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Report No. 17709

IMPLEMENTATION COMPLETION REPORT

PHILIPPINES

POWER TRANSMISSION AND REHABILITATION PROJECT

(LOAN NO. 3626-PH)

APRIL 17, 1998

Energy and Mining Sector Unit
East Asia and Pacific Region

CURRENCY EQUIVALENTS

(As of December 31, 1997)

Currency Unit	=	Philippine Peso (P)
P1.00	=	US$0.025
US$1.00	=	P40.00
P1.00	=	100 Centavos

FISCAL YEAR OF BORROWER

January 1 to December 31

ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
BOT	Build-Operate-Transfer
BPS	Bureau of Product Standards
BTO	Build-Transfer-Operate
COP	Committee on Privatization
DA	Department of Agriculture
DAR	Department of Agrarian Reform
DBM	Department of Budget and Management
DENR	Department of Environment and Natural Resources
DOE	Department of Energy
DOF	Department of Finance
DOST	Energy Coordinating Committee
DSR	Debt Service Ratio
DTI	Department of Trade and Industry
ECC	Energy Coordinating Council
EHV	Extra High Voltage
EOIS	Efficiency and Operational Improvement Study (NPC)
ERB	Energy Regulatory Board
ESP	Energy Sector Plan
GDP	Gross Domestic Product
ICC	Investment Coordinating Committee
IDP	International Development Planners
IPP	Independent Power Producer
MW	Megawatt (1,000,000 Watts)
NEA	National Electrification Administration
NEDA	National Economic and Development Authority
NPC	National Power Corporation
OEA	Office of Energy Affairs
OP	Office of the President
OPSF	Oil Price Stabilization Fund
PCIERD	Philippine Council for Industry and Energy Research
PD	Presidential Decree
PDP	Power Development Program (NPC)
PHRD	Policy and Human Resources Development
PNOC	Philippine National Oil Corporation
PNOC-EDC	PNOC Energy Development Corporation
PU	Public Utility
RA	Republic Act
REC	Rural Electric Cooperative
ROM	Rehabilitate-Operate-Maintain
RORB	Return on Rate Base
SAR	Staff Appraisal Report

Regional Vice President	: Jean-Michel Severino, EAP
Country Director	: Vinay Bhargava, EACPF
Sector Manager	: Yoshihiko Sumi, EASEG
Task Manager	: Mohammad Farhandi, EASEG

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Preface

This is the Implementation Completion Report (ICR) for the Power Transmission and Rehabilitation Project in the Republic of the Philippines, for which Loan 3626-PH in the amount of US$110 million equivalent was approved on August 13, 1993, and made effective on December 6, 1993.

Loan 3626-PH was closed on December 31, 1997, compared with the original closing date of December 30, 1996. Final disbursement is expected to take place by April 30, 1998. Some US$55.45 million was canceled on August 25, 1995, and an additional US$2.95 million was canceled on January 14, 1997.

The ICR was prepared by Calum Gunn, Consultant, EASEG, and Leo Rodaje, Operations Officer, EACPF, under the supervision of Mohammad Farhandi, Principal Energy Specialist, Energy and Mining Sector Unit of the East Asia and Pacific Region. The ICR was cleared by Yoshihiko Sumi, Sector Manager, EASEG.

Preparation of this ICR was begun in October 1997 followed by an ICR mission in November 1997. It is based on material in the project file as well as data provided by the Borrower. The Borrower contributed to the preparation of the ICR by stating their views as reflected in the mission's Aide Memoire (Appendix A), by preparing their own evaluation of the Project's execution (Appendix B), and by commenting on the draft ICR (Appendix C).

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Evaluation Summary

Introduction

i. This Project is one in a recent series of loans outlining a major reform program for the Philippine energy sector, and for the power sector in particular. Each project, to some extent, involves the same Borrower, the National Power Corporation (NPC); the key player in the power sector.[1] Central aspects of this reform program include ensuring NPC's financial viability and strengthening its institutional capacity, and vertically and horizontally unbundling the Corporation in preparation for privatization. This ICR provides an opportunity to review the progress of reform, and additionally sets a precedent for evaluating the outcomes of the subsequent projects in the series.

Project Objectives and Results

ii. **Physical Objective and Project Economic Rate of Return**. The Project's main objective, as stated in the Staff Appraisal Report (SAR), was to alleviate the power shortages in Luzon, caused by a power crisis that had begun in 1991. Brownouts caused by the crisis were responsible for causing economic losses to the Philippines of around US$600-$800 million per year. This objective was to be achieved by financing many of the transmission lines that would connect a series of "fast track" generation plants into the Philippine power grid. From the Bank's perspective, the Project was consistent with the regional objective to encourage private sector participation in power generation, since the "fast track" projects were primarily to be developed under BOT (Build-Operate-Transfer) and BTO (Build-Transfer-Operate) contracts with IPPs (paras 1-4).

iii. The Project substantially achieved the objective of contributing to the resolution of the power crisis, in spite of the fact that a significant portion of the Loan was canceled (paras 16-17). However, this achievement came at a high cost, and a recalculation of the Project's net present value (NPV) results in a negative amount. Project approval was given on the basis of ignoring the avoided cost of the economic damage caused by power outages. Nevertheless, even taking this economic damage into account in the recalculation, based on the assessment of avoided costs in the SAR, does not produce a positive NPV, due to the expensive nature of the "fast track" IPPs (para. 19). On the other hand, the magnitude of the power crisis may have been such that the avoided cost of outages was underestimated in the SAR, and hence the Project may have resulted in a significant net benefit in macroeconomic terms (para. 20).

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[1] These projects are: the already closed Energy Sector project (although its JEXIM-financed component is still active, and is being supervised by the Bank), for which PNOC and the Government were also Borrowers (NPC's component being Loan 3163-PH); the Leyte-Cebu and Leyte-Luzon Geothermal projects, due to close in June 1998 and June 1999 respectively, and for which PNOC is also a Borrower (NPC's components being Loans 3700-PH and 3746-PH); and the Transmission Grid Reinforcement project, due to close in December 2000 (Loans 3996-PH and 3997-PH).

iv. Although it was recognized at the time that responding rapidly to the crisis would result in a tradeoff between the shorter lead times of the "fast track" plants and their associated higher costs, the economic evaluation in the SAR overestimated the future plant factors of these IPP units. It did not explicitly consider the impact of sector reform and the associated introduction of competition in generation on the dispatch of the IPPs. Moreover, the Project's internal rate of return (IRR) in the SAR was overstated, as the calculation excluded the impact of transmission losses, even though it was stated that losses had been taken into account. Had the IRR been determined on the basis of the assumptions actually specified in the SAR, for the case where the avoided cost of outages was ignored, it would have been 6.5 percent instead of 11 percent, and the Project would have exhibited a negative NPV (para. 18).

v. **Sectoral Policy Objective**. Apart from contributing to the alleviation of the power crisis, the Project provided an opportunity for the Bank to support a series of reforms in the energy sector by maintaining a dialogue with the Government regarding an Energy Sector Plan (ESP) which covered policies, institutions and implementing mechanisms. Although many of the actions in the ESP have been implemented, a major issue of concern is the protracted debate over the details of an Omnibus Electricity Bill which provides the mandate to privatize NPC and empowers the Department of Energy (DOE) to effect the restructuring of the entire power industry (paras 11-12).

vi. **Financial and Institutional Development Objectives**. Two related objectives of the Project, and of the ESP as well, were ensuring NPC's financial viability to make required investments, and also strengthening the Corporation's institutional capacity, since the healthy performance of NPC is critical to the effective and efficient operation of the power sector as a whole. Achievement of the Project's institutional objective has been reasonably impressive, although progress in this respect is continuing. NPC has implemented many of the recommendations of the 1994 Efficiency and Operational Improvement Study (EOIS), which was funded by the Japan Grant Facility and managed by the Bank within the scope of the Project (para. 15).

vii. The importance of the Project's financial objective is evidenced by the associated stringent conditions required to be met before Board presentation (para. 9), and consequently the relatively long period between the appraisal mission and Board presentation in the face of the power crisis. Thus, although a substantial provision for retroactive financing allowed many of the Project's physical components to be completed prior to Board presentation, NPC completed some of the more urgent transmission works using alternative sources of funding. NPC's financial viability was seen as critical, since the Corporation's financial problems were considered to have been one the key contributing factors leading to the crisis in the first place. In many of the previous years NPC had been unable to generate sufficient cash internally to finance its substantial investment requirements (para. 2).

viii. The Bank spent considerable effort prior to Board presentation in helping NPC to increase its base electricity tariff and to provide tariff indexing for the costs to NPC of fuel, purchased power and foreign exchange fluctuations, all in an attempt to improve the Corporation's revenue stream (para. 13). With the conditions of Board presentation met, the Bank felt that NPC's problems had been resolved and that the Corporation was on track to meet its financial covenants while satisfactorily financing its investment program. Yet in hindsight, although necessary, these tariff changes were not sufficient measures to ensure NPC's financial viability, and so the financial objective has not been achieved. NPC still does not have enough internally generated funds to cover debt servicing requirements (para. 14), and the quality of the Corporation's equity, which consists largely of appraisal surplus, is poor (para. 32).

ix. **Major Factors Affecting the Project**. The main factors which have maintained NPC's financial difficulties (Section C) are: (i) the consequences of historical decisions made by the Government and

NPC prior to the Project's inception, which constrained NPC's possible response to the crisis; (ii) the slow pace of sector reform, which has delayed privatization and hence the infusion of fresh equity; (iii) Government emphasis on developing indigenous energy resources for strategic and environmental reasons at a high contractual cost, the burden of which is not being equally shared by all electricity consumers; (iv) competition from new IPPs, which NPC finds difficult to meet given the high cost of some of its existing IPP contracts; (v) delays in tariff approval and problems with tariff design, which have had temporarily negative impacts on NPC's revenue stream; (vi) NPC's high reserve margin, which raises its average costs; and (vii) weak integration of financial and non-financial planning within NPC, which has resulted in non-optimal investment programs and non-optimal asset utilization.

Overall Outcome and Bank/Borrower Performance

x. **Bank Performance**. Bank performance in project identification and preparation was satisfactory. Considerable flexibility was built into the project description to facilitate changes in the project design in response to inconstant crisis conditions. However, although the Bank's commitment to assist NPC in restructuring its tariffs and strengthening its institutional capacity was laudable, overall, the performance of the Bank in appraising the Project is rated deficient, specifically with respect to the sensitivity analysis of the Project's IRR and the assessment of NPC's financial situation (Section E). The Project focused mainly on improving NPC's income statement (by securing revenue through automatically-adjusting tariffs), whereas greater effort was also needed to improve NPC's balance sheet (by augmenting its level of equity). Further, the short term benefits of mitigating the economic damage caused by the power crisis were estimated at the time as offsetting the longer term costs due to the expensive IPP contracts. Given that the process of sector reform made NPC's market share and overall level of sales very difficult to forecast, the sensitivity of the IRR to such highly uncertain factors should have been investigated in the SAR. Nevertheless, Bank performance during supervision was generally satisfactory, and NPC's financial problems were diagnosed more accurately during the appraisal for the later Transmission Grid Reinforcement project.

xi. **Borrower Performance**. NPC's performance during preparation and implementation of the Project was satisfactory, and the Corporation was highly committed to the Project (Section F). NPC acted to meet all the Bank's conditions of Board presentation and loan effectiveness, and physical implementation was marked by many contracts being completed early and under the cost estimates. NPC took action with regard to the majority of recommendations in the EOIS, although some were put on hold pending the outcome of NPC's ongoing restructuring process. On the other hand, compliance with financial covenants was not attained in every year, and the financial objective of the Project was not achieved. However, a number of the factors contributing to this result were outside of NPC's direct control during the project period (para. ix).

xii. **Project Sustainability**. Overall, the prospects for project sustainability are uncertain (Section D). In terms of responding to the power crisis, the Project has contributed to making it unlikely that such a level of brownouts will happen again in the foreseeable future. Nevertheless, meeting the Project's physical objective came at a high cost, and has contributed to the perpetuation of NPC's poor financial position. Since the financial viability of NPC is critical to ensuring an effective and efficient power sector, this means that the project sustainability as a whole must also be rated as uncertain. This conclusion is reinforced by: (i) general sectoral uncertainty caused by the delay in passing the Omnibus Electricity Bill; (ii) the recent depreciation of the peso; and (iii) implementation delays in NPC's other Bank-financed projects.

xiii. **Assessment of Outcome**. The overall outcome of the Project is rated unsatisfactory (Section G). The reason for the unsatisfactory rating is twofold: (i) NPC has maintained its precarious financial situation over the Project period, and hence the objective of ensuring NPC's financial viability has not been achieved (para. viii); and (ii) the high cost of meeting the Project's physical objective was a contributing factor to this situation, and consequently a recalculation of the Project's NPV results in a negative value (para. iii). The importance of the Project's financial objective is evidenced by the stringent conditions relating to NPC's finances which were required to be met prior to Board presentation (para. vii). NPC's financial viability was seen as critical, since the Corporation's financial problems were considered to have been one the key contributing factors leading to the power crisis. Hence, ensuring the sustainability of the Project's short term physical objective, to resolve the immediate needs of the power crisis, was dependent on also achieving the longer term financial objective.

xiv. Nevertheless, this outcome must be qualified by noting that: (i) the physical objective to alleviate the power crisis was substantially achieved; (ii) the magnitude of the power crisis may have been such that the avoided cost of outages was substantially higher than the assessment in the SAR, hence the Project may have resulted in a significant net benefit in macroeconomic terms; and (iii) in meeting the Project's physical objective, the implementation performance of NPC was satisfactory. Many of the factors leading to both the Project's poor economic return and the perpetuation of NPC's precarious financial situation were as a consequence of decisions made by the Government and NPC prior to the Project's inception. To a large extent these factors constrained NPC's possible response to the power crisis.

Future Operation and Key Lessons Learned

xv. **Future Operation**. The Bank's recent sector reports have built on the ESP by providing the strategic framework for restructuring and privatizing the power sector, and NPC in particular. More specifically, the covenants of the Transmission Grid Reinforcement project include the requirement for the separation of NPC's transmission activities as a separate corporate entity. Yet NPC's precarious financial situation, the slow pace of sector reform and the fragmented nature of the distribution sector, are still of concern. The Bank will continue to monitor NPC's finances through its ongoing supervision of the subsequent projects. However, a resolution of these outstanding issues still requires a concerted effort by DOF, DOE, NPC, PNOC-EDC and NEA, with coordinated assistance from both the Bank and ADB (Section H).

xvi. **Key Lessons Learned**. The stringent conditions of Board presentation relating to the Project's financial objective, which resulted in presentation delays in the face of a crisis, suggest that the resolution of short term problems was not to be at the expense of the long term financial viability of the Philippine power sector's key player. However, because the IPP arrangements associated with the Project were developed under crisis conditions, they came at a high cost. This has been a contributing factor to the failure of this Project to meet its financial objective and has detrimentally affected the Project's economic rate of return. Such an outcome indicates the need to clearly identify potential interactions between project objectives, and highlights the pitfalls in not conducting sufficient sensitivity analyses of a project's economic rate of return, particularly in a sector undergoing major structural reform. Further, return on rate base (RORB) and debt service ratio (DSR) financial covenants are not in themselves sufficient indicators of a public utility's financial resiliency. Had NPC actually met the covenants in every year of the Project, this would have masked the actual precariousness of the Corporation's financial position (Section I).

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PART I: IMPLEMENTATION ASSESSMENT

A. STATEMENT/EVALUATION OF OBJECTIVES

1. **Background**. Beginning in 1991, the Philippines experienced a very serious power crisis which posed a grave threat to its economic development and stability. The crisis resulted in substantial outages of up to 10 hours per day in Luzon and Mindanao, hurting industrial production and the development of new industrial and commercial activities. In addition, there were serious disruptions of key services that depended on electricity, ranging from traffic management to water supply and sewerage. The cost of consequent unemployment and economic losses was estimated by the Bank to be around US$600-$800 million per year.[2]

2. The crisis was partially due to natural causes, a serious persistent drought which caused several key hydro dams to be below minimum operating levels. However, equally important were institutional problems which had resulted in minimal investments being made in power generation during the period from 1986 to 1992. These problems included: (i) inadequate financial performance of the National Power Corporation (NPC), the state-owned entity responsible for power generation and transmission, due to insufficient tariff levels resulting in negative cash generation and reduced amounts available for power investments; (ii) inadequate maintenance and rehabilitation of NPC's thermal plants (having an average age of 22 years), resulting in frequent unplanned outages; (iii) long delays in obtaining environmental approval for power projects, in part due to the very negative public perception of NPC; (iv) slow procurement, project implementation and disbursement procedures by NPC; and (v) the mothballing of the Philippine Nuclear Power Plant (600 MW).

