible for controlling the payments received (one clerk is assigned to every three collectors). After the control documents are completed, the collectors deposit the receipts for the day with cashiers. The offices remain open until 23:00 hours to give the collectors an opportunity return the results of their day's work.

Each collector is given 150 bills to collect every day. Every day he must return the proceeds of the day (including the corresponding bill stubs) and the uncollected bills to an assigned office. Clerks then attempt to reconcile this information. Uncollected bills are returned to the collector the next day, together with an additional 150 bills corresponding to that day's task.

The clerks keep account of collected bills by marking a computerized list which shows the amount of each invoice. Further notes are kept in a hand-written notebook for each collector. The reconciliation of the amounts collected is manual. The collector is

allotted one week to collect a bill. The collector is paid a premium on collections to discourage him from retaining the money that he has collected. After one week the uncollected bills go to the cut-off crews. The collector is expected to accompany the cut off-crew. It should be noted that there is no charge for reconnection after cut-off (most utilities are allowed by the regulatory bodies to make a reconnection charge which may offset the extra costs incurred in performing the cutoff and discourage customers from not paying their bills).

Customers may pay their bills in specific collection centers. These facilities are not used very often because the collectors will continue returning to the customer's dwelling until the bill is collected.

Special collection procedures are followed for large customers and government accounts.

Eventually, the collection information is logged into the computer. However, there does not appear to be a mechanism to show the arrears in the subsequent bills. The information regarding cut-offs and arrears to non-government customers does not seem to correspond: we were told that arrears at the end of the month amount to 7% of the number of bills, but that there are approximately 75 cutoffs per month (out of 4.5 million customers). These data should be studied very closely to determine if the 7 % of arrears corresponds to delinquent customers or whether it includes the week's grace period granted to the collector to complete his task. At any rate, 75 cut-offs per month represent only 0.002 % of the customers, which may indicate that the cut-off process is not very proficient or is not applied to small customers (which constitute the largest number and with whom it would not be cost effective to cut-off and reconnect service due to non-payment).

8.4.2 South Delta Company

There are 670 meter readers, 901 collectors, as well as 833 clerical workers assigned to the readers and collectors.

Each day the collectors working in urban areas are allocated 1500 bills; those working in rural areas are allocated 1000 bills. The collectors each day return the proceeds of the work and the uncollected bills. The uncollected bills are then given to another collector, who is allowed 30 days to finish his task and return the money he collected. There is no obligation for the second collector to hand-in the receipts prior to the end of the 30-day period. Consequently, it is estimated that such a collector may have up to L.E. 15,000 in his possession at the end of the period.

After the 30 day's period the unpaid accounts are sent to cut-off. No data was available on the number of cut-offs. It was estimated that each month, 5000 new customers are connected, while 2000 are disconnected.

TABLE 8.1
TYPICAL LENGTH OF BILLING CYCLE
SOUTH DELTA COMPANY

Description	Days to Process	
	Average	Maximum
Meter reading	15	30
Transfer of data to lists	included	included
Validation runs (3)	10	10
Distribution of bills and collection	45	60
Total	70	100

Conditions for cut-off are met at the end of total possessive periods as shown in Table 8-1.

8.5 COMPUTER PROGRAMS

The billing programs available in the Al-Ahram computers are sophisticated and user-friendly. The computers maintain large data bases of statistical information and individual customer histories. Suitable back-up procedures are maintained to insure the integrity of the data. The analysts assigned to the billing process are very competent with regards to the use of the computers and their software.[2]

Unfortunately, there is little communications between the Al-Ahram computer staff, EEA, HCCDEP and the EDCOs and, therefore, the wealth of computerized information available is **totally under-utilized**. The utilization of this information would be greatly enhanced if both the EEA and the HCCDEP could access it and use it in statistical analyses. It should be pointed out that this access should be allowed only if: i) a suitable data base management system (DBMS) were available, and the interested parties were trained to use it, and ii) the DBMS would absolutely not allow any changes to the data in the mainframe computer by any of the parties using the above information. The main advantage of this procedure would be to provide experience to all interested parties in the use and management of data bases, which is an essential feature of modern computerization.

[2] Apparently there are plans to allow each EDCO to produce its own billing system. It should be realized that a billing system is only a very small part of the full customer service process. It takes years to develop a workable customer service system.

The Alexandria Company is presently obtaining computer equipment to improve its billing process.

It is strongly recommended that, as a first temporary step, computer terminals linked to the Al-Ahram computer be provided to EEA and the HCCDEP to enable their staff to obtain statistical data on the operations of the EDCOs quickly. Access to the mainframe computer, by these parties, must be limited to reading the data, but under no circumstance should these persons be allowed to change any of the information contained in the computer.

8.6 FRAUD

While we did **not** observe any instances of fraudulent use of electricity, we did identify several weaknesses in the design of customer installations which would facilitate bypassing the meters or otherwise reduce the measurements that form the basis for billing.

Probably one of the main reasons that fraud has not been a predominant factor up to now is that tariff rates have been relatively low, and therefore not constituted an incentive to reduce the size of electric bills. However, as the price of electricity increases, there will be much more interest in electricity theft. The EDCOs are currently unprepared to deal with the fraudulent use of electricity. Fraud reduction requires that the utilities be prepared to address: i) the legal aspects of taking quick and firm action to punish people engaged in fraud; ii) policy definitions to insure that adequate administrative procedures are available to deal with fraud; iii) insuring adequate deterrence of fraudulent connections in the design of service lines and meter installations; and iv) the organizational structure to provide a large, well trained, well equipped staff for the detection and removal of fraudulent installations.

Some utilities in high fraud areas have found that in order to keep electricity theft under control they are obliged to maintain a specialized staff for detection of fraud whose size is approximately one third of the personnel that deals with installations, maintenance, and removal of meters and service drops.

We recommend that the EDCOs start planning and organizing their fraud reduction organizations. These organizations should start being operational within two years.

8.7 SUGGESTED IMPROVEMENTS TO THE METER READING PROCESS

Under the meter reading process we include all the steps starting with the identification of the meter and proceeding through reading, registering, and validating the readings, and finally sending these readings to the computer.

We consider the goals of the improvements to be: i) the reduction of the time interval between meter reading and the time bills are issued; ii) the improvement of meter reading accuracy; iii) increased control of billed customers; and iv) the provision of quick, efficient validations.

Achievement of these goals will require the following:

8.7.1 Relocation of Meters

In order to increase meter reading efficiency it is essential that the meters be located outside the customer's premises in order to facilitate access to them. Several options for the relocation of meters outside premises were suggested in Section 8.2.

The relocation of meters would have the following advantages:

i) it would eliminate the need for the readers to return to those customer's premises that were closed on prior visits;

ii) it would increase the number of meters that can be read in one day by one meter reader (it is not unusual among utilities to read 275 meters per day in urban-suburban areas, and 400-500 meters in urban areas with multiple dwellings in each building);

iii) it would reduce the number of meter readers needed to carry out the task; and

iv) it would accelerate the printing of bills, by eliminating the period currently allowed the meter reader to gain access to every the customer's premises.

Excess meter readers could be used to relocate meter and to assign company numbers to the relocated meters.

*It is recommended that the EDCOs take immediate steps to relocate **all** meters outside the customers' premises or to provide means of reading the meters from outside.*

8.7.2 Eliminate the "Traditional Meter Reading Books"

Two options are available for the elimination of the books:

a) Readings could be marked directly onto the route lists produced by the computer. There should not be any problems in carrying out this transition, but it should be expected that slight modifications would be required in the list in order to simplify the meter reader's task. This procedure would reduce the time and number of errors now produced by transferring the information from the books to the lists sent to the computer.

b) Automated Meter Reading devices could be introduced, similar to those acquired by the Cairo Company. These electronic devices store the pertinent route information. The meter reader either manually enters the meter reading on a keyboard or uses the remote reading facility described in 8.2.2. This method has two advantages over option (a): i) readings can be validated on the spot (by checking the average consumptions stored in the device); and ii) the recorded information can be fed directly into the computer, eliminating delays and the possibility of transcription errors. The disadvantage of this method is the relatively high cost of the required electronic equipment.

It is strongly suggested that the use of the traditional meter reading books be phased out within six months and be replaced by automated meter reading equipment and/or computer produced lists.

8.7.3 Validation and Data Entry

Two options are be available to improve the validation and data entry processes:

a) The use of Automated Meter Reading equipment would automatically validate the readings while they are taken. At the end of the work day, it would prepare the data on magnetic media to facilitate their transfer to the billing computers.

b) Satellite computers could be installed at each EDCO (or where meter readings are key-punched and validated simultaneously). This procedure would require that the satellite computers receive the information from the customer data base in the Al-Ahram computer either through magnetic or optical media, or on line through telephone lines. This process assumes that all readings that do not pass the validation criteria are returned to the originating meter readers be checked or corrected within one working day. Once validation is processed, the information can be sent to the mainframe computer. This process requires that information be key-punched daily.

It is recommended that meter readings be validated within two working days after being taken. These procedures can be carried out either by using Automated Meter Reading equipment or by installing satellite computers near the EDCOs.

8.8 COLLECTIONS

The manual system used by the EDCOs to collect the bills at the customer's premises is inefficient and extremely difficult to control. Most utilities collect customers' payments in one or more of the following ways: i) at strategically located company operated offices with specially trained cashiers to receive payments; ii) through banks, drugstores, supermarkets, etc.;

and iii) via checks which are mailed to the utility (when the postal facilities are reliable and the use of checks is widespread).

The EDCOs should consider abolishing the collection of bills at the customers' premises within a reasonable period, which we suggest should not exceed two years. This interval should give the EDCOs sufficient time to: i) establish the necessary administrative and data processing systems; ii) establish systems to distribute the bills to the customers' premises, prior to payment; iii) build and equip the appropriate collection offices; iv) train the personnel that will staff the required offices; and v) carry out a thorough public relations campaign to inform the public at large to accept the new procedures.

This procedure would bring about the following advantages:

- A much quicker collection period. It would not be unreasonable to expect the majority to be paid within 10 days of their issuance.

- Increase control of Accounts Receivable (collection of bills). The new systems should provide entry of each collection into the computer customer data base within no more than two working days from the day the payment is made. This would allow each EDCO to monitor and analyze the effectiveness of its collection practices and take corrective steps if and as needed.

- Increase the security of the money collected by providing safekeeping facilities in the collection offices and reducing the likelihood of individual collectors being attacked and their collections stolen.

- The customers would know ahead of time the amount of their bills.

Provided the administrative and data processing systems are well designed, every cashier can be expected to handle at least eight (8) times the number of customers served by the present-day collectors.

It is not expected that this change will bring about sizable savings in out-of-pocket expenses, because what will be saved by reducing the present collection staff be offset by the larger salaries that may have to be paid to the people working in the collection offices, plus the added costs associated with the establishment of these offices (which could also serve as Customer Service offices).

It is recommended that the collection of electricity payments at the customers' premises be phased out within two years and replaced with a system of collection offices where the customers pay their bills directly.

8.9 RECOGNITION OF THE IMPORTANCE OF CUSTOMER SERVICE

It is often thought that Customer Service (also called Commercial Operations) should be limited to those operations that culminate in an effective collection of the customer's bills. This conception can lead to extremely poor utility performance. The group or groups that provide "customer service" should have service as their top goal. The services provided by the "customer service" groups are the only contacts that the users of electricity have with their Company. Therefore, the EDCO's corporate image will depend mainly on such contact. Accordingly, it is imperative that any contact with the customer be on a courteous, efficient, and prompt basis.

Proper service is only possible if management makes a firm decision to render these services and to give the organization responsible for providing them sufficient resources and status within the corporate structure to allow them to perform adequately.

It is strongly recommended that the EDCOs commence planning the organization that is required to provide adequate customer service and to budget for its requirements. This planning should take into account how the various functions are going to be carried out, as well as the establishment and location of offices where the public is to be contacted and served.

7/6

8.10 SUMMARY OF RECOMMENDATIONS

a) As a first temporary step, computer terminals linked to the Al-Ahram computer be provided to EEA and the HCCDEP to enable their staff to obtain statistical data on the operations of the EDCOs quickly. Access to the mainframe computer, by these parties, must be limited to reading the data, but under no circumstance should these persons be allowed to change any of the information contained in the computer.

b) The EDCOs should start planning policies and the organization structure for fraud reduction.

c) The EDCOs should take immediate steps to relocate all meters outside the customers' premises, or provide the means to read meters from outside customer premises.

d) The use of the traditional meter reading books should be phased out within six months and be replaced by automated meter reading equipment and/or computer produced lists.

e) Meter readings should be validated within two working days after being taken.

f) It is recommended that the collection of electricity payments at the customers' premises be phased out within two years and replaced with a system of collection offices where customers pay their bills.

g) The EDCOs should commence planning the organization that is required to provide adequate customer service and to budget for its requirements. This planning should take into account how the various functions are going to be carried out, as well as the establishment and location of offices where the public is to be contacted and served.

9 FINANCE AND ACCOUNTING

The Egyptian Electricity Distribution system consists of The Holding Company for Construction and Distribution of Electric Power (HCCDEP), and eight regional Electricity Distribution Companies (EDCOs).

GLOSSARY OF TERMS

Accumulated Depreciation - Depreciation is recorded every three months to recognize the physical deterioration of fixed assets. The accumulated depreciation account represents the cumulative balance of depreciation of an asset since its acquisition. The accumulated depreciation for an asset should be removed from the accounts when the asset is retired.

Accumulated Provision for Bad Debts - At any point in time, a portion of the accounts receivable of an entity represent amounts which will not be collected, thus becoming bad debts. The entity is, however, not able to identify the specific bad accounts. To account for this, the entity periodically records a provision for bad debts as an expense. The cumulative amount of these provisions is carried in an account titled Accumulated Provision for Bad Debts.

Invested Capital/Capitalization - consists of the ownership investment in the entity, earnings retained in the business, and long-term debt incurred to provide funds necessary to carry out the business.

Consolidated Financial Statements - the method of presenting financial statements wherein the parent company and its controlled subsidiaries' assets, liabilities, income and expenses are combined and shown in total. Inter-company accounts receivable and payable and income and expenses transactions between two or more of the consolidated entities are eliminated in the consolidated financial statements.

Equity Method Financial Statements - the method of presenting financial statements wherein the parent company shows its net investment in one or more controlled subsidiaries as a single line item in its balance sheet and shows its share of the earnings of such subsidiaries as a single line item in its income statement. Under this method, the individual assets and liabilities and the individual components of income and expense of the subsidiaries are not shown in the parent company financial statements.

Imputed Interest - the procedure prescribed within the Egyptian Unified System of Accounts whereby, in addition to interest actually paid, an imputed amount is recorded in the accounts as an operating expense and as non-operating income (having no effect on net income). It is calculated in a manner which assumes that all of the entities' assets other than land and buildings, net of all liabilities other than long-term debt, are financed by debt bearing an interest rate equal to that of the Egyptian Central Bank (21.5% for the year 1991-1992).

Imputed Rent - the procedure prescribed within the Egyptian Unified System of Accounts whereby, in addition to rent actually paid, an imputed amount is recorded in the accounts as an operating expenses and as non-operating income (having no effect on net income). It is intended to reflect operating expenses as if the entity owned no buildings, but paid rent for those buildings which it actually owns.

Inter-company Receivables and Payables - amounts owed by one member of a controlled group of companies to another member of the group.

Internal Cash Generation - funds provided to an entity through the operation of its business. This is generally calculated by adding back to net income charges for depreciation, additions to reserves and other changes to income which do not involve an expenditure of cash.

Replacement Cost Depreciation - a procedure advocated by some whereby depreciation expense would be based on the current replacement cost of a fixed asset rather than the original cost of the asset.

9.1 FINANCIAL STATEMENTS

The HCCDEP normally prepares its financial statements using the equity method; that is, it does not consolidate the electric distribution companies into its financial statements. HCCDEP reports its investment in the distribution companies as a single line item in its balance sheets and reports its share of the distribution companies' income as a single line item in its income statement. The equity method financial statements of HCCDEP for 1990-1991 and 1991-1992 are presented below.

9.1.1 The Holding Company for Construction and Distribution of Electric Power: Statements of Income June 30, 1991 and June 30, 1992

	1991	1992
	(in L.E. 000)	
Revenue:		
Revenue from Investments	9,700	52,578
Other Revenue	2,143	1,907
Total Revenue	11,843	54,485
Expenses:		
Wages	1,686	1,973
Material and Services	318	444
Depreciation	118	129
Income Taxes	8,293	8,617
Other Expenses	39	57
Total Expenses	10,454	11,220
Net Income	1,389	43,265

9.1.2 The Holding Company for Construction and Distribution of Electric Power:
Balance Sheet
June 30, 1991 and June 30, 1992

	1991*	1992
	(in L.E. 000)	
ASSETS		
Fixed Assets:		
Buildings	522	530
Transportation Equipment	526	526
Instruments & Tools	1	1
Furniture & Office Equipment	283	304
Total Fixed Assets	1,332	1,361
Accumulated Depreciation	412	530
Net Fixed Assets in Service	920	831
Work in Progress	3,451	7,094
Total Net Fixed Assets	4,371	7,925
Investments	691,095	718,774
Long-term Receivables	24,630	18,774
Current Assets:		
Cash	2,812	2,017
Receivables	10	10
Accrued Revenue	13,038	59,963
Inventories	0	136
Other Debit Accounts	3,833	2,059
Total Current Assets	19,693	64,185
Total Assets	739,789	808,984
CAPITAL & LIABILITIES		
Capital & Reserves:		
Capital	690,895	717,900
Reserves & Provisions	8	2,186
Total Capital & Reserves	690,903	720,086
Long-term Debt:		
Foreign Long-term Debt	5,503	7,626
Domestic Long-term Debt	24,857	19,001
Total Long-term Debt	30,360	26,627
Other Liabilities:		
Dividends Payable	0	41,102
Suppliers & Other Creditors	387	183
Other Credit Accounts	18,139	20,986
Total Other Liabilities	18,526	62,271
Total Capital & Liabilities	739,789	808,984

Once yearly, HCCDEP prepares combined financial statements as part of its financial report, as required by the Arab Investment Bank. Inter-company receivables and payables are not eliminated in these financial statements. Consequently, the statements do not constitute the type of consolidated financial statements required for companies and their majority-owned subsidiaries in the US and most European nations. The income statement presented below was obtained from other sources; the Balance Sheet is from HCCDEP's annual report. Certain accounts have been re-classified or combined from those presented by HCCDEP in its annual report.

9.1.3 Electric Distribution Companies (EDCOs):
Income Statement
June 30, 1991 and June 30, 1992

	1992 (in L.E. 000)	
Operating Revenue:		
Sales of Electricity	2,750,351	
Other		317,271
Total Operating Revenue	3,067,622	
Operating Expenses:		
Purchased Power	1,989,016	
Wages	325,948	
Materials	272,600	
Services	56,456	
Depreciation	74,388	
Taxes	13,348	
Interest	49,837	
Rent		246
Total Operating Expenses	2,781,783	
Operating Profit	285,783	
Non-operating Expenses, Net of Non-operating Revenue	138,360	
Net Income	147,423	

This Statement of Income does not include imputed interest of L.E. 321,894,000 or imputed rent of L.E. 2,527,000 which are recorded in the accounts as both income and expense, having no effect on net income. This procedure was discussed in Volume I of this report.

9.1.4 The Holding Company for Construction and Distribution of Electric Power, and EDCOs:
Combined Balance Sheet
June 30, 1991 and June 30, 1992

	1991 (in L.E. 000)
ASSETS	
Fixed Assets:	
Land	4,263
Buildings	64,131
Machinery & Equipment	1,544,235
Transportation Equipment	47,453
Instruments & Tools	32,570
Furniture & Office Equipment	22,737
Total Fixed Assets in Service	1,715,389
Accumulated Depreciation	540,276
Work in Progress	117,163
Total Net Fixed Assets	1,292,276
Investments	5,223
Long-term Receivables	18,774
Current Assets:	
Cash	138,640
Customer Receivables, Net	1,853,459
Other Receivables	148,327
Inventories	469,578
Other Debit Accounts	45,791
Total Current Assets	2,655,795
Total Assets	3,972,068
CAPITAL & LIABILITIES	
Capital & Reserves:	
Capital	770,306
Reserves	127,639
Retained Net Income (Deficit)	(17,202)
Total Capital & Reserves	880,743
Long-term Debt	362,943
Other Liabilities:	
Obligations to Banks	31,782
Suppliers	869,609
Other Debtor Accounts	1,826,991
Total Other Liabilities	2,728,382
Total Capital & Liabilities	3,972,068

9.1.4.1 Fixed Assets

The fixed assets of the eight distribution companies as of June 30, 1990 through 1992 are summarized in the following table.

TABLE 9-1
TOTAL FIXED ASSETS FOR EACH EDCO

Distribution Company	1990 (in L.E. 000)	1991 (in L.E. 000)	1992 (in L.E. 000)
Cairo	264,299	295,980	354,589
Alexandria	179,097	201,449	216,437
Canal	174,562	194,373	213,506
North Delta	181,077	204,866	228,930
South Delta	170,632	200,317	215,785
Beheira	56,971	64,142	87,516
North Upper Egypt	149,214	179,481	221,972
South Upper Egypt	146,508	144,889	175,332
Totals	1,322,360	1,485,497	1,714,067

Fixed asset records are maintained, and depreciation is recorded in accordance with the Egyptian Unified System of Accounts. The average depreciation rate for the distribution companies in 1992 was 4.66%. This is comparable to rates for distribution facilities of investor-owned utilities in the United States.

In 1991 and 1992, the foreign long-term debt portion was revolved after the decline in the exchange rate value of the pound against most major foreign currencies. Consequently, the repayment of long-term debt payable in foreign currencies will require a greater amount of Egyptian currency than the original book value of the long-term debt. The offsetting entry was to increase the book value of fixed assets which were financed by such foreign long-term debt. However, this item is less important at the HCCDEP and EDCOs than at EEA, because the foreign debt and fixed asset balances are much smaller than their counterparts at EEA.

In addition, under the Egyptian Uniform System of Accounts (EUSA), EDCOs continue to depreciate assets at 50% of the normal rate after they are fully depreciated. This appears to be an attempt to approximate what is commonly called Replacement Cost Depreciation, and is intended to provide sufficient funds to permit the replacement costs of retired assets of current prices. The method mandated by EUSA does not achieve that goal. For example, even in a time of rapidly increasing prices, no additional depreciation would be recorded if none of the fixed assets had become fully depreciated. Conversely, even if prices had not increased significantly, the additional depreciation would still be recorded when fixed assets reached their expected life.

9.1.4.2 Other Balance Sheet Items

Customer accounts receivable, net of the provision for uncollectible accounts, was 54.5% of annual operating revenue at June 30, 1991 and had increased to 60.4% at June 30, 1992. On average, therefore, the equivalent of over seven months revenue was uncollected as of June 30, 1992.

The capital structure of the distribution companies is much more acceptable than that of EEA. With capital and reserves of L.E. 880,743,000 and long-term debt of L.E. 362,943,000, the equity ratio is 70.8% of total capitalization.

9.1.4.3 Trends in Operating Expenses

Trends in wages and in materials and services expense are reflected in the following tables for the years ended June 30, 1989 through 1992:

TABLE 9-2
TREND IN OPERATING EXPENSES

	1989	1990	1991	1992	Average % Increase
Wages (in L.E. 000)					
Cairo	55,357	64,027	84,698	107,557	24.8%
Canal	18,211	22,099	27,290	34,752	24.0%
North Delta	11,715	14,115	17,320	23,243	25.7%
South Delta	15,272	18,847	25,784	30,166	25.5%
Beheira	9,207	11,270	14,208	18,375	25.9%
N. Upper Egypt	14,884	17,946	20,045	26,368	21.0%
S. Upper Egypt	16,687	21,365	22,468	28,239	19.2%
Total	166,162	204,729	253,948	325,948	25.2%
Materials & Services (in L.E. 000)					
Cairo	95,929	103,282	140,407	155,023	17.3%
Alexandria	21,286	31,522	31,976	30,203	12.4%
Canal	24,115	38,389	40,555	46,644	24.6%
North Delta	6,843	11,494	10,859	18,232	38.6%
South Delta	8,213	10,758	14,938	18,818	31.8%
Beheira	8,537	10,892	11,213	16,088	23.5%
N. Upper Egypt	15,684	13,285	17,299	24,050	14.9%
S. Upper Egypt	14,643	17,331	15,824	19,998	10.9%
Total	195,430	236,953	283,071	329,056	19.0%

The average percentage increases over this period of 25.2% for wages and 19.0% for materials and services are significantly less than the average increase in operating revenues of 38.3%. This can be attributed to the program designed to increase tariffs to curtail demand and make the distribution companies more self-sufficient.

The average increases also compare favorably with inflation in Egypt for this three-year period's 18.8% as measured by the wholesale price index, and 19.0% as measured by the consumer price index.

The following table shows annual increases in wage and materials an services expenses compared to increases which might be expected when growth in kilowatt hour sales and increase in the consumer price index are considered:

TABLE 9-3 KEY GROWTH RATES				
	1990	1991	1992	Average
Growth in KWh Sales	6.5%	6.7%	4.7%	6.0%
Growth in Consumer Price Index	21.3%	14.7%	21.1%	19.0%
Expected Growth in Operating Expenses[1]	29.2%	22.4%	26.8%	26.1%
Growth in Wages	23.2%	24.0%	28.4%	25.2%
Growth in Material & Services Expenses	21.2%	19.5%	16.2%	19.0%

9.1.4.4 Internal Cash Flow

The EDCO's internal cash generation for the year ended June 30, 1992 was much improved over prior years -- primarily as a result of tariff increases.

Internal cash generation was L.E. 221,811,000 (net income of L.E. 147,423,000 plus depreciation of L.E. 74,388,000). This was 80.7% of construction expenditures of L.E. 274,973,000 (increase in fixed assets in service of L.E. 228,570,000 and increase in work in progress of L.E. 46,403,000).

9.1.5 South Delta Distribution Company

The South Delta Distribution Co. was chosen as representative for financial statements for the EDCOs in general. Its Statement of Income & Balance Sheet for June 30, 1992 is shown below:

[1] Growth in KWH Sales multiplied by Growth in CPI.

9.1.5.1 South Delta Distribution Company:
Statement of Income
June 30, 1991 and June 30, 1992

	1992 (in L.E. 000)
Operating Revenue:	
Sales of Electricity	199,563
Other	18,491
Total Operating Revenue	218,054
Operating Expenses:	
Purchased Power	125,946
Wages	30,166
Materials	15,521
Services	3,296
Depreciation	8,180
Taxes	3,440
Interest	5,565
Rent	11
Total Operating Expenses	192,125
Operating Profit	25,927
Non-operating Expenses, Net of Non-operating Revenue	3,459
Net Income	29,386

This Statement of Income does not include imputed interest of L.E. 32,836,000 or imputed rent of L.E. 169,000 which are recorded in the accounts as both income and expense, having no effect on net income. This procedure was discussed in Chapter 11 of Volume I.

9.1.5.2 South Delta Distribution Company:
Statement of Income
June 30, 1992

	1992 (in L.E. 000)
ASSETS	
Fixed Assets:	
Land	1,043
Buildings	4,755
Machinery & Equipment	203,375
Transportation Equipment	3,254
Instruments & Tools	2,162
Furniture & Office Equipment	1,196
Total Fixed Assets in Service	215,785
Accumulated Depreciation	61,471
Work in Progress	7,815
Total Net Fixed Assets	162,129
Investments	650
Current Assets:	
Cash	11,464
Customer Receivables, Net	128,920
Other Receivables	16
Inventories	30,818
Other Debit Accounts	5,292
Total Current Assets	176,510
Total Assets	339,289
CAPITAL & LIABILITIES	
Capital & Reserves:	
Capital	117,202
Reserves & Provisions	4,920
Total Capital & Reserves	122,122
Long-term Debt	11,486
Other Liabilities:	
Suppliers	36,638
Other Debtor Accounts	169,043
Total Other Liabilities	205,681
Total Capital & Liabilities	339,289

9.2 OTHER AREAS SIMILAR TO EEA

Like EEA, the Holding Company for Distribution and the EDCOs maintain their accounts in accordance with the Egyptian Unified System of Accounts.

The following comments included in Volume I of this report regarding EEA are also applicable to the EDCOs:

1. Examining depreciation rates and the need for depreciation studies.

2. Essentially, all accounting records are maintained manually, and significant benefits could be achieved from the carefully designed, phased implementation of an automated system.

3. Annual budgets and five-year projections should be prepared each year with input originating at the lowest departmental level. These budgets should be used to promote and enforce accountability among departmental managers.

9.3 SUMMARY OF RECOMMENDATIONS

Our recommendations regarding the accounting systems of the Egyptian Electricity Distribution System are summarized in the following paragraphs, in order of priority.

(a) HCCDEP and EDCOs should adopt a specific plan for the automation of its accounting records. Automation should be implemented in phases, in parallel with the manual system before each phase is finalized. The design of the system should take place with substantial managerial and prospective user the distribution sector. The Holding Company indicated that a study has been conducted to implement such a plan. However, due to lack of funding, it was postponed.

(b) Even though HCCDEP indicated that it is in the process of compiling an annual budget, each EDCO should prepare annual budgets after guidelines and goals are provided by upper management, beginning at the lowest departmental level. Departmental budgets should contain a level of detail manageable by the department head. Department heads should be provided periodic reports comparing budget to actual performance, and be held accountable for the department achievement relative to the goals set by upper management. Five-year projections should also be prepared each year to plan cash flow, revenue, and financing requirements.

(c) HCCDEP and the EDCOs should conduct a depreciation study to establish depreciation rates more in keeping with the economic consumption of the fixed asset costs.

(d) HCCDEP and the EDCOs should discontinue recording depreciation at 50% of the normal rate after the fixed asset has been fully depreciated. This method does not achieve the stated goal.

10 PROPERTY RECORDS, MAPPING AND ACCOUNTING FOR ADDITIONS AND RETIREMENTS

The first seven Sections of this chapter contain a general explanation of why well-maintained property records, mapping, and consistent accounting practices are essential to the commercial operation of a utility. The purpose of this explanation is to outline the advantages of some administrative tools that are not well known in Egypt.

Drawings or maps displaying the topographical layout of electric systems are one of the essential tools for expansion planning, operation, and maintenance of the grids. Property records also allow the planners and operators to make informed decisions. Property records can easily be extended to include accounting data, which are eventually used to measure the financial performance of the utility.

Relatively simple administrative systems can greatly simplify the up-keep and reliability of the databases. These administrative systems would automatically update data in the electric systems through the normal flow of documents such as work orders.

GLOSSARY OF TERMS

AM (Automatic Mapping)
The process whereby the utility's maps are updated through the administrative procedures used to carry out construction and maintenance work.

Capitalization
When an expenditure is recorded in an asset account and is deferred as an expense through depreciation.

CPR (Continuous Property Records)
The data bases that record the cost, description, quantity and vintage of the assets.

Expensed
The process of charging an expenditure, as an expense, to the current operations.

FM (Facilities Management)
The process whereby the descriptions and costs of the assets of a utility are updated through the administrative procedures used to carry out construction and maintenance work.

Uniform Code of Accounts
A classification and description of the contents of the accounts of a utility. It must also contain instructions of how to handle expenditures and revenues. All utilities must use the same code.

Unit of Construction
A well-defined set of components which make up a unique assembly to be used in the construction or retirement of assets. only complete units of construction can be capitalized or retired.

Work Order
The administrative process used to define, authorize, budget, carry out and collect expenditures for any work to be performed.

Expense the Expenditure
The net profit for the year will be smaller by the amount of the expenditure (net of taxes). Assets will be unchanged. In subsequent years the profit will not be affected by the expenditure.

Expenditure is Capitalized
The net profit for the year will not be affected by the expenditure (except for tax credits, if available). The asset base will be increased by the amount of the expenditure. In subsequent years the profit will be reduced by the depreciation expense corresponding to the original expenditure. The asset base is decreased every year by the amount of the depreciation expense. Taxes will not be the same as in the "expensed" example.

The automatic integration of property records, operating and maintenance expenditures, and construction costs requires the establishment of uniform standards and procedures. This would insure consistent results which can be properly interpreted by all concerned parties. Under such

a system, operation, maintenance, and construction functions must be the deciding factors in keeping account of costs. It is therefore essential that the personnel performing the above functions be trained to recognize the source of such costs, and also to understand how their decisions will affect the financial operation of the utility.

The Cairo EDCO has embarked on a program to computerize mapping of its Medium Tension (MT) feeders.

10.1 THE INTERFACE BETWEEN TECHNICAL AND ACCOUNTING FUNCTIONS

Any enterprise has two basic choices of how to record the expenditures it has incurred:

- It may choose to "expense" it, meaning that the expenditure is recorded as an expense in the current accounting period; or

- It may choose to "capitalize" it, meaning that the expenditure is recorded as an asset, and is expensed every subsequent year through the mechanism of depreciation. This amounts to spreading relatively large expenditure over several payments.

"Prepaid and deferred expenses" can be considered as provisions (reserves) to record expenditures before (or after) the actual expense is charged to an accounting period. For most utilities, prepaid and deferred expenses are usually a relatively small part of the total expenditures. When an expenditure is capitalized, it increases the asset base of the utility, and therefore also changes the rate of return. This consideration is important when the utility's return is regulated and is based on the net assets.

Because the decision as to whether or not to "expense" or "capitalize" an expenditure directly affects a company's net profit, it is extremely important to establish rules to insure consistency in the calculation of financial results.

10.2 THE IMPORTANCE OF PROPERTY RECORDS

Since the asset base is usually the standard against which the utility's rate of return is measured, it is important that:

i) it reflects accurately what the assets are, and
ii) it provides easy means to assign to the assets their fair value.

Administrative systems must also exist to update the records, including all additions and retirements. To assure the consistency of the results, it is also essential that there be a widespread awareness of whether expenditures should be capitalized or expensed.

10.3 MAPPING

The maps may have a multitude of types, scales, and details of their contents. Often there are lists (computerized or not) which complement the information shown on the maps.

Most distribution utilities have at least maps on which they have superimposed the routes of the medium tension (MT) lines. There is no limit to the amount of detail that can be shown on these maps. Some utilities have maps for the Low Tension (LT) lines and may go as far as displaying the customers' service drops. The scale of these maps varies depending on the density of customers.

Many utilities tie their maps to the areas' geodetic coordinates and number their fixed installations in accordance with a set of well-defined related coordinates. Further, maps may be produced on a variety of media, from drafting paper to computerized graphics.

10.4 STATE OF THE ART STATUS OF PROPERTY RECORDS

We define Continuous Property Records (CPR) as the accumulation and updating of data pertaining to the physical characteristics, location, age (vintage) and cost of the installations, equipment, real estate and intangibles that belong to each of the EDCOs.

Traditionally these records are divided into two categories: technical and financial and little effort is made to integrate them. The advent of inexpensive power computers and database management software brought about a movement towards computerizing and integrating the continuous property records with mapping. Furthermore, numerous utilities already implemented, or are in the process of implementing, the so called am/fm (automatic mapping/facilities management) systems.

It is not necessary to implement both the "am" and "fm" systems simultaneously. Many utilities started with the "am" portion (for example Kenya and Tanzania have nearly completed implementing such programs) and are planning to extend it to include "fm". Since the justification for the "fm" portion depends on the actual need to know the real value of the utility's assets, adoption of these systems depends on the regulatory requirements and the prior organization of the accounting records.

In order for am/fm systems to operate, it is essential that the following prerequisites are met:

- A uniform code of accounts specifically for Utility Accounting must exist. This code is not merely a listing of accounts and a description of the types of costs that must be recorded in each of them, but is also a comprehensive set of instructions as to how these costs are to be dealt with (whether they are to be expensed or capitalized).

- An effective work order system must exist. It must be capable of recognizing and recording expenditures incurred in accordance with the above uniform code of accounts.

10.5 TYPES OF MEASUREMENT OF RETURN AND THE ASSOCIATED PROPERTY RECORDS

There are several ways to measure the return of a distribution utility, depending on the regulatory climate or how possible negotiations for the purchase of a utility may proceed. Some of the significant methods to measure return are:

10.5.1 Return on Rate Base

Rate base reflects the net investment in a utility. The traditional definition is:

Rate Base = (Net Assets) + (Working Capital)

Usually Net Assets are calculated as being the revalued cost of the equipment, installations, real estate, and intangibles less the accumulated depreciation. The accumulated depreciation may be calculated in many ways, but the methods that best reflect the condition of the equipment and installations are: i) revalued depreciation, or ii) observed condition (which takes into account wear and tear, obsolescence, and regulatory actions).

By definition, this method of measuring return requires that the continuous property records be very accurate and updated, and that they contain enough account age (vintage) information to revalue them as needed. The depreciation rates used must reflect the actual life of the equipment.

10.5.2 Return on Equity

The principle is that the return on equity (dividends and appreciation) must be adequate to attract new investors to provide new equity, which would be used to finance the utility's expansion. This method is best suited for countries that have competitive and well developed Stock Markets, subject to stringent regulation. Continuous property records and depreciation calculation must be accurate in order to safeguard the interest of the stockholders

10.5.3 Return on Investment for a Purchase

This approach applies to those cases when a private investor is interested in purchasing an operating utility and the same tariffs apply throughout the area or country - this is equivalent to a private investor purchasing of one of the EDCOs. Since the revenue is

fixed by the existing tariffs, the investor will be willing to purchase the EDCO at a price that will provide a return that is considered adequate for his investment and risk. The price offered is not related to the value of the assets. In this case, there is no absolute need of keeping CPRs. However, the seller would be in a much better position to negotiate if he can prove the value of the assets being sold.

Thus, accurate CPRs would be a required management tool if some of the most usual methods of measuring return are used. CPR would not be essential, but would be advantageous to have, if another method of measuring return were used.

10.6 DETAILS TO BE CONTAINED IN THE CONTINUOUS PROPERTY RECORDS

Some of the desirable features to be included in CPR systems are:

10.6.1 Classification of Accounts

A classification of accounts should be designed to have accounts for equipment or installations which can be easily recognized. In turn, each account contains clearly defined "units of construction" and "units of retirement" which reflect the way additions or retirements are constructed or carried out. Thus, the decision of which account is to be used in capitalizing an expenditure should be left to the people working in the field, who are more familiar with the details of the work itself.

10.6.2 Instructions

Instructions of how to differentiate between items to be expensed and capitalized.

10.6.3 Vintages

Means to maintain, within one account, the years in which each addition was made and on which retirement considerations will take place.

10.7 UNIFORM CODES OF ACCOUNTS

There are many codes of accounts suitable for utility use. The portions of these codes dealing with assets have similar characteristics, but their emphasis are directed primarily to:

- Recording the information about the expenditures to be capitalized into the CPR and, secondarily, maintain the records by profit center, or
- Recording the information by profit center, and, secondarily, customize the gathering of data for the continuous property records.

The Unified Code of Accounts originally issued by the U.S. Federal Power Commission (FPC) (now Federal Energy Regulatory Commission (FERC)) is one of the most comprehensive statements for utilities' accounting. However, it is difficult to apply because it requires that the expenditures be broken into numerous categories. Furthermore, since it was originally written in the early 30's, it is not feasible to modify it to take into account new technological developments and data processing, without affecting many existing users. However, this code served as the inspiration of other recent codes, which have been accepted by some developing countries. These countries have adopted, simplified, and modernized their code, since they were not under the constrains of adversely affecting the existing utilities' accounts.

10.8 MAPPING SYSTEMS USED BY THE EDCOs

Our understanding of the mapping systems used by the EDCOs is based on inspection tours of two of them: Cairo and South Delta. It is expected that the systems used by the other EDCOs differ considerably in detail.

10.8.1 Cairo

The distribution system is composed principally of directly buried Medium Tension (MT) and Low Tension (LT) cables and their associated transformers and service risers. There are scale drawings of the layout (single line since all cables are three phase) of both the MT and LT networks. These drawings are incorporated in books which are easily transportable. The drawings contain grids to tie them to topographic coordinates and follow conventional standards for their numbering and filing. The MT system is being incorporated into a computerized Geographic Information System (GIS) which, in addition to showing the main topographical features, contains the information on the cables and transformers. The latter information is contained in a database. There are no immediate plans to incorporate the LT systems in the computerized GIS. The software for this system was developed locally.

The maps are updated through a formalized work order procedure where the field crews report (including sketches) the main features of the work they performed. We could not identify any costing data being included with these work orders.

The database (which uses the ADABAS Database Management System) also contains information on the splices in the cables, which were placed through maintenance work, when the conductors failed in operation. Maintenance and construction personnel rely on the maps to guide them through their work.

Presently each District office has its own independent computer system and there are on-going plans to tie all the offices through a telephone Local Area Network (LAN).

10.8.2 South Delta

The distribution system is composed principally of overhead MT and LT lines and their associated transformers and service drops. There are very few drawings, in approximate scale, showing the main topographic features and the single line layout of the MT conductors. The transformers are also shown on the drawings.

The maps are updated through an informal exchange of information between the drafting group and the filed crews. The drawings are not drawn, identified, or numbered in accordance with accepted engineering practices. There is no assurance that all field work is reported.

10.9 WORK ORDER SYSTEM

10.9.1 Cairo

There is a rudimentary work order system which maintains cards that accumulate the technical information pertaining to work performed on the distribution system. This information was previously stored on cards, but now, the data pertaining to the MT system is being computerized. No evidence was found of costs pertaining to work orders being stored.

10.9.2 South Delta

The Company is implementing a work order system which i) describes the work, ii) produces a budget, iii) authorizes the expenditure, iv) collects all pertinent costs, and v) summarizes the costs. The system is manual and is not linked to the stores' (inventory) data, so it does not necessarily obtain trustworthy costing information. Since it is not being computerized, there are no means to sort the information to conform with an established system of accounts.

10.10 CLASSIFICATION OF EXPENDITURES

Since there is no uniform code of accounts, the interpretation of what represents capitalization is up to the individuals that do the accounting. Thus there is no assurance that the accounting data correctly represent the financial status of the Company. An accumulation of inappropriate practices may result in large distortions of interpretations, especially when attempting to calculate the return on investment.

One of the best methods of classifying expenditures is to establish **units of construction**. The units of construction should be designed to reflect the way installations are built or retired. By definition, a **complete** unit of construction is the only assembly that can be capitalized or retired. Any work involving less than a unit of construction must be expensed. It should be pointed out that the establishment of a unit of construction requires many subjective considerations and,

therefore, it would be unfair to state that the corresponding definition is right or wrong: the point that must be established is that its use will result in consistent reporting.

Assumptions		
Asset original value		1,000
Straight Line Yearly Depreciation Expense	100	
Asset remains in service until end of year	4	
Assets is in stores until end of year	6	
Calculations as Performed by Distribution Company		
Net Deprec. value at end of year 4 (1000-4x100)		600
Value of asset when entered in stores		600
Depreciation during period in stores	0	
Asset value when installed at end of year 6	600	
Straight Line Yearly Depreciation Expense	60	

Comments

- The asset should be depreciated even when not in use (in stores)
- The depreciation expense should be based on the original cost of the asset, not the net cost when placed in storage
- The asset should remain in a property (asset) account as long as it is in a condition of being used usefully

We detected some unusual accounting interpretations, especially regarding retirements and change-over of equipment. When we asked about the procedure followed when an asset was destroyed before being fully depreciated, and thus had to be retired, the answer was: "why worry - it has not happened yet". In the box above, we describe the general procedure followed when a movable asset (such as a transformer) is replaced by another similar asset and is placed in stock, until it is used again.

It should be noted that the asset is not depreciated while it is in stock. This is not realistic. Since depreciation is the result of deferring an expense during the useful life of the asset, which is still being reduced by many factors (obsolescence, corrosion, shelf life aging) that are present even when the device is not in use.

Additionally, the yearly depreciation expense is 1,000 before the asset is placed in the stores, and 600 after it is installed again. This contradicts the stated principle that the method to be used is based on linear depreciation.

It is recommended that a uniform code of accounts that clearly defines the procedures to be followed in handling returns of assets to inventory be designed.

10.11 ADOPTION OF A REALISTIC CODE OF ACCOUNTS

While a well designed uniform code of accounts is an essential management tool for the consistent evaluation of results and the well-informed introduction of improvements, it would be very difficult to quantize the benefits that would be derived from its adoption by the EDCOs.

Almost universally, a uniform code of accounts is a prerequisite to a fair regulatory process because it allows the performance comparison of similar enterprises which, by their nature, are a quasi-monopoly (as the case would be if the EDCOs are to be privatized.)

Consequently, it is recommended that a suitable code of accounts and its related instructions and practices be adopted by all the EDCOs within one year, and that their accounting be maintained in accordance with this code, subsequent to its adoption.

It is also recommend that an intensive training program be carried out among the management, accounting, financial, and engineering functions of the Companies to instruct their staff in the actual use of the code and in how its implementation will result in an effective management tool.

10.12 ADOPTION OF MAPPING AND FACILITIES MANAGEMENT PROCEDURES

The benefits to be derived from a good mapping system are difficult to quantize. As a rough approximation, it could be said that 5 -10 % of the time expended by maintenance crews could be saved if they had available proper maps and records to identify the work to be done. Planning and design time could be reduced to less than half by the presence of good maps.

System studies (expansion, losses, voltage drops) are now performed as separate special studies, which are no longer up-to-date the moment they are finished. The cost of these studies can total several hundred thousand of Egyptian pounds.

An EDCO could install, with an approximate cost of US$ 60 - 70,000, a complete system for am which could also carry out system studies. Approximately one third of this cost would be taken up by computer and plotting equipment, and the rest would be software. Additional sets of software for other EDCOs could be licensed for less than the first set, but it should not be expected that there would be substantial savings in the computer equipment. The am system could be extended, with only the acquisition of a compatible Database Management System, to perform fm duties.

It is not known if the Geographic Information System (GIS) recently implemented by the Cairo EDCO is compatible with existing am systems software, but there should not be too much difficulty in fitting it to these commercial systems. Since fm systems operate only if both the Uniform System of Accounts and the Work Order system are working, it is important to improve these systems before implementing the fm systems.

Thus, it is recommended that: i) an AM system be implemented in at least one EDCO; and ii) an investigation be carried out to determine what steps must be taken to implement an am system at the Cairo EDCO (using the existing GIS and MT cable databases).

10.13 ADOPTION OF WORK ORDER SYSTEM

The Work Order system that is being implemented in some of the EDCOs will be a formidable tool in conditioning the staff to the principles involved. However, the system has been designed mainly for manual operation, and thus should be expanded to use computers that consult a database of units of construction and the materials records in the inventory accounts.

Prior to computerizing the Work Orders system it is essential that the following steps be completed:

- Design and establish units of construction for the most common additions to and retirements from the distribution systems.

- Establish a coding system to identify the materials and supplies that would make up the respective inventories (stores). The corresponding codes should be part of the units of construction descriptions.

It is recommended that the EDCOs start immediately in defining standard designs (units of construction) for the distribution systems and establish a coding system to identify each of the components used in these units.

It is also suggested that six months prior to the scheduled termination of the design of the units of construction and the establishment of the coding for materials, the EDCOs start modifying the Work Order system to make it compatible with computerization.

10.14 SUMMARY OF RECOMMENDATIONS

a) Design of a uniform code of accounts that clearly defines the procedures to be followed in handling returns of assets to inventory.

b) An intensive training program should be carried out among the management, accounting, financial, and engineering functions of the EDCOs to instruct their staff in the actual use of the code.

c) An am system should be implemented in at least one EDCO; and i) an investigation should be carried out to determine what steps must be taken to implement an am system at the Cairo EDCO (using the existing GIS and MT cable data base).

d) EDCOs should start immediately in defining standard designs (units of construction) for the distribution systems and establish a coding system to identify each of the components used in the units of construction.

e) EDCOs should start modifying the Work Order system to make it compatible and applicable for computerization.

11 BUSINESS PLAN

After reviewing a representative group of distribution companies and their legal, human management, technical, and financial aspects and having formulated various recommendations; we strongly recommend that each distribution company establish a Business Plan and consider it as a key element in the commercialization process. This portion of the planning process must be integrated with the financial and human resources that will be required to maintain and augment the physical system. At the managerial level, the purpose of the Business Plan is to define incremental improvements in the organization, maintenance and efficiency of the system, while continually striving to lower maintenance costs, and improve service.

A business plan will require early agreement on the definition of the Enterprise Mission Statement as well as on the first year's major objectives. As an example, the mission of the enterprise, in this case an Electric Distribution Company (EDCO) may be "to be responsible for providing reliable electric service to all who desire it within our area at the lowest reasonable cost". One of the associated objectives may be "to have a reliability of 99.8% measured at the residential level". However, regardless of the specifics, appropriate agreements and overall managerial direction will have to be in place in order to define the pace and direction of the desired development of EDCOs. These matters will concern GOE as well as the EDCOs and will evolve over time.

The business plan outline (Figure 11-1) and the associated business plan development process suggested herein can act as a guide for the development of the EDCO's business plan. These figures envision a process that anticipates adoption of the recommendations contained in the report. The development of the EDCO's business plan will evolve and change each year because it requires a great deal of interaction and communication internal to the EDCOs as well as with other EEA and other GOE entities. This process itself is almost as important as the product.

11.1 DISCUSSION AND BACKGROUND FOR DEVELOPING A BUSINESS PLAN

EEA and the Distribution Companies have been successful in electrifying over 95% of Egypt. The basic system is reliable and of recent design. Senior managers and officials are clearly dedicated to maintaining a reliable supply of electricity to the country.

Having accomplished pervasive electrification, the challenge is to develop the most efficient delivery of service. The term "efficiency" implies least cost delivery, resulting ultimately in electric supply service which is as competitive as possible.

The term "service" implies providing the power and energy required by customers in a manner satisfactory to the customers at a price which accurately reflects the cost of providing the electricity.

Whether or not privatization occurs, the new organization of the EDCOs compels them to be run on a commercially sound, self-supporting basis without receiving or providing subsidies to other sectors. The business plan process described herein will explain what processes are required to achieve self-sustained, or "enterprise" operations.

11.2 SPECIFIC CONSIDERATIONS FOR THE FIRST YEAR BUSINESS PLAN

- The overall objectives of self sufficiency and competitiveness should be agreed upon within the GOE and the Holding Company. In other words, the EDCOs' mission statement should be subject to approval at the highest levels through the General Assembly of shareholders.

- Government related issues need to be studied, considered and resolved. Among these issues are transfer pricing from EEA to the EDCOs customer redress.

- The establishment of timing and methods for financing programs to reduce overemployment and retraining.

- Clarification of managerial authority to allow efficient, independent management subject to market and regulatory constraints.

- The provision of incentives to the work force and to managers to promote results-oriented attitudes and customer-oriented service.

- The creation of conditions which will help to assure the commercial success of the enterprise, including the authority to collect its revenues from <u>all</u> customers.

Figure 11-1

ELECTRIC DISTRIBUTION COMPANIES SUGGESTED BUSINESS PLAN OUTLINE

Table of Contents

- **Mission Statement of EDCO and Overall Objectives During Plan Period**

- **Industry Overview, Review of Current EDCO Status:**

  - Discussion of the Business Environment;
  - Government Policy Environment and;
  - Macro economic situation
  - EDCO Organizational Chart
  - Review of Prior and Ongoing Goals and Objectives

- **Chairman's Letter to the Board of Directors** (an Executive Summary of the Business Plan and his personal comments)

- **Major Goals and Objectives**
  - Forecast Peak Load and Energy Sales
  - Financial Targets
  - Personnel
  - Performance Compensation
  - Policy Analysis and Decisions
    - * Training Academy
    - * Demand Side Management
    - * Load Shaping Programs
    - * Tariffs
      - ° Electric Distribution Companies
      - ° EHV Customers
      - ° HV Customers
  - -Decision Criteria
    - * Least Cost Expansion Investment
    - * Reliability
    - * Others
  - Financial Planning
    - * Capital Investment Plan
    - * Sources of Financing
    - * Operating Statement
    - * Cash Flow
    - * Balance Sheet
  - Research and Development

- **Executive Summary of System Plans**
  - Sources of Energy
  - Transmission
  - Customer service
  - Others

- **Financial Model Results** (1 year actual; 3-5 Year Projections)
  - Base Plan
  - Downside Scenario
  - Upside Scenario

11.3 THE BUSINESS PLANNING PROCESS

The business plan document is the result of an extensive planning effort conducted throughout the organization. While the majority of the planning effort will develop from the bottom of the organization, it is very important that the mission statements, goals and objectives first be developed by the very top levels of management. After this top managerial task in concluded, mission objectives will be relayed to the next level down, who will use them to develop objectives for their respective areas of responsibility. This process should be continued through successive reporting levels down to the level of the first line supervisors.

It must be stressed that the goals and objectives of each level of management must support the goals and objectives of the organization as a whole, as well as the goals and objectives of the next higher level of management. By following this process managers take responsibility for their contribution to the success of the organization. This constitutes an important step in increasing accountability. The goals and objectives established by any manager (in conjunction with his immediate supervisor) may also form the basis for that manager's performance evaluation and any performance-based compensation.

As one might expect, this can be a very lengthy process. However, upon its completion, every level of management will become fully aware of its role and responsibilities in the organization's overall mission.

11.4 FUNCTIONAL AREA OPERATIONS AND MAINTENANCE BUDGETS

The individual department budgets must be designed to accomplish the objectives defined by the manager. The budget should consist of all employee expenses (including payroll, travel, training, etc.), department manuals, subscriptions, office and computer supplies, and office equipment. It should also include all standard maintenance expenses which are not part of a specific capital improvement project. All expenses such as document reproduction, floor space, employee overhead expenses (medical, vacation, retirement), and Management Information System (MIS) costs should be allocated or charged directly to the group using the service. This adds to the level of accounting effort, but results in increased control over these expenses.

The individual department budgets will then be consolidated into the next higher level of organizational budgets. At each higher level budget details may be reduced if the manager feels that it is not necessary to track all of the individual expenses that the various departments might identify or wish to track themselves. However, there must be a minimum that is reported in order to satisfy the financial reporting requirements of the financial models.

11.5 FUNCTIONAL AREA CAPITAL IMPROVEMENT BUDGET

This section of the capital improvement is intended for those projects not directly associated with the construction or development of distribution systems (substations, subtransmission lines, etc.) These might include such projects as the development of a new accounting system, the acquisition of new computers, the development of a new financial reporting system, or the construction of a new office building. Essentially, these are projects that also create an asset. The development of this budget must be coordinated with the development of the Operations and Maintenance budget. For example, when an employee is scheduled to spend time working on the development of a new computer software system, it will be necessary to remove that employee's payroll expenses from the operations budget and apply it to the project budget to avoid double counting the employee's wages. This applies to all other department expenses to ensure that the true cost of the project is being accounted for.

As with the operation and maintenance budget, the level of budget detail reported is up to management. For capital projects, it can include as little as the annual cash construction requirements along with an in-service date and an expected depreciation life, or it can provide full revenue calculation for each project. These revenue calculations should represent the amounts saved or generated by the implementation of the project being budgeted over a reasonable period of time. These revenue calculations should justify the inclusion of the project's expenses in the budget.

11.6 LOAD GROWTH DOCUMENT

Load forecasting activities should be reported in a Load Growth Document. These activities center around an econometrically based model of energy sales, customers, and seasonal peak demands. These should be developed throughout the system and cover all the customers. The details of these activities are beyond the scope of this section. However, we include a brief overview of the process.

The econometric model identifies the relationship between energy use and customer growth. These should be analyzed by geographic areas. Underlying factors affecting market behavior include the price of electricity, the prices of competing sources of energy (fuels), economic activity as measured by employment levels or gross national product, population, climate, etc. Statistical analysis is used to determine the most representative mathematical expression from an empirical data base. Forecasts of energy sales and demand are made by combining forecasted values of the underlying factors with the econometric equations. Peak demands are forecast by customer class and other load factors that are derived from historical load research data. These are developed for each major substation and feeder.

The load growth document provides the system expansion plan with projected load shapes for all major transformer stations, peak demand in kilowatts (kW), and energy consumption patterns in kilowatt hours (kWh). It also provides the rate model with the kWh and kW projections separated by customer class so that the expected revenues can be developed for input to the financial planning process. These inputs are illustrated in Exhibit 5 (The Integrated Planning Loop).

11.7 REVENUE PROJECTIONS

Revenue projections are calculated using a rate model that uses kWh and kW projections by customer class as provided by the load growth document. Revenue projections, in turn, are used to design the financial plan. The rate model takes into account the impact planned rate changes. This model must interact with the financial planning model to receive inputs on revenue requirements and the timing of rate changes. The rate model, in addition to providing revenue information to the financial model, will provide the new projected energy prices for load forecasting so that the impact of prices on load growth projections and energy consumption projections can be determined (Refer to Figure 11-2).

11.8 SYSTEM EXPANSION PLAN

The system expansion plan is probably the most complex portion of the business plan process due to the vast number of alternatives that must be tested and evaluated. While the details of this activity are beyond the scope of this section, an overview is provided for continuity. Figure 11-2 provides an index for a future system expansion plan. In its final form the plan should include the following individual plans:

- System Expansion Plan Project Capital Budget
- 10 Year Energy Resource Origination Plan
- 5 Year Environmental Plan
- 5 Year Operations and Maintenance Systems Plan
- 5 Year Demand Side Management Plan

An example of the planning process required to develop the generation plan is provided in Exhibit 4. Although this process is specific to the generation system the same type of iterative process must be applied to each of the other plans.

The system expansion plan evaluates the various alternative ways to serve the EDCO customers. These alternatives must be reviewed to determine the most cost effective way to delivery service Alternatives must take into account at least the following:

- Refurbishing and upgrading of existing substation;
- Retirement of older installations
- Expansion of existing facilities

After the optimal plan is selected, a complete budget must be developed for each project within each of the identified plans. The project budget data is incorporated into the construction budget, to be integrated with the functional area capital improvement budgets.

Figure 11-2

EDCO: SUGGESTED CONTENTS OF THE SYSTEM EXPANSION PLAN

- **Introduction**

- **Objectives**

- **Forecast**
  - Forecast Approach
  - Outlook
  - Power Demand and Energy Sales by geographic areas
  - Ten Year Forecast
  - Forecast Scenarios (Base, High, Low)
  - Methods

- **Figure/Tables**
  - EDCO System Peak Demand by Geographic Area
  - EDCO Projected System Peak Demand Scenario
  - EDCO Projected Energy Requirements Scenario

- **Technology Screening**
  * Methodology
  * Results

- **Purchased Energy**
  * EEA
  * Cogeneration and Small Power Production

- **Demand Side Management**

- **Integration of Alternatives**
  * General EDCO system Overview
  * General Operating and Planning Philosophy
  * System Requirements and Capabilities in Different Geographic Areas
  * 1993 System Performance Discussion

- **Figure/Tables**
  - System Load (High/Low & Planning Load Forecast)
  - EDCO Load & Resources Projection:
  - Minimum and Maximum Energy Needs:
    Resources Available for Sales

- **Figures/Table**
  - KV System Map
  - KV Requirements and Capability Curves
  - Projected EDCO System Peak:
    Summer Requirements
    Winter Requirements

11.9 CONSTRUCTION BUDGET

The construction budget is simply an accumulation of all of the capital expenditures from the System Expansion Plan and the Functional Area Capital Improvement budgets. It is generally treated as a separate document for tracking purposes so that Management and the Board can specifically review and approve selected projects. The data from this budget can be fed into the financial plan at any level of detail desired by the manager.

11.10 FINANCIAL PLAN

The financial plan is the point at which all of the resulting data, generated throughout the business plan process, is brought together and the final test applied. The primary method to develop the financial plan is the Financial Planning Model. This model integrates the required inputs to generate income statements, cash flows and balance sheets. From these reports the financing needs of the organization can be determined as well as the organization's ability to actually meet financing requirements. Various techniques can be used to determine the type of financing that will best fit the plan and how the cost of the financing will affect the overall performance of the organization. The financial analysis will also indicate if the organization can meet the financial targets defined by the lending institutions. If internal cash generation, debt/equity ratios, debt coverage ratios and net income are inadequate, then additional analysis will determine how much additional revenue will be required to trim these indicators to adequate levels. Revenue requirements analysis performed in the rate model will determine if the amount of revenue required is actually achievable and justifiable and additional analysis in the load forecast model will indicate the impact on energy use and future load growth.

11.11 DOES THE PLAN MEET THE STATED OBJECTIVES?

After the Business Plan is completely assembled management must review it, and test it against the objectives that defined at the beginning of the business process. If they have been met, the process has been successful and the plan may go to the Board for final review and approval. If not, then the points of disparity must be determined and discrepancies corrected.

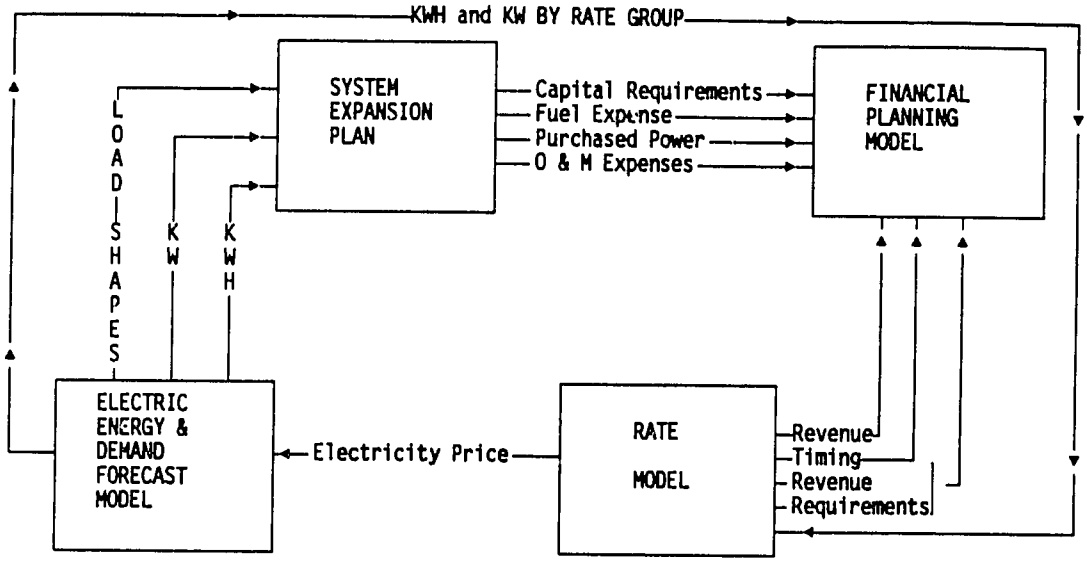
11.12 THE INTEGRATED PLANNING LOOP

The key planning activities associated with the development of the business plan necessitates the consideration and integration of three major issues; Demand, Supply, and Finance. The Integrated Planning Loop illustrated in Figure 11-4 presents graphically the major planning tools and how they are integrated in the business planning process. The loop itself merely consists of a committee of those individuals that either run the associated computer modelling tools or perform the required analysis. They will meet to discuss and coordinate the scenarios that must be analyzed. This greatly improves the quality of the analysis as well as the time required to complete the analytical task. The use of computer models in each of the identified analytical steps enhances the planning process by allowing for a greater number of simulations of potential economic, energy, and financial conditions. Numerous questions concerning the impact of real

or potential changes can be analyzed by use of the models. By judicious analysis of the model results, the impact of various scenarios can be evaluated by management to determine a course of action. The primary models are concerned with load forecasting, supply planning, and financial planning including rate impact assessment. Considerable preparation, data collection, and judgement are necessary to make proper inputs to the models. Considerable experience is also required to properly interpret the information provided by the models. However, by analyzing a greater number of scenarios there is a much greater likelihood that the true least-cost business plan will be developed.

Figure 11-3

INTEGRATED PLANNING LOOP



11.13 SUMMARY OF RECOMMENDATIONS

It is strongly recommended that the different EDCOs start, as soon as possible, to develop a business plan. The first step will consist of a definition of the "Mission" of each EDCO and the financial objectives it wishes to achieve. The whole exercise of the Business Plan will help to focus the attention at levels through the organization on the direction the enterprise is heading and what objectives are to be achieved. It will integrate the efforts of all the departments and become a yardstick to measure the accomplishments of the organization.

APPENDIX A

LAWS AND REGULATIONS OF THE EGYPTIAN POWER SECTOR

SECTIONS A - H

SECTION A

A.R.E. PRESIDENTIAL DECREE NO. 1472 FOR THE YEAR 1964 ESTABLISHING THE EGYPTIAN GENERAL AUTHORITY FOR PRODUCTION AND TRANSFER OF ELECTRICAL ENERGY

HIS EXCELLENCY, THE PRESIDENT

With reference to the Constitution issued on March 25, 1964,

Law No. 60 for the year 1963 issuing The General Authorities Law,

Presidential Decree No. 1301 for the year 1964 forming the Cabinet and establishing the Ministry of Electrical Energy,

Presidential Decree No. 1407 for the year 1964 organizing the industry and Mineral Resources Sector,

And to the National Council,

IT IS HEREBY DECIDED:

ARTICLE 1:

A general authority is to be established and named The Egyptian General Authority for Production and Transfer of Electrical Energy Distribution under the Ministry of Electrical Energy.

ARTICLE 2:

The Authority is to act in a corporate entity basis. The reference Law No. 60 for the year 1963 is applicable to it.

ARTICLE 3:

This Authority is responsible for management, operation and maintenance of the substations, and transfer to the main networks in various parts of Egypt. It is responsible for load transfer between Cairo Zone and east Delta and Mid Delta, Alexandria Zone and West Delta and Upper Egypt Zone.

ARTICLE 4:

The Authority's capital is composed of:

(a) The state equity in capitals of the subsidiary companies, cooperative associations and establishments owned by the Authority and;

(b) The funds allocated by the State to the Authority.

ARTICLE 5:

The Authority's resources are composed of the following:

(a) The net profits of the subsidiary companies, cooperative associations, and establishments owned by the Authority, as well as the Board of Directors members' equity in its controlled subsidiary companies;

(b) The loans it obtains;

(c) The funds allocated to it by the State;

(d) Any other funds resulting from their activities or in return for jobs or services which it renders to the subsidiary companies, cooperative associations, or establishments owned by it.

ARTICLE 6:

His Excellency, the President issues a decree forming the Authority's Board of Directors, which is the highest authority controlling all its affairs and proposing the general policy to be followed. His Excellency may issue whatever necessary decrees to achieve its main goal, especially:

(1) Issue the decrees, internal regulations, and decisions concerning the financial, administrative, and technical affairs of the Authority, regardless of the governmental regulations.

(2) Issue the decrees for appointment of the Authority's employees, their promotion, transfer, termination and fixing their salaries remunerations, and pensions.

(3) Approve the Authority's annual budget.

(4) Study all issues which the Minister or Chairman of the Board may deem as falling within the Authority's specializations and;

(5) Study the periodical progress reports on operation of the Authority and its financial position.

The Board of Directors may form within its members a committee or more to whom some specializations may be delegated. The Board may also delegate to the Chairman or the Head of the Authority some of its specializations. The Board may also delegate one of its members or one of the managers to carry out certain duties.

ARTICLE 7:

The Chairman of the Board manages the affairs of the Authority, represents it in its relations with the other entities, and represents it at the court of law. The Chairman is responsible to His Excellency, the Minister of Electrical Energy for executing the general policy set for achieving the Authority's objectives. He may designate some of his authorities to one or more managers.

ARTICLE 8:

The Board of Directors meets at least once a month with an invitation by the Chairman. His Excellency, Minister of Electrical Energy, may invite the Board to hold a meeting whenever he deems it necessary.

The Board's quorum is correct only if the majority of the members attend. The decisions are issued by majority votes of the attendants. If the voted two sides are equal, the Chairman's side supersedes.

ARTICLE 9:

The Board Secretary records the minutes of the meetings and the text of decrees issued, which are signed by the Chairman and the Secretary of the Board.

ARTICLE 10:

The Authority's Chairman presents the Board's decrees to His Excellency, the Minister of Electrical Energy, for sanctioning them, and present to His Excellency, the President the issues which require issuing a Presidential Decree.

ARTICLE 11:

The general authorities may utilize various methods to achieve their goals, especially:

(a) Establish joint stock companies or cooperative associations solely, with a partner or with other partners. The shares of these companies may be put in circulation with effect from their establishment;

(b) Extend credit to the companies or cooperative associations under its supervision, or guaranteeing them when they take loan agreements, after the companies use up all available credit capabilities;

(c) Acquire shares and stocks of the companies by subscribing or purchasing them, regardless of the period stated before putting the shares and stocks of new companies in circulation and;

(d) Issue letters of guarantee that are as powerful as the letters of guarantee issued by the banks to its subsidiary companies and cooperative associations in all their transactions with others. In such cases, the Authority must stand by its obligations which are committed in such guarantees.

ARTICLE 12:

The Authority Board of Directors may acquire credit from banks, organizations, companies and others in order to achieve its goals.

ARTICLE 13:

The Authority opens an account with the Central Bank, wherein its revenues are directed. It utilizes this account within the funds allocated to it in the Budget.

If this revenue becomes less than the total funds allocated to the Authority in the Budget, the Treasury is responsible to settle the deficit from the National Balance Sheet along the fiscal year in accordance with the regulations set by it thereof.

If this revenue becomes positive, it goes to the National Balance Sheet.

The revenue is the difference between the Authority's resources and its periodical expenses, i.e., total operational expenses and the transferable expenses projected in the budget.

ARTICLE 14:

The Authority's Board of Directors prepares a Balance Sheet and a Profit and Loss Account for every fiscal year. The Board also has to prepare a report on the Authority's activity during the current fiscal year and its financial position at the end of that year.

The fiscal year of the Authority is July 1st through June 30th.

ARTICLE 15:

Without contradicting the inspection of the Central Accounting Authority, the Authority's Board of Directors may appoint one of more persons as Accounts Auditors who fulfill the legal requirements stated in Law No. 133 for the year 1951 for Accountants and Auditors. The Board of Directors fixes the Auditor's fees. The auditor will have the auditor's rights and duties as is valid in the joint stock companies. If there are several auditors, they are jointly responsible.

ARTICLE 16:

His Excellency, Minister of Electrical Energy, has the authority to supervise and guide the Authority. He presents to His Excellency, the President, a report on the Authority's activity at the end of the elapsed year, enclosing therewith a copy of the Board of Director's Annual Report and the Central Accounting Authority's report.

ARTICLE 17:

The Authority may make procedures for direct and administrative sequestration in accordance with the regulations of Law No. 308 for the year 1955 on Administrative Sequestration in order to obtain its rights.

ARTICLE 18:

This Decree is to be published in the Official Gazette.

Issued at the Presidency
8 The El Hegga 1383 - 20 April 1964

Gamal Abdel Nasser

SECTION B

A.R.E. PRESIDENTIAL DECREE NO. 1473 FOR THE YEAR 1964 ESTABLISHING THE EGYPTIAN GENERAL AUTHORITY FOR DISTRIBUTION OF ELECTRICAL ENERGY

HIS EXCELLENCY, THE PRESIDENT

With reference to the Constitution issued on March 25, 1964,

Law No. 60 for the year 1963 issuing The General Authorities Law,

Presidential Decree No. 1301 for the year 1964 forming the Cabinet and establishing the Ministry of Electrical Energy,

Presidential Decree No. 1470 for the year 1964 organizing the industry and Mineral Resources Sector,

And to the National Council,

IT IS HEREBY DECIDED:

ARTICLE 1:

A general authority to be named The Egyptian General Authority for Electrical Energy Distribution under the Ministry of Electrical Energy.

ARTICLE 2:

The Authority has a legal entity. The referred Law No. 60 for the year 1963 is applicable to it.

ARTICLE 3:

This Authority is responsible for distribution of electrical energy and its sales to the consumers in various parts of Egypt.

ARTICLE 4:

The Authority's capital is composed of:

(a) The state equity in capitals of the subsidiary companies, cooperative associations and establishments owned by the Authority and;

(b) The funds allocated by the State to the Authority.

ARTICLE 5:

The Authority's resources are composed of the following:

(a) The net profits of the subsidiary companies, cooperative associations, and establishments owned by the Authority, as well as the Board of Directors members' equity in its controlled subsidiary companies;

(b) The loans it obtains;

(c) The funds allocated to it by the State;

(d) Any other funds resulting from their activities or in return for jobs or services which it renders to the subsidiary companies, cooperative associations, or establishments owned by it.

ARTICLE 6:

His Excellency, The President issues a decree forming the Authority's Board of Directors, which is the highest authority controlling all its affairs and proposing the general policy to be followed. His Excellency may issue whatever necessary decrees to achieve its main goal, especially:

(1) Issue the decrees, internal regulations, and decisions concerning the financial, administrative, and technical affairs of the Authority, regardless of the governmental regulations.

(2) Issue the decrees for appointment of the Authority's employees, their promotion, transfer, termination and fixing their salaries remunerations, and pensions.

(3) Approve the Authority's annual budget.

(4) Study all issues which the Minister or Chairman of the Board may deem as falling within the Authority's specializations and;

(5) Study the periodical progress reports on operation of the Authority and its financial position.

The Board of Directors may form within its members a committee or more to whom some specializations may be delegated. The Board may also delegate to the Chairman or the Head of the Authority some of its specializations. The Board may also delegate one of its members or one of the managers to carry out certain duties.

ARTICLE 7:

The Chairman of the Board manages the affairs of the Authority, represents it in its relations with the other entities, and represents it at the court of law. The Chairman is responsible to His Excellency, the Minister of Electrical Energy for executing the general policy set for achieving the Authority's objectives. He may designate some of his authorities to one or more managers.

ARTICLE 8:

The Board of Directors meets at least once a month with an invitation by the Chairman. His Excellency, Minister of Electrical Energy, may invite the Board to hold a meeting whenever he deems it necessary.

The Board's quorum is correct only if the majority of the members attend. The decisions are issued by majority votes of the attendants. If the voted two sides are equal, the Chairman's side supersedes.

ARTICLE 9:

The Board Secretary records the minutes of the meetings and the text of decrees issued, which are signed by the Chairman and the Secretary of the Board.

ARTICLE 10: .

The Authority's Chairman presents the Board's decrees to His Excellency, the Minister of Electrical Energy, for sanctioning them, and present to His Excellency, the President the issues which require issuing a Presidential Decree.

ARTICLE 11:

The general authorities may utilize various methods to achieve their goals, especially:

(a) Establish joint stock companies or cooperative associations solely, with a partner or with other partners. The shares of these companies may be put in circulation with effect from their establishment;

(b) Extend credit to the companies or cooperative associations under its supervision, or guaranteeing them when they take loan agreements, after the companies use up all available credit capabilities;

(c) Acquire shares and stocks of the companies by subscribing or purchasing them, regardless of the period stated before putting the shares and stocks of new companies in circulation and;

(d) Issue letters of guarantee that are as powerful as the letters of guarantee issued by the banks to its subsidiary companies and cooperative associations in all their transactions with others. In such cases, the Authority must stand by its obligations which are committed in such guarantees.

ARTICLE 12:

The Authority Board of Directors may acquire credit from banks, organizations, companies and others in order to achieve its goals.

ARTICLE 13:

The Authority opens an account with the Central Bank, wherein its revenues are directed. It utilizes this account within the funds allocated to it in the budget.

If this revenue becomes less than the total funds allocated to the Authority in the Budget, the Treasury is responsible to settle the deficit from the National Balance Sheet along the fiscal year in accordance with the regulations set by it thereof.

If this revenue becomes positive, it goes to the National Balance Sheet.

The revenue is the difference between the Authority's resources and its periodical expenses, i.e., total operational expenses and the transferable expenses projected in the budget.

ARTICLE 14:

The Authority's Board of Directors prepares a Balance Sheet and a Profit and Loss Account for every fiscal year. The Board also has to prepare a report on the Authority's activity during the current fiscal year and its financial position at the end of that year.

The fiscal year of the Authority is July 1st through June 30th.

ARTICLE 15:

Without contradicting the inspection of the Central Accounting Authority, the Authority's Board of Directors may appoint one of more persons as Accounts Auditors who fulfill the legal requirements stated in Law No. 133 for the year 1951 for Accountants and Auditors. The Board of Directors fixes the Auditor's fees. The auditor will have the auditor's rights and duties as is valid in the joint stock companies. If there are several auditors, they are jointly responsible.

ARTICLE 16:

His Excellency, Minister of Electrical Energy, has the authority to supervise and guide the Authority. He presents to His Excellency, the President, a report on the Authority's activity at the end of the elapsed year, enclosing therewith a copy of the Board of Director's Annual Report and the Central Accounting Authority's report.

ARTICLE 17:

The Authority may make procedures for direct and administrative sequestration in accordance with the regulations of Law No. 308 for the year 1955 on Administrative Sequestration in order to obtain its rights.

ARTICLE 18:

This Decree is to be published in the Official Gazette.

Issued at the Presidency
8 The El Hegga 1383 - 20 April 1964

Gamal Abdel Nasser

SECTION C

A.R.E. PRESIDENTIAL DECREE NO. 1474 FOR THE YEAR 1964 ESTABLISHING THE EGYPTIAN GENERAL AUTHORITY FOR EXECUTING ELECTRICAL PROJECTS

HIS EXCELLENCY, THE PRESIDENT

With reference to the Constitution issued on March 25, 1964, Law No. 60 for the year 1963 issuing The General Authorities Law,

Presidential Decree No. 1301 for the year 1964 forming the Cabinet and establishing the Ministry of Electrical Energy,

Presidential Decree No. 1470 for the year 1964 organizing the industry and Mineral Resources Sector,

And to the National Council,

IT IS HEREBY DECIDED:

ARTICLE 1:

A general authority to be named The Egyptian General Authority for Executing Electrical Projects is to be established under the Ministry of Electrical Energy.

ARTICLE 2:

The Authority has a corporate entity. The referred Law No. 60 for the year 1963 is applicable to it.

ARTICLE 3:

This Authority is responsible for executing the projects pertaining to electricity and to the production, transmission, and distribution of electrical energy.

ARTICLE 4:

The Authority's capital is composed of:

(a) The state equity in capitals of the subsidiary companies, cooperative associations and establishments owned by the Authority and;

(b) The funds allocated by the State to the Authority.

ARTICLE 5:

The Authority's resources are composed of the following:

(a) The net profits of the subsidiary companies, cooperative associations, and establishments owned by the Authority, as well as the Board of Directors members' equity in its controlled subsidiary companies;

(b) The loans it obtains;

(c) The funds allocated to it by the State;

(d) Any other funds resulting from their activities or in return for jobs or services which it renders to the subsidiary companies, cooperative associations, or establishments owned by it.

ARTICLE 6:

His Excellency, the President issues a decree forming the Authority's Board of Directors, which is the highest authority controlling all its affairs and proposing the general policy to be followed. His Excellency may issue whatever necessary decrees to achieve its main goal, especially:

(1) Issue the decrees, internal regulations, and decisions concerning the financial, administrative, and technical affairs of the Authority, regardless of the governmental regulations.

(2) Issue the decrees for appointment of the Authority's employees, their promotion, transfer, termination and fixing their salaries remunerations, and pensions.

(3) Approve the Authority's annual budget.

(4) Study all issues which the Minister or Chairman of the Board may deem as falling within the Authority's specializations and;

(5) Study the periodical progress reports on operation of the Authority and its financial position.

The Board of Directors may form within its members a committee or more to whom some specializations may be delegated. The Board may also delegate to the Chairman or the Head of the Authority some of its specializations. The Board may also delegate one of its members or one of the managers to carry out certain duties.

ARTICLE 7:

The Chairman of the Board manages the affairs of the Authority, represents it in its relations with the other entities, and represents it at the court of law. The Chairman is responsible to His Excellency, the Minister of Electrical Energy for executing the general policy set for achieving the Authority's objectives. He may designate some of his authorities to one or more managers.

ARTICLE 8:

The Board of Directors meets at least once a month with an invitation by the Chairman. His Excellency, Minister of Electrical Energy, may invite the Board to hold a meeting whenever he deems it necessary.

The Board's quorum is correct only if the majority of the members attend. The decisions are issued by majority votes of the attendants. If the voted two sides are equal, the Chairman's side supersedes.

ARTICLE 9:

The Board Secretary records the minutes of the meetings and the text of decrees issued, which are signed by the Chairman and the Secretary of the Board.

ARTICLE 10:

The Authority's Chairman presents the Board's decrees to His Excellency, the Minister of Electrical Energy, for sanctioning them, and present to His Excellency, the President the issues which require issuing a Presidential Decree.

ARTICLE 11:

The general authorities may utilize various methods to achieve their goals, especially:

(a) Establish joint stock companies or cooperative associations solely, with a partner or with other partners. The shares of these companies may be put in circulation with effect from their establishment;

(b) Extend credit to the companies or cooperative associations under its supervision, or guaranteeing them when they take loan agreements, after the companies use up all available credit capabilities;

(c) Acquire shares and stocks of the companies by subscribing or purchasing them, regardless of the period stated before putting the shares and stocks of new companies in circulation and;

(d) Issuing letters of guarantee that are as powerful as the letters of guarantee issued by the banks to its subsidiary companies and cooperative associations in all their transactions with others. In such cases, the Authority must stand by its obligations which are committed in such guarantees.

ARTICLE 12:

The Authority Board of Directors may acquire credit from banks, organizations, companies and others in order to achieve its goals.

ARTICLE 13:

The Authority opens an account with the Central Bank, wherein its revenues are directed. It utilizes this account within the funds allocated to it in the budget.

If this revenue becomes less than the total funds allocated to the Authority in the Budget, the Treasury is responsible to settle the deficit from the National Balance Sheet along the fiscal year in accordance with the regulations set by it thereof.

If this revenue becomes positive, it goes to the National Balance Sheet.

The revenue is the difference between the Authority's resources and its periodical expenses, i.e., total operational expenses and the transferable expenses projected in the budget.

ARTICLE 14:

The Authority's Board of Directors prepares a Balance Sheet and a Profit and Loss Account for every fiscal year. The Board also has to prepare a report on the Authority's activity during the current fiscal year and its financial position at the end of that year.

The fiscal year of the Authority is July 1st through June 30th.

ARTICLE 15:

Without contradicting the inspection of the Central Accounting Authority, the Authority's Board of Directors may appoint one of more persons as Accounts Auditors who fulfill the legal requirements stated in Law No. 133 for the year 1951 for Accountants and Auditors. The Board of Directors fixes the Auditor's fees. The auditor will have the auditor's rights and duties as is valid in the joint stock companies. If there are several auditors, they are jointly responsible.

ARTICLE 16:

His Excellency, Minister of Electrical Energy, has the authority to supervise and guide the Authority. He presents to His Excellency, the President, a report on the Authority's activity at the end of the elapsed year, enclosing therewith a copy of the Board of Director's Annual Report and the Central Accounting Authority's report.

ARTICLE 17:

The Authority may make procedures for direct and administrative sequestration in accordance with the regulations of Law No. 308 for the year 1955 on Administrative Sequestration in order to obtain its rights.

ARTICLE 18:

This Decree is to be published in the Official Gazette.

Issued at the Presidency
8 The El Hegga 1383 - 20 April 1964

Gamal Abdel Nasser

SECTION D

A.R.E. PRESIDENTIAL DECREE NO. 3726 FOR THE YEAR 1965 ESTABLISHING THE EGYPTIAN GENERAL AUTHORITY FOR ELECTRICITY

HIS EXCELLENCY, THE PRESIDENT

With reference to the Constitution,

Law No. 60 for the Year 1963, issuing the General Authorities Law;

Law No. 44 for the Year 1965, organizing Accounts Audit of General Authorities and Establishments,

Law No. 3546 for the Year 1962, issuing the Regulations for Employees of Subsidiary Companies Controlled by General Authorities,

Presidential Decree No. 800 for the Year 1963 on Application of Companies Regulations to the Employees of General Authorities,

Presidential Decree No. 1472 for the Year 1964, establishing the Egyptian General Authority for Production and Transfer of Electrical Energy,

Presidential Decree No. 1473 for the Year 1964 establishing the Egyptian General Authority for Distribution of Electrical Energy,

Presidential Decree No. 1474 for the Year 1964, establishing the Egyptian General Authority for Executing Electrical Projects,

Presidential Decree No. 1475, reorganizing the Ministry of Electrical Energy,

Presidential Decree No. 2011 for the Year 1965, sanctioning the Budget for the Financial Year 1965/1966,

Presidential Decree No. 3366 for the Year 1965, forming the Cabinet,

And the National Council,

IT IS HEREBY DECIDED:

ARTICLE 1:

A general authority to be named The Egyptian General Authority for Electricity is hereby established. It is a General Authority with regards to applying the regulations of Law No. 60 for the Year 1963. It is under the Ministry of Industry, Mineral Resources, and Electricity headed by His Excellency, the Minister of Industry, Mineral Resources and Electricity. It is to be located in Cairo.

This Authority replaces the Egyptian General Authority for Executing Electrical Projects, the Egyptian General Authority for Production and Transfer of Electrical Energy, and the Egyptian General Authority for Distribution of Electrical Energy.

ARTICLE 2:

The General Authority is responsible for:

(1) Executing the projects pertaining to production, transmission, and distribution of electrical energy;

(2) Managing, operating and maintaining power substations, transferring and organizing loads among the main networks in the various parts of Egypt and;

(3) Distributing and selling electrical power in various parts of Egypt.

ARTICLE 3:

The Authority's capital is composed of:

(a) The state equity in capitals of the subsidiary companies, cooperative associations and establishments owned by the Authority and;

(b) The funds allocated by the State to the Authority.

ARTICLE 4:

The Authority's resources are composed of the following:

(a) The net profits of the subsidiary companies, cooperative associations, and establishments owned by the Authority, as well as the Board of Directors members' equity in its controlled subsidiary companies;

(b) The loans it obtains;

(c) The funds allocated to it by the State;

(d) Any other funds resulting from their activities or in return for jobs or services which it renders to the subsidiary companies, cooperative associations, or establishments owned by it.

ARTICLE 5:

His Excellency, the President issues a decree forming the Authority's Board of Directors, which is the highest authority controlling all its affairs and proposing the general policy to be followed. His Excellency may issue whatever necessary decrees to achieve its main goal, especially:

(1) Issue the decrees, internal regulations, and decisions concerning the financial, administrative, and technical affairs of the Authority, regardless of the governmental regulations.

(2) Issue the decrees for appointment of the Authority's employees, their promotion, transfer, termination and fixing their salaries remunerations, and pensions.

(3) Approve the Authority's annual budget.

(4) Study all issues which the Minister or Chairman of the Board may deem as falling within the Authority's specializations and;

(5) Study the periodical progress reports on operation of the Authority and its financial position.

The Board of Directors may form within its members a committee or more to whom some specializations may be delegated. The Board may also delegate to the Chairman or the Head of the Authority some of its specializations. The Board may also delegate one of its members or one of the managers to carry out certain duties.

ARTICLE 6:

The Chairman of the Board manages the affairs of the Authority, represents it in its relations with the other entities, and represents it at the court of law. The Chairman is responsible to His Excellency, the Minister of Electrical Energy for executing the general policy set for achieving the Authority's objectives. He may designate some of his authorities to one or more managers.

ARTICLE 7:

The Board of Directors meets at least once a month with an invitation by the Chairman. His Excellency, Minister of Electrical Energy, may invite the Board to hold a meeting whenever he deems it necessary.

The Board's quorum is correct only if the majority of the members attend. The decisions are issued by majority votes of the attendants. If the voted two sides are equal, the Chairman's side supersedes.

ARTICLE 8:

The Board Secretary records the minutes of the meetings and the text of decrees issued, which are signed by the Chairman and the Secretary of the Board.

ARTICLE 9:

The Authority's Chairman presents the Board's decrees to His Excellency, the Minister of Electrical Energy, for sanctioning them, and present to His Excellency, the President the issues which require issuing a Presidential Decree.

ARTICLE 10:

The general authorities may utilize various methods to achieve their goals, especially:

(a) Establish joint stock companies or cooperative associations solely, with a partner or with other partners. The shares of these companies may be put in circulation with effect from their establishment;

(b) Extend credit to the companies or cooperative associations under its supervision, or guaranteeing them when they take loan agreements, after the companies use up all available credit capabilities;

(c) Acquire shares and stocks of the companies by subscribing or purchasing them, regardless of the period stated before putting the shares and stocks of new companies in circulation and;

(d) Issue letters of guarantee that are as powerful as the letters of guarantee issued by the banks to its subsidiary companies and cooperative associations in all their transactions with others. In such cases, the Authority must stand by its obligations which are committed in such guarantees.

ARTICLE 11:

The Authority Board of Directors may acquire credit from banks, organizations, companies and others in order to achieve its goals.

ARTICLE 12:

The Authority opens an account with the Central Bank, wherein its revenues are directed. It utilizes this account within the funds allocated to it in the budget.

If this revenue becomes less than the total funds allocated to the Authority in the budget, the Treasury is responsible to settle the deficit from the National Balance Sheet along the fiscal year in accordance with the regulations set by it thereof.

If this revenue becomes positive, it goes to the National Balance Sheet.

The revenue is the difference between the Authority's resources and its periodical expenses, i.e., total operational expenses and the transferable expenses projected in the budget.

ARTICLE 13:

The Authority's Board of Directors prepares a Balance Sheet and a Profit and Loss Account for every fiscal year. The Board also has to prepare a report on the Authority's activity during the current fiscal year and its financial position at the end of that year.

The fiscal year of the Authority is July 1st through June 30th.

ARTICLE 14:

Without contradicting the inspection of the Central Accounting Authority, the Authority's Board of Directors may appoint one of more persons as Accounts Auditors who fulfill the legal requirements stated in Law No. 133 for the year 1951 for Accountants and Auditors. The Board of Directors fixes the Auditor's fees. The auditor will have the auditor's rights and duties as is valid in the joint stock companies. If there are several auditors, they are jointly responsible.

ARTICLE 15:

His Excellency, Minister of Electrical Energy, has the authority to supervise and guide the Authority. He presents to His Excellency, the President, a report on the Authority's activity at the end of the elapsed year, enclosing therewith a copy of the Board of Director's Annual Report and the Central Accounting Authority's report.

ARTICLE 16:

The Authority may make procedures for direct and administrative sequestration in accordance with the regulations of Law No. 308 for the year 1955 on Administrative Sequestration in order to obtain its rights.

ARTICLE 17:

The employees of the Egyptian General Authority for Executing Electrical Projects, The Egyptian General Authority for Production and Transfer of Electrical Energy, and the Egyptian General Authority for Distribution of Electrical Energy are transferred with their grades to the Egyptian General Authority for Electricity or any other authority by a decree from the Prime Minister based on the proposition of the Central Authority for Organization and Administration.

ARTICLE 18:

The referenced Presidential Decrees No.'s 1472, 1473, and 1474 for the Year 1964 are hereby cancelled as also any ARTICLE contradicting the regulations of this Decree.

ARTICLE 19:

This Decree is to be published in the Official Gazette and is valid with effect from the date of publishing.

Issued at the Presidency
on 24 Gamada El Akher 1385 - October 19, 1965

Gamal Abdel Nasser

SECTION E

LAW NO. 12/1976
FOR SETTING UP
THE EGYPTIAN ELECTRICITY AUTHORITY

In the Name of the People

HIS EXCELLENCY, THE PRESIDENT OF THE REPUBLIC

The People's Assembly has approved of the following Law which is hereby promulgated.

ARTICLE 1:

A public authority to be named "Egyptian Electricity Authority" shall be set up. It shall be a legal entity, affiliated to the Ministry of Power and shall have its head office in the city of Cairo.

The said Authority shall be subject to the rules and regulations spelled out in this Law.

ARTICLE 2:

The Authority shall be exclusively assigned the following duties:

(a) Implementation of the projects related to production of electric power, its transmission and distribution throughout the Republic.

(b) Management of electric power stations, their operation and maintenance, as well as regulation of the loads on the main networks throughout the Republic.

(c) Distribution of electric power and its sale throughout the Republic.

(d) Carrying out of studies and research regarding everything connected with the Authority's activities.

(e) Rendering of expert advice and implementing which fall within the Authority's jurisdiction, whether internal or external, and with the Authority's capabilities and experience or which are attainable through it.

ARTICLE 3:

The Authority's capital is composed of:

(1) The funds of the Egyptian Electricity Authority founded by virtue of Republican Decree No. 3726 of 1965;

(2) The funds to be appropriated by the State.

ARTICLE 4:

The Authority's revenues are made up of:

(1) The sums appropriated by the State;

(2) Proceeds of the sale of electric energy;

(3) The price differential resulting from sale of electric current at prices lower than the approved tariff for development purposes which are borne by the Public Treasury;

(4) Proceeds of the Authority's activities and in consideration of works and services rendered to third parties internally or externally;

(5) Loans advanced to the Authority by the State;

(6) Credit facilities secured by the Authority;

(7) Donations and grants-in-aid.

ARTICLE 5:

The Authority shall have a special budget to be prepared in advance with the rules set out in its status without being restricted by the laws and regulations governing preparation of the State budget. Also, the Authority shall have a special account for depositing its revenue, and any surplus in the Authority's budget shall be carried forward from year to year.

ARTICLE 6:

The Council of Ministers shall set the interest rate of the loans to be advanced by the State to the Authority.

ARTICLE 7:

The Authority shall be entitled to engage in all actions and deeds designed to accomplish the purposes for which it is set up, including direct contracting with individuals, companies, banks as well as local and foreign organizations, in consonance with the rules set forth in the Authority's statutes.

ARTICLE 8:

The Authority is entitled, within the boundaries of its budget, to import itself or through another party without an import permit, its requirements of production, materials and instruments, tools, spare parts, and means of transportation required for its activities in conformity with the rules as set by the Authority's statutes, without being restricted by the laws and regulations governing importation or foreign currency.

ARTICLE 9:

The Authority's imports of equipment, instruments and materials required for its projects shall be exempt from customs duties and other taxes and dues. Also, imports by companies, organizations and bodies with the Authority of instruments, equipments, tools, motor vehicles, materials and other movables are exempted from customs duties and other taxes and dues, provided that they are subject to inspection and the Authority's declaration that the exempted commodities are imported and required for its project's implementation. Such exempted commodities shall be liable to the payment of taxes and dues in respect thereof if they are disposed of to another party within five years from the date of their enjoying the franchise.

Also, interest on loans and external credit facilities contracted for by the Authority shall be exempted from taxes.

ARTICLE 10:

The Authority shall have a Board of Directors. Its Chairman shall be appointed by Republican decree, which shall also set his salary; whereas appointment of Members of the Board shall be by an Order of the Prime Minister upon the recommendation of the Minister of Energy.

ARTICLE 11:

The Board of Directors is the supreme body responsible for the management of the Authority's affairs. It discharges its functions as laid down in this Law. It has the discretion to take whatever decisions it deems for the attainment of the objective for which the Authority was founded, particularly:

(1) Approval of the Authority's regulative structure;

(2) Proposal of the tariff for the distribution and sale of electric energy to the various users of electricity after seeking the opinion of the Central Agency for Accountancy and the costing to be approved by the Electricity Sector, Higher Council and the competent and Ministerial Committee;

The said tariff shall not be enforced until after its approval by the Council of Ministers.

(3) Approval of the Authority's annual draft budget and its draft balance sheet;

(4) Transfer of credit from one item to another within the boundary of the same category;

(5) Laying down the Authority's internal regulations related to financial, accounting, administrative, trading, technical and supply matters, as well as other general organization regulations;

(6) Framing the regulation related to the Authority's personnel, including social insurance, traveling allowance and transportation expense.

(7) Formulating a system for surveillance and standards of performance in accordance with economic criteria.

(8) Proposing the contracting for loans.

(9) Accepting donations and grants-in-aid offered the Authority which are not inconsistent with its aims and purposes.

(10) Reviewing the periodical reports to be submitted concerning the progress of works at the Authority and its financial position.

(11) Reviewing whatever the Minister of Energy or the Chairman of the Board deems to submit to the Board regarding issues falling within his competence.

The Board may set up from among its members a committee or more to be entrusted temporarily with some of its assignments.

The Board is entitled to delegate one of its assignments upon one of its members or entrust to him a certain mission.

ARTICLE 12:

The Board meets at least once a month upon the invitation of its Chairman, provided that a quorum of the majority of its members are present. Its resolutions are passed with the absolute majority of its members. When the votes for and against are equal, the Chairman shall have the deciding vote. In the case of absence of the Board Chairman, the Board elects a substitute. The Board is entitled to invite whoever it deems to attend its meetings in an advisory capacity without having the right to cast their votes.

ARTICLE 13:

The Authority's Board Chairman shall communicate to the Minister of Energy the Board's resolutions within three days from their adoption for their approval. The said resolutions shall be considered enforceable unless the Minister objects to them in writing to the Authority's Board within thirty days from the date of his receiving them.

ARTICLE 14:

The Authority's Board Chairman is assigned the following duties:

(1) Execution of the Board's resolutions;

(2) Management of the Authority, development of its system of works, and establishing its organization;

(3) Supplying the Minister of Energy and the State bodies with information, details and documents they request.

The Authority's Board Chairman may delegate upon a Director or more some of his assignments.

ARTICLE 15:

The Authority's Board Chairman shall represent it at the courts of Law in its relations with other parties.

ARTICLE 16:

The Minister of Energy shall nominate a delegate to replace the Chairman temporarily in the event of his absence or should his post be rendered vacant.

ARTICLE 17 :

The Authority's Board may, with the consent of the Minister of Energy, dispose of the foreign currency allotted to the Authority in favor of the State's monetary budget, or the foreign currency accruing from the loans advanced to it, or resulting from its activity, or in consideration of the works and services it renders to other parties, or the donations and grants-in-aid it receives, in accordance with the rules set out in the statutes.

ARTICLE 18:

The decisions of public utility respecting the real estate required for the Authority's projects rests with the Minister of Energy. The provisions of the Law regulating the expropriation of property for public or utility improvement shall apply.

ARTICLE 19 :

In order to acquire its rights, the Authority may take legal proceedings to serve attachments in accordance with the provisions of Attachments Law.

ARTICLE 20 :

The Authority's statutes shall be issued by Republican decree without being restricted by the State's rules and regulations applicable in the Government machinery, within six months from the date of publication of this Law in the Official Gazette. The statutes shall take into consideration the following:

First: Linking the wage to productivity.

Second: The maximum pay scale annexed to Law No. 58 of 1971 related to the Government's civil servants.

Third: The additional and incentive bonuses and allowances to be set for the Authority's personnel should not exceed double the salaries set for them.

Fourth: The main principles of the standard social insurance scheme as spelled out by Law No. 79 of 1975.

Fifth: Traveling allowances and transportation expenses of the Authority's personnel according to the hierarchy of their grades and original salaries should not exceed the actual expenses they incur.

Sixth: Adoption of the rules of the standard accounting system.

Seventh: No direct contract awards are to be made except to monopolistic foreign firms or those with specialized international expertise or in cases of urgency, subject to the approval of the Minister of Energy.

Eighth: Adopt the most up-to-date procurement contract rules applied in similar projects.

ARTICLE 21:

The Authority shall supersede the General Egyptian Electricity Corporation (GEEC) set up in virtue of Republican Decree No. 3726 of 1965 as regards its rights and obligations.

ARTICLE 22:

The GEEC personnel shall be transferred to the Authority without taking any further measure.

ARTICLE 23:

Presidential Decree No. 3726 of 1965, setting up the GEEC, is hereby cancelled, as well as any other provision contrary to the rulings of this Law.

ARTICLE 24:

The Minister of Energy shall issue the necessary Orders for the execution of this Law.

ARTICLE 25:

This Law shall be published in the Official Gazette, and shall become operative as from the date of its publication.

This Law shall be embossed with the State Seal, and shall be executed as one of its laws.

Published on February 12, 1976.

SECTION F

LAW NO.27/1976

ESTABLISHING RURAL ELECTRIFICATION AUTHORITY

In the People's Name,

HIS EXCELLENCY, THE PRESIDENT,

The People's Assembly has passed the following Law, which we have issued:

ARTICLE 1:

A general authority is established named "Rural Electrification Authority". The Authority has a corporate entity and is supervised by His Excellency, the Minister of Electricity. It is located in Cairo.

The regulations in this Law apply to this Authority.

ARTICLE 2:

The Authority is responsible for the following:

(1) Study, plan and develop of all the work concerning the rural electrification, and modernizing the existing distribution network. This includes all the transfer substations and the electrical lines starting from low tension, medium tension, and high tension up to 66 kV.

(2) Execute all required electrical connection work to supply the power necessary for the small local industries, irrigation machinery, agricultural mechanization equipment, and others in the cities and villages out of Cairo and Alexandria.

(3) Provide consulting services and executing the projects which fall within the Authority's specialization locally or internationally which are within the Authority's capabilities and expertise available to or through it.

ARTICLE 3:

The Authority's capital is composed of the following:

(1) Funds of the Rural Electrification General Authority which is established by Presidential Decree No. 470 for the Year 1971.

(2) The Funds allocated by the State.

ARTICLE 4:

The Authority's resources are composed of:

(1) The funds allocated by the State;

(2) The funds resulting from its activities or in return for jobs or services which it renders to other locally or abroad;

(3) Loans provide by the State;

(4) Credit facilities acquired by the Authority and;

(5) Grants and Aids.

ARTICLE 5:

The Authority has a special budget prepared in accordance with the internal regulations, regardless of the laws and regulations organizing the General National Budget. The Authority also has a special account wherein it deposits its resources.

The profit is carried forward in the Authority's budget from year to year.

ARTICLE 6:

The Authority may carry out all transactions which may enable to it to achieve its goals. The Authority may directly hold transactions with persons, companies, banks, local authorities and foreign authorities in accordance with the rules set by the internal regulations of the Authority.

ARTICLE 7:

The Authority may, within its budget, import itself, or through others without license, any production requirements, materials, machinery, equipment, spare parts and means of transportation which it may need for its operation. This is in accordance with the Authority's internal regulations, regardless of the legal regulations, import regulations or foreign currency regulations.

ARTICLE 8:

The tools, equipment and materials imported by the Authority for its projects are exempt from customs duties, taxes, and other fees. The machinery, equipment, tools, automobiles, requirements and other movables which are imported by the companies, authorities and contractors dealing with the Authority are exempt from the customs, duties, taxes and other fees. This is based on inspection and the Authority's certification that the exempted goods are imported and necessary for executing its projects. Taxes and duties must be paid for these exempt goods if any transactions to others are being made within five years from date of their exemption.

The interest on loans and international credit facilities held by the Authority is exempt from all taxes.

ARTICLE 9:

The Authority has a Board of Directors formed as follows:

(1) Chairman: Minister of Electricity

(2) Chairman of the Egyptian Electricity Authority

(3) Chairman of the General Egyptian Land Survey Authority

(4) State Under Secretary for the following Ministries: Local Administration, Finance, Irrigation, Agriculture, Industry and Mining to be appointed by the Minister concerned

(5) The Authority's Legal Consultant

(6) Five Specialists/Experts in electricity affairs to be appointed for a period of one renewable year by His Excellency, the Minister of Electricity, fixing thereof their remunerations

ARTICLE 10:

The Authority's Board of Directors is the highest authority controlling its affairs. The Board carries out its specializations as indicated in this Law. The Board may issue decisions which it may deem necessary to achieve the Authority's goals, especially:

(1) Approve the Authority's Organizational Chart;

(2) Approve the Authority's Annual Planned Budget and Planned Final Account;

(3) Transfer funds from one ARTICLE to another under the same category;

(4) Establish the Authority's internal regulations regarding the financial, accounting, administrative, commercial, technical and warehousing affairs as well as other general regulations;

(5) Establish the personnel regulations for the employment system, employees' insurance, travel per diem, and their transportation fees;

(6) Establish a control system and performance evaluation criteria according to the economic circumstances;

(7) Suggest loan acquisition;

(8) Accept grants and donations offered to the Authority which do not conflict with its objectives;

(9) Study the periodical reports presented on the Authority's operation and its financial position;

(10) Study any issues presented by His Excellency, the Minister of Electricity or the Authority's Executive President to the Board concerning any problems within its specialization.

The Board of Directors may form among its members a committee or more to whom some duties may be delegated. The Board may also delegate to the Executive President of the Authority or one of the managers temporarily some of its specializations. The Board may also delegate to one of its members or one of the managers a specific duty or specialization.

ARTICLE 11:

The Chairman of the Board of Directors convenes a meeting at least once a month. The meeting is considered correct only if quorum attendance is made. The Board issues its decisions by quorum voting. If the two voting parties' numbers are equal, the Chairman's party supersedes. In the case of the Chairman's absence, the Authority's Executive President replaces him. The Board may invite to its meetings whomever it deems necessary to utilize his experience without having the right to vote.

ARTICLE 12:

The Executive President of the Authority passes the Board of Directors decision on to His Excellency, the Minister of Electricity, within three days from date of issuing them for approval. These decisions are considered valid unless His Excellency, the Minister, objects to them in writing to the Authority's Board of Directors within thirty days from date of receiving them.

ARTICLE 13:

The Authority's Executive President is responsible for:

(1) Executing decisions of the Board of Directors;

(2) Managing the Authority, handling its affairs, and developing the operation systems;

(3) Providing His Excellency, the Minister of Electricity, and the State authorities with required data, information and documents.

The Authority's Executive President may delegate some of his authorities to a manager or more.

ARTICLE 14:

The Executive President represents the Authority in court and in its transactions with others.

ARTICLE 15:

His Excellency, the Minister of Electricity, delegates someone to temporarily replace the Executive President of the Authority in case of his absence or his position being vacant.

ARTICLE 16:

The Authority's Board of Directors may, after His Excellency, the Minister of Electricity's approval, hold transactions in the foreign currency allocated to the Authority in the National budget or resulting from the loans it obtains, its activity, or in return for jobs and services rendered by it to others, or grants and donations which it may acquire in accordance with the internal regulations.

ARTICLE 17:

Decisions on estates' public utility are made by decrees by His Excellency, the Minister of Electricity, in accordance with the regulations of the law organizing estates' sequestration for public utility or improvement.

ARTICLE 18:

The Authority to obtain its rights and dues may make administrative seizure procedures in accordance with the regulations of the law concerning administrative seizures.

ARTICLE 19:

The internal regulations of the Authority are issued by a Presidential Decree, regardless of the regulations applied in the State administration authority within six months from the date of publishing this Law in the Official Gazette. The rules of these regulations must take the following basis into consideration:

First: Establish salary in relation to performance evaluation.

Second: The maximum limits of the salaries scales annexed to Law No. 58 for the Year 1971, issuing the State civil employment system as regards the permanent employees of the Authority.

Third: The original remunerations which are granted to the temporary highly qualified employees are not to exceed five times the maximum limits of the salaries set in the scale annexed to the referenced Law No. 58 for the Year 1971. The contract with these employees is not to exceed five years, which may be renewable.

Fourth: The additional incentive remunerations and allowances to which the employees are entitled should not exceed double the salary or the original remuneration set for the employee.

Fifth: The basic principles for the unified social insurance system issued as per Law No. 79 for the Year 1975.

Sixth: The values of travel or transportation allowances to the Authority's employees -- classified according to their categories or original remunerations -- is not to exceed the actual costs which they pay.

Seventh: Follow the Unified Accounting System Regulations.

Eighth: Direct Purchase Orders are not to be issued except to monopolizing or highly specialized foreign authorities, or in the cases of emergency, after prior approval by His Excellency, the Minister of Electricity.

Ninth: Apply the most recent warehousing methods used in similar projects in industrialized nations.

ARTICLE 20:

The Authority replaces the General Rural Electrification Authority which had been previously established by a Presidential Decree No. 470 for the Year 1971, for Establishing the General Rural Electrification Authority in all rights due to it and liabilities to which it had been committed.

ARTICLE 21:

All employees who have been employed at the General Rural Electrification Authority are automatically transferred to the Authority without making further procedures.

ARTICLE 22:

The Presidential Decree No. 470 for the Year 1971, establishing the General Rural Electrification Authority is hereby cancelled. Also, any regulations contradicting the regulations of this Law are hereby cancelled.

ARTICLE 23:

His Excellency, the Minister of Electricity, issues the necessary decrees to execute this Law.

ARTICLE 24:

This Law is published in the Official Gazette and is operative from the date of publishing.

This Law is stamped with the National Stamp and is valid as any National Law.

Issued at the Presidency
on 22 Rabie El Awal
(Lunar Year)

March 23, 1976 - Anwar El Sadat

SECTION G

DECREE NO. 423/1983
BY THE PRESIDENT OF THE ARAB REPUBLIC OF EGYPT INSTITUTING THE PUBLIC SECTOR'S AUTHORITY FOR THE DISTRIBUTION OF ELECTRIC POWER

After having reviewed the Constitution; and the Decree No. 308/1955 concerning the administrative seizure; and the Decree No. 48/1978, issuing the regulations of the Public Sector employees; and the Decree No. 159/1981, issuing the Act of joint stock companies and limited liability companies; and the Decree No. 97/1983, issuing an Act in relation with the authorities and companies of the public sector; and after the Cabinet's approval had been obtained; and in accordance with the directions of the Council at State,

The following Decree has been issued by the President of the Arab Republic of Egypt:

ARTICLE 1:

An Authority called "The Public Sector's Authority for the Distribution of Electric Power" shall be established, and shall have the legal corporate character with its headquarters at Cairo, and to be supervised by the Minister of Electricity.

ARTICLE 2:

The Authority shall supervise the following electricity distribution companies:

(1) Cairo Electricity Distribution Company;

(2) North Upper Egypt Electricity Distribution Company;

(3) Alexandria Electricity Distribution Company;

(4) Delta Electricity Distribution Company;

(5) Behiera Electricity Distribution Company;

(6) Canal Electricity Distribution Company;

(7) South Upper Egypt Electricity Distribution Company.

ARTICLE 3:

The Capital of the Authority shall consist of:

(1) Capital of the Distribution Companies supervised by the Authority and owned complete by the State;

(2) The State's shares in the capital of Distribution Companies supervised by the Authority which participates in it in collaboration with other public or private corporate bodies, or individuals;

(3) Funds allocated by the State.

ARTICLE 4:

Sources of the Authority shall consist of:

(1) Its share in the Companies' distributable net profits;

(2) A share, against supervision, stipulated in the distribution of the Companies' profits;

(3) Funds allocated by the State;

(4) Donations, grants, local and foreign credit facilities accepted or concluded by the Board of Directors;

(5) Proceeds of its activities, and the proceeds of works and services rendered by it to the Distribution Companies or to third parties.

ARTICLE 5:

The Authority shall be managed by a Board of Directors to be appointed by a Presidential Decree for a period of four years upon the nomination of the Minister of Electricity. The Board shall be formed as follows:

(1) Chairman of the Board;

(2) Not more than five members from among the Chairmen of the Distribution Companies supervised by the Authority;

(3) Not more than four members with adequate qualification and expertise in their specializations required for the Distribution Companies' supervised by the Authority in the administrative, organizational, technical, financial, economic and legal affairs;

(4) Representative of the Employees' General Syndicate in the Authority's sphere of activity, to be elected by the Syndicate Board. In case there are more than one Syndicate in the Authority's sphere of activity, the Boards of such Syndicates shall meet to elect the said representative.

ARTICLE 6:

The Authority's Board of Directors shall be the upper authority that manages its affairs, and shall be entitled to take such decisions it deems necessary for the fulfillment of the objectives for which the Authority was established. The Board shall also consider all matters referred to it by the Minister of Electricity or by the Board's Chairman in relation to issues concerning the Authority or the Distribution Companies supervised by it.

The Board shall have the right in particular to:

(1) Approve the regulatory budget for the Authority;

(2) Approve the Balance Sheet of the Authority and its Final Lists and Accounts;

(3) Lay down the regulatory by-laws of the Authority, and issue decisions concerning its financial, administrative and technical affairs regardless of the governmental regulations;

(4) Lay down and evaluate performance standards, and consider reports concerning the functioning of work and the financial situation of the Authority;

(5) Establish joint stock companies by itself or in collaboration with public or private corporate bodies or with individuals;

(6) Pass the Distribution Companies' shares by means of purchasing or participating in their capitals, regardless of periods fixed for circulating the shares of new companies;

(7) Make borrowing.

ARTICLE 7:

Without prejudice to the functions of each one of the Boards of the Distribution Companies supervised by the Authority, the Authority's Board is entrusted with the following functions:

(1) Approving plans and general goals of each Distribution Company and for the Distribution Companies as a whole in accordance with the general policy of the State and within the framework of the State's plan for the economic and social development;

(2) Studying basic problems which impede the Distribution Companies' progress, in order to avoid certain difficulties that may be faced by the Distribution Companies, as well as suggesting the methods of remedy;

(3) Preparing technical and economic studies related to general activity of the Distribution Companies supervised by the Authority in order to develop practices and activities that fall within its terms of reference, and laying down certain standards for rewarding and questioning, based upon the Distribution Companies' commitment to achieve the objectives intended by the State's general plan;

(4) Following-up the Distribution Companies supervised by the Authority in different spheres of activity, especially in relation to production, wages, incentives, etc., in accordance with models and controls laid down by the Authority's Board, and following up the Distribution Companies in avoiding the comments raised by the Central Agency for Accounting;

(5) The coordination among the Distribution Companies supervised by the Authority, and between them and other authorities of the public sector, in matters of mutual interest;

(6) The coordination among the Distribution Companies supervised by the Authority in order to achieve the maximum level of vertical and horizontal integration so as to remedy the difficulties in production and financing, etc. The Board may therefore establish a Fund to balance the prices of the products or activities of the Distribution Companies. The financing sources of this Fund shall be agreed upon with the agreement of the Ministry of Finance;

(7) Supporting common training schemes so as to cure the shortage of qualified manpower and the difficulties in technical and administrative matters;

(8) Lending the Distribution Companies supervised by the Authority, or guaranteeing them in loan agreements concluded by these Distribution Companies;

(9) Suggesting the transfer of investments from the company which has not used them to another one supervised by the Authority;

(10) Suggesting the merger of a company supervised by the Authority into another company, or dividing it, or joining it with another authority of the public sector after the agreement between the two authorities as the general interest may require;

(11) Determining the remuneration (including salaries, rewards, wages, monetary and material benefits, attendance allowance and job allowance) to be paid to those who represent the Distribution Companies supervised by the Authority in the Boards and general assemblies of the companies whose capitals are participated by the Company, against efforts exerted by those representatives, provided that such remuneration shall not exceed the ceiling fixed in an Act to be issued by the Prime Minister. The difference in excess over such ceiling, if any, shall be reverted to the Company.

ARTICLE 8:

The Authority's Board of Directors shall meet once every month upon an invitation by the Chairman. The presence of the majority of members shall be required for the validity of the meeting. Decisions shall be adapted by the majority of votes of the attending members. In case of equality, the Chairman shall have a casting vote.

The Board may invite to the meeting some persons with adequate expertise from the Authority or others, but those shall have no voting power.

The Board may form one or more committees from among its own Members. Some of the Board's function may be entrusted to this or other committees or to the Chairman or one of the manages. The Board may entrust a certain task to any of its members or managers.

ARTICLE 9:

The Minister of Electricity shall have the right to invite the Authority's Board to be convened, and he may, in all cases, attend the Board meetings as a Chairman.

ARTICLE 10:

The Board's decisions shall be submitted within seven days by the Chairman to the Minister for approval. The Minister shall give his decision in relation to the Board's decisions and forward it to the Authority within 15 days after the receipt of such documents; otherwise, they shall be valid and effective without prejudice for the approval of other higher authorities that may be required by the law.

ARTICLE 11:

The Chairman of the Authority shall represent the Authority before the courts and in its relations with third parties. The following functions shall be entrusted to the Chairman:

(1) Managing the decisions of the Board;

(2) Managing the affairs of the Authority;

(3) Furnishing the Authority with data and information they may require.

The Chairman may entrust some of his functions to one or more top managers.

ARTICLE 12:

The Minister of Electricity shall appoint someone to replace the Chairman of the Authority when he is absent or his post becomes vacant.

ARTICLE 13:

The fiscal year of the Authority shall commence and end with the fiscal year of the State. The Authority shall have a separate regulatory budget prepared in accordance with other commercial budgets. The Authority shall open a bank account with the Central Bank of Egypt or any other Bank of the public sector, in which the Authority's funds shall be deposited.

ARTICLE 14:

The Authority's accounts shall be subject to the control of the Central Agency of Accounting according to the stipulations of the agencies' laws.

The Authority shall be deemed as a governmental body in applying the terms of Article 14 of the "Stamp Act" / Act No. 111/1980.

ARTICLE 15:

The Authority may proceed into administrative seizure according to the law organizing this matter in order to recover its rights.

ARTICLE 16:

The employees of the Authority shall be subject to the public sector employees' regulations issued by the Act No. 48/1978.

ARTICLE 17:

This Decree shall be promulgated in the official journal, and enter into force as from the date of promulgation.

Issued at the Presidency on October 27, 1983

Hosny Mobarak
President
Arab Republic of Egypt

SECTION H

LAW NO. 203 OF 1991
PROMULGATING PUBLIC BUSINESS SECTOR LAW

In the name of the people,

THE PRESIDENT OF THE REPUBLIC,

The people's Assembly has passed the following Law and we have issued it:

ARTICLE 1:

The provisions of the attached Law shall apply with regard to the public business sector, by which sector is meant holding companies and their subsidiary companies that are subject to the provisions of this Law.

Both types of these companies shall take the form of joint stock companies, and the provisions of the Law of joint stock companies, partnerships limited by shares and limited liability companies promulgated by Law 159 of 1981 be applicable thereto where no specific provision is made in this Law provided that these be not in contradiction with the provisions of this Law. The provisions of the Law of public sector organizations and companies promulgated by Law 97 of 1983 shall not apply to the companies referred to.

ARTICLE 2:

Holding companies shall replace public sector organizations (authorities) governed by the provisions of Law 97 of 1983 referred to, and subsidiary companies shall replace the companies supervised by those organizations with effect from the date of this Law's coming into force without the need to take any other procedure.

All rights, including usufruct and lease rights, of the cancelled public sector organizations and companies, holding and subsidiary companies as the case may be, shall be transferred to and they shall assume all their liabilities and shall be fully accountable therefor.

The statutes of each of the holding and subsidiary companies shall be published in the Egyptian Events Journal (Al Wakaie Al Missriya) and shall be recorded in the commercial registry at each company's cost and expense.

ARTICLE 3:

Boards of Directors of the holding and subsidiary companies shall be formed in accordance with the provisions of the attached Law within six months from the date of its coming into force.

Present Chairmen and Board Directors of public sector organizations and companies, as the case may be, shall undertake management of the said companies until their new Boards are formed.

ARTICLE 4

Employees at each of the public sector organizations and companies who are in service at the date of this Law's coming into force, shall be transferred to the holding or subsidiary companies at their same positions, wages allowances, leaves, cash and in-kind benefits and compensations.

These employees shall continue to be treated according to all the rules and regulations governing their employment affairs until personnel regulations of the companies to which they are transferred in accordance with the provisions of the attached Law are issued within one year from the said date.

The transferred employee shall retain, in a personal capacity, the wages, allowances, leaves, cash and in-kind benefits (privileges) and compensations which he receives even though they be more than what is entitled to him under these regulations, without affecting any future increment, or benefits entitled to him.

ARTICLE 5:

Without prejudice to what is specifically provided for in this Law or in the accompanying Law, public sector employees regulations issued by Law 48 of 1978 shall not be applicable to employees of the companies governed by the provisions of the accompanying Law with effect from the date of these regulations' coming into force.

ARTICLE 6:

Tribunals of the council of state shall continue to consider the following suits and appeals which were brought to these tribunals until a definite ruling be awarded with regard thereto in accordance with the rules currently in force without the need to take any other procedure.

First: Disciplinary actions, appeals of disciplinary penalties and other actions relating to employees of the companies governed by the provisions of this Law if they were brought prior to the application of the regulations specified in the preceding article.

Second: Other actions and appeals which those companies are parties thereto if they were brought prior to this Law's coming into force.

ARTICLE 7:

Companies governed by the provisions of this Law may not be deprived of any benefits or be charged with any burdens that are prejudicial to equating them with joint stock companies governed by the provisions of Law 159 of 1989 referred to engaged in the same activity. Item (1) of article 6 of Law 66 of 1971 concerning the establishment of a public organization named "Nasser Social Bank" shall be repealed, and the phrase "within the applicable monetary budget" stated in paragraph 1 of Article (1) of Law 118 of 1975 concerning import and export shall be repealed also.

ARTICLE 8:

The President of the Republic shall issue a decree specifying the Minister concerned in the application of the provisions of this Law, and he shall present to the Council of Ministers periodic reports, as specified in the Executive Regulations, on the results of operations of the companies governed by the provisions of this Law.

ARTICLE 9:

An economic authority, a public organization or a public sector company which have special systems decreed for them, may be a Presidential decree after approval by the Council of Ministers, be converted into a holding or an affiliated company under the provisions of this Law.

ARTICLE 10:

Provisions of Article 8 of this Law shall not affect (prejudice) the administrative and executive powers and authorities with which Ministers are vested by Laws, regulations and Presidential decrees.

ARTICLE 11:

The Council of State alone shall be the authority for reviewing the model memorandum of association and model of articles of association of companies governed by the provisions of this Law. The companies referred to may request the council of state through the concerned Minister to give opinion supported by reasons on matters related to their personnel affairs or their Board Directors or other matters relating to any of their affairs.

ARTICLE 12:

The Prime Minister shall issue the Executive Regulations of the accompanying Law within three months from the date of this Law's coming into force. He shall also issue model memorandum of association and model articles of association of companies governed by the provisions of this Law within months from the date of the Executive Regulations' coming into force.

Model articles of association may be multiplied according to the nature of activity of the companies.

ARTICLE 13:

This Law shall be published in the official gazette, and shall come into force thirty days after the date of its publication.

This Law shall be stamped with the seal of the state and shall be enforced as one of its Laws.

Issued at the Presidency
on 7 Zue Hejja 1411 A H
June 19, 1991
Hosny Mubarak

PUBLIC BUSINESS SECTOR COMPANIES LAW

CHAPTER 1 - HOLDING COMPANIES

SECTION 1
INCORPORATION

ARTICLE 1:

A decree shall be issued by the Prime Minister upon a proposal by the concerned Minister, authorizing the incorporation of the holding company, the capital of which shall be fully owned by the state or by public (*) artificial entities, and it shall have its own artificial entity as of the date of its registration in the commercial registry. The holding company shall take the form of a joint stock company, and shall be considered as one of the special Law persons, and the decree issued for its incorporation shall specify its name, head office, duration, the purpose of its incorporation and capital. The decree issued for the incorporation of the company together with its statutes shall be published, at its cost and expense, in the Egyptian Events Journal (Al Wakaie) and shall be registered in the commercial registry.

ARTICLE 2:

Holding companies shall invest their funds through their affiliated companies, and may undertake the investment themselves when need be.

Holding companies shall contribute to the development of national economy in their field of activity and through their subsidiary companies within the framework of the public policy of the state.

To accomplish its objectives a holding company may:

(1) Establish joint stock companies by itself (alone) or in participation with public or private artificial entities or individuals.

(2) Purchase or sell shares of joint stock companies or participate in their capital.

(3) Form and manage a portfolio of the company with its included shares, stocks, debentures and other financial instruments or assets.

(4) Undertake all actions that would help achieve all or part of its objectives.

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* Judicial Persons

CHAPTER 1 - HOLDING COMPANIES

SECTION 2
BOARD OF DIRECTORS

ARTICLE 3:

A holding company shall be managed by a Board of Directors which shall be formed by a resolution of the General Assembly upon a proposal by the Chairman. The Board's term shall be for three renewable years, and shall comprise an odd number of Directors which shall not be less than seven and not more than eleven members, and it shall be formed as follows:

- A full-time Chairman.

- A number of members not less than five members to be selected from persons having experience in economic, financial, technical, legal and business administration aspects.

- A representative of the General Federation of the Trade Unions (syndicates) of Egypt to be selected by the Federation's Board of Directors.

Neither the Chairman nor the Board members are considered company's personnel.

The resolution issued for the formation of the Board shall specify the full-time Directors, and salaries to be received by the full-time Chairman and Directors. This resolution shall specify the membership remuneration and meeting attendance allowance to be received by the Chairman and the Directors of the Board. The company's statutes shall specify the annual remuneration that they are entitled to subject to the provisions of Article 34 of this Law.

ARTICLE 4:

A person, who has been sentenced to a felony or a restraining in a crime of dishonesty or bankruptcy, or any of the penalties specified in the Articles 49, 50 and 51 of this Law, shall not serve as Chairman or as member of the Board of Directors of the company.

ARTICLE 5:

The Chairman and, all or part of, the members of the Board of Directors of the company may be removed during the term of office by a causative resolution of the General Assembly in accordance with the procedures set forth in Article 29 of this Law if their continuance in office would be detrimental to the company's interests. The Chairman and members of the Board of Directors of the company may not be re-appointed if the targeted objectives of the company are not achieved during the membership term.

ARTICLE 6:

The Board of Directors shall exercise all the powers necessary to (*) discharge the company's business, and shall undertake all actions required for the accomplishment of the company's purpose, except for those powers assigned to the General Assembly of the company, and in this connection the Board shall in particular:

(1) Lay out the general policies and specify the means required for their accomplishment.

(2) Manage the company's portfolio by sale and purchase of the shares, stocks, debentures and other financial instruments and assets included in it.

(3) Propose establishment of joint stock companies by the company alone or in participation with public or private artificial entities or individuals.

(4) Sale or purchase of joint stock companies or participate in their capital.

(5) Undertake all actions required to rectify financial structures and progress course of its unsuccessful subsidiary companies and to enhance their profitability and cut down (rationalize) costs.

(6) Approve the draft balance sheet and the closing financial statements prior to be presented to the General Assembly of the company.

(7) Set performance standards, evaluation and review reports submitted on the work progress of the company.

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* Dispose of

(8) Approve the company's organization structure and lay out internal regulations for financial administrative, technical and other aspects.

(9) Do what the Chairman of the General Assembly or the Chairman of the Board deem necessary to be presented to the Board.

ARTICLE 7:

The Board of Directors shall meet at least once every month upon a call by its Chairman, and in case of his absence the Chairman of the General Assembly shall assign one of the Board Directors to preside the meeting.

The convocation of the Board shall be valid only if attended by the majority of its members, and its resolution shall be passed by a majority of votes of the attendees, and in case of a tie (equality) the Chairman shall have the casting vote.

The Board may invite to its meeting whomever the Board deems would be of use to it from those having experience from the company's employees or other persons, however, they shall not be counted in the vote on the resolutions of the Board.

The Board may form from among its members a committee or committees to which it may delegate some of its powers, it may also delegate some of its powers to the Chairman or one of its managers. The Board may authorize one of its members or one of the managers to carry out a specific assignment provided that he shall present to the Board a report on the work he carried out.

ARTICLE 8:

The Chairman of the Board shall represent the company before courts and in its dealings with others, and shall be responsible for:

(1) Implementation of the resolutions of the Board.

(2) Management of the company and discharge of its business.

The Chairman shall exercise the powers prescribed by Law and regulations for the Managing Director and shall carry out his duties. He many delegate part of his powers to one or more Directors of the Board.

CHAPTER 1 - HOLDING COMPANIES

SECTION 3
THE GENERAL ASSEMBLY

ARTICLE 9:

The General Assembly shall consist of the following:

(1) The concerned Minister as Chairman.

(2) Members having experience in the field of activities undertaken by the companies affiliated to the holding company, whose number shall not be less than twelve and not more than fourteen members among whom shall be at least one representative nominated by the General Federation of the (Trade) Unions of Egypt. A decree by the Prime Minister shall be issued for the selection of such members, and shall specify the attendance allowance that they receive in accordance with the rules specified by the Executive Regulations.

The meetings of the General Assembly shall be attended by the Chairman and Directors of the Board of the company and auditors of the Central Auditing Agency who shall not be counted in the votes.

The resolutions of the General Assembly shall be passed by a majority of the votes of the attendees except in the cases where the Executive Regulations or the company's statutes require a special majority.

The Executive Regulations shall set forth the conditions required for the validity of the meeting of the General Assembly and the casting of votes on matters presented to the General Assembly at ordinary or extraordinary meeting as the case may be.

ARTICLE 10:

Subject to the provisions of this Law and its Executive Regulations and the company's statutes, the ordinary General Assembly shall:

(a) Approve the Board of Directors' report on the company's activity, and consider discharging the Board from responsibility for the reporting period.

(b) Approve the company's balance sheet and financial statements.

(c) Approve the continuance of the Board Chairman and Directors for another term in office relieving them by secret ballot.

(d) Approve profits distribution.

(e) Consider all that which the Chairman of the General Assembly or the Board of Directors deem necessary to be presented to it.

It shall not permissible to dispose of or sell any of the production lines assets except for after the approval of the General Assembly and to be according to the rules, determined by the Executive Regulations.

ARTICLE 11:

The company's statutes should not be amended except with the approval of the extraordinary General Assembly in accordance with the provisions of the Executives Regulations.

CHAPTER 1 - HOLDING COMPANIES

SECTION 4
THE COMPANY'S FINANCIAL SYSTEM AND AUDITING OF ITS ACCOUNTS

ARTICLE 12:

The statutes shall specify the beginning and end of the fiscal year of the company. The company's funds shall be considered as private property of the state. The company shall deposit its revenues in local and foreign currency in a bank account with the Central Bank of Egypt or one of the commercial banks.

ARTICLE 13:

The holding company shall prepare consolidated financial statements presenting the assets and liabilities, shareholders equities, revenues and expenses and applications (uses) of the company and its subsidiary companies in accordance with the positions, conditions and information set forth by the Executive Regulations.

ARTICLE 14:

The company's net profits shall be determined and distributed by a resolution of the General Assembly in accordance with the provisions of this Law and its Executive Regulations.

The state share in these profits shall revert to the treasury.

ARTICLE 15:

The Central Auditing Agency (CAA) shall audit the accounts of the company and evaluate its performance in accordance with the CAA Law.

CHAPTER 2
SUBSIDIARY COMPANIES
OF THE HOLDING COMPANY

SECTION 1
INCORPORATION

ARTICLE 16:

In the application of the provisions of this Law, a company in which at least 51% of its capital is owned by a holding company, shall be considered an affiliated.

If this percentage is owned by more than one holding company, public artificial entity or public sector bank, the Prime Minister shall issue a decree specifying the holding company to which this company shall be affiliated.

An subsidiary company shall take the form of a joint stock company and shall have its artificial entity as of the date of registering it in the commercial registry.

ARTICLE 17:

Upon a proposal by the Board of Directors of the holding company, the concerned Minister shall issue a decree for the incorporation of the subsidiary company. This decree, together with the statutes, shall be published, at the company's expense, in the Egyptian Event Journal (Al Wakaie), and the company shall be registered in the commercial registry.

CHAPTER 2
SUBSIDIARY COMPANIES
OF THE HOLDING COMPANY

SECTION 2
COMPANY'S CAPITAL AND SHARES

ARTICLE 18:

The company's capital shall be divided into equal nominal shares. The statutes shall specify (100) shares's nominal value which shall not be less than (5) five Egyptian pounds and not more than one hundred Egyptian pounds. This provision shall not apply to subsidiary companies that replaced, under the provisions of this Law. Companies which were supervised by public sector organizations.

A share shall be indivisible, and shall not be issued at a value lower than its nominal value. It also may not be issued at a higher value except in the cases and at the conditions specified in the Executive Regulations, and such increase shall be added to the Reserve.

The issuance expenses shall not, under any circumstances, exceed the limit to be specified by a resolution of the General Authority for Money Market.

The Executive Regulations shall set forth the information to be contained in the shares' certificates, substitution for lost or damaged certificates and what action is to be taken with regard to these certificates when an amendment is made to the statutes of the company.

ARTICLE 19:

If in-kind tangible or intangible shares are to be included in the capital of the company upon its incorporation or when an increase in its capital is made, the founders or the Board of Directors, as the case may be, shall request the concerned to verify whether these shares have been accurately valuated.

Verification of the accuracy of valuation shall be undertaken by a committee to be formed by a decree of the concerned Minister, and shall be chaired by a counsellor from a Legal Authority to be selected by the Chairman of that Authority. The committee's membership shall comprise no more than four persons having economic, accounting, legal and technical experience, a representative of the founders or the share holders to be selected by the Board of Directors of the holding company or the Board of Directors of the affiliated company, as the case may be, and a representative of each of the ministry of finance and the Central Agency for Accounting.

The committee shall submit its report to the concerned Minister within a period no more than sixty days from the date of referring the papers to it, and the valuation shall become final only when approved by him.

ARTICLE 20:

The company's shares shall be negotiable in accordance with the provisions set forth in the general regulations of the Stock Exchange promulgated by Law 161 of 1957, and the Law of joint stock companies, partnerships limited by shares and limited liability companies promulgated by Law 159 of 1981.

Incorporation share, in-kind shares, and shares subscribed in by the company's founders may be negotiated as of the date of its registration in the commercial registry.

CHAPTER 2
SUBSIDIARY COMPANIES OF THE HOLDING COMPANY

SECTION 3
THE BOARD OF DIRECTORS

ARTICLE 21:

Subject to the provisions of Article (4) of this Law, a company whose capital is fully owned by a single holding company or together with other holding companies, public entities or public sector banks, shall be managed by a Board of Directors to be appointed for renewable term of three years.

The Board of Directors shall meet at least once every month upon a call by its Chairman, and in his absence the Chairman of the General Assembly shall delegate a Board director to preside the meeting.

The Board shall consist of an odd number of Directors, not less than five and not more than nine including the Board Chairman as follows:

(a) A part-time Chairman having experience, to be appointed by the General Assembly of the company based upon a nomination by the Board of Directors of the holding company.

(b) Part-time members, to be appointed by the Board of Directors of the holding company from among those who have experience, representing the entities participating in the company, and shall form 50 percent of the number of the Board members.

(c) A number of members equal to the number of members who have experience, to be elected from the employees of the company in accordance with the provisions of Law regulating this matter.

(d) The Chairman of the (Trade Union) Committee, who shall not be counted in the vote and in case the company has more than one Trade Union Committee, the General Trade Union shall select one of the Chairmen of these committees.

The General Assembly shall determine the membership remunerations to be received by the Chairman and members of the Board referred to in item (a) and (b) of the preceding paragraph, and the company's statutes shall specify their annual remuneration subject to the provision of Article 34 of this Law.

The General Assembly shall determine the meeting attendance allowance to be received by the Board members, and the annual remuneration of the elected members at an amount not exceeding the annual basic salary.

The holding company's Board of Directors shall elect from among the appointed members set forth in item (b) one or more Managing Directors on full-time basis for management of the company, and shall set the salary to be paid to him in addition to the amounts which he is entitled to under paragraph 4 of this Article.

The Board shall specify who is to replace the Managing Director in case of his absence, if his office becomes vacant or his removal.

The Board may entrust its Chairman with the duties of the Managing Director provided that he shall work full time, and in his case the Board shall determine the salary to be paid to him in addition to the amount, which he is entitled to under paragraph 4 of this Article.

ARTICLE 22:

Subject to the provisions of Article 4 of this Law, a company whose capital is participating in by individuals or artificial persons of the private sector, shall be managed by a Board of Directors to be appointed for a renewable term of three years, and shall consist of an odd number of Directors; not less than five and not more than nine including the Chairman of the Board, as follows:

(a) A part-time Chairman from those having experience, to be appointed by the Chairman of the General Assembly of the company based upon a nomination by the Board of Directors of the holding company.

(b) Part-time members from those having experience, to be selected by the Board of Directors of the holding company, representing the parties participating in the company.

(c) Part-time members in proportion to what is owned by the artificial persons of the private sector or individuals participating in the company, to be selected by the representatives of these parties in the General Assembly.

(d) Part-time members to be elected from the employees of the company in accordance with the Law regulating this matter, and their number shall be equal to the number of the Board members under items (b) and (c).

(e) The Chairman of the Trade Union Committee who shall not be counted in the vote, and in case of having more than one union committee in the company, the General Trade Union shall select one of the Chairmen of these committees.

The General Assembly shall determine the membership remuneration to be received by the Board Chairman and members referred to in items a, b, and c. The company's statutes shall specify the annual remuneration which they are entitled to subject to the provision of Article 34 of this Law.

The General Assembly shall determine the meeting attendance allowance to be paid to Board members, and the annual remuneration which the elected Board members are entitled at an amount not exceeding the annual basic salary.

The Board of Directors of the holding company shall select from among the members set forth in item b, a managing director who shall work on full-time basis and the Board shall specify who is to replace him in case of his absence, if his office becomes vacant or his removal.

The Board of Directors may entrust the duties of the Managing Director to the Chairman in which case he shall work full-time for the management.

The provisions of the preceding Article shall apply to the entitlement of the managing director or the Chairman who works full-time for management.

ARTICLE 23:

The Managing Director shall have all the authorities related to management of the company and shall undertake all actions necessary for the accomplishment of its purpose, with the exception of that which is assigned to the General Assembly and the Board of Directors under the provisions of this Law and its Executive Regulations and the statutes of the company.

ARTICLE 24:

The Managing Director shall represent the company before the courts and in its dealings with others.

CHAPTER 2
SUBSIDIARY COMPANIES
OF THE HOLDING COMPANY

SECTION 4
THE GENERAL ASSEMBLY

ARTICLE 25:

The General Assembly of the company whose capital is fully owned by the holding company alone or jointly with other holding companies, or with public artificial entities or public sector banks, shall be formed as follows:

(1) The Chairman of the Board of Directors of the holding company, or whoever replaces him in his absence, shall be President of the General Assembly.

(2) Members of the Board of Directors of the holding company to which the company is affiliated.

(3) Members from those who have experience whose number shall not be more than four to be selected by the General Assembly of the holding company which shall set the attendance allowance to be paid to them.

(4) Two members to be selected by the union committee, and the meetings of the General Assembly shall be attended by the Chairman and members of the Board of Directors of the company and the auditors from the Central Agency for Auditing, who however, shall not be counted in the votes.

The General Assembly's resolutions shall be passed by a majority of votes of the attendees except in the case where the Executive Regulations or the company's statutes require a special majority.

The Executive Regulations shall set forth the conditions required for the validity of convocation of the General Assembly and the system of voting on the matters presented to it whether at ordinary or extraordinary meetings.

ARTICLE 26:

The General Assembly of the company whose capital is jointly owned, together with the holding company, by individuals or artificial persons of the public sector, shall be formed as follows:

(1) The Chairman of the holding company, or whoever replaces him in his absence, shall be President.

(2) Members of the Board of Directors of the holding company to which the company is affiliated.

(3) Shareholding individuals and artificial persons of the private sector, and they shall have the right to attend the General Assembly in person or by proxy provided that the proxy be established by a written power of attorney and the proxy should be a shareholder, unless the company's statutes required holding a certain number of shares to qualify for attendance. However, each shareholder who holds at least ten shares shall have the right to attend even though the company's statutes stipulate otherwise.

The right to voting of the representatives of the holding company, the public artificial persons, the public sector banks, the private sector artificial persons or individuals, shall be proportionate to the capital share of each in accordance with the voting quorum required by the company's statutes.

Resolutions of the General Assembly shall be passed by a majority of votes of the representatives of capital shares present, except in the cases where the Executive Regulations or the statutes of the company require a special majority.

The meetings of the General Assembly shall be attended by the Chairman and members of the Board of the company and the auditors of the Central Agency for Auditing, who, however, shall not be counted in the votes.

The Executive Regulations shall set forth the conditions required for the validity of convocation of the General Assembly and the method of voting on the matters presented to it.

ARTICLE 27:

Subject to the provisions of this Law and its Executive Regulations and the statutes, the General Assembly shall:

(a) Approve the balance sheet and profit and loss account.

(b) Approve the Board of Directors' report on the company's activity, and release (discharge) the Board from responsibility.

(c) Approve the profits distribution.

(d) Approve the continuance of the Chairman and Directors of the Board in office for another term or remove them, by silent vote.

(e) Consider whatever the President of the General Assembly of the company, the Chairman of the Board of Directors of the holding company, the Board of Directors of its subsidiary company, or the shareholding artificial persons to the private sector or individuals who own 10% of the capital deem necessary to be presented to the General Assembly.

ARTICLE 28:

The statutes of the company may not be amended except with approval of the extraordinary General Assembly and in accordance with the provisions of the Executive Regulations.

ARTICLE 29:

The President of the General Assembly may call the Assembly for an extraordinary meeting to consider the removal of the Chairman and all or part of the members of the Board of Directors of the company during their term of office.

In this case the President of the General Assembly should give notice to the General Assembly and to the Board Directors to be removed stating his view and the reasons on which it is based at least ten days prior to the convocation of the General Assembly, Board Members to whom the notice has been addressed may discuss its contents in a memorandum to be placed with the Secretariat of the General Assembly at least three days before its convocation. The President of the General Assembly shall read the memorandum to the General Assembly, and the member who presented the memorandum may appear before the General Assembly before it makes its decision to refute the reasons of his removal.

The General Assembly shall make its decision by secret ballot, and the removal resolution shall not be valid unless it be passed by a majority of two thirds of the shares represented in the meeting.

A member who is removed by a resolution of the General Assembly shall be deprived of his salary, remunerations and any amounts he used to receive from the company as of the date of issuance of the Resolution.

In all events, the Chairman and Directors of the Board of the company should not attend the meetings of the General Assembly if its agenda includes the removal of the whole Board or some of its members or the Chairman.

In case of removal of the whole Board, the extraordinary General Assembly shall issue a resolution appointing one or more commissioners (mandataries) to manage the company on temporary basis until a new Board is formed in accordance with the provisions of this Law within three months from the date of issuance of the removal resolution.

But if the removal be confined to the Chairman or the managing director or some members of the Board, the Board shall be completed in accordance with the provisions of this Law, and the new member shall complete the term of office of his predecessor.

ARTICLE 30:

Without prejudice to the provisions of this Law, the provisions or Articles 59 through 76 of Law 159 of 1981 referred to shall apply to the General Assemblies of companies owned by the holding company jointly with artificial persons of the private sector or individuals.

CHAPTER 2
SUBSIDIARY COMPANIES
OF THE HOLDING COMPANY

SECTION 5
FINANCIAL SYSTEM AND
AUDITING OF THE ACCOUNTS OF THE COMPANY

ARTICLE 31:

The statutes shall specify the beginning and end of the financial year of the company giving regard to the fiscal year of the holding company to which it is affiliated.

ARTICLE 32:

Net profits are the profits resulting from operations undertaken by the company after deduction of all costs necessary for the realization of these profits and after calculating and earmarking all depreciation and provisions as required by accounting standards prior to distribution of profits in any form whatsoever.

The Board of Directors shall earmark at least 5% (five percent) of the profits referred to in the preceding paragraph to form a legal reserve. The General Assembly of the company may stop earmarking this reserve or may reduce its percentage if it has reached 50% (fifty percent) of the capital.

Legal reserve may be used to cover the company's losses and to increase capital.

The company's statutes may stipulate for earmarking a specific percentage of the net profits to form a regular reserve.

If the regular reserve is not allocated for specific purposes set forth in the statutes of the company, the General Assembly, upon a proposal by the Board of Directors, may resolve to use it in whatever may be of benefit to the company or to the shareholders.

The General Assembly, upon a proposal by the Board of Directors, may from other reserves.

The Executive Regulations shall set forth the rules and conditions of distributing distributable (dividends) profits.

ARTICLE 33:

Company employees shall have a share of the profits resolved to be distributed, which shall be determined by the General Assembly based on a proposal by the Board of Directors and which shall be not less than 10% (ten percent) of these profits.

Profits paid to employees in cash shall not exceed the total amount of their basic annual wages.

The Executive Regulations shall set forth the method of allocating profits in excess of total annual wages to services that would be of benefit to the employees of the company.

ARTICLE 34:

The company's statutes shall set forth the method of setting and distributing the remuneration of the members of the Board of Directors. The remuneration of the Board may not be more than 5% (five percent) of distributable profits after the allocation of an amount of profits not less than 5% (five percent) of capital as a prime share for shareholders and employees.

ARTICLE 35:

The Central Agency for Auditing shall audit the accounts of the company and evaluate its performance in accordance with its Law.

CHAPTER 3
GENERAL PROVISIONS

SECTION 1
AMALGAMATION, DIVISION, (TERMINATION) DISSOLUTION AND LIQUIDATION OF HOLDING COMPANIES AND THEIR SUBSIDIARY COMPANIES

ARTICLE 36:

Holding companies may be divided and amalgamated by a decree of the Prime Minister upon a proposal by the concerned Minister, and their subsidiary companies may also be divided and amalgamated by a resolution of the Board of Directors of the company or of holding companies and with the approval of the General Assembly of the merged-in or divided company as the case may be.

Every company created through amalgamation or division shall have an independent artificial entity with the ensuing legal implications.

Subject to the provisions of this Law and its Executive Regulations, the provisions of Articles 130 through 135 of Law 159 of 1981 referred to shall apply to amalgamation cases.

ARTICLE 37:

The committee set forth in Article 19 of this Law shall undertake valuation of net assets of companies in cases of amalgamation and division. The committee's resolutions with regard to holding companies should be approved by the concerned Minister, and the resolutions regarding subsidiary companies should be approved by the General Assembly of the merged and the merged-in company or of the divided company as the case may be.

ARTICLE 38:

If the company's losses reach half the issued capital, the Board of Directors should immediately call the extraordinary General Assembly to consider dissolution or continuance of the company.

ARTICLE 39:

The company shall terminate at any of the following events:

(1) Dissolution of the company.

(2) Expiration of the specified duration in the company's statutes.

(3) Completion of the purpose for which the company has been established.

(4) Amalgamation or division.

The terminated company shall be in a state of liquidation and the provisions of Articles 137 through 154 of Law 159 of 1981 referred to and its Executive Regulations shall apply to it.

CHAPTER 3
GENERAL PROVISIONS

SECTION 2
ARBITRATION

ARTICLE 40:

Arbitration may be requested to settle disputes arising between the companies governed by the provisions of this Law, or between them and public or private sector artificial persons, or individuals, whether local or foreigners, and in this connection, the provisions of the Third Chapter of the Third Book of the Law of Civil and Commercial Proceedings shall apply.

ARTICLE 41:

Requests for arbitration between public sector companies or between them and a central or local governmental body, a general or a public sector authority or a general organization submitted before the date of this Law's coming into force, and disputes on execution of rulings issued with regard thereto shall continue to be heard before the Arbitration Boards formed in accordance with the provisions of the public sector organizations and companies Law promulgated by Law 97 of 1983 and in accordance with the provisions and procedures set forth therein.

CHAPTER 3
GENERAL PROVISIONS

SECTION 3
ON PERSONNEL (SYSTEM) POLICY IN HOLDING COMPANIES AND THEIR SUBSIDIARY COMPANIES

ARTICLE 42:

The company in conjunction with the concerned General Trade Union shall lay out the regulations relating to its personnel policy. These regulations shall include in particular wages, increments, allowances and leaves policy in accordance with each company's organization and these regulations shall be approved by the concerned Minister.

The company, in conjunction with the Lawyers General Syndicate, shall lay down the regulations relating to its legal department observing their respective classification of enrollment on the Lawyers listings, their allowances, the rules and procedures of measuring their performance, their duties and disciplinary procedures with regard to them. Until such regulations are issued, the provisions of the Law concerning legal departments of general authorities and public organizations and their affiliated units promulgated by Law 47 of 1973 shall be applicable to them.

These regulations shall be issued by a decree of the Prime Minister upon a presentation by the concerned Minister.

ARTICLE 43:

The following shall be observed in laying down the rules regulating personnel affairs:

First: Every company shall have an organizational structure and a table of positions compatible with the nature of the company's activities and objectives.

Second: The wages system should comply with the minimum prescribed by Law.

Third: Linking wages, incentives, allowances, bonuses and other compensations and monetary benefits of the employees to the production or turnover achieved by the company and the profits realized.

ARTICLE 44:

The provisions of Articles 78, 79, 80, 81, 82, 83, 85, 86, 87, 91, 92 and 93 of the Law of Personnel Employment in the Public Sector promulgated by the Law 48 of 1978 and the provisions of Law 117 of 1958 concerning the regulation of Administrative Prosecution and Disciplinary Tribunals and the Provisions of the State Council No. 47 of 1972 referred to shall apply with the respect to the duties of employees in holding companies, their interrogations and disciplinary procedures.

ARTICLE 45:

The service of an employee shall terminate for any of the following reasons:

(1) Loss of Egyptian nationality or absence of reciprocal condition for subjects of other countries.

(2) Reaching the age of sixty subject to the provisions of the Social Security Law promulgated by Law 79 of 1975.

(3) Medically unfitted for service.

The provisions of Chapter 5 of the said Law shall apply to Occupational Safety and Health.

The provisions of the Labor Law shall apply to the company's employees where no specific provision is made in this Law or in the regulations issued in implementation thereof.

CHAPTER 3
GENERAL PROVISIONS

SECTION 4
PENALTIES

ARTICLE 49:

Without prejudice to any severer penalty or legal description set forth in the Penal Code or in any other Law, any person who commits any of the following acts shall be publishable by a term of imprisonment not less than two years and a fine not less than two thousand pounds (2,000) and not more than ten thousand pounds (10,000) or either of these two penalties:

(1) Any person who intentionally tampers with the company's statutes, prospectus or any other company documents, or recording therein incorrect information, or in violation of the provisions of this Law or joint stock companies Law (referred to), and any person who knowingly signs or distributes these documents.

(2) Any person who maliciously overvaluates in-kind shares presented by the partners, at more than its true value.

(3) Any manager of member of the Board of Directors who distributes to shareholders or to others profits or interests contrary to the provisions of this Law or the company's statutes, and any auditor who approves this distribution.

(4) Any manager, member of the Board of Directors or liquidator who intentionally states incorrect information in the balance sheet or in the profit and loss account or who intentionally ignores to mention essential facts in these documents.

(5) Any auditor who intentionally makes an incorrect report on the result of his audit or who intentionally conceals essential facts in this report.

(6) Any manager, member of the Board of Directors or auditor or assistant or employee thereof, and any person entrusted with inspection of the company, who divulges any of the company's secrets that he ex-officio has access to, or who uses these as secrets to obtain benefit for himself or for others.

(7) Any person appointed by the competent administrative authority to inspect the company who intentionally states in his report on the result of inspection false events or who intentionally ignores to mention in his report essential facts that would affect the result of inspection.

ARTICLE 50:

Without prejudice to any severer penalty set forth in the Penal Code or any other Law, any person issuing or offering for negotiation shares, stocks, debentures, subscription receipts or temporary certificates contrary to the provisions set forth in this Law, shall be punishable by a fine of not less than five hundred (500) pounds and not more than five thousand (5,000) pounds.

ARTICLE 51:

In case of recurrence, the minimum and maximum fines set forth in the two preceding Articles shall be doubled.

ARTICLE 52:

Funds of companies governed by the provisions of this Law shall be deemed as public funds and those in charge of their management, and their employees shall be considered as public servants with respect to the application of the provisions of Chapters 3 and 4 of the Second Book of the Penal Code.

ARTICLE 53:

Criminal proceedings may not be initiated in the crimes referred to in Articles 116 bis, 116 bis (a) and 116 bis (b) of the Penal Code with regard to members of the Board of Directors of companies governed by the provisions of this Law except upon an order by the Public Prosecutor, the Assistant Public Prosecutor or the First Public Attorney.

ARTICLE 54:

Those charged with verification of the crimes committed in violation of the provisions of this Law and the decrees issued implementation thereof, and who shall be specified by a decree of the Minister of justice in conjunction with the competent Minister, shall have the right to pursue all the records and books of the holding company or its affiliated companies. The Chairman, members of the Board of Directors, the managing director, the auditor and all employees of these companies should present to them all information, data, papers, documents, records and books which they require to perform their duty.

ARTICLE 55:

Without prejudice to the provisions of the preceding Article, no supervising authority of the State, except for the Central Agency for Auditing, may exercise any act of supervision in the head office or branch offices of any of the companies governed by the provisions of this Law unless a permission to do so is obtained from the competent Minister or the Chairman of the Board of Directors of the holding company.

APPENDIX B

DESCRIPTION OF PROJECT TASKS AND PROJECT TEAMS

APPENDIX B

PART A - DESCRIPTION OF PROJECT TASKS

Task I:

The K&M project team shall have a definitional visit with members of the PSED program team to establish final budgets, schedules and any other administrative procedures and contract requirements.

The K&M project team shall prepare a detailed workplan for approval by USAID, (Washington/Cairo Mission) and EEA review: setting forth the sequence of tasks, activities of each team member, and a schedule for attaining critical milestones.

The K&M project team shall perform mobilization activities and contacts with high level Egyptian officials to refine the implementation process and the identification of the MOE resources necessary to successfully carry out the study.

Task II:

The K&M project team shall prepare plan and questionnaires for required information (in Washington).

Task III:

The K&M project team shall assemble documents and information pertaining to:

- legal and regulatory framework in the energy sector;
- Charter and by-laws of EEA;
- Charter and by-law of the eight Distribution Companies and the Electric Distribution Holding company;
- tariffs charged for electric energy sales by customer classification;
- accounting practices;
- balance sheets, income statements and profit and loss statements for EEA and other entities;
- tariff studies already prepared;
- other studies prepared in the last five (5) years for EEA and the Distribution Companies.

Task IV:

The K&M project team shall:

- review EEA's most recent load and energy forecast.
- review EEA's most recent capacity needs' assessment study.
- review present system for generation of electricity, including efficiencies of plants, aging, need for replacement, and evaluation of assets.

Task V:

The K&M project team shall review EEA's most recent long range transmission development plan and integration of isolated systems into the interconnected power system.

The K&M project team shall review transmission by voltage class (i.e., 500 KV, 220 KV, 132 KV), including value of assets, extent of transmission, transmission patterns, transmission losses, transfer price to distribution companies, selling prices to HV customers, sample contracts, and future plans.

Task VI:

The K&M project team shall perform a distribution system study, including review of present system, pricing, collections, losses, and evaluation of assets.

Task VII:

The K&M project team shall review computer systems and computer software applications used in planning.

The K&M project team shall review accounting systems of EEA and distribution companies.

Task VIII:

The K&M project team shall assess profitability and financial work of the different areas of power sector, i.e. generation, transmission, and distribution.

Task IX:

The K&M project team shall review the overall organizational structure of the electric utility organization, including the Ministry of Electricity and Energy's relationship with EEA and the distribution companies.

Task X:

The K&M project team shall prepare a draft final report outlining findings and recommendations. Copies are to be submitted to USAID/Egypt, who will distribute copies to EEA in sufficient time for review before meeting for discussions.

Task XI:

The K&M project team shall meet with EEA, USAID/Egypt, and R&D/EI as requested to answer specific questions and clarify the contents of the draft final report as required.

The K&M project team shall organize and conduct a presentation of the Assessment at the EEA headquarters in Cairo during the twentieth (20th) week of the contract. The presentation will be for representatives of the Ministry of Electricity and Energy, the Egyptian Electricity Authority, other GOE organizations designated by the Ministry of EEA and USAID/Egypt, and other donors designated by USAID/Egypt. The presentation will emphasize the study methodology, major findings and recommendations and long range plans involving policy reforms and institutional development that will allow the Electric Power Sector to grow to meet increased demand, while attaining a degree of financial independence.

The K&M project team shall prepare and conduct briefer presentations for the senior management of the Ministry of Electricity and Energy and USAID/Egypt emphasizing the major conclusions of the assessment, recommendations and the long range plan involving reforms and institutional development.

Task XII:

The K&M project team shall incorporate all appropriate clarifications and suggestions into the Final Report.

The K&M shall provide to USAID/Egypt a camera-ready original copy and fifty (50) paper copies of the Final Report, with annexes, appendices, etc., and two electronic copies adhering to the following software criteria:

1. DOS 3.31 - Disk format on 5 1/4" disks, formatted 1.4 MB, double sided, double density only;
2. Wordperfect 5.51 - for word processing.
3. DBase III+ - for databases;
4. LOTUS 1-2-3 - for spreadsheets; and
5. Harvard Graphics - for charts, graphs, etc.

Three paper copies of the Final report and one electronic copy shall also be provided to R&D/EI.

PART B - K&M PROJECT TEAM

The K&M project team consists of highly qualified personnel to implement the project objective and best serve USAID and EEA's goals. The following is a listing of the specialists involved in Phase I of the project and a brief overview of their experience and background:

Mr. Jerry Geist - Mr. Geist will serve as K&M's Utility Management Specialist. He is the retired Chairman and President of Public Service Company of New Mexico. He retired after thirty years of service, fourteen as its Chief Executive. He is active as a strategy consultant to: NYSE Energy Company, a large multi-national engineering company; two major research laboratories; was chairman of an environmental control manufacturing company; consulted on major, international infrastructure-privatization projects; was instrumental in arranging related financing ($300 M. U.S.$); was a financial consultant for a "multi" state franchise organization, and arranged for its equity and capital resource group; and was a consultant to a large venture capital fund. Mr. Geist is a member of the Advisor Committee of the U.S. Electric Utility for the Federal Energy Administration and the U.S. Department of Labor's Southwestern Regional Manpower Advisory Committee. Mr. Geist has a B.S. degree in Electrical Engineering and received an Outstanding Graduate Award from the University of Colorado, in Boulder. In 1961 he became a Registered Professional Engineer.

Mr. Jose A. Trujillo - Mr. Trujillo is presently vice president for K&M. He is responsible for the overall management and direction of K&M's consulting and business development efforts. He is also the Corporate Director of K&M's Private Sector Energy Development project with USAID. He also was an advisor to the government of the Dominican Republic on matters dealing with privatization and the financing of the electric utility sector. He managed and directed K&M's involvement and participation in privatization projects in Argentina, Poland, and the Caribbean. Mr. Trujillo will be the Policy & Management Specialist. He has over 15 years experience in privatization and management. Prior to joining K&M, he was a consultant providing services in various areas of expertise. He worked on projects that included the potential for implementation of thermal energy efficiency expert systems and evaluation of market and investment conditions. Mr. Trujillo holds a B.S. degree in Marketing and an MBA in Management, from the University of the District of Columbia.

Mr. Ibrahim Khalifa - Mr. Khalifa is presently K&M's Senior Associate. He has participated in various engineering and privatization activities within the company. Throughout his career in industry and management consulting, Mr. Khalifa has dealt extensively with utilities in many countries such as: EGAT in Thailand; Manila Electric in the Philippines; Bombay Electric Supply & Transport; CADAFE in Venezuela; MEW in Kuwait; Electricity Du Liban in Lebanon, the various utilities in Saudi Arabia; and MEW in the Sultanate of Oman. While President of Phelps Dodge Overseas Corporation

and Executive Consultant to Bechtel Power Corporation, Mr. Khalifa has consistently maintained a close working relationship with the Egyptian Electricity Authority. In 1982, he participated in several power generating projects and in the "Organization and Management Enhancement". He has also participated in various studies on tariffs and energy conservation with RCG/Hagler Bailly. Since 1989, he has worked with K&M on various projects including the Kuremat Power Plant Project. Mr. Khalifa started his career as an Electric Power Engineer with the Cairo Electricity and Gas Administration in Egypt and was sent for training with both the Electrite de France, in Paris and the British Electricity Authority, in London. He has over 40 years of worldwide experience in the electric power industry. Mr. Khalifa has a B.S. degree in Electrical Engineering from Cairo University.

Mr. H. John Dunshee - Mr. Dunshee will serve as K&M's Transmission specialist. He has over 30 years of experience in electric utility and transmission operations for Tucson Electric Power Company and Kansas City Power and Light. As Superintendent of Power System Control, he was in charge of energy management, transmission analysis, and dispatching and scheduling. As Principal Distribution Engineer, he was responsible for expansion of 300 distribution circuits and 76 substations. He was also involved in doing load flow studies, short circuit, stability, and relay coordination studies with 345 kV transmission lines. Mr. Dunshee has M.S. and B.S. degrees in Electrical Engineering from the University of Missouri and is a Registered Professional Engineer in Missouri, Arizona, and New Mexico.

Mr. Andrew Ottolenghi - Mr. Ottolenghi is K&M's Director of Utility Operations and will serve as overall technical coordinator and distribution specialist. Throughout almost 40 years of work experience, Mr. Ottolenghi was involved in various aspects of the electric utility field with specialization in its commercial operations and distribution. He was involved in institutionalization of programs to reduce technical and non-technical losses, improvement to the power and load factor of industrial and commercial users, and determination of changes, and its effects, of electric tariffs and metering methods. His experience was gained internationally through work in the U.S., Canada, Dominican Republic, Panama, Egypt, Tanzania, Ecuador, Philippines, and Venezuela. Mr. Ottolenghi has a B.S. degree in Electrical Engineering from the University of Toronto, Canada and also an MBA in Business Administration from McGill University.

Mr. Johannes Peppelaar - Mr. Peppelaar is K&M's Chief Mechanical Engineer and will serve as a steam and fossil power plant specialist. He has over 40 years of work experience in power plant development and maintenance. As Senior Power Plant Engineer for General Electric Corporation, he was responsible for preparation of equipment specifications, equipment and line sizing, and for determination of pre-boiler piping and HRSG's chemical cleaning methods, steam piping, air blowing, etc. for several in-house projects. Mr. Peppelaar has a B.S. degree in Marine Engineering from Scheveningen University in Holland.

Mr. David Wheelock - Mr. Wheelock will serve as Hydro Plant Specialist. He has 13 years of work experience in hydro plant construction and maintenance. Mr. Wheelock's experience includes the design and construction direction of the Upper and Lower Projects, Peterborough Hydro Project, New Hampshire. Additionally, Mr. Wheelock directed the planning and design of numerous pipelines, tunnels, and penstocks, including major waste water interceptors. He also performed hydrologic assessments and energy production determination of the following projects: Wailuku Hydro Project, Hawaii; La Paz Hydro Project, Costa Rica; and Beaver Hydro Project, New York. Mr. Wheelock has a B.S. degree in Civil Engineering from the University of Texas in Austin and an M.S. degree in Water Resources.

Mr. William Lackey - Mr. Lackey will serve as the Utility Accounting Specialist. He has 34 years of utility accounting experience. He served as Vice President, Comptroller, and Chief Accounting Officer of the Public Service Company of New Mexico, New Mexico's public utility. Prior to that, Mr. Lackey was Manager of the Audit Department of Peat, Marwick, Mitchell & Company. He has a B.A. degree in Business Administration, specializing in Accounting, from the University of North Texas.

Dr. William Loehr - Dr. Loehr will serve as Energy Economist. Mr. Loehr has extensive experience in projects dealing with trade problems, payment regimes, credit and financial conditions, and pricing strategies in many developing countries, including: Nicaragua, Kenya, Belize, the Caribbean, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Barbados, and Egypt. He was a participant in the tariff study carried out by RCG/Hagler Bailly for EEA in 1991. Dr. Loehr has a B.S. degree in Economics from the University of Connecticut and a Ph.D. in Economics from the University of Colorado.

Mr. Richard Felak - Mr. Felak will serve as Power Plant Technical Planning Specialist. Mr. Felak, who has over 24 years of work experience in the electric utility industry, worked with General Electric where his responsibility included integrated transmission and generation system modeling and analysis, utility economics, and reliability studies. As Senior International Liaison Engineer, he was responsible for power system planning and engineering studies worldwide.

Mr. Sameh Mobarek - Mr. Mobarek is K&M's Associate in Finance and will serve as Financial Analyst. Mr. Mobarek has worked as Management Information Systems Analyst with Anderson Consulting, developing management systems that control the billing process, metering information, and management reports for Caroline Power and Light. As a Global Energy Markets Analyst for Bechtel Power Corporation, he was involved in the analysis and investigation of the global energy and power markets in the U.S. and abroad, especially in OPEC countries. He has a B.S. degree in Electrical Engineering and Computer Science from George Washington University.

APPENDIX C

STUDIES AND DOCUMENTS REVIEWED FOR EDCOS

PART A

TECHNICAL DOCUMENTS/DISTRIBUTION

(1) Dual-Mode Residential Energy Monitoring System

(2) Cashpower 2000

(3) Draft Preliminary Finding Report

(4) Annual Statistical Report (1990/1991)

(5) Losses Reduction in Electricity Distribution Systems in Egypt (Draft Report Vol. 1 & Vol. 2 and Appendix, June 1992)

PART B

ACCOUNT
HOLDING COMPANY FOR ELECTRIC DISTRIBUTION

(1) The Holding Company for Distribution's Financial Status and Financial Statements for the year ending 06/30/92.

(2) HCD Budget for 1992/93 year.

(3) HCD Current Operating

(4) South Delta Distribution Company (91/92)

- Current Accounts - Summary
- Financial Affairs Organizational Chart
- Balance Sheet
- Current Accounts
- Sales Income
- Profit and Losses
- Capital Resources and Uses
- Income Statement
- Current Accounts (01/07/92 - 2/31/92)
- Sales Income (01/07/92 - 2/31/92)
- Profit and Losses (01/07/92 - 2/31/92)
- Capital Resources and Uses (01/07/92 - 2/31/92)

(5) HCD's Breakdown of Capital Investments in the Eight Regional Companies.

(6) General Budget in 06/30/91.

PART C

LEGAL FRAMEWORK/DISTRIBUTION

(1) Decree No. 220/1978 Establishing the Holding Company for Electricity Distribution

(2) Decree No. 260/1992 Members of the General Committee for the Holding Company for Electricity Distribution.

(3) The Executive Regulations of the Public Business Sector Companies Law.

(4) Law No. 203 of 1991 - Promulgating Public Business Sector Law

(5) Basic system project for the HCD

APPENDIX D

USAID COMMENTS TO ADDRESS LEGAL ISSUES

OCTOBER 17, 1993

PART A - THE HOLDING COMPANY FOR THE CONSTRUCTION AND THE DISTRIBUTION OF ELECTRICAL POWER AND ITS AFFILIATED COMPANIES

ITEM 1:

The report described properly the current legal status of this holding company. It is a holding company for the construction and distribution of electric power. It is comprised of eight electric distribution of electric power. It is comprised of eight electric distribution companies, three construction companies related to the electric power sector, one manufacturing company related to the electric sector, and four construction companies not related directly to the electric sector. This holding company and its affiliated companies are functioning under public Business Sector Law No. 203/1991. Consequently the private shareholders ownership exceeds 40% in one of these companies, it will be private company under Law 159/1981 concerning private sector companies.

ITEM 2:

The report also concluded that under the present status there is no legal impediment to commercial operations of the electricity distribution affiliated companies. Therefore, they should improve their profitability in order to attract potential purchasers. In my view this conclusion is correct, however, pursuant to aforesaid provisions of Law 12/1976, the Ministry of Electricity and the Council of Ministers still have the power to set tariffs. This power may affect the potential profitability of the affiliated companies. Setting tariffs according to the above system may result in arbitrary tariffs and not responsive to the true cost of operation and services. The disadvantage in the existing system of setting tariffs may lead to accept the creation of an independent Regulatory Board. This is the topic of the next time.

JW

PART B - REPORTS' APPENDICES

There is some confusion and disorder in the report's appendices concerning Laws and Decrees. Certain titles of these laws and Decrees do not relate to respective articles written below. This is the case for Presidential Decrees and Laws in pages A-6 and A-11 in volume 1 and in pages A-6, A-11, A-17, A-24 in volume 2. I consider this confusion due to omissions in the report However, they do not affect the valuable and correct recommendations and results of the report as I mentioned previously.