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PROJECT PERFORMANCE AUDIT REPORT

INDONESIA: FIRST AND SECOND ELECTRICITY DISTRIBUTION PROJECTS
(CREDITS 165-IND AND 334-IND)

November 16, 1979

Operations Evaluation Department

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INDONESIA: FIRST AND SECOND ELECTRICITY DISTRIBUTION PROJECTS
(CREDITS 165-IND AND 334-IND)

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PROJECT PERFORMANCE AUDIT REPORT

INDONESIA: FIRST AND SECOND ELECTRICITY DISTRIBUTION PROJECTS
(CREDITS 165-IND AND 334-IND)

Preface

This report presents the results of a performance audit of the First and Second Electricity Distribution Projects for which Credits 165-IND and 334-IND were made in October 1969 and September 1972 respectively. The two credits were disbursed and closed in December 1975 and June 1978 respectively.

The report consists of Highlights prepared by the Operations Evaluation Department (OED) and a Project Completion Report (PCR) prepared by the East Asia and Pacific Regional Office. The Utility has prepared a completion report which has been taken into account in the preparation of the PCR.

Following its abbreviated procedure, OED has reviewed the respective Appraisal and President's Reports, the credit documents, the minutes of the Board discussions and the PCR. OED has also discussed the project with Bank staff. On the basis of this limited review, OED finds no reason to disagree with the analysis and the conclusions of the PCR.

Following normal OED procedures, a copy of the draft audit report was sent to the Utility and the Government for their comments. Those comments which were received have been taken into account in finalizing the report. They are also reproduced as an Appendix to the report.

PROJECT PERFORMANCE BASIC DATA SHEET 1/INDONESIA: FIRST AND SECOND ELECTRICITY DISTRIBUTION PROJECTS
(CREDITS 165-IND AND 334-IND)

<u>KEY PROJECT DATA</u>		
<u>Item</u>	<u>Appraisal Expectation</u>	<u>Actual or Current Estimate</u>
Total Project Cost (US\$ million)	74.8	101.0
Overrun (%)		33
Credit Amount Cr. 165 (US\$ million)	15.0	15.0
Disbursed	15.0	15.0
Credit Amount Cr. 334 (US\$ million)	40.0	40.0
Disbursed	40.0	40.0 ^{2/}
Date for Completion of Physical Components	6/76	12/79
Proportion Completed by Appraisal Target Date (%)		50
Proportion of Time Overrun (%)		75
Incremental Financial Rate of Return (%)	18	10
Financial Performance		Poor but better than expected at appraisal
Institutional Performance		Satisfactory

As of June 30:	<u>Cumulative Estimated and Actual Disbursements (Cr.334) 3/</u>					
	<u>(US\$ million)</u>					
	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>Dec. 1978</u>
(i) Estimated	16.5	34.5	40.0	40.0	40.0	40.0
(ii) Actual	2.0	11.7	27.5	36.8	39.6	40.0
(ii) as % of (i)	12	34	69	92	99	100

<u>OTHER PROJECT DATA</u>		
<u>Item</u>	<u>Original Plan</u>	<u>Actual</u>
First Mention in Files or Timetable		About mid-1967
Negotiations		9/69 (165-IND) 5/72 (334-IND)
Board Approval		10/21/69 (165-IND) 6/2/72 (334-IND)
Credit Agreement Date		10/29/69 (165-IND) 9/29/72 (334-IND)
Effectiveness Date		6/1/79 (165-IND) 3/12/73 (334-IND)
Closing Date	12/31/73 12/31/76	12/31/75 (165-IND) 6/30/78 (334-IND)
Borrower		Republic of Indonesia
Executing Agency		Perusahaan Umum Listrik Negara (PLN)

1/ This Data Sheet covers the combined project for the two Credits

2/ About US\$9,000 was cancelled.

3/ A Disbursement Schedule was not provided for Credit 165.

Fiscal Year: April 1 - March 31
 (Until 1973 PLN's fiscal year coincided with calendar year).
 Follow-on Project Name: West Java Thermal Power Project
 Credit Number: 399-IND
 Amount (US\$ million): 46.0
 Credit Agreement Date: June 22, 1973

Mission Data

		<u>Month/Year</u>	<u>No. of weeks</u>	<u>No. of Persons</u>	<u>Man Weeks</u>	<u>Date of Report</u>
Appraisal	165-IND	April 1969	3	2	6	Oct. 8, 1969
Appraisal	334-IND	various ^{1/}	-	up to 5		June 2, 1972
Appraisal	399-IND	November 1972	3	2	6	May 10, 1973
Supervision		October 1973	2	2	4	Nov. 13, 1973
Appraisal	1127-IND	November 1974	3	3	9	May 20, 1975
Supervision		July 1975	2	2	4	Sept. 29, 1975
Appraisal	1259-IND	December 1975	3	2	6	April 30, 1976
Appraisal	1365-IND	May 1976	3	2	6	Jan. 12, 1977
Supervision		Sept. 1977	2	2	4	Jan. 26, 1978
Supervision		Feb. 1978	3	1	3	July 17, 1978
Supervision		July 1978	2	1	1	Aug. 22, 1978

Country Exchange Rates

Name of Currency:	Rupiah (Rp)	
	<u>1971</u>	<u>1977</u>
Exchange Rate:	US\$ 1 = Rp 420	US\$ 1 = Rp 415

^{1/} Brief contacts were maintained by the Bank with the Borrower during 1969-71. Towards the end of 1968, a power engineer was attached to the resident mission in Indonesia.

PROJECT PERFORMANCE AUDIT REPORT

INDONESIA: FIRST AND SECOND ELECTRICITY DISTRIBUTION PROJECTS
(CREDITS 165-IND AND 334-IND)

Highlights

The two credits were the Bank Group's first and second operations in the Indonesia Power Sector. They financed a combined project which consisted mainly of rehabilitation and expansion of Jakarta's distribution system. The two operations were also intended to carry out some major institutional, organizational, and financial reforms in the power sector with the help of management consultants. The envisaged reforms included the drawing up of a new charter to give a greater degree of autonomy to Perusahaan Umum Listrik Negara (PLN), the utility responsible for public power supply.

The first credit was made without a proper project feasibility study, and sizeable portions of the two credits were earmarked for financing the costs of services of management consultants. Furthermore, the credit agreements did not include any of the Bank Group's standard covenants on the financial aspects of the utility (e.g., rate of return on assets, net internal contribution towards construction expenditure, limit on debt service or total debt) other than a cost recovery covenant. These features of the credits reflect the fact that: the project was urgently required to improve the dismal quality of power service which, among other things, was impeding the industrial and commercial development of the country; the power sector and the utility were badly organized; and the financial state of the utility was poor.

The project was slightly revised and is now expected to be fully completed by end-1979, some 3 1/2 years later than originally scheduled, while its final costs are expected to be about 33% higher than the appraisal estimate. About 16% of the credits was disbursed towards the costs of management consulting services (PCR para. 3.12).

As a result of the project, the reliability of power supply and the level of supply voltage at the consumer end have improved, and energy sales have increased by over 100% during the four-year period 1973-77 (PCR paras. 4.01, 4.02, 4.03). On the other hand, transmission and distribution losses are still at an unacceptably high level (about 20% of generation), due in large part to overloaded distribution networks, illegal consumption and inaccurate assessment of unmetered consumption. Consequently, a program to reduce losses has been prepared (PCR paras. 4.04, 4.05).

The financial situation of the utility has improved and the actual results, measured in terms of operating revenues covering operating costs, have been better than envisaged at the time of appraisal (PCR para. 5.01). The recalculated incremental financial rate of return on the project is 10% compared to the appraisal estimate of 18%.

Many of the envisaged institutional and other reforms were carried out with the help of management consultants. PLN has been given a substantial degree of autonomy in the management of the power sector including the responsibility for project construction and procurement. It was placed directly under the Minister of Public Works and Electric Power, and the intermediate position of Director General of Power was abolished ^{1/}. PLN is now a reasonably well-managed utility (PCR paras. 6.06-6.09) ^{2/}.

The following points may be of particular interest:

- domestic inflation contributed to project cost overrun (PCR para. 3.12);
- several factors contributed to project implementation delays, e.g. misunderstanding between the utility and the Bank Group on the appointment of consultants, inexperience of the utility in dealing with foreign consultants and suppliers, unfamiliarity of the utility with Bank Group's procurement procedures, problems in acquisition of land and in obtaining rights-of-way, and difficulty in changing over to a new system voltage (PCR paras. 3.02, 3.06, 3.07);
- excellent workmanship on the distribution system has led to low fault rates, lower even than the fault rates on similar systems in some developed countries (PCR para. 4.06);
- staff recruitment and training contributed towards the utility's improvement in project implementation and system operation (PCR paras. 3.08, 3.14, 3.15);
- the consultants gave an impressive performance after successfully overcoming the problems arising from language barriers and from chaotic conditions which originally prevailed within the utility (PCR para. 6.10);
- Bank Group's missions provided assistance to the utility and to its consultants particularly on matters of procurement (PCR para. 3.11).

^{1/} By way of contrast, the transformation of the telecommunications utility into an autonomous public sector enterprise took about four years, and the intermediate position of Director General of Telecommunications was retained - see Project Performance Audit Report on Indonesia: First Telecommunications Project (Report No. 1646, dated June 22, 1977).

^{2/} Further institutional changes have recently been introduced in the power sector and changes to PLN's charter have been contemplated. In 1978, PLN was placed under the newly established Ministry of Mines and Energy and the Directorate General of Power was re-established to perform the functions of policy planning, regulation and licensing.

COMMENTS FROM THE UTILITY

Oct. 24, 1979, Jakarta

2939 FOR KAPUR. RECEIVED TELEX-MESSAGE ~~FROM MR.~~ SARDJONO OF
PLN TO BE CONVEYED TO YOU READING AS FOLLOWS :
QUOTE REURLET SEPTEMBER 28, 1979 WE ARE PLEASED TO CONFIRM OUR
AGREEMENT ON THE DRAFT PERFORMANCE AUDIT REPORT ON INDONESIA-
FIRST AND SECOND DISTRIBUTION PROJECTS (CREDITS 165-IND AND
334-IND). REGARDS, SURYONO UNQUOTE. THANKS AND REGARDS, SARDJONO,
PLN. REGARDS

BALLEREAU

Oct. 30, 1979, Jakarta

INCOMING TELEX

(vii)

APPENDIX

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COMMENTS FROM THE UTILITY

3002 FOR KAPUR RECEIVED THE FOLLOWING TELEX FOR YOUR ATTENTION.
QUOTE

REOUR TLX NO. 3000/TLX/79, OF OCT. 24, 1979, PLEASE CONVEY THE
FOLLOWING TELEX MESSAGE TO MR. KAPUR, IBRD WASHINGTON :

RE : PROJECT PERFORMANCE AUDIT REPORT., CREDITS 165-IND AND 334-IND.

CONCERNING THE STATISTICAL FINANCIAL FIGURES WE FOUND THE FOLLOW-
ING SMALL DIFFERENCES AS COMPARED TO OUR AUDITED ANNUAL ACCOUNTS :

1) FINANCIAL PERFORMANCE (PAGE II)

	1971	1972	1973	1975	1976	1977	1978
REVENUE/COST RATIO	72,7	72,1	77,4	94,9	99,3	106,4	102,4

2) INCOME STATEMENT - ACTUALS (ANNEX 8 - TABLE I)

	1972	1973	1975	1976
SALES REVENUE	17	24	40	61
OTHER REVENUE	2	-	-	-
TOTAL REVENUE	19	24	40	61
OPERATING EXPENSES				
FUEL	5	7	10	15
OPERATIONS	11	13	19	28
DEPRECIATION	10	11	12	13
TOTAL EXPENSES	26	31	41	57
OPERATING INCOME	-7	-7	-1	4
NET INCOME (OPER.)	-7	-7	-1	4

RATE OF RETURN (R/O)

OPERATING RATIO (O/O)	136,3	129,2	102,5	93,4
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3) BALANCE SHEET-ACTUALS (ANNEX 3 - TABLE II)

APPENDIX
Page 3

	1972	1973	1975	1976
FIXED ASSETS				
PLANT IN SERVICE	134	166	199	229
LESS + DEPRECIATION	20	32	47	61
	---	---	---	---
OPERATING PLANT	114	134	152	168
WORK IN PROGRESS	33	23	117	274
CURRENT ASSETS				
CASH	6	8	20	16
INVENTORIES	10	21	20	25
RECEIVABLES	8	24	18	23
	---	---	---	---
T O T A L	24	53	58	69
	---	---	---	---
TOTAL ASSETS	171	210	328	511
EQUITY				
PAID-IN CAPITAL	167	208	309	475
RETAINED EARNINGS	-12	-13	-8	-10
	---	---	---	---
TOTAL EQUITY	155	195	301	465
DEBITORS	8	1	4	4
CONSUMER CONTR.	8	14	23	41
	---	---	---	---
TOT. EQ/LIABILITIES	171	210	328	511
	---	---	---	---

4) BASED ON THE ABOVE, THE FUNDS FLOW STATEMENTS SHOULD BE ADJUSTED ACCORDINGLY.

REGARDS, SURYONO, PLN. UNQUOTE REGARDS

BALLEREAU

INDONESIA: FIRST AND SECOND ELECTRICITY DISTRIBUTION PROJECTS
(CREDITS 165-IND AND 334-IND)

Project Completion Report 1/

I. INTRODUCTION

1.01 This report covers two interrelated projects for the common purpose of:

- (a) rehabilitation and expansion of the electricity distribution system in the city of Jakarta and its environs; and
- (b) provision of extensive management consulting and training services to improve the organization and efficiency of PLN.

Financing of the project was provided by the initiating credit of US\$15 million (165-IND) which assisted in implementing the most urgent rehabilitation work and engineering studies to define an appropriate distribution project (para. 3.01), and a credit of US\$40 million (334-IND) equivalent which enabled completion of the expansion project as defined by the first project.

1.02 The credits contributed only about 8% of the then estimated 10-year investment program of about US\$670 million but provided an opportunity for the Association to make an effective contribution to the development of the Indonesian power sector and PLN. The comprehensive institution building effort which commenced through these two credits laid the foundations for the improvement of PLN's management and operations from a chaotic level to the present standard of reasonable competence.

II. PROJECT PREPARATION AND APPRAISAL

Origin

2.01 Credit 165-IND. As a result of the difficult political and economic conditions experienced in Indonesia before 1968, maintenance and development of the electric power facilities were neglected and operations of the public power sector became disorganized. The Bank's Resident Staff (RSI) recommended in February 1969 that an IDA credit should be considered for the expansion of the electricity distribution system in Jakarta and the Government of Indonesia followed with an official request in the same month.

1/ The Utility and its consultants have prepared a completion report dealing mainly with the technical aspects of the project. The information provided therein was useful in the preparation of the Bank's Completion Report.

2.02 From the beginning, the project was conceived only as a "first contact" operation to use a minimum input of IDA funds to provide resources for urgently needed rehabilitation of the Jakarta distribution system, improvement of PLN's operations, and an engineering study for expansion of distribution. The Jakarta area was chosen because the weakness of the distribution system was impeding the restoration and development of industry and commerce in the capital city and its environs which accounted for about 50% of the country's electricity demand.

2.03 Credit 334-IND. After having overcome initial difficulties in getting the first credit underway (para 2.04), the Association decided to continue assisting Indonesia in the power sector by financing the balance of work required to complete the Jakarta distribution rehabilitation and expansion program defined by the consultants as part of the first project.

Preparation, Appraisal, Negotiation and Approval

2.04 Great difficulties were encountered during processing of Credit 165-IND in convincing the Indonesian authorities of the need for institutional improvement to be carried out with the help of consultants. Inexperience in dealing with foreign organizations, suppliers and consultants aggravated the situation and, last but not least, Indonesia's protracted Government rules and regulations prevented any tangible progress for some time. Language problems and inexperience of the consultants in overseas work made progress even more difficult.

2.05 With the exception of the 165-IND appraisal mission, which was in the field in March/April 1969, no "organized" assignment schedule was observed. Matters were dealt with in an ad-hoc fashion with RSI taking the lead in many respects and headquarters staff travelling to Indonesia as and when the need arose. The appraisal of Credit 334-IND was based on information obtained during various missions and through correspondence with the Government, PLN, the consultants and RSI.

2.06 Credit 165-IND was made in 1969 without a project feasibility study. However, by the time Credit 334-IND was considered in 1972, consultants had completed the feasibility study for systematic expansion of the Java Distribution system.

2.07 Credit 165-IND was approved by the Board on October 21, 1969 and the credit was signed on October 29, 1969. Credit 334-IND was approved on June 2, 1972 and signed on September 29, 1972.

Project Description

2.08 .. The principal features of the original project are the following (both credits):

- A. Rehabilitation and expansion of the electricity distribution system of the city of Jakarta and environs, including:

- (a) provision of distribution transformer, switchgear, cables, street lighting, metering and other equipment and supplies;
 - (b) establishment of a standard voltage of 220/380V for the secondary distribution system (voltage conversion); and
 - (c) **associated engineering consulting services.**
- B. Provision of extensive management consultants' services to improve the organization and efficiency of the power sector and to provide assistance and training in the operations, technical, financial and administrative sphere of activity.

2.09 The project was carried out in accordance with the above project description, with some changes required by the changing development pattern of the city. These are common with distribution projects and are explained in paragraph 3.09.

Covenants

2.10 The particular covenants included in the documents of both credits deal largely with financial, institutional and managerial matters. One of the most important of these (Sect. 4.08 of the Credit Agreement) was that PLN should be vested with full and exclusive responsibility for the public electricity sector of Indonesia, including planning, procurement, construction, operation, maintenance and ownership of all facilities. Their contents and effect on the sector and PLN's operations will be discussed, in general terms, in the respective paragraphs of this report. Annex 1 provides a summary of the covenants.

III. PROJECT IMPLEMENTATION

Credit Effectiveness and Project Start-up

3.01 Under Credit 165-IND it was agreed that the following conditions of effectiveness would be observed. PLN would be charged with the full and exclusive responsibility for the public sector, including:

- (i) selection and procurement of services and equipment, materials and supplies for the project and for the public electric power system in the country; and
- (ii) carrying out of project construction with the exception of those projects which were started prior to September 17, 1969.

3.02 It took longer than anticipated for the Government to provide satisfactory evidence to the Association that it had the firm intention to fulfill the above-mentioned conditions of effectiveness. This ultimately took the form of Presidential Decree No. 18/72 under which PLN has been operating

and subsequently built up its image as a premium institution in the country. Furthermore, serious difficulties arose with the selection and appointment of the engineering and management consultants which formally ended not before June 1970 when SOFRELEC of France was chosen for both consulting activities. Credit 165-IND was declared effective on June 1, 1970, seven months after signing. Credit 334-IND became effective on March 12, 1973, about six months after credit signing. In this case, the reason for the long interval between credit signing and effectiveness was the delay in introducing PLN's new tariffs. The Government had undertaken to permit PLN to introduce a new structure for electricity tariffs by January 1, 1973 coupled with a 25% increase in level but delayed the decision until late May 1973 when it gave a firm commitment to IDA to raise the tariffs on July 1, 1973, which it actually did.

Project Implementation

3.03 As mentioned in paragraph 2.08, the project consists of a distribution rehabilitation and expansion project for Jakarta and a comprehensive management consulting effort. The following paragraphs deal only with the technical aspect of the project whereas the management aspects will be described in Chapter VI (Institutional Development).

3.04 State of the Distribution Network at the Beginning of the Project. Immediately after their appointment in June 1970, the consultants (SOFRELEC) started to analyze the prevailing state of the Jakarta distribution network and found the following:

- (i) an insufficient number and low capacity of high voltage/medium voltage substations;
- (ii) overloaded low voltage distribution lines resulting in average drops of 35% with extremes of 70% in some suburbs;
- (iii) overloading of distribution systems which resulted in frequent power failures and inability to connect new industrial consumers;
- (iv) too many distribution voltages (12 kV, 7 kV and 2.4 kV for primary; and 220/380V and 127 / 220V for secondary);
- (v) obsolete equipment;
- (vi) the system design did not provide for emergency supply in case of failures, for instance cable faults;
- (vii) high distribution system losses (about 26%); and
- (viii) a very low level of urban electrification (one consumer per 43 inhabitants; about 30% of the urban areas not electrified).

3.05 Consultants' Recommendations. SOFRELEC completed the feasibility study in early-1971 and made the following recommendations:

- (a) reinforcement and extension of the 70 kV network;
- (b) increase in the number of high voltage/medium voltage substations from 6 to 11;
- (c) adoption of the 20kV and 380V voltage levels respectively for medium and low voltage distribution;
- (d) construction of about 950 medium voltage/low voltage substations;
- (e) installation of a grid of 20 kV underground cables appropriately arranged for better security of supply; and
- (f) strengthening of the low voltage network and the service entrances.

3.06 Implementation. At the time of appraisal, completion of the distribution project was expected by mid-1976. All equipment has now been purchased and the funds of both IDA credits have been disbursed, but completion of the construction and installation work is not expected until end-1979, 3-1/2 years behind the original schedule.^{1/} The delays are greatest on the low voltage network and this is due to the difficult problem of changeover to the new system voltage (para. 3.05(c)).

3.07 The major difficulties encountered in implementing the project were the following:

- (a) delays in procurement, arising, inter alia, out of initial unfamiliarity with IDA procedures. An average of 18 months elapsed between issue of invitations to bid and delivery. Most of these delays were due to slow processing of documents by the Indonesian authorities as the following breakdown illustrates:

- bidding	3 months
- bid evaluation including evaluation approval by the Government	3 months
- IDA approval of documents	1 month
- contract signing	1 month
- issue of letter of credit by Bank Indonesia	5 months
- time of delivery to Jakarta harbor	4 months
- customs clearance	1 month

Total 18 months

- (b) shortage of PLN and contractors' personnel trained in equipment installation in the earlier stages;
- (c) delays in obtaining right-of-way permits for cable trenches. The municipality of Jakarta has in the past delayed issuance of permits for laying cables by up to 6 months. It was only after a high

^{1/} The project is now virtually complete.

level meeting between PLN and the Deputy Governor of Jakarta in late 1975 /1 that a more expeditious procedure was introduced;

- (d) delays in land acquisition for substations;
- (e) lack of accurate maps of the city and frequent alterations in development plans for some parts of the city; and
- (f) in the early stages of the project shortage of warehouse space delaying procurement of equipment and material.

3.08 Since 1975 distinct improvements were noticeable in project implementation. This was mainly attributable to more efficient engineering work by PLN/consultants and an appreciative attitude by Government authorities towards PLN's financial needs. It also reflected SOFRELEC's successful efforts in training PLN's and contractors' personnel. The following table illustrates the physical progress in project implementation:

<u>Year</u>	<u>Implementation Progress</u>	
	<u>Annual Progress</u> (%)	<u>Cumulative Progress</u> (%)
1972	-	-
1973	4	4
1974	10	14
1975	20	34
1976	20	54
1977	27	81
1978	10 (estimated)	91 (estimated)
1979	9 (estimated)	100 (estimated)

3.09 Change in Project Scope. The project has been carried out in general accordance with the project description. During implementation, however, some changes in scope were necessitated by alterations in the city's development plans and regulations./2 The number of substations and the length of medium voltage cables increased by about 25%, which could not be accommodated by the physical contingencies provided (about 10%). To deal with this situation, the reinforcement and extensions in the high voltage system (70 kV) (US\$3.74 million) and the load control center (US\$1.05 million) were deleted from the project and PLN used funds from other sources to complete these works.

3.10 As of June 30, 1978 the status of project implementation was as follows:

/1 An IDA Supervision mission initiated this meeting.

/2 A municipal decree prohibited installation of overhead distribution lines within the city limits.

Items	Total Quantity Required to Complete Project	Quantity Implemented	Percent of Implementation
Medium voltage cables	945 km	945 km	100%
Substations	950	950	100%
Low Voltage Network	16,000 poles	11,064 poles	69%
Service Entrances	93,000 consumers	63,776 consumers	69%
Voltage change	111,000 consumers	81,875 consumers	74%
Public lighting	1,870 poles	1,040 poles	56%
Control cables	35 km	35 km	100%

Procurement

3.11 Procurement was made on the basis of international competitive bidding in accordance with the Association's Guidelines. Special efforts were made by the Association through field supervision by a procurement specialist to provide technical assistance to the consultants and PLN. This assistance has been of great value to PLN on this and succeeding projects. The equipment required for the project was procured under eight different tenders (called lots), resulting in eighty contracts. The lots were initially kept comparatively small on account of PLN's limited storage space. It contributed to slow progress because PLN had to run through the Government approval process (para. 3.07) more often than would have been necessary with fewer lots - a system adopted for the next project.

Costs

3.12 The total costs of the project at appraisal and at present are summarized below. A breakdown of estimated and actual foreign costs on the project is given in Annex 9. Similar breakdown of local costs is not available.

	<u>Local</u>	<u>Foreign</u>	<u>Total</u>
	-----(in US\$ million)-----		
Appraisal	19.8	55.0	74.8
At present	46.0	55.0	101.0

The increase in local costs is largely due to the rapid local inflation, particularly during the period 1973/76 which was not foreseen at the time of appraisal. Increases in the foreign component, which were largely due to increases in the number of substations and length of cables were counter-balanced by deleting other items (para. 3.09).

Disbursements

3.13 Due to the reasons mentioned in various paragraphs, disbursements were much slower than anticipated at the time of appraisal. A comparison of the estimated versus actual disbursements is attached as Annex 2.

Performance of Consultants and Beneficiary

3.14 SOFRELEC's performance as engineering consultant was good. Design work, document preparation and bid evaluation was done efficiently and on time, and staffing of the supervisory team was adequate.

3.15 PLN's contribution to implementing the project improved gradually. During the first three years, PLN was not adequately staffed to contribute sufficiently to the progress of the project. Thereafter, PLN's distribution construction group has been progressively staffed with younger, competent and dedicated engineers who, together with trained contractors, have since been able to carry out the project efficiently.

IV. OPERATING PERFORMANCE

4.01 The efficiency of a distribution project can best be judged by the following performance indicators:

- (a) capability to supply loads;
- (b) improvement in supply voltage;
- (c) reduction in distribution losses; and
- (d) fault statistics.

Capability to Supply Loads

4.02 Between 1973 and 1977 the electricity demand in Jakarta increased as follows:

Year	Peak Demand (MW)	Demand Growth	Energy (Gwh)	Energy Growth
1973	158	29.5%	666	28.8%
1974	181	14.6%	737	10.7%
1975	192	6.1%	893	21.2%
1976	205	6.8%	1,053	17.9%
1977	255	24.4%	1,387	31.7%

This improvement was made possible through transfer of loads from the old 12 kV system to the new 20 kV system. The 12 kV distribution system would not have been able to cope with the load growth. Most of the new loads were supplied from the 20 kV network as shown below:

Year	Peak demand on 12 kV system (MW)	Increase on 12 kV system	Peak demand on 20 kV system (MW)	Increase on 20 kV system	Total demand (MW)	Increase in total demand
1973	158	29.5%	-	-	158	29.5%
1974	176	11.4%	5	-	181	14.6%
1975	152	-13.6%	40	700.0%	192	6.1%
1976	142	- 6.6%	63	57.5%	205	6.8%
1977	145	2.1%	110	74.6%	255	24.4%
1978	130	-10.3%	160	45.5%	290	13.7%

The total firm capacity^{/1} of the distribution system is now 420 MW, 290 MW at 20 kV and 130 MW at 12 kV. These figures understate the actual potential as the cables have been designed with additional capacity which can be utilized as needed by adding transformers at substations.

Improvement in Supply Voltage

4.03 As mentioned in paragraph 3.04, the distribution system in Jakarta suffered from severe voltage drops which reached the unbelievable level of 70% in certain areas. Annex 3 illustrates the distribution of low voltage areas prevailing in 1970 by black dots from which it is evident that there was hardly any area with satisfactory service conditions. Annex 4, which shows the same area in 1976 after completion of slightly more than 50% of the project, indicates the sharp decrease in districts with unsatisfactory voltage levels, an appropriate illustration of the project's impact on the quality of electricity supply.

Distribution Losses

4.04 The distribution losses in the project area, which were 18.9% in 1970, increased further to 25.8% in 1974 due to overloading of the distribution system by growth of demand. From 1975 onwards the impact of the project was felt and losses decreased to a level of 19.5% in 1977.

4.05 The prevailing level of losses (19.5%) is still unacceptably high reflecting probably pilferage, inaccurate assessment of consumption by unmetered customers, and, in general, management difficulties. There is scope for further reduction in the level of technical losses by about 6-8% as the new project facilities are fully utilized (the load is presently only about 10%

^{/1} As indicated by the transformation capacity presently provided.

of the design capability of the 20 kV system and the low voltage networks have yet to be fully commissioned). During appraisal of Loan 1513-IND the Bank indicated to PLN its serious concern at the inadequate progress in loss reduction and requested PLN to prepare a comprehensive program of reduction of losses by region and category (generation, transmission and distribution). This overall program has been agreed, but the first step, identification of the most heavily loaded sections and preparation of specific plans to reinforce them, is still under preparation. This indicates that PLN's management has to assign adequate priority to this work and that much progress has still to be achieved in PLN's system planning which apparently has hitherto concentrated more on planning and organizing of financing than on planning aspects of a technical nature (para. 6.09).

Fault Statistics

4.06 The high quality of construction work of the project is reflected in the low number of faults on the 20 kV cable system.

Year	Length of 20 kV cables in service	Number of faults	Faults per 100 km per year
1975	180 km	1	0.6
1976	420 km	21	5.0
1977	895 km	25	3.0

The corresponding failure rates in other countries are:

France	9.6 faults/100 km/year
UK	12 faults/100 km/year
Germany	10.5 faults/100 km/year
Italy	12 faults/100 km/year

Even after allowing for the fact that the network in Jakarta is new, it can be concluded that the quality of workmanship is excellent to achieve such low fault rates.

V. FINANCIAL PERFORMANCE

5.01 When the appraisal report for Credit 165-IND was drafted in 1969, no basis for preparing meaningful financial data was available and the future was even more obscure. Therefore no financial analysis could be made at that time. Although financial statements employing conventional utility accounting practices were prepared in 1972 (appraisal of Credit 334-IND), they were not considered reliable enough to constitute more than an indication of PLN's

possible future financial performance. Consequently it does not appear meaningful in this report to carry out the normal comparison of projected versus actual financial results.^{1/} However, to indicate PLN's improved financial position to date, the following table is provided to show several financial indicators:

Fiscal year ^{/a}	1971	1972	1973	1975 ^{/b}	1976	1977	1978
	----- (%) -----						
Revenue/Cost Ratio ^{2/}	72.7	72.1	77.4	94.9	99.3	106.4	102.4
Rate of Return	-	-7.2	-6.3	-	4.0	3.6	2.0
Increase in Average Revenues	-	4.2	23.9	47.1	33.3	27.0	27.4
Net Internal Cash Generation as % of Investments	^{/c}	28.4	-47.5	15.8	7.8	14.5	18.2

^{/a} Until 1973 the fiscal years coincided with the calendar year. Since 1975 they extend from April 1-March 31.

^{/b} First quarter 1974 omitted.

^{/c} Records for 1971 not available.

VI. INSTITUTIONAL DEVELOPMENT

6.01 The Bank Group's operations were largely responsible for PLN's transformation from a state of complete chaos to a viable public utility, capable of supplying electricity to the economy in a reliable manner. This management improvement effort started with Credits 165-IND and 334-IND but progress in the early stages was slow and sustained efforts were needed in subsequent operations.

Situation at the Time of the Association's First Involvement

6.02 During 1953-57 the three Dutch-owned electric utility companies supplying power in Indonesia were nationalized. The transfer was far from amicable. Records were destroyed and there was no transition period during which the new Indonesian management could have been trained by its predecessors. During subsequent years the decline in the efficiency of the

^{1/} For comparison purposes, the forecast and actual results are given in Annex 8.

^{2/} Includes allowances for bad debts.

utilities was marked by inadequate expansion and poor operating conditions. In 1961 the three nationalized utilities were consolidated into a single entity, the predecessor of PLN, responsible for all public electric utility facilities in the country. In 1965, when PLN was organized, it was relieved of the responsibility of major power construction, and system planning was made the responsibility of both the Ministry of Public Works and Electric Power/1 and PLN.

6.03 PLN was operating under a body of laws relating to Government agencies in general (and a 1965 decree concerning it specifically) which appeared to convey autonomous powers to PLN. In reality, however, PLN functioned as a Government agency responsible to the Directorate General of Power, which was the policy making body and the department, together with the Public Works Department, responsible for construction of generating plant. The actual function of PLN was primarily that of implementing policies and administering them on a day-to-day basis. PLN's management was thus relegated to a secondary role.

6.04 In 1969 PLN was incapable of providing adequate and reliable electric service and this has led to a large buildup of captive plant (equivalent to PLN's own installed capacity by 1976). With the expected growth of the sector, it was essential to analyze the weaknesses of PLN and introduce changes to make PLN responsible for the public sector of the Borrower, including construction, system planning, procurement, staff employment and finance in the public power sector.

The Management Consulting Effort

6.05 No improvement could have been expected without outside help. Consequently, PLN with Association concurrence, appointed SOFRELEC of France who, with the assistance of Peat, Marwick and Mitchell of the United Kingdom in matters of accounting and finance, carried out the consulting services.

6.06 It took time before SOFRELEC could formulate recommendations with respect to PLN's problems. Records had to be reconstructed and assets physically identified; large outstanding consumer accounts had to be verified and means found for their settlement; tariff levels and structure had to be studied. The initial phase of the consultants' work took about three years and involved, to a considerable degree, essential fact finding. The main accomplishment during the period included:

- (a) draft of an Electricity Act which provided normal autonomy to PLN. More specifically, it provided PLN with the responsibility for project construction and procurement of goods and services. With

/1 At that time PLN's supervising agency. From May 1978 PLN reports to the Ministry of Mines and Energy.

Association agreement, this Act formed the basis of Presidential Decree No. 18/72,^{/1} the law on which PLN's corporate existence is based;

- (b) recommendations on a new structure and level of tariffs;
- (c) preparation of an accounting system and recommendations on cash management and control, inventory control, consumer administration, mechanization and budgeting;
- (d) physical identification, classification and valuation of assets;
- (e) recommendations on personnel regulations and administration, job analysis and job structure; and
- (f) design of a comprehensive training program.

The Financial Recovery Plan

6.07 The lessons learned from Bank Group operations under Credits 165/334-IND were applied at the time of appraisal for Credit 399-IND in late 1972. PLN's problems were then far better identified and specific recommendations for their solution were available. Among other things SOFRELEC's investigations had revealed that PLN's financial situation was worse than earlier anticipated, with high operating losses and very low internal cash generation. Consequently, a financial recovery plan, designed to improve PLN's management capabilities and to overcome its financial weaknesses over time, was agreed upon and, until recently, constituted the yardstick against which PLN's progress was measured and achieved. Its main features were:

- (a) a detailed plan of activities designed to improve PLN's operations and, as a consequence, its financial position (Annex 5);
- (b) annual programs of the activities to be taken towards improvement. These programs were discussed with and supervised by the Association; and
- (c) improvement of PLN's finances so that operating revenues would cover 80% of operating expenses in FY75, 90% in FY77 and 100% in FY79 (PLN has actually achieved more than 100% coverage already in FY76 - para. 5.01).

^{/1} Government preferred a partially rather than fully autonomous entity since total autonomy would have been inconsistent with its policy of controlling important sectors of the economy. Consequently, the Government retained responsibility for matters affecting the national economy (tariffs, approval of investment plans) and exercised control over other matters it considered important (evaluations of bids and decisions on contract awards for investments financed through the Government budget).

Progress Achieved Under the Financial Recovery Plan

6.08 The progress achieved to date is encouraging on balance despite the fact that in certain areas, particularly in system planning (para. 6.09) and in introducing accounting systems in the outlying areas, better progress could have been made. The achievement made can be summarized as follows:

- (a) Accounting and Finances: Unexpectedly good and fast improvement, though far from being perfect, has been registered in the field of accounting and finance. Financial control systems have been introduced, a reporting system has been designed and mechanization is progressing on schedule. A detailed fixed asset accounting system will be introduced soon, in headquarters as well as in the outlying areas. Large government dues to PLN through October 1969 were paid up (Annex 1).
- (b) Operations: Good results have been achieved in system operations and maintenance where operating manuals and maintenance procedures have been developed and introduced. Overall efficiency has improved. High system losses are still a problem but are being attacked with a specific loss reduction program. Considerable sales increases are also expected as a consequence of an aggressive consumer connection program.
- (c) Construction: Improvement in the management of construction activities has been slow in the past and is only accelerating now somewhat. This is not entirely PLN's fault since the reasons for delays have been Government involvement and delays in approving consultants' and supply contracts and opening of letters of credit. The slow and meticulous approval process which also involves detailed questioning of PLN staff has made PLN personnel very cautious, for instance in bid evaluation, and does not convey to them the need for speedy work. Decisive improvement will only occur when a more pronounced business sense will enter the thinking of Government officials and PLN.
- (d) Planning: Progress in this difficult field was slow in the past, mainly due to lack of experienced personnel. The Bank Group is presently trying to assist PLN to put its system planning in Java on a sound basis and for this purpose PLN has set up a program for the planning period 1978-79 to 1986-87. Planning for the areas outside Java will be improved in the near future with Bank assistance (see also para. 6.09).
- (e) Training. An extensive training program has been initiated by PLN with the assistance of SOFRELEC. It is continuously being maintained (Annex 6).

6.09 During appraisal of Credit 334-IND, it was apparent that PLN was insufficiently involved in the technical aspects of planning for optimal development and it was feared that the financing approach adopted (division of the country into subregions with separate financing agencies undertaking the responsibility of assisting PLN in overcoming problems in each area) would weaken PLN's effort and result in poor coordination. There is evidence that coordination has not been satisfactory though PLN established a system planning unit and trained younger engineers who are competent and fully capable of performing most of the technical work with a minimum of expatriate assistance. But far more commitment is required to this work by top echelons in PLN and more inter-sectoral coordination is needed to maximize benefits. The prevailing high level of system losses (paras. 4.04 and 4.05) and the fact that weaknesses in approach to long term system planning are seen in areas outside Java (where PLN is not assisted by consultants to the extent it is in Java) indicate the urgent need for further improvement in this area.

Consultants' Performance

6.10. Considering the difficult circumstances which prevailed in the beginning, SOFRELEC and Peat, Marwick and Mitchell have done a good job. Initially, language barriers and inexperience of the consultants in working in such chaotic conditions delayed progress. But as soon as these barriers were erased, progress was impressive. The consultants' proved their ability to establish a good rapport with the client and to overcome the initial reservations. Under the circumstances it is not surprising that their progress reporting in the earlier period did not always live up to expectations.

VII. PROJECT JUSTIFICATION

Project Objectives

7.01 As pointed out in Chapter IV, the project has been successful in improving system performance and ensuring continuity of supply. It enabled PLN to supply a much larger share of the market in Jakarta under much better standards (voltage levels and reliability) than it would otherwise have been able to do. It also has resulted in a successful management consulting effort.

Internal Rate of Return

7.02 During appraisal of Credit 334-IND the internal rate of return was estimated at 18%. The recalculation, details of which are given in Annex 7, results in a rate of return of about 10%. In calculating the rate of return the following assumptions have been made:

- (a) for purposes of comparison, the same partial load carrying capacity as assumed during appraisal (811 GWh per year, 422 GWh above the previous level of 589 GWh). This level corresponds to the capacity of the system to distribute power from generating stations in existence at the then expected time of commissioning of the project (1975) and is considerably lower than the actual distribution capacity of the project, thus understating the benefits;
- (b) discounting of the actual cost streams to arrive at constant 1973 prices (the year when actual project implementation started (para 3.08) by using the actual inflation factors (Annex 7); and
- (c) valuation of the benefits by using the average revenues per kWh sold in any given year between FY 1973 and 1979 discounted to arrive at constant 1973 levels by using the actual inflation factors (Annex F).

7.03 The rate of return is lower than that estimated at the time of appraisal. The main reason for this is the sharp increase in fuel prices during the past several years which was not foreseen during appraisal.

VIII. ASSOCIATION PERFORMANCE

Working Relationship

8.01 During the first two years of project implementation the working relationship between PLN and the Association, although not inadequate, has not been as good as one would have wished. The reasons for this somewhat unhappy beginning can be summarized as follows:

- (a) inexperience on the part of the Indonesian authorities in dealing with international organizations and, generally, foreign consultants and suppliers; and
- (b) disagreements between the Association's headquarters and the Resident Staff in Indonesia, particularly with respect to the appointment of consultants.

8.02 The above-mentioned situation has resulted in frequent misunderstandings. For instance, long discussions were required to sort out the problem of whether IDA or PLN should select the consultants; PLN misunderstood the significance of a consultants' shortlist and, without informing Association's headquarters but with the agreement of the Resident staff, increased the list from 6 to 21 and, in addition, solicited financing terms.

8.03 The above has been recounted only to illustrate the difficulties of the earlier years. Fortunately they are all problems of the past. Today the relationship between PLN and the Bank Group is excellent and PLN has become a competent counterpart for foreign suppliers, contractors, financiers and international organizations.

Supervision

8.04 As Bank Group has been financing power projects on an annual basis and in continuous contact with PLN and the Government, supervision was carried out mostly in the context of these appraisals. Separate supervision reports have not always been prepared. The operation has provided the Bank Group and Government of Indonesia with the valuable experience of institution building through a combination of legal and administrative improvements and expert management assistance.

IX. CONCLUSION

9.01 The engineering part of the project was conventional but involved major problems of (i) changing over to a new system of distribution voltage, and (ii) coordination with changing City Department plans. These caused implementation delays, but the project has fulfilled its objective of providing a modernized, and adequate, distribution system for the Metropolitan area. Employment of foreign consultants may not always be the ideal solution in developing countries but very often it is the only feasible one and, as in this case, where it was adopted with persistence, it has provided benefits of lasting value.

9.02 The operation has provided the Bank Group and the Government of Indonesia with the valuable experience of institution building through a combination of legal and administrative improvements and expert management assistance.

9.03 The Indonesian public sector is subject to strict Government control even in day-to-day matters and PLN has been no exception to this rule. Although PLN has had considerable improvement in its autonomy, governmental control is still too great - particularly in regard to procurement matters - and results in slow project implementation.

INDONESIA

PERUSAHAAN UMUM LISTRIK NEGARA (PLN)

CREDITS 165 AND 334-IND

FIRST AND SECOND ELECTRICITY DISTRIBUTION PROJECTS

Summary of Particular Covenants

Condition of Effectiveness

PLN should be vested with the full and exclusive responsibility for all procurement of goods and services and is responsible for the public electricity sector of Indonesia, including planning, procurement, construction, operation, maintenance and ownership of all facilities.

Comment

Fulfilled by stating intention to introduce legislation in the Legal Opinion. Actually given effect to by Presidential Decree No. 18/72.

Other Covenants

The electricity debts of Government agencies outstanding on October 29, 1969 shall be paid within one year, and the Government shall take all action necessary to ensure at all times that amounts owed to PLN for electricity services will be paid promptly when due.

Most of the debts outstanding on October 29, 1969 were paid within one year. There were some accounting discrepancies between PLN and some Government agencies, particularly the military, and IDA agreed to a special audit. Current debts are being settled on a quarterly basis.

PLN shall employ management consultants satisfactory to the Association and carry out the consultants recommendations as the Government, PLN and the Association consider appropriate.

Implemented mainly in the context of the Financial Recovery Plan.

Introduction of new tariffs by January 1, 1973.

Introduced on July 1, 1973 with Association Agreement.

Actual Disbursements versus Appraisal Estimate

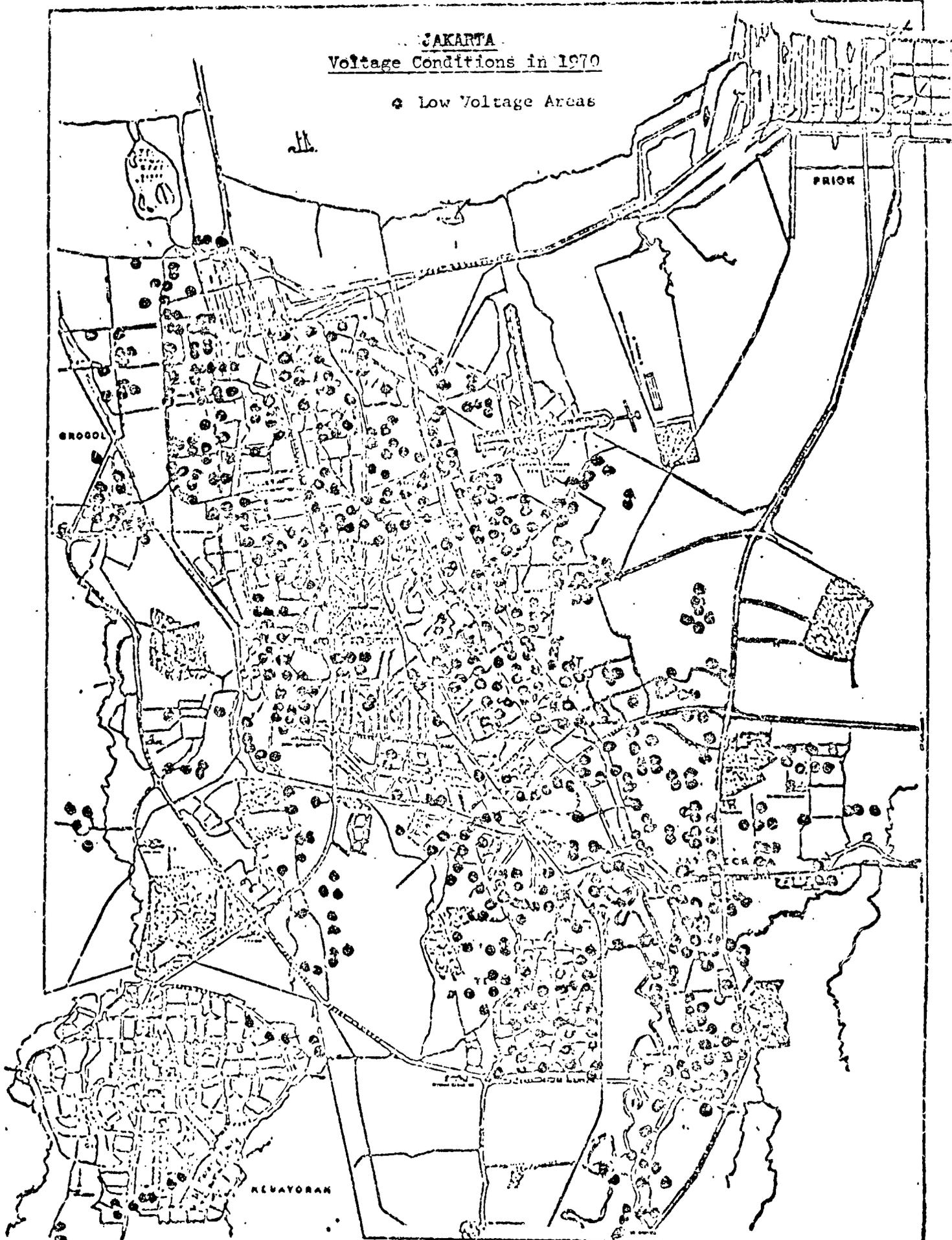
1. The appraisal report for Credit 165-IND does not include an estimated disbursement schedule which at that time was not a standard requirement for appraisals. Consequently, the following tables include the actual disbursements of Credit 165-IND in both columns for actual as well as estimated disbursements.

2. The actual and estimated disbursement schedule of the combined credits 165 and 334-IND is as follows:

<u>IDA Fiscal Year and Semester</u>	<u>Cumulative</u>	
	<u>Actual Disbursements</u>	<u>Estimated Disbursements</u>
	(in US\$ thousand)	
<u>1971/72</u>		
2nd semester	400	400
<u>1972/73</u>		
1st semester	3,600	3,600
2nd semester	9,300	9,300
<u>1973/74</u>		
1st semester	11,045	22,000
2nd semester	13,631	31,500
<u>1974/75</u>		
1st semester	18,872	41,500
2nd semester	27,337	49,500
<u>1975/76</u>		
1st semester	36,480	53,000
2nd semester	40,000	55,000
<u>1976/77</u>		
1st semester	49,700	-
2nd semester	52,600	-
<u>1977/78</u>		
1st semester	53,900	-
2nd semester	55,000	-

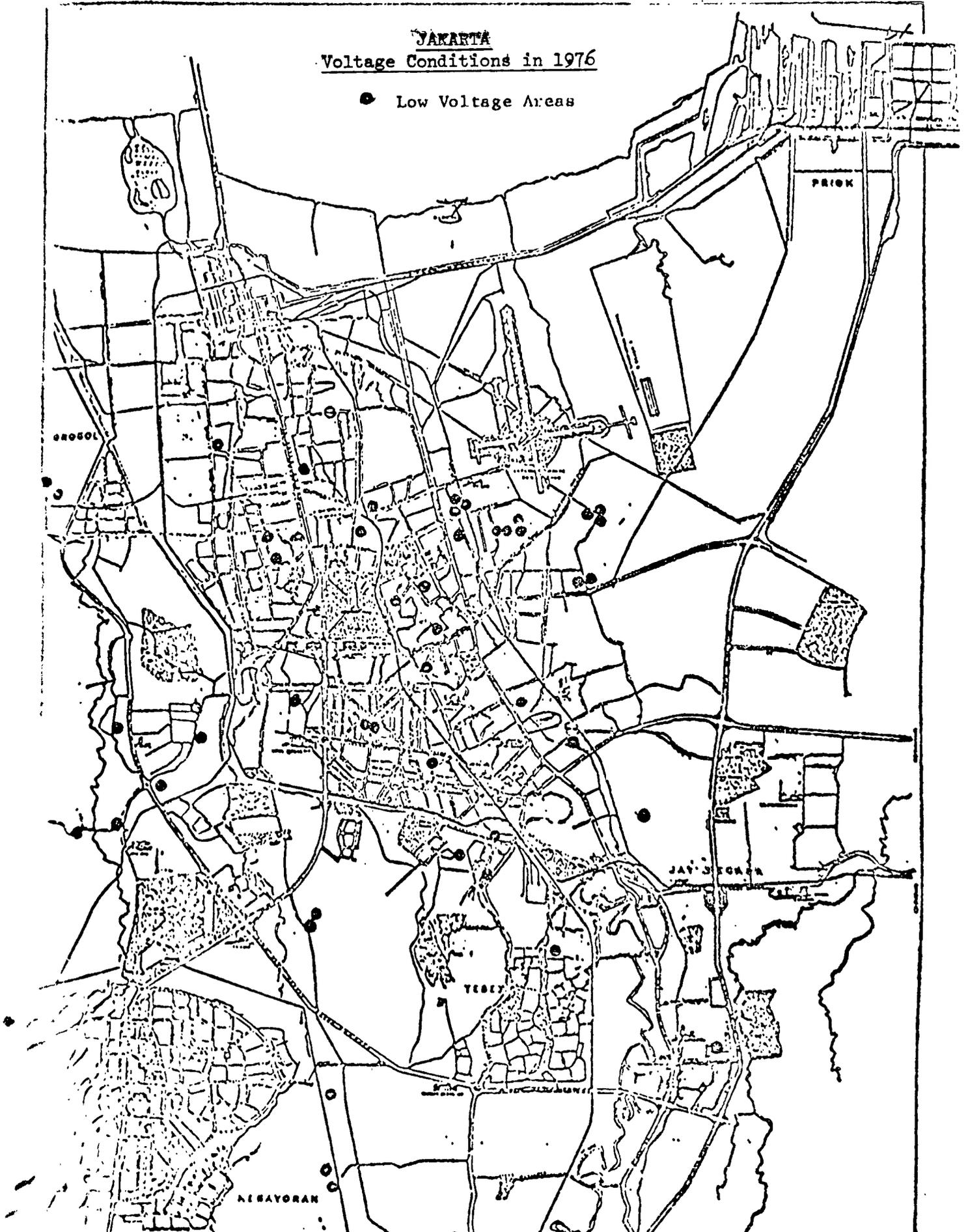
JAKARTA
Voltage Conditions in 1970

⊕ Low Voltage Areas



JAKARTA
Voltage Conditions in 1976

● Low Voltage Areas



FINANCIAL RECOVERY PLAN

MANAGEMENT SERVICES

FOR

PERUSAHAAN UMUM LISTRIK NEGARA

TERMS OF REFERENCE

BACKGROUND AND DESCRIPTION OF SERVICES

Perusahaan Umum Listrik Negara (PLN) is presently engaging the French consulting firm SOFRELEC to assist it in providing extensive management consulting and engineering services (first phase) with the assistance of the International Development Association (IDA) financing through Credit No. 165-IND for the First Electricity Distribution Project in Jakarta. IDA has recently extended a new credit for the Second Electricity Distribution Project, IDA Credit No. 334-IND, which, inter alia will be used to finance the foreign exchange cost of the second phase management consultant services complementary to the services being provided under Credit No. 165-IND. A new charter has been issued by the Government (Government Regulation No. 18, 1972) to define the status, duty and responsibility of PLN.

The extensive Management and Training Services represent part of PLN's on-going five year expansion program in the framework of the comprehensive financial recovery plan, which takes into account all aspects of PLN's administration and operations and is designed to allow PLN not later than during its fiscal year 1978/1979 to cover out of the revenues from its sales of electricity all its administrative and operating expenses (including maintenance, adequate provision for depreciation and bad debt, and taxes, if any) and interest and other charges on debt.

Furthermore, these Services are designed to enable PLN to plan annually the measures required to make adequate progress towards financial recovery during each of its annual financial recovery programs and to review and assess in semi-annual intervals the actual progress made.

The Services are expected to be completed by June 30, 1976.

SCOPE OF SERVICES

The management consultant will make recommendations to PLN and assist PLN in improving its entire management including the accomplishment of training. The improvement of management would cover activities relating to planning, personnel, finance, construction, operation and maintenance of the generating plants, transmission and distribution systems, and would allow PLN to achieve financial recovery and attain the following operating ratios not later than over the following fiscal years:

1974/75 - 80 percent,
1976/77 - 90 percent, and
1978/79 -100 percent.

In performing the Services, the Consultant should identify and systematically analyze, in consultation with PLN, the problems confronting PLN and submit in due time program proposals, stipulating clearly the activities, the flow of activities and detailed time schedules.

In addition to providing continuing day-to-day assistance and advice to PLN's management on all aspects of the company's operations, the Services will consist of the following:

I. PLANNING

1. Assist PLN in the restructuring of the Directorate of Planning, including preparation of an appropriate organization chart and all related documents (e.g. job descriptions, definition of responsibilities, etc.).
2. Assist PLN in the preparation of its investment program and, in coordination with the Directorate of Finance, assist in the drafting of Financial Forecasts, including Revenue Account, Balance Sheet, Source and Application of Funds Statement, etc.
3. Assist PLN in the preparation of its overall planning including the definition of a general policy for investment and projects priorities.
4. Prepare terms of reference for a National Long Range Power Development Study (Overall Long Range System Planning and Long Range Financial Planning), advise PLN on facilities needed and assist in the execution of such Study.
5. Assist PLN in establishing a "Central Data Bank for Management Purposes."
6. On-the-job training for general planning techniques.

II. PERSONNEL AND TRAINING

1. Assist PLN in the continuation of efforts and actions already in progress resulting from the services provided by the Consultant under Addendum B dated April 25, 1972 to the Contract between PLN and the Consultant, dated June 3, 1970 No. Pdj. 031/PST/70., including specifically:
 - (a) implementation of new personnel regulations based on Government Regulation No. 18, 1972 such as: recruiting and dismissal, salaries, wages and pensions, assessment, transfers, etc.;

- (b) restructuring and training of its labor force, and in the implementation of the job organogram, job analysis, job qualifications and job descriptions; and
 - (c) establishment of the necessary training centers.
2. Assist PLN in the implementation of new administrative procedures and office management at the Head Office and other areas.
 3. Assist PLN with other general organization or training problems on request (e.g. planning, finance, construction, safety, etc.)

III. FINANCE

1. Continue and complete all activities in progress on the revised financial and accounting systems and procedures, including:
 - (a) consumer administration: improvement and assistance in the implementation of clerical procedures covering consumer service, billing, consumer accounting, credit control, data control, collecting, meter reading;
 - (b) conditions for connection: in connection with Part VII of these Terms of Reference, drafting such conditions, covering among other things, PLN consumer contracts, conditions of access to the premises, collection, disconnection, etc.;
 - (c) mechanization of consumer administration: drafting all necessary instructions, assistance in the negotiations with electronic data processing companies, and training and implementation;
 - (d) cash control: improvement of the system already implemented in Java and assistance in further implementation;
 - (e) cash accounting and cash management: drafting the necessary instructions and assisting in their implementation;
 - (f) uniform accounting: review and improvement of the new uniform code of accounts;
 - (g) inventory control: assistance in the implementation of the new proposed system, in connection with Parts V, VI and VII of these Terms of Reference;
 - (h) fixed assets administration: drafting the necessary instructions and assisting in their implementation;
 - (i) depreciation: review the outline proposals already submitted, draft final instructions concerning a depreciation policy and assist in their implementation;

- (j) revaluation of fixed assets: drafting a method for the revaluation of fixed assets and assisting in its implementation, including the necessary discussions with the Ministry of Finance;
 - (k) budgeting: improvement of the already implemented system, covering operating and investment budgets, and assistance in its implementation;
 - (l) annual accounts: improvement of the forms in connection with the annual accounts, including Revenue Account, Balance Sheet and all necessary supporting schedules; assistance in the completion, including consolidation of said annual accounts;
 - (m) management reporting system: drafting an outline of general management reporting system, assistance in its implementation, and thereafter, improvements to the system;
 - (n) payroll accounting: drafting the necessary instructions and assistance in their implementation;
 - (o) internal audit: issue the necessary recommendations concerning a comprehensive internal audit program and assist in its implementation;
 - (p) project commissioning: in connection with Part IV of these Terms of Reference, review and improve the existing procedures concerning project commissioning and thereafter, the transfer of the related financial data from "work in progress" to "fixed assets in operation" in PLN's accounts;
 - (q) insurance: assist PLN in the establishment of a comprehensive insurance policy;
 - (r) financial forecasting: in connection with Part I of these Terms of Reference, assist in the establishment of long-term financial forecasts, including Revenue Account, Balance Sheet, Source and Application of Funds Statement, etc.; and
 - (s) tariffs: propose all necessary tariff adjustments, assist in the negotiations with all Ministries concerned, and assist in the implementation of the agreed tariff.
2. Provide continuing advice and guidance to the management of PLN on all financial and related matters, including negotiations with third parties.

3. Assist PLN in the development and implementation of its new organization as may be required by the financial functions within PLN.
4. Make additional follow-up visits to review progress at the Head Office and other areas, and provide further advice and guidance for the improvement of all systems and procedures.
5. Undertake a feasibility study to evaluate the justification of further utilization of electronic data processing systems.
6. Continue and develop the training programs in the financial and accounting fields.

IV. CONSTRUCTION

1. Establish basic technical standards for generation, transmission and distribution equipment.
2. Assist PLN in improving the organizational aspects of construction activities (Head Office, Regional Offices and job sites).
3. Assist PLN in defining the relations between the Directorates of Planning, Construction and Operation during study, design, execution, trial operation and commissioning of projects.
4. Establish procedures to improve the management of projects (including appraisal, budgeting, accounting and reporting) and assist in their implementation.
5. Organize and conduct training for administrative and financial management of projects.
6. Assist PLN in improving the procedures to accelerate the completion of projects and to achieve optimum results.
7. Advise PLN on establishing the necessary facilities and procedures for project commissioning and acceptance testing.

V. GENERATION

In addition to the services already contracted for in Addendum C dated April 18, 1973 to the Contract between PLN and the Consultant, dated June 3, 1970 No. Pdj. 031/PST/70, the Consultant shall:

1. Recommend improvements on the logistics of fuel handling and assist PLN to negotiate long-term fuel contracts.
2. Assist PLN in the implementation of inventory control procedures in the power plants.

3. Assist PLN in the establishment of a Directorate of Generation at the Head Office.
4. Assist PLN to improve the power plant protection systems.
5. Study and assist in the implementation of special safety regulations for the power plants.
6. Prepare and assist PLN in the implementation of procedures for operation and maintenance of gas turbine and diesel power plants (a) in the capital cities of the Provinces, and (b) interconnected with the high-voltage network.
7. Prepare and assist PLN in the implementation of procedures for operation and maintenance of hydro power plants in accordance with priorities as may be determined by PLN.

VI. TRANSMISSION

1. Recommend improvements in operation and maintenance procedures and assist in their implementation.
2. Undertake a study and assist in the establishment of a load dispatch center for West Java.
3. Recommend load dispatch procedures to minimize operating costs.
4. Recommend adequate and reliable system protection schemes.
5. Recommend appropriate technical system standards.
6. Design a training program for transmission operation and maintenance.
7. Advise PLN on appropriate measures to reduce system losses.

VII. DISTRIBUTION

1. Assist PLN in the organization and establishment of Regional Distribution Centers.
2. Assist PLN in the improvement and implementation of general procedures for distribution operation and maintenance, including appropriate system protection.
3. Assist PLN in the establishment of appropriate commercial policies for the distribution of power.

4. Assist PLN in the organization and establishment of a Directorate of Distribution at the Head Office.
5. Assist PLN in the improvement and implementation of administrative procedures for the distribution of power (inventory control, consumer administration, system standards, etc.).
6. Training as included in Part II of these Terms of Reference.
7. Advise PLN on appropriate measures to reduce system losses.

A more detailed specification of activities required for PLN's financial recovery is stipulated in the appendix attached as an integral part of these Terms of Reference. This appendix outlines the Consultant's activities and the approximate time schedule for commencement of each activity, as well as those actions needed on the part of PLN and the Government to supplement the Services.

The appendix is divided into two (2) categories:

1. Category A specifies activities which should have the immediate impact and require immediate action in allowing PLN to recover its financial position.
2. Category B specifies supplementary activities, the implementation of which is expected at a later stage.

April 24, 1973

Annexes
Category A
Category B

o. I]	ACTIVITY (2)	Responsibility of PLN and Consultant	Responsibility of Consultant		Responsibility of PLN	Areas of imple- mentation			Govern- ment in- volve- ment (10)	Relevant section of Terms of Reference (11)
		Basic data available to Consultant (3)	Submission of Recommendations by Consultant to PLN (4)	Preparatory work for implementa- tion undertaken by Consultant (5)	Start of implemen- tation with assist- ance of Con- sultant (6)	Head Office (7)	Java areas (8)	Other areas (9)		
I. PLANNING										
1.	Investment program	June 73	Review Oct. 73	-	April 74	yes	yes	yes	Approval by Jan. 74	I.2
2.	Cash flow	June 73	Review Oct. 73	-	April 74	yes	yes	yes	Approval by Jan. 74	I.2
3.	Central Data Bank	-	Nov. 73	March 74	June 74	yes	-	-	-	I.5
II. PERSONNEL AND TRAINING										
<u>Regulations</u>										
4.	a. Personnel	Complete	Complete	Oct. - Dec. 73	Dec. 73	yes	yes	yes	Regulation by Oct. 73	II.1(a)
5.	b. Salaries and wages	Complete	Complete	Oct. - Dec. 73	April 74	yes	yes	yes	Regulation by Oct. 73	II.1(a)

No. (1)	ACTIVITY (2)	Responsibility of PLN and Consultant	Responsibility of Consultant		Responsibility of PLN	Areas of imple- mentation			Govern- ment in- volve- ment (10)	Relevant section of Terms of Reference (11)
		Basic data available to Consultant (3)	Submission of recommendations by Consultant to PLN (4)	Preparatory work for implementa- tion undertaken by Consultant (5)	Start of implemen- tation with assist- ance of Con- sultant (6)	Head Office (7)	Java areas (8)	Other areas (9)		
6.	c. Pensions	May 73	June 73	Oct.-Dec. 73	April 74	yes	yes	yes	Regulation by Oct. 73	II.1(a)
7.	d. Dismissal and recruitment	Complete	June 73	Oct. 73	Jan. 74	yes	yes	yes	-	II.1(a)
8.	e. Assessment, trans- fers, etc.	Complete	July 73	Aug. 73	Jan. 74 up to Feb. 76	yes	yes	yes	-	II.1(a)
<u>Manpower Planning</u>										
9.	a. Job organogram, job analysis, job quali- fications and job descriptions	Complete	June 73	Aug. 73	Oct. 73	yes	yes	yes	-	II.1(b)
10.	b. Restructuring program	Complete	Complete	Oct. 73	Jan. 74 up to Feb. 76	yes	yes	yes	Approval by Oct. 73	II.1(b)
11.	Training centers and training	To be completed Dec. 73	Start June 73	.	June 73	yes	yes	yes	-	I.6 II.1(b)(c) II.3 III.6 IV.5 VI.6 VII.6

No. (1)	ACTIVITY (2)	Responsibility of PLN and Consultant	Responsibility of Consultant		Responsibility of PLN	Areas of imple- mentation			Government in- volve- ment (10)	Relevant section of Terms of Reference (11)
		Basic data available to Consultant (3)	Submission of recommendations by Consultant to PLN (4)	Preparatory work for implementa- tion undertaken by Consultant (5)	Start of implemen- tation with assist- ance of Con- sultant (6)	Office (7)	Java areas (8)	Other areas (9)***		
12.	Office management procedures	May 73	Jan. 74	March 74	April 74	yes	-	-	-	II.2
13.	Safety regulations	Complete	June 74	July-Dec. 74	Jan. 75	yes	yes	yes	-	II.3 V.5
III. FINANCE										
14.	Consumer administration	Complete Complete	Complete Complete	Complete -	Jan. 73 Aug. 74	-	yes	1 yes	Regulation Regulation	III.1(a) III.1(a)
15.	Conditions for connection	June 73	Dec. 73	-	June 74	yes	yes	yes	Regulation	III.1(b)
16.	Mechanization of consumer administration	-	Complete	underway	underway	-	WJ* EJ**	1	-	III.1(c)
17.	Cash control improvement	-	Continuous	Continuous	Continuous	yes	yes	1/2 5/6	-	III.1(d)
18.	Cash accounting and cash management	-	Dec. 73	March 74	July 74	yes	yes	yes	-	III.1(e)
19.	Uniform accounting im- provement	-	Continuous	Continuous	Continuous	yes	yes	yes	Inform	III.1(f)
20.	Inventory control	Complete	Complete	Aug. 73	Jan. 74	yes	yes	yes	-	III.1(g)
21.	Fixed assets adminis- tration	-	June 74	Dec. 74	April 75	yes	yes	yes	Inform	III.1(h)
22.	Depreciation policy	-	June 73		April 74	yes	yes	yes	Approval	III.1(i)

* WJ - West Java
** EJ - East Java
*** Numbers refer to Exploitation

o. 1)	ACTIVITY (2)	Responsibility of PLN and Consultant	Responsibility of Consultant		Responsibility of PLN	Areas of imple- mentation			Government in- volve- ment (10)	Relevant section of Terms of Reference (11)
		Basic data available to Consultant (3)	Submission of recommendations by Consultant to PLN (4)	Preparatory work for implementa- tion undertaken by Consultant (5)	Start of implemen- tation with assist- ance of Con- sultant (6)	Head Office (7)	Java areas (8)	Other areas (9)		
3.	Revaluation of fixed assets	-	June 74	Sept. 74	Feb. 75	yes	yes	yes	Approval	III.1(j)
4.	Operating budget improvement	-	Continuous	Continuous	Continuous	yes	yes	yes	-	III.1(k)
5.	Investment budget improvement	-	Continuous	Continuous	Continuous	yes	yes	yes	-	III.1(k)
6.	Annual accounts improvement	-	Continuous	Continuous	Continuous	yes	yes	yes	-	III.1(l)
7.	General management reporting system	Complete	Oct. 73	Nov. 73	Jan. 74	yes	yes	yes	-	III.1(m)
8.	Payroll accounting	-	June 73	Dec. 73	April 74	yes	yes	yes	-	III.1(n)
9.	Internal audit	May 73	Dec. 73	Jan.-March 74	April 74	yes	yes	yes	Inform	III.1(o)
0.	Project commissioning	July 73	Oct. 73	-	April 74	yes	yes	-	-	III.1(p)
1.	Insurance	Dec. 73	Jan. 74	Jan. 75	-	yes	yes	yes	Approval	III.1(o)
2.	Financial forecasting	June 73	Oct. 73	-	April 74	yes	yes	yes	Approval	III.1(r)
3.	Tariffs	Complete	Yearly review	in due time	in due time	yes	yes	yes	Approval	III.1(s)

CATEGORY A

No. (1)	ACTIVITY (2)	Responsibility of PLN and Consultant	Responsibility of Consultant		Responsibility of PLN	Areas of imple- mentation			Government in- volve- ment (10)	Relevant section of Terms of Reference (11)
		Basic data available to Consultant (3)	Submission of recommendations by Consultant to PLN (4)	Preparatory work for implementa- tion undertaken by Consultant (5)	Start of implemen- tation with assist- ance of Consult- ant (6)	Head Office (7)	Java areas (8)	Other areas (9)		
IV. CONSTRUCTION										
34.	Basic technical standards	July 73	March 74	-	June 74	yes	yes	yes	Support	IV.1
35.	Improvement of Management of projects	June 73	June 74	July 74	Oct. 74	yes	yes	yes	Regulation by June 74	IV. 4
36.	Procedures to accelerate the completion of projects and to achieve optimum results									IV.3 IV.6
	- project execution and supervision	July 73	Start Oct. 73	-	April 74	yes	yes	-	-	
	- construction procurement	July 73								
	foreign currency	-	Complete	-	April 74	yes	-	-	-	
	local currency	-	Oct. 73	-	April 74	yes	yes	-	-	
	- project commissioning	July 73	Oct. 73	-	April 74	yes	yes	-	-	
V. GENERATION										
<u>Steam and gas turbine plants</u>										
37.	a. Improvement of operation and maintenance procedures	Complete	Dec. 73	-	Jan. 74	-	yes	yes	-	Addendum C and V.6

o. 1)	ACTIVITY (2)	Responsibility of PLN and Consultant	Responsibility of Consultant		Responsibility of PLN	Areas of imple- mentation			Government in- volve- ment (10)	Relevant section of Terms of Reference (11)
		Basic data available to Consultant (3)	Submission of recommendations by Consultant to PLN (4)	Preparatory work for implementa- tion undertaken by Consultant (5)	Start of implemen- tation with assist- ance of Con- sultant (6)	Head Office (7)	Java reas (8)	Other reas (9)		
8.	b. Plant location data	Complete	July 73	-	Oct. 73	yes	yes	yes	Support by Aug. 73	V.1
9.	c. Fuel handling and storage	Complete	Oct. 73	-	April 74	-	yes	yes	Support	V.1
10.	d. Fuel requirements and specifications	Complete	Oct. 73	-	Jan. 74	-	yes	yes	-	V.1
11.	e. Long-term fuel con- tracts	Dec. 73	-	Feb. 74	April 74	yes	yes	yes	Support by March 74	V.1
12.	f. Control of fuel quality and quantity	Complete	Start Oct. 73	-	April 74	-	yes	yes	Support	V.1
13.	g. Facilities for fuel quality control (plant)	-	Start Dec. 73	-	April 74	-	yes	yes	Support	V.1
14.	h. Facilities for fuel quality control (master lab.)	Dec. 74	Feb. 75	-	April 75	-	yes	yes	Support	V.1
15.	Inventory control	Complete	Complete	Aug. 73	Jan. 74	yes	yes	yes	-	V.2
16.	Establishment of Direc- torate of Generation	Complete	Complete	Sept. 73	Jan. 74	yes	-	-	-	V.3
17.	Power plant protection systems	Complete	Dec. 73	-	April 74	-	yes	yes	Support	V.4

CATEGORY A

No.	ACTIVITY	Responsibility of PLN and Consultant	Responsibility of Consultant		Responsibility of PLN	Areas of implementation			Government involvement	Relevant section of terms of Reference
		Basic data available to Consultant	Submission of recommendations by Consultant to PLN	Preparatory work for implementation undertaken by Consultant	Start of implementation with assistance of Consultant	Head Office	Java areas	Other areas		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	<u>Diesel and hydro power plants</u>									
1.	Procedures for operation and maintenance	-	Start Dec. 73	-	Jan. 74	-	yes	yes	Support	V.6 V.7
	<u>VI. TRANSMISSION</u>									
2.	Improvement of operation and maintenance procedures	Complete	Start Jan. 74	-	Feb. 74	-	yes	yes	Support	VI.1
3.	Load dispatch center	Complete	Dec. 73 (only study)	-	April 74 (engineering design)	-	WJ*	-	Support	VI.2 VI.3
4.	System protection	Complete	Dec. 73	-	April 74	-	WJ*	-	Support	VI.4
5.	Appropriate technical system standards	June 73	Start March 74	-	June 74	yes	yes	yes	Support	VI.5
6.	System loss reduction	-	Start Nov. 73	Continuous	Continuous	-	yes	yes	Support	VI.7
	<u>VII. DISTRIBUTION</u>									
1.	Organization and establishment of Directorate of Distribution	Complete	Complete	Sept. 73	Jan. 74	yes	-	-	-	VII.4

* WJ = West Java

No. (1)	ACTIVITY (2)	Responsibility of PLN and Consultant	Responsibility of Consultant		Responsibility of PLN	Areas of imple- mentation			Govern- ment in- volve- ment. (10)	Relevant section of Terms of Reference (11)
		Basic data available to Consultant (3)	Submission of recommendations by Consultant to PLN (4)	Preparatory work for implementa- tion undertaken by Consultant (5)	Start of implemen- tation with assist- ance of Con- sultant (6)	Head Office (7)	Java areas (8)	Other areas (9)		
55.	Organization and estab- lishment of Regional Distribution Centers	Complete	Complete	Jan. 74	April 74	-	yes	-	-	VII.1
56.	Operation and maintenance procedures	Complete	Start Feb. 74	-	March 74	-	yes	yes	-	VII.2
57.	System loss reduction	-	underway	Continuous	Continuous	-	yes	yes	-	VII.7
<u>Administrative procedures</u>										
58.	a. Inventory control	Complete	Complete	Aug. 73	Jan. 74	yes	yes	yes	-	VII.5
59.	b. Consumer administra- tion (conditions for connection)	June 73	Dec. 73	-	June 74	yes	yes	yes	Regulation by June 73	VII.5
50.	c. Installation reg- ulations	Complete	June 74	July-Dec. 74	Jan. 75	yes	yes	yes	Regulation by Aug. 74	VII.5
51.	Commercial policies	-	Continuous	Continuous	Continuous	yes	yes	yes	Approval	VII.3

No.	ACTIVITY	Responsibility of PLN and Consultant	Responsibility of Consultant		Responsibility of PLN	Areas of implementation			Government involvement	Relevant section of Terms of Reference
		Basic data available to Consultant (3)	Submission of recommendations by Consultant to PLN (4)	Preparatory work for implementation undertaken by Consultant (5)	Start of implementation with assistance of Consultant (6)	Head Office (7)	Java areas (8)	Other areas (9)**		
I. PLANNING										
62.	Overall long-range planning	July 73	Sept. 73	Nov. 73	Study Jan. 74	yes	yes	yes	Support	I.3 I.4
II. PERSONNEL AND TRAINING										
53.	Office management procedures	May 73	June 74	July - Sept. 74	Oct. 74	-	yes	yes	-	II.2
III. FINANCE										
54.	Cash control	-	-	-	July 75	-	-	3/74/ 8/74	-	III.1(d)
55.	Mechanization of consumer administration	-	-	-	July 75	-	CJ*	2/5/ 6	-	III.1(c)
56.	Project commissioning	July 74	Oct. 74	-	April 75	-	-	yes	-	III.1(p)

* CJ = Central Java
** Numbers refer to Exploitation

CATEGORY B

ACTIVITY (2)	Responsibility of PLN and Consultant	Responsibility of Consultant		Responsibility of PLN	Areas of imple- mentation			Govern- ment in- volve- ment (10)	Relevant section of Terms of Reference (11)
	Basic data available to Consultant (3)	Submission of Recommendations by Consultant to PLN (4)	Preparatory work for implementa- tion undertaken by Consultant (5)	Start of implemen- tation with assist- ance of Con- sultant (6)	Head Office (7)	Java areas (8)	Other areas (9)		
IV. CONSTRUCTION									
Procedures to accelerate the completion of projects and to achieve optimum results									
- project execution and supervision	July 74	Oct. 74	-	April 75	-	-	yes	-	IV.6
- procurement in local currency	-	Oct. 74	-	April 75	-	-	yes	-	IV.6
- project commissioning	July 74	Oct. 74	-	April 75	-	-	yes	-	IV.3
- facilities for commissioning and acceptance tests	Dec. 73	March 74	-	June 74	yes	-	-	Support	IV.7
V. GENERATION									
Diesel plants									
- fuel storage and handling	Complete	Oct. 74	-	Dec. 75	-	yes	yes	Support	V.1
- control of fuel quantity and quality	Sept. 74	Oct. 74	-	Dec. 74	-	yes	yes	Support	V.1
- facilities for fuel quality control (plant)	Dec. 74	Start Dec. 74	-	April 75	-	yes	yes	Support	V.1

No. (1)	ACTIVITY (2)	Responsibility of PLN and Consultant	Responsibility of Consultant		Responsibility of PLN	Areas of imple- mentation			Govern- ment in- volve- ment (10)	Relevant section of Terms of Reference (11)
		Basic data available to Consultant (3)	Submission of recommendations by Consultant to PLN (4)	Preparatory work for implementa- tion undertaken by Consultant (5)	Start of implemen- tation with assist- ance of Con- sultant (6)	Head Office (7)	Java areas (8)	Other areas (9)		
	<u>VI. TRANSMISSION</u> (For reference)	-	-	-	-	-	-	-	-	-
	<u>VII. DISTRIBUTION</u>									
69.	Organization and estab- lishment of Regional Distribution Centers	Complete	June 74	Sept. 74	Jan. 75	-	-	yes	-	VII.1

INDONESIA

PERUSAHAAN UMUM LISTRIK NEGARA (PLN)

Training

The following training activities have been undertaken in the past or are presently underway.

A. TRAINING CENTERS

1. In Operation

- (a) Slipi: This is the training center for finance and administration. It was originally inaugurated in 1972 and, after some interruption, reopened in September 1974. During the first phase about 150 employees were trained. The total capacity has been increased to about 300 trainees per year. Between October 1975 and end-1978 420 persons have been trained. The center employs 7 full-time teachers.
- (b) Cibogo: Center for technical training in generation, transmission and distribution control. It was opened in 1973. By end-1974 159 employees had been trained and training program for another 470 have been conducted between early 1975 and end-1978. The Center employs 8 full-time and 16 part-time instructors.
- (c) Ancol: Center for distribution construction and maintenance. It was originally inaugurated in 1972 and, after interruption, reopened in early 1975. The total capacity is about 180 persons per year in classes of 12-32 weeks duration.
- (d) Tanjung Priok: Center for steam and gas turbine plant operation. The center was opened in March 1976. Its capacity is 60 employees per year.

INDONESIA

PERUSAHAAN UMUM LISTRIK NEGARA (PLN)

CREDITS 165 AND 334-IND

FIRST AND SECOND ELECTRICITY DISTRIBUTION PROJECTS

Internal Economic Return

1. The internal economic return was computed on the Jakarta electricity distribution rehabilitation and expansion project with a capital cost of US\$105.8 million equivalent at current prices (including reinforcement of the 70 kV system and the load control center which were financed from services other than the IDA credits). It is the discount rate at which the present worth of the project cost and other attributable costs, at constant prices, net of duties and taxes, is equal to the present worth of the revenues, at constant prices, derived from it. The table below show the assumptions made:

Fiscal	Additional Generation (GWh)	Additional Sales (GWh)	Additional Revenues	Project	Additional Generation Cost
				Cost	
				-----US\$ million----- (1963 Prices)	
	(a)	(b)	(c)	(d)	(e)
1973	-	-	-	13.32	-
1974	29	32	1.05	7.16	0.52
1975	100	115	3.31	16.96	1.80
1976	195	220	7.38	15.03	3.50
1977	304	352	13.41	12.61	5.19
1978	395	422	14.83	3.32	6.90
1979	395	422	14.00	-	6.83
1980	395	422	14.00	-	6.83
1981	395	422	14.00	-	6.83
1982	395	422	14.00	-	6.83
2002	395	422	14.00	-	6.83

(a) and (b): The additional generation and sales are those included in SOFRELEC's feasibility study dated December 1971. The additional energy generation required is less than the estimated increase in sales; this is due to much lower system losses with the new distribution system.

(c): Valued at the average revenues per kWh sold in any given year between FYs 73 and 79 discounted to arrive at constant 1973 levels by using a 50/50 mix (local/foreign) of the actual inflation factors.

(d): The total cost of US\$68.4 million equivalent at constant 1973 prices (US\$40.9 million for foreign and US\$27.5 million for local) was arrived at by discounting the cost streams by using the following annual inflation factors:

	<u>Foreign</u>	<u>Local</u>
1974	8%	34.6%
1975	8%	19.4%
1976	8%	17.0%
1977	9%	11.8%
1978	7%	11.0%

(e): Using the actual prices of fuel oil at Singapore between FYs 1973 and 79 discounted to arrive at constant 1973 levels by using the actual foreign inflation factors.

The discount rate which equalizes the above cost and benefit streams is about 10%.

INDONESIA

PERUSAHAAN UMUM LISTRIK NEGARA

Income Statements: FY72-79
(Billions of Rupiah)

	<u>1972</u>		<u>1973/a</u>		<u>1975</u>		<u>1976</u>		<u>1977</u>		<u>1978</u>	
	Appraisal	Actual	Appraisal	Actual	Appraisal	Actual	Appraisal	Actual	Appraisal	Actual	Appraisal	Actual
Sales increase (%)	7.6	6.0	10.0	14.9	10.0	12.4	13.8	14.7	13.9	9.9	14.0	14.4
Energy sales (GWh)	1,900	1,893	2,090	2,175	2,530	2,444	2,880	2,804	3,280	3,082	3,740	3,527
Average price/GWh	8.0	9.0	10.0	11.0	12.5	16.4	12.5	21.7	12.5	27.3	14.4	27.5
Energy revenue	15	17	21	24	32	40	36	61	41	84	54	97
Other revenue	3	2	3		3		4	0	4	0	4	0
<u>Total Revenue</u>	<u>18</u>	<u>19</u>	<u>24</u>	<u>24</u>	<u>35</u>	<u>40</u>	<u>40</u>	<u>61</u>	<u>45</u>	<u>84</u>	<u>58</u>	<u>97</u>
<u>Operating Expenses</u>												
Fuel	4	5	5	7	5	10	5	15	6	23	7	29
Operations	16	11	16	13	16	19	18	23	19	37	21	43
Depreciation	10	10	11	11	13	12	14	13	16	16	17	23
	<u>30</u>	<u>26</u>	<u>32</u>	<u>31</u>	<u>34</u>	<u>41</u>	<u>37</u>	<u>57</u>	<u>41</u>	<u>76</u>	<u>45</u>	<u>95</u>
Operating income	-12	-7	-8	-7	1	-1	3	4	4	8	13	2
<u>Interest</u>			1		5		6		8		9	
Charged construction			1		5		1		3		3	
Charged operations			0		0		5		5		6	
Net income	-12	-7	-8	-7	1	-1	-2	4	-1	8	7	2
Rate base	91	100	114	155	149	126	177	128	197	152	219	194
Rate of return (%)	-13.2	-6.0	-7.0	-	-1.3	-1.6	1.7	-1.6	2.0	5.3	5.9	1.0
Operating ratio (%)	166.6	136.8	133.3	129.2	97.1	102.5	92.5	93.2	91.1	90.5	77.6	97.9

/a Fiscal year end changed from December 31 to March 31 for FY75. Appraisal figures are on calendar year basis.

INDONESIA

PERUSAHAAN UMUM LISTRIK NEGARA

Balance Sheets: FY72-79
(Billions of Rupiah)

	1972		1973/a		1974		1976		1977		1978	
	Appraisal	Actual										
ASSETS												
Fixed Assets												
Plant in service	117	134	159	166	225	199	256	229	294	306	333	390
Less: Depreciation	19	20	30	32	56	47	70	61	86	78	103	106
Operating plant	98	114	129	134	169	152	186	168	208	228	230	284
Works in progress	30	33	15	23	26	117	28	274	29	358	30	531
Current Assets												
Cash	2	6	6	8	11	20	10	16	10	29	15	39
Inventories	6	10	6	21	7	20	7	25	8	31	9	40
Receivables	5	8	6	24	7	18	8	28	9	35	9	48
Total	13	24	18	53	25	58	25	69	27	95	33	127
Total Assets	150	171	162	210	220	328	239	511	264	681	293	942
Equity and Liabilities												
Equity												
Paid-in capital	167	167	175	208	186	309	187	475	187	617	187	814
Retained earnings	-20	-12	-28	-13	-35	-8	-37	-10	-38	-1	-31	-2
Total Equity	147	155	147	195	151	301	150	465	149	616	156	812
Long-Term Debt												
Debt due			12		65		85	8	111	11	132	42
Current Liabilities												
Payables	3	8	3	1	4	4	4	4	4	1	5	8
Total	3	8	3	1	4	4	4	4	4	1	5	8
Consumers' contributions		8		14		23		41		53		80
Total Equity and Liabilities	150	171	162	210	220	328	239	511	264	681	293	942
Increase in gross plant (%)	25.8	21.8	35.9	24.6	41.5	19.2	13.8	15.1	14.8	33.6	13.3	27.4
Debt as % of debt & equity			7.5		30.0		36.2	1.7	42.6	1.8	45.8	4.9
Current ratio	4.3	2.9	6.0	17.7	6.2	12.2	6.2	17.2	6.8	95.0	6.6	15.9

/a Fiscal year end changed from December 31 to March 31 for FY75. Appraisal figures are on calendar year basis.

BREAKDOWN OF PROJECT FOREIGN COSTS

	<u>Appraisal Estimates</u>	<u>Current Estimate ^{1/}</u>
1. High voltage system (70 kV)	2.8	nil
2. Medium voltage system	6.5	13.5
3. Distribution substations	10.3	9.3
4. Low voltage system	3.6	8.9
5. Service entrances	5.2	3.9
6. Voltage change	1.3	2.3
7. Street lighting	3.4	1.2
8. Regional and National Control Centre	0.9	0.1
9. Transportation	4.4	n.a. ^{1/}
10. Engineering services and training	4.4	6.6
11. Management Services	5.0	8.6 ^{2/}
12. Contingencies - Physical	3.8	nil
- Prices	3.5	nil
TOTAL	<u>55.0</u>	<u>54.4</u>

NOTE: For the sake of practicality, the two credits have been put together, at least from the technical point of view. This breakdown slightly differs for some items from the Appraisal Report because categories of both credits are not the same as number and content.

^{1/} Transportation costs are included in each project component.

^{2/} This figure of US\$8.6 million constitutes about 16% of the total sum from the two credits.

INDONESIA
PUBLIC GENERATING FACILITIES BY AREAS (MARCH 31, 1975)