3. In response to the crisis, the Government of the Philippines enacted the "Electric Power Crisis Act of 1993" (RA 7648) to give the President special powers to facilitate tariff increases and to expedite project approvals. A "fast track" generation program of BOT (Build-Operate-Transfer) and BTO (Build-Transfer-Operate) contracts with the private sector was initiated comprising 700 MW of capacity for Luzon and 200 MW for Mindanao. These contracts involved internal combustion turbines operating on relatively expensive fuel/bunker oil or diesel that could be commissioned rapidly. Other conventional power supply projects (coal, geothermal and hydro), which have lower operating expenses, require much longer construction lead times and hence would not have been able to provide the necessary relief in the short term. NPC intended that as soon as adequate conventional power generation was installed to serve base load requirements, that these operationally expensive plants be reserved for peak power generation or standby capacity, as is dictated by the principles of economic dispatch. However, it was recognized that these plants would continue to be expensive, since the high take-or-pay charges under the BOT contracts persist irrespective of operational conditions.

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[2] This estimate, which was presented in the Project's Staff Appraisal Report (SAR), corresponded to around 1.5 percent of GDP, and was calculated on the basis of using US$0.50/kWh as the cost of unserved energy. (This was the value used by the National Power Corporation (NPC) in its planning process).

4. **Project Objectives**. As stated in the Project's Staff Appraisal Report (SAR) of June 1993, the main objective of the Project was to alleviate power shortages in Luzon, through: (a) a transmission system expansion and reinforcement program needed to bring power to Manila from the "fast track" generation plants; and (b) the rehabilitation of the Bataan thermal generating plant (225 MW). The Project was also intended to improve the performance of the energy sector through the approval by the Government, in consultation with the Bank, of an Energy Sector Plan (ESP) covering policies, institutions and implementing mechanisms. In addition, it was to ensure the financial viability of NPC to undertake a massive and long-overdue investment program and improve its institutional setup.

5. **Project Components**. The Project was originally designed to have the following major components: (a) expansion of the transmission system in the Bataan and Batangas areas near Metro Manila; (b) provision of goods and materials (conductors, insulators and supports) to reinforce the transmission system; (c) rehabilitation of the two units (Unit #1, 75 MW and Unit #2, 150 MW) of the Bataan oil-fired thermal power plant; (d) consulting assistance to prepare a master plan to develop the 500 kV extra high voltage (EHV) system and rehabilitate the Bataan thermal plant; and (e) an "Efficiency and Operational Improvement Study" (EOIS) funded by the Japan Grant Facility and managed by the Bank.

6. After the Loan was declared effective, conditions in the power sector changed from those prevailing at the time of appraisal. Among other changes, one of the proposed BOT developments (600 MW) never eventuated, necessitating the indefinite postponement of the proposed transmission reinforcement measures in the Batangas area. Furthermore, NPC opted to seek a private sector developer to rehabilitate the Bataan thermal plant on an ROM (Rehabilitate-Operate-Maintain) basis in line with new policies to divest generation to the private sector, and not to use funds from the Loan for this purpose. On August 24, 1995, NPC requested the cancellation of these components.

7. **Evaluation of Objectives**. In responding to the emergency conditions brought on by the power crisis, the Project objectives relating to the physical components were directed at ensuring the successful implementation of the Government's "fast track" generation program. They also complemented the Bank's wider country objectives of promoting private sector involvement in infrastructural development. The description of the transmission system expansion and reinforcement components of the Project in the Loan Agreement was sufficiently broad to allow a flexible change of project scope in response to the risk of non-implementation of specific generation projects. Moreover, the risk of delays in the implementation of the transmission components was minimized by an advanced and effective procurement program monitored monthly by the Bank, and by the provision for retroactive financing of up to 20 percent of the loan amount prior to signing. Implementation of the physical components of the Project was neither demanding nor complex from NPC's perspective, and there were no major environmental or resettlement issues.

8. The Loan Agreement required an exchange of views between the Bank and the Government on the ongoing process of sector reform outlined in the ESP. The Government approved the ESP prior to Board presentation and this plan provided a roadmap for an extremely ambitious and complex program of reform for the wider energy sector, not just the power sector (para. 11).

9. The objective of ensuring NPC's financial viability to undertake its investment program did not have a related project component. However, stringent conditions for Board presentation required an increase in NPC's base tariff and a provision for an automatic tariff adjustment to reflect fluctuations in the cost to NPC of purchasing petroleum products, in order to improve NPC's revenue stream. In addition, loan effectiveness conditions included further tariff indexing for the costs to NPC of coal,

geothermal steam and purchased power, and to account for foreign exchange rate fluctuations. NPC's financial viability was also an area of action in the ESP. The ESP proposed enacting legislation to authorize equity infusions to NPC from the Oil Price Stabilization Fund (OPSF). At the time of Board presentation, the Bank felt that NPC's financial problems had been resolved and that the Corporation was on track to meet the covenanted return on rate base (RORB) of 8 percent and debt service ratio (DSR) of 1.3. Yet, although necessary, these tariff changes and limited equity infusions were not sufficient measures to ensure NPC's financial viability (para. 32).

10. The objective of improving NPC's institutional setup was to be achieved by the implementation of the recommendations of the EOIS (para. 15) and a transmission system development study, for which extensive terms of reference were included in the SAR.

B. Achievement of Project Objectives

11. **Sectoral Policy Objective**. Achievement of the Project's sectoral policy objective has been partial. Nevertheless, although significant additional restructuring of the power sector is still required, the gains made during the project period through the ESP were reasonably impressive. Many of the required actions in the plan have been implemented (Table 6C). These included passing legislation to: (i) create the Department of Energy (DOE); (ii) deregulate the oil industry; (iii) rationalize the tariff and tax component of petroleum products; (iv) empower a single body, the Energy Regulatory Board (ERB), to have control over the regulation of electric utility pricing; (v) prohibit and prosecute power pilferage; and (vi) institutionalize the Committee on Power Conservation and Demand Management.

12. On the other hand, the main issue still outstanding is the protracted debate in the Philippine Senate and Congress over the details of an Omnibus Electricity Bill (first drafted in early 1995) that provides the mandate to privatize NPC and empowers the DOE to effect the restructuring of the entire power industry. Unfortunately, in November 1997, the Supreme Court of the Philippines declared the Oil Industry Deregulation Act of 1996 (RA 8180) unconstitutional.[3] This redirected the focus of both Senate and Congress, and ensured that the Omnibus Bill would not be passed under the current administration. Furthermore, legislation both to remove the current disincentives to private sector participation in geothermal development, and to change the proscriptive policy regarding geothermal royalties that has driven up steam prices, is still pending after more than four years.

13. **Financial Objective**. Despite notable efforts on both the part of the Bank and of NPC, achievement of the Project's financial objective has been negligible. NPC complied with its RORB covenant in 1994 and 1996 (8.3 and 8.2 percent respectively), but not in 1993 and 1995 (5.9 and 7.3 percent). The DSR was 0.9, 1.3, 0.9 and 1.4 in the years from 1993 to 1996. As a result of the Project, NPC's bulk tariffs were restructured to improve NPC's income (para. 9). This process included: a base rate tariff increase; the application of automatic adjustments for the cost to NPC of fuel (i.e., petroleum products, coal and geothermal steam), purchased power and foreign exchange rate fluctuations; and the introduction of demand charges to all customers. A later development was the approval by ERB of an open access transmission tariff (OATT) applied to IPPs wanting to wheel power through NPC's transmission network to distributors. (This has set an important precedent, as the wheeling tariff level is based on receiving a 12 percent RORB on NPC's transmission assets).

14. However, irrespective of covenant compliance or non-compliance, and in spite of the measures taken to restructure tariffs, NPC still faces financial difficulties in terms of not having enough internally

[3] Congress approved a new and more competitive deregulation law in February 1998.

generated funds to even cover debt-service requirements. Hence, NPC has not been able to satisfactorily finance its investment program as planned. NPC had intended to put P37.1 billion and P38.7 billion into new projects in 1995 and 1996. Actual capital expenditure was only P20.6 billion and P23.3 billion during these years. (The major factors impacting on NPC's financial situation are outlined in Section C).

15. **Institutional Development Objective**. Achievement of the Project's institutional objective has been partial. Although reasonably impressive gains have been made, further progress in this respect is still required (para. 27). NPC has implemented many of the 1994 EOIS recommendations to strengthen the management of its assets and to function more in accordance with commercial principles. On the basis of these recommendations and the lessons learned from the Bank's involvement with NPC through the Energy Sector project (Loan 3163-PH) and the ongoing Leyte Geothermal projects (Loans 3700-PH and 3746-PH), specific corrective measures were taken during the course of the Project period. These included: (i) appointment of project directors under a new vice presidency; (ii) establishment of a Project Management Office to manage the responsible design groups in the Engineering Department, as well as outside consultants; (iii) strengthening NPC's procedures to deal with environmental and resettlement issues; (iv) training in the implementation of Bank procurement procedures; (v) standardization of bid documents to ensure a uniform approach in evaluating and awarding contracts (as was covenanted under the Loan Agreement); and (vi) the development of other programs such as Reliability Central Maintenance (RCM) and Total Quality Management (TQM) intended to achieve continuous performance improvement. In addition, the Transmission Master Plan funded under the Loan provided the basis for planning much of NPC's future transmission expansion program (Table 7). However, actions on some recommendations in the EOIS have been put on hold, pending the outcome of the current restructuring of NPC.

16. **Physical Objective**. The overall physical objective was substantially achieved, even taking into account the cancellation of the component for rehabilitating the Bataan thermal plant. In terms of alleviating the power crisis, the Project eventually facilitated the transmission of up to 1200 MW of additional power within Luzon, and to the Metro Manila region in particular (Appendix A). The construction of the Hermosa-Bocaue-Balintawak line, and the associated expansion of the Balintawak and Manila substations, were both necessary to evacuate power generated from the Subic and Bataan regions to Manila. The temporary Limay-Hermosa dual circuits, financed retroactively and completed prior to loan signing, transmitted up to 600 MW of power from the Bataan (ABB) combined-cycle plant to the Hermosa substation. In addition, the Subic-Olongapo line and the expansion of the Olongapo substation, allowed the transmission of up to 100 MW from the Enron-Subic II plant through to Hermosa. In Northern Luzon, the Payocpoc-Bauang line allowed the export of around 200 MW from First Private Power's (FPP) Bauang plant. The construction of the Pinamucan-Batangas line, completed prior to loan signing, and the expansion of the Batangas and Binan substations and of the Calaca and Makban switchyards, connected up to 100 MW into the grid from the Enron-Pinamucan plant. Finally, the rehabilitation of the Kalayaan-Tayabas line and the expansion of the Dolores substation eventually contributed to bringing north up to an additional 200 MW from the geothermal plants in Southern Luzon.

17. Prior to the Project's inception, the Bataan thermal plant had been operating at less than half its capacity and experiencing frequent outages. Its rehabilitation under the project scope was intended to restore the plant to full capacity. This component of the Loan in its entirety, including the remaining portion of the associated consultancy contract, was canceled in August 1995, the justification being that the rehabilitation would still be performed through divesting the plant to the private sector on an ROM basis (para. 6). As yet, this has not ensued. Nevertheless, the failure of this component to be completed within, or outside, the extent of the Loan did not hinder achievement of the project objective to provide relief for the power crisis. Moreover, the portion of the related consultancy contract that was utilized did

enable NPC to revise its maintenance procedures to achieve an increase in firm capacity and a reduction in forced outages (Table 7).[4]

18. **Economic Rate of Return**. The internal rate of return (IRR) for the transmission expansion and reinforcement program was estimated in the SAR as 11 percent, assuming that NPC's average bulk tariff could be increased from P1.66/kWh to P1.84/kWh. Although it was stated in the SAR that the IRR was calculated accounting for transmission losses, this was not the case. Correcting for this, the IRR in the SAR would have been only 6.5 percent with an associated negative net present value (NPV) of P1.9 billion.[5] When avoided losses to the economy due to frequent power outages were taken into account, the IRR was considerably higher, indicated in the SAR as being 136 percent. (The avoided cost of outages, associated with the incremental sales due to the Project, was presented in the SAR as being P7.2 billion over a two year period). Correcting again for the omission of transmission losses, the IRR in the SAR would have been 92 percent, with a positive NPV of P3.1 billion.

19. The Project NPV has been recalculated on the basis of NPC's current forecasts for plant costs, power tariffs, sales and revenues (Table 9). Both the Enron-Subic II and Enron-Pinamucan plants have been included in the revised economic analysis, since the Project facilitated the transmission of power from both of these plants in order to alleviate the power crisis (para. 16). The ESI plant was built by a different developer and is included in the analysis as the FPP-Bauang plant. The recalculated NPV is negative P14.6 billion, ignoring avoided outage costs, or negative P9 billion, including the level of avoided outage costs used in the SAR. The main reason for the substantially lower recalculated NPV is NPC's reduced forecasts for plant factors, in particular, that for the ABB combined-cycle units. Given that NPC's average tariff for Luzon is optimistically projected to almost double over the next nine years, these plant factors could be also be optimistic (para. 24).[6]

20. On the other hand, it is possible that an insufficient level of avoided outage costs was used in the SAR's economic analysis; such costs are problematic to estimate, even *ex post*. These costs have been reassessed, based on assumptions provided in the Bank's 1994 Philippines Power Sector Study (13313-PH), to give an indication of the possible order of magnitude for the economic damage mitigated

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4 A quantitative analysis of the benefits of the Bataan thermal plant rehabilitation was not attempted in the SAR. However, it was considered that the rehabilitation cost of around US$31 million was justified in comparison to the replacement cost of the plant. Given the significant improvement in performance that has been achieved at the Bataan thermal plant, primarily due to the associated consultancy study, it can be concluded that this component of the Project achieved a higher economic return than was expected.

5 (All NPVs discussed in this Section are for a discount rate of 10 percent). The SAR calculation also assumed that transmission expenditure for 1992 was sunk (i.e., around 8 percent of the Project's transmission costs were ignored). In addition, station losses (typically around 3 percent) appear to have been ignored. These have been included in the revised calculation. Finally, the plant factor for the ESI plant was listed in the SAR's Annex 15 (containing the IRR calculation) as being 79 percent after 1995; sales figures in the SAR were actually calculated on the basis of a more realistic plant factor of 30 percent.

6 Another issue relating to the plant factors is that the economic viability of this Project, the components of which were acknowledged by the SAR as not normally being part of a least cost expansion program, may have been detrimentally affected by investment decisions made subsequent to the Project's inception. Without performing a detailed optimization analysis, it cannot be ruled out that later investments, particularly in base-load geothermal and coal-fired plants (both currently operating as well as under construction), may have suboptimally displaced, and continue to further displace, the sunk ABB units in the dispatch merit order (para. 27). Even if justifiably displaced, all the plants relating to the Project may have some additional economic value associated with their use as reserve capacity which is not accounted for in the recalculated IRR.

by the Project.[7] Applying these assumptions results in an overall avoided cost of outages of P26.8 billion over the three year period 1993-1995 (compared to P7.2 billion used in the SAR over a two year period). Using this substantially higher level of avoided costs in the recalculated economic analysis results in a positive NPV of P7.0 billion.[8]

C. Major Factors Affecting the Project

21. **Factors Not Subject to Government or NPC Control.** (a) Historical factors: NPC's need to respond to the power crisis by relying on plants that would not normally have been part of a least cost generation expansion program stemmed from historical factors (para. 2), and hence were not subject to the control of either NPC or the Government subsequent to the inception of the Project. At the onset of the crisis in 1991, insufficient generation investments were in the pipeline, and due to existing undercapacity NPC had little choice but to keep its aging plants online rather than risk outages. Without periodic overhauls, the condition of its generation facilities deteriorated sharply, further exacerbating the crisis. In addition to problems related to securing environmental and social clearances, the lack of generation investment was due to insufficient internal cash generation. With encouragement from the Government, NPC had stopped implementing the existing fuel cost and exchange rate adjustments in its tariff in 1989. Also, the Corporation had had to delay tariff increases required to respond to the large hike in oil prices caused by the Gulf War, and was unable to arrange needed equity financing due to constraints on Government cash investments. This had forced NPC to borrow in foreign currency to meet its local currency investment requirements; a situation which has continued. Conditions were further complicated by the politicizing of NPC tariff increases in anticipation of the May 1992 presidential and congressional elections.

22. (b) Tariff design: The formula initially approved by ERB for the purchased power adjustment would have had a negative impact on NPC's revenue had it been applied, and it was not until 1996 that NPC was able to have a more favorable methodology approved. When finally applied for Luzon customers, it contributed to a major improvement in NPC's average rate for 1996. Another tariff change, intended at least initially to be revenue neutral, was introduced as a covenant under the Loan. This was the application of a higher demand charge component in the bulk tariff. Because the split of demand and energy charge components was approved by ERB based on historical data, and NPC's customers have in most cases subsequently improved their load factors, this change resulted in a negative impact to NPC.

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[7] This 1994 study assumed the economic cost of outages to be US$0.43/kWh for 1993, and US$0.28/kWh subsequently. The reduction over time is because, after a long period of unreliable service, consumers tend to be better prepared for outages, thus reducing the impact of the crisis. A large number of consumers purchased gensets as back-up units during the power crisis, generating at a cost of around US$0.17/kWh. The avoided cost in each year is thus the weighted average of NPC's own estimate of US$0.50/kWh (Footnote 2) and the self-generation cost, as the production from gensets increases. Applying these avoided costs to the incremental sales due to the Project over the period 1993-1995, for the peak 8 hours of each day, results in an overall value of P26.8 billion. This calculation is not intended to be definitive, but only to provide a possible order of magnitude. For instance, attributing avoided costs to the entire year of 1995, during which other NPC and IPP plants came on-line, might overstate the benefits.

[8] The IRR associated with this higher level of avoided costs is only 3.5 percent. This seemingly anomalous result is because the cost-benefit stream is the reverse of that for typical investment projects. Net benefits occur in the initial years of the Project (due to the avoided outages), whereas net costs occur in all subsequent years (since revenue from incremental sales is insufficient to cover the capacity costs of the "fast track" plants).

23. **Factors Subject to Government Control.** (a) Pace of sector reform: A key factor influencing NPC's finances is the slow pace of sector reform, particularly the delay in the passage of the Omnibus Bill by more than two years (para. 12). The privatization of NPC's generation assets is not a realistic option until after this Bill is passed. In early 1996, the SAR for the Transmission Grid Reinforcement project (Loans 3996-PH and 3997-PH), noted that rapid progress with commercialization and privatization was of great importance to NPC, as its financial planning depended on adequate amounts of fresh equity capital through the sale of shares in its planned subsidiaries by 1997. Although noting that the Government has a policy of not acquiring any more equity in NPC, this SAR warned that, if the privatization program failed to provide adequate amounts of equity by this time, the Government would need to provide relief, either through new equity investments or advances given on highly concessional terms. The infusion of equity from the OPSF (para. 9) and from revenues of the Philippine Amusement and Gaming Corporation has had little impact.

24. (b) Competition from new IPPs: Ironically, the process of sector reform has itself contributed to NPC's financial difficulties. One of the main impacts of reform has been to expose NPC to competition in generation. In principle, this is desirable aspect of the reform process, but the playing field is tilted in favor of the IPP entrants that want to wheel power through NPC's transmission network and sell directly to distributors. NPC finds it difficult to compete with these relatively efficient and lower cost new generators, because its average generation cost is weighted upward by the expensive contracts it already has with some of its own IPPs.[9] NPC maintains that the solution to its problems lies in increasing market share through aggressive pricing and contracts. Consequently, NPC recently applied to ERB for a reduction in its base tariff, and approached the Bank to request a relaxation of all RORB loan covenants. The motivation for these requests is that, if NPC's generation market share is eroded, its already high reserve margin and average costs will increase further, launching a vicious cycle of reduced sales and even higher costs. However, the solution to this problem does not lie in NPC establishing a monopoly in generation through a relaxation of its financial covenants with the Bank, but rather in leveling the playing field through recouping the higher costs of past decisions from all consumers, not just NPC's.

25. (c) Emphasis on indigenous resources: Apart from being a response to the immediate needs of the power crisis, a number of NPC's power purchase arrangements were entered into in order to comply with the Government's promotion of the use of indigenous energy resources, especially geothermal. Contracts entered into for strategic reasons, or to internalize externalities, can be considered as beneficial to all electricity consumers (or even to the economy at large), and the burden should be shared accordingly. As a partial rejoinder, NPC has filed an unbundled tariff with ERB which contains a component explicitly quantifying the additional cost to NPC due to the "development of indigenous resources". Correspondingly, NPC recently proposed to the Department of Finance (DOF) the imposition of a geothermal levy, borne by all electricity consumers, to recover the cost of geothermal contracts over and above the competitive market price.[10]

26. **Factors Subject to NPC Control.** (a) High reserve margin: At the time, the Government was aware that, as a result of the "fast track" projects, once the longer term and more economical power supply alternatives had materialized, peak power capacity might be somewhat in excess of what would be

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[9] For 1996, the average cost of NPC's plants was reported as 1.3658 P/kWh, whereas the average for NPC's IPPs was 1.9853 P/kWh, of which the geothermal plants cost 1.6826 P/kWh (as presented in the Bank's 1997 Energy Strategy and Pricing Study; para. 39).

[10] The price that PNOC-EDC can offer NPC for steam is inflated by the Government's policy on geothermal royalties. Although a bill to reform this policy has been pending in Congress since 1993, it has not yet been passed (para. 12).

planned under normal circumstances. This was justified on the basis that such a high reserve margin was necessary to ensure that further damage to the economy was avoided, and to hedge against the risks relating to the unreliability of existing thermal plants, the possibility of implementation delays, and uncertainty regarding the financing of some of the "fast track" projects. The SARs for both this Project and the subsequent Leyte projects concurred with this view, suggesting that a margin of at least 30 percent would be required. However, NPC has continued to bring more projects onstream, and around 1900 MW of new generation is programmed over the next four years.[11] To ensure that NPC's financial situation is not further eroded due to a poor average plant factor, markets need to be found for this capacity, but NPC's market share is becoming increasingly constrained by competition from new IPPs (para. 24).

27. (b) Weak integration of financial and non-financial planning: The EOIS (para. 15) noted a need for closer integration between financial and non-financial planning within NPC. Accordingly, NPC still needs a clear strategy to ensure: the financial viability of projects; the affordability of marketing, investment and borrowing decisions; optimum asset utilization; and the minimization of foreign exchange risks. The tendency of NPC's marketing and planning groups to marginalize advice from its financial departments is a contributing factor to NPC's current situation.

D. Project Sustainability

28. Overall, the prospects for project sustainability are uncertain. In terms of responding to the power crisis, the Project has contributed to making it unlikely that such a level of brownouts will happen again in the foreseeable future. In fact, rather than suffering from undercapacity, NPC now experiences a high reserve margin (para. 26). Moreover, the related Leyte projects and Transmission Grid Reinforcement project, which follow the course outlined by the Transmission Master Plan funded under the scope of the Project, continue to improve the robustness of NPC's transmission network. Although some transmission bottlenecks are still being experienced with respect to the existing generation capacity, these should be eliminated during 1998.

29. Nevertheless, meeting the Project's physical objectives came at a high cost, and has contributed to the perpetuation of NPC's poor financial position (para. 24). Since the financial viability of NPC is critical to ensuring an effective and efficient power sector, this means that the Project's sustainability as a whole must also be rated as uncertain. This conclusion is reinforced by: (i) general sectoral uncertainty caused by the delay in passing the Omnibus Bill (para. 23); (ii) the recent depreciation of the peso; and (iii) implementation delays in NPC's other Bank-financed projects.

E. Bank Performance

30. **Identification and Preparation.** Bank performance in project identification and preparation was satisfactory. The Loan provided an opportunity for a positive demonstration of the Bank's support for a Borrower experiencing financial and institutional difficulties, and needing to respond rapidly to a crisis situation. Specifically, it was designed to ensure that NPC had the capability to respond to the "fast track" initiatives by private sector BOT and BTO proponents to restore power as quickly as possible, since commercial loans are typically not available for transmission or rehabilitation work. Considerable

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[11] Without performing a detailed optimization analysis, it cannot be ruled out that investments which contribute to the high reserve margin, both presently and in the future, may detrimentally impact the specific economic viability of this Project (Footnote 6), in addition to affecting the Corporation's finances.

flexibility was built into the project description to facilitate changes in the project design in response to inconstant crisis conditions. The project scope was also directed at ensuring NPC's financial viability, strengthening its institutional capacity, and initiating a wide range of reforms in the energy sector through agreement with the Government on the ESP, not just in meeting the immediate needs caused by the power crisis.

31. **Appraisal.** Bank performance in appraising the Project is rated deficient. However, the provision for retroactive financing enabled NPC to complete urgent transmission works prior to loan signing, although some of the originally planned sub-projects were financed by other sources because of the delay in signing. Furthermore, the Bank's commitment to assist NPC in restructuring its tariffs and strengthening its institutional capacity was laudable. Nevertheless, the assessment of NPC's financial situation and the sensitivity analysis of the Project's IRR had limitations. In the period between the appraisal mission and presentation of the Project to the Board, which lasted around 9 months due to the stringent conditions attached to Board presentation, the Bank placed a clear emphasis on NPC's financial difficulties (para. 37) and pointed out the expensive nature of the "fast track" generation plants. For instance, the appraisal mission had noted that, while appreciating the Government's concern about the deteriorating power situation and anxiety to safeguard the country's economy, it would have been prudent to perform a critical review of some of the less economical power plants being procured, as these plants could cause a serious drain on NPC's already stretched financial resources. The SAR also noted that, in the future, a proliferation of BOT contracts under take-or-pay conditions might result in complex dispatch problems and difficulties in allocating the reserve and spinning costs of capacity. Yet, by the time of Board presentation, the improvements to NPC's income stream through tariff increases and adjustments (para. 13), were considered sufficient to relieve NPC's situation.

32. The only risk identified in the SAR with respect to NPC's finances was that base tariffs might not be increased sufficiently further in the future. However, this risk was considered to be mitigated by ERB's prior endorsement of the principles behind NPC's revised tariff structure, and because the new administration in the Philippines was seen as having targeted energy problems as a top priority. The potential impact of a more competitive generation environment on NPC's market share and financial position was not considered, neither was it contemplated that, as a consequence, NPC would ever willingly file for a rate reduction as opposed to a rate increase (para. 24). Furthermore, it was not until the SAR for the Transmission Grid Reinforcement project that the Bank placed appropriate emphasis on the poor quality of NPC's equity (which consists largely of appraisal surplus), highlighting that the Corporation's financial constraints derive from its balance sheet rather than from its income statement. In other words, the Project focused mainly on securing NPC's revenue through automatically-adjusting tariffs, whereas greater effort was also needed to augment its level of equity.

33. At Board presentation the concern was raised that the IRR presented in the SAR was relatively low, suggesting problems with productivity in the power sector. In addition, a question was posed regarding the IRR's sensitivity to assumptions regarding tariff rates, and whether other sensitivity factors had been examined.[12] For instance, although implementation delays had been identified in the SAR as a risk, the sensitivity of the IRR to this factor was not examined. The response was that the IRR was

[12] The SAR's Annex 15 did present a calculation of the IRR based on the existing tariff of P1.66/kWh (para. 18). This resulted in a reduction of the IRR from 11 percent to 1 percent when ignoring avoided costs, and from 136 percent to 7 percent when including avoided costs, or correcting for the omission of transmission losses (para. 18), from 6.5 percent to negative 2 percent, and from 92 percent to positive 2 percent, respectively. However, this analysis was not discussed in the main body of the SAR, and the highly sensitive aspect of the IRR was not highlighted.

acceptable given the emergency circumstances under which the Project was to be executed, and that when losses to the economy due to frequent power outages were taken into account, the IRR was considerably higher (para. 18). Yet, even accounting for the benefits of negating the outages, based on the assumptions presented in the SAR, the SAR's NPV is only positive because of sales subsequent to 2008 (i.e., after the end of the BOT contract cooperation periods, once the requirement to pay annual capacity fees has expired). Given the ongoing process of sector reform, by such a time, power sales will be governed by a totally different market mechanism, making individual plant factors, NPC's market share and overall level of sales, very difficult to forecast.[13] In hindsight, the sensitivity of the IRR to highly uncertain factors, in particular future plant factors, should have been investigated in the SAR.

34. **Supervision**. Bank performance during supervision was generally satisfactory, although it might be argued otherwise since there were only two formal implementation review missions. However, supervision of the Project needs to be assessed in the context of the related missions for supervision of the Leyte projects, and for project preparation and appraisal of the Transmission Grid Reinforcement project. Issues raised in this context led to the funding under the Project of studies on economic dispatch and open access transmission tariffs (Table 7). Moreover, NPC's financial problems were diagnosed more accurately as part of the appraisal for the Transmission Grid Reinforcement project. Finally, the presence of a local procurement specialist at the resident mission in the early stages of the Project was beneficial.

F. Borrower Performance

35. **Preparation**. NPC's performance during preparation of the Project was satisfactory. NPC was highly committed to the Project and acted to meet all the Bank's conditions of Board presentation and loan effectiveness. The delays in this respect were in part due to a Supreme Court injunction against the rate increase approved by NPC's Board, and the subsequent time taken by ERB to reapprove this increase and other automatic tariff adjustments.

36. **Implementation**. NPC's performance during implementation of the Project was satisfactory. Physical implementation was marked by many contracts being completed early (Table 5) and under the cost estimates. However, in one case NPC failed to comply with the Bank's procurement guidelines, which resulted in the denial of contract funding. The loan closure date was extended to accommodate the completion of contracts to supply communications equipment and to develop model transmission service contracts. However, this extension was mainly required because these components were more closely related to the scope and timetable of the later Transmission Grid Reinforcement project. NPC took action with regard to the majority of recommendations contained in the institution-building consultancy studies, although some of the recommendations in the EOIS were put on hold pending the outcome of NPC's ongoing restructuring process (para. 15). NPC also worked closely with the Bank to restructure its tariffs. Compliance with financial covenants was not attained in every year and the financial objective of the Project was not achieved (para. 13). However, as is discussed in Section C, a number of the factors contributing to this result were outside of NPC's direct control during the project period.

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[13] Although it cannot be ruled out that the later investments which displace the "fast track" plants in the merit order were suboptimal, and hence unfairly affect the re-evaluation of the economic viability of the Project (Footnote 6), it was recognized in the SAR that significant additions of base-load geothermal and coal-fired plant were already programmed by NPC.

G. Assessment of Outcome

37. The overall outcome of the Project is rated unsatisfactory. The reason for the unsatisfactory rating is twofold: (i) NPC has maintained its precarious financial situation over the Project period, and hence the objective of ensuring NPC's financial viability has not been achieved; and (ii) the high cost of meeting the Project's physical objective was a contributing factor to this situation, and consequently a recalculation of the Project's NPV results in a negative value (para. 19). The importance of the Project's financial objective is evidenced by the stringent conditions relating NPC's finances which had to be met prior to Board presentation (para. 9). NPC's financial viability was seen as critical, since the Corporation's financial problems were considered to be one the key contributing factors leading to the power crisis in the first place (para. 2). Hence, ensuring the sustainability of the Project's short term physical objective, to resolve the immediate needs of the power crisis, was dependent on also achieving the longer term financial objective.[14]

38. Nevertheless, this outcome must be qualified by noting that: (i) the physical objective to alleviate the power crisis was substantially achieved; (ii) the magnitude of the power crisis may have been such that the avoided cost of outages was substantially higher than the assessment in the SAR, hence the Project may have resulted in a significant net benefit in macroeconomic terms; and (iii) in meeting the Project's physical objective, the implementation performance of NPC was satisfactory. Many of the factors leading to both the Project's poor economic return and the perpetuation of NPC's precarious financial situation were as a consequence of decisions made by the Government and NPC prior to the Project's inception. To a large extent these factors constrained NPC's possible response to the power crisis.

H. Future Operation

39. The Bank's 1994 Power Sector Study (Report 13313-PH) and 1997 Energy Strategy and Pricing Study (Report 16605-PH) have built on the ESP by providing the strategic framework for restructuring and privatizing the power sector, and NPC in particular. More specifically, the covenants of the Transmission Grid Reinforcement loan include the requirement for the separation of NPC's transmission activities as a separate corporate entity, and provide a framework of procedures, under a Transmission Grid Code, for implementing optimal generation dispatch. This loan also includes a large technical assistance component (co-financed by ADB) for NPC to build on the institutional support provided by the Project, and a PHRD grant to ERB to strengthen its capacity to evaluate transmission charges and related dispatch issues. Nevertheless, NPC's precarious financial situation, the slow pace of sector reform and the fragmented nature of the distribution sector, continue to be major areas of concern. The Bank will continue to monitor NPC's finances through ongoing supervision of the Leyte projects and the Transmission Grid Reinforcement project. However, a resolution of these outstanding issues still requires a concerted effort by DOF, DOE, NPC, PNOC-EDC and the National Electrification Administration (NEA), with coordinated assistance from both the Bank and ADB.

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[14] At the time, the Region indicated that, if the changes to NPC's tariffs specified as conditions for Board presentation were not approved, then further processing of this Loan and subsequent loans to the power sector would be stopped.

I. KEY LESSONS LEARNED

40. The stringent conditions of Board presentation relating to the Project's financial objective, which resulted in presentation delays in the face of a crisis, suggest that the resolution of short term problems was not to be at the expense of the long term financial viability of the Philippine power sector's key player. However, because the IPP arrangements associated with the Project were developed under crisis conditions, they came at a high cost. This has been a contributing factor to the failure of this Project to meet its financial objective and has detrimentally affected the Project's economic rate of return. Such an outcome indicates the need to clearly identify potential interactions between project objectives, and highlights the pitfalls in not conducting sufficient sensitivity analyses of a project's economic rate of return, particularly in a sector undergoing major structural reform. Further, return on rate base (RORB) and debt service ratio (DSR) financial covenants are not in themselves sufficient indicators of a public utility's financial resiliency. Had NPC actually met the covenants in every year of the Project, this would have masked the actual precariousness of the Corporation's financial position.

IMPLEMENTATION COMPLETION REPORT
PHILIPPINES
POWER TRANSMISSION AND REHABILITATION PROJECT
(Loan 3626-PH)

PART II: STATISTICAL ANNEXES

Table 1: Summary of Assessment

A. Achievement of objectives	Substantial	Partial	Negligible	Not applicable
	(/)	(/)	(/)	(/)
Macroeconomic policies	☐	☐	☐	☒
Sector policies	☐	☒	☐	☐
Financial objectives	☐	☐	☒	☐
Institutional development	☐	☒	☐	☐
Physical objectives	☒	☐	☐	☐
Poverty reduction	☐	☐	☐	☒
Gender concerns	☐	☐	☐	☒
Other social objectives	☐	☐	☐	☒
Environmental objectives	☐	☐	☐	☒
Public sector management	☐	☐	☐	☒
Private sector development	☐	☐	☐	☒
Economic benefits	☐	☐	☐	☒

B. Project Sustainability	Likely	Unlikely	Uncertain
	(/)	(/)	(/)
	☐	☐	☒

C. Bank Performance	Highly Satisfactory	Satisfactory	Deficient
	(/)	(/)	(/)
Identification	☐	☒	☐
Preparation assistance	☐	☒	☐
Appraisal	☐	☐	☒
Supervision	☐	☒	☐

D. Borrower Performance	Highly Satisfactory	Satisfactory	Deficient
	(/)	(/)	(/)
Preparation	☐	☒	☐
Implementation	☐	☒	☐
Covenant compliance	☐	☐	☒
Operation (if applicable)	☐	☐	☐

E. Assessment of Outcome	Highly Satisfactory	Satisfactory	Unsatisfactory	Highly Unsatisfactory
	(/)	(/)	(/)	
Assessment of outcome	☐	☐	☒	☐

Table 2: Related Bank Loans

Loan/credit title	Purpose	Year of approval	Status
Loan 2201-PH & 2202-PH Petroleum Exploration Promotion Project	Promote private oil companies in petroleum exploration and strengthen the exploration capabilities of Bureau of Energy and PNOC	1982	Closed
Loan 2203-PH Geothermal Exploration Project	Improve national strategy for geothermal exploration, government geothermal development policy and institutions; facilitate private involvement in geothermal exploration etc.	1982	Closed
Loan 2969-PH Bacon-Manito Geothermal Power Project	Support the least cost source incremental capacity for Luzon grid; and strengthen institutional capabilities and financial viability	1988	Closed
Loan 3163-PH Energy Sector Project	Orient the development strategy of the energy sector-National Power Corporation component	1990	Closed
Loan 3164-PH Energy Sector Project	Orient the development strategy of the energy sector-Philippines National Oil Corporation component	1990	Closed
Loan 3165-PH Energy Sector Project	Orient the development strategy of the energy sector-Government component (DOE, ERB, EMB, NEA)	1990	Closed
JEXIM NPC-JEXIM component of Loan 3163-PH	First phase of a least-cost energy sector development program	1992	Active
Loan 3439-PH Rural Electrification Revitalization Project	Enhance National Electrification Administration's effectiveness, REC's Investment Program for 1992-95	1992	Active
Loan 3700-PH, Loan 3702-PH Leyte-Cebu Geothermal Project	Develop geothermal resources for power generation, strengthen institutions and their financial viability	1994	Active
Loan 3746-PH/Loan 3747-PH Leyte-Luzon Geothermal Project	Develop geothermal resources for power generation, strengthen institutions and their financial viability	1994	Active
Loans 3996-PH/3997-PH Transmission Grid Reinforcement Project	Support the Government's plan to restructure the National Power Corporation and power sector privatization	1996	Active

Table 3: Project Timetable

Steps in project cycle	Date planned	Date actual
Identification	N/A	June 1992
Preparation	N/A	June 1992
Appraisal	N/A	September 1992
Negotiations	September 1992	October 16-20, 1992
Board presentation	December 1992	June 22, 1993
Signing	N/A	August 13, 1993
Effectiveness	N/A	December 6, 1993
Project completion	June 30, 1996	December 31, 1997
Loan closing	December 30, 1996	December 31, 1997

Table 4: Loan Disbursements: Cumulative Estimated and Actual
(US$ million)

Bank FY	FY93	FY94	FY95	FY96*	FY97	FY98
Appraisal estimate	00.0	21.60	55.20	98.40	110.00	
Revised estimates (August 1995)*	0.00	17.73	36.66	48.40	54.55	
Revised estimates (January 1997)†	0.00	17.73	36.66	42.97	46.10	51.60
Actual	0.00	17.73	36.66	42.97	46.64	51.60
Actual as % of revised estimate	100	100	100	100	101	100

* As of August 25, 1995, US$55.45 million of the loan was officially canceled: from Category 1, US$17.95 million equivalent; from Category 2 US$31.0 million equivalent; and from the Unallocated Category, US$6.5 million equivalent

† As of January 14, 1997, US$2.95 million of the loan was canceled: from Category 1, US$2.45 million equivalent; and from the Unallocated Category, US$0.5 million

Table 5: Key Indicators for Project Implementation
Procurement Monitoring

Contract Description	Contract Completion			
	Starting Date	Planned Date	Actual Date	Remarks
Part A - TRANSMISSION SYSTEM EXPANSION AND REINFORCEMENT				
1. Supply of T/L Materials				
a. F & D OF WOOD POLES FOR FAST TRACK PROJECTS	11-Jan-93	15-Apr-93	31-Mar-93	Ahead of schedule
b. SUPPLY OF INSULATORS FOR FAST TRACK PROJECTS	23-Mar-94	N/A	N/A	
2. Supply of Substation Equipment				
a. POWER TRANSFORMERS FOR BALINTAWAK & DOLORES S/S	29-Mar-94	31-Dec-94	24-Nov-94	Ahead of schedule
b. SUBSTATION EQUIPMENT FOR MAKBAN A & B SWITCHYARD	14-Mar-94	31-Dec-94	09-Nov-94	Ahead of schedule
c. SUBSTATION EQUIPMENT FOR BALINTAWAK, DOLORES AND BINAN S/S	29-Mar-94	31-Dec-94	24-Nov-94	Ahead of schedule
d. SUBSTATION EQUIPMENT FOR BATANGAS S/S, OLONGAPO S/S, CALACA S/Y AND MANILA S/Y	06-Jul-94	31-Dec-94	03-Mar-95	3 month delay
3. Supply of T/L Materials				
a. 795 MCM ACSR POWER CONDUCTOR FOR T/L PROJECTS	02-Aug-93	31-Jan-94	09-Feb-94	1 month delay
b. OVERHEAD GROUND WIRE, GROUND LEAD WIRE, AND GUY WIRE FOR F/T PROJECTS	29-Jun-93	31-Jan-94	30-Apr-94	4 month delay
c. OVERHEAD GROUND WIRE, LINE ATTACHMENTS, HARDWARE ACCESSORIES FOR F/T PROJECTS	28-May-93	31-Jan-94	24-Jan-94	Ahead of schedule
d. STEEL POLES FOR FAST TRACK PROJECTS	31-May-93	31-Jan-94	24-Jan-94	Ahead of schedule
e. ADDITIONAL ORDER OF STEEL POLES AND ACCESSORIES	13-Apr-94	31-Jan-94	30-Sep-94	7 month delay

Table 5 (continued): Key Indicators for Project Implementation
Procurement Monitoring

Contract Description	Contract Completion			Remarks
	Starting Date	Planned Date	Actual Date	
4. Replacement of Steel Towers				
a. REPLACEMENT OF STEEL TOWERS BORROWED FROM CALACA-DASMARINAS T/L	06-Apr-95	04-Oct-95	05-Aug-95	Ahead of schedule
5. Kalayaan-Tayabas T/L Rehabilitation	N/A	N/A	N/A	Project component only to cover cost of accelerating contract schedule
6. Upgrade of Telecommunication Network of Batangas	07-Feb-97		07-Dec 97	
7. Telecommunication Equipment for Expansion/Upgrade of Luzon Telecom System		16-Jun-97	31-Dec 97	
Part B - REHABILITATION OF BATAAN THERMAL PLANT	N/A	N/A	N/A	Project component canceled
Part C - INSTITUTIONAL STRENGTHENING (TECHNICAL ASSISTANCE/CONSULTANCY)				
1. Efficiency and Operational Improvement Study			30-Aug-93	
2. Master Plan Study for EHV Transmission	28-Nov-94	Apr-95	30-Aug-95	
3. Contracting & Economic Dispatching of Private Power Study		Jul-95	31-Jul-95	
4. Comprehensive Tariff Study and Strategy Project	06-Nov-96		31-Dec-97	
5. Rehabilitation of Bataan Thermal Power Plant	06-May-94	Jul-96	09-May-95	
6. Northwestern Luzon EHV Consultancy	06-Apr-95	Jun-96	05-Aug-95	

Table 6A: Key Performance Indicators for Project Operation - Monitoring Indicators
i) Appraisal

Financial Year Ending 31 Dec	1992	1993	1994	1995	1996	1997
ACHIEVEMENT OF GOALS						
Total Energy Sales (GWh)	23911	27122	29294	31531	34393	37034
Net sales (Excl. Magellan & Test-Run)	23743	26467	28916	30293	33111	34606
Power Sold/Total Pop. (kWh/person)	372	414	438	462	494	522
MANAGEMENT/EFFICIENCY						
# Days Accounts Receivable	39	39	38	38	38	38
% Receivables on Billing	10.6%	10.6%	10.5%	10.5%	10.5%	10.5%
Total number Employees	14,162	13,976	13,996	14,017	14,038	14,297
# of operational Employees	12,129	11,943	11,943	11,943	11,943	12,182
Personnel Cost on revenues	4.41%	3.75%	3.37%	3.08%	2.71%	2.78%
Sales per Oper. Employees (MWh)	1958	2216	2421	2536	2772	2841
% Total Energy Losses	7.2%	7.3%	7.4%	7.4%	7.3%	7.4%
FINANCIAL RATIOS:						
Average Tariff - P/kWh	1.59	1.75	1.97	2.22	2.49	2.84
Average Tariff Increase P/kWh	0.193	0.166	0.212	0.252	0.268	0.357
Average Tariff - USc/kWh	5.9	6.2	6.4	7.0	7.5	8.3
Working Ratio/1	63.1%	59.0%	58.4%	57.4%	58.7%	57.8%
Operating Ratio/2	83.5%	79.6%	78.9%	78.0%	78.4%	78.1%
Rate of Return-NPC's Charter/3	5.8%	7.7%	7.7%	7.7%	7.7%	7.7%
Rate of Return on Revalued Assets /4	6.1%	8.0%	8.0%	8.0%	8.0%	8.0%
Rate on Capital Employed /5	-1.9%	3.5%	5.0%	6.0%	7.9%	7.8%
Net Profit on Equity	1.9%	6.8%	6.6%	7.5%	8.9%	9.8%
Self-Financing Ratio (3-years Avg.)/6	7%	20%	15%	25%	36%	68%
Debt Service Coverage/7	1.11	1.47	1.35	1.59	1.73	2.44
Interest Coverage/8	1.15	1.65	1.55	1.55	1.54	1.72
Debt/Equity Ratio/9	44.5%	51.6%	55.5%	57.3%	58.4%	57.0%
IN CONSTANT 1992 PRICES						
Average Tariff - P/kWh	1.59	1.64	1.73	1.84	1.95	2.09
Real Tariff Increase (Decrease)	4.5%	3.2%	5.2%	6.4%	6.2%	6.9%

CRITICAL FINANCIAL INDICATORS 1993-1998

VARIABLE OR INDICATOR	Minimum	Average	Maximum	VARIABLE OR INDICATOR	Minimum	Average
Cash (million Pesos)	3631	4224	4901	Debt Service Ratio	1.3	1.9
Average Tariff - P/kWh	1.64	1.88	2.09	Days Accounts Receivable	38	38
Working ratio	57.4%	58.2%	59.0%	Total Debt/Equity Ratio	51.6%	55.4%
Rate of return (Revalued)	8.0%	8.0%	8.0%			

1/ Operational expenses excluding depreciation / operational revenues
2/ Total operational expenses (including depreciation & prov. for d/a) / operational revenues
3/ Operating income on net average fixed assets plus one sixth of cash operating expenditures
4/ Operating income on net average revalued fixed assets in operation
5/ Profit before interest and taxes / total equity and reserves
6/ Cash available from operations / 3-year average capital expenditures
7/ Operating cash flow divided by debt service (principal plus operational interest)
8/ Profit before interest and taxes / total interest (operational and capitalized)
9/ Long-term debt / (long-term debt plus total equity)

Table 6A: Key Performance Indicators for Project Operation - Monitoring Indicators
ii) Actual

Financial Year Ending 31- Dec.	1992	1993	1994	1995	1996
ACHIEVEMENT OF GOALS					
Total Energy Sales (GWh)	23,958	24,805	28,745	31,031	33,381
Net sales (Excl. Magellan & Test-Run)	23,875	24,712	28,499	30,272	32,549
Power Sold/Total Pop. (kWh/person)	367	370	419	442	487
MANAGEMENT/EFFICIENCY					
# Days Accounts Receivable	38	39	36	38	37
% Receivables on Billing	10.70%	11.91%	10.33%	11.13%	11.22%
Total number Employees	14,208	14,560	15,794	14,742	13,119
# of operational Employees	11,185	13,142	12,448	12,164	11,024
Personnel Cost on revenues	3.76%	3.85%	4.97%	6.41%	6.39%
Sales per Oper. Employees (MWh)	2,142	1,887	2,309	2,551	3,028
% Total Energy Losses	6.8%	6.8%	6.1%	6.8%	6.3%
FINANCIAL RATIOS:					
Average Tariff - P/kWh	1.58	1.64	1.77	1.73	1.96
Average Tariff Increase P/kWh	0.18	0.06	0.13	(0.04)	0.23
Average Tariff - USc/kWh	6.3	5.9	7.3	6.6	7.4
Working Ratio/1	62.4%	60.3%	61.1%	56.9%	59.5%
Operating Ratio/2	61.2%	83.5%	76.1%	78.0%	79.1%
Rate of Return-NPC's Charter/3	6.8%	5.7%	8.0%	7.0%	7.9%
Rate of Return on Revalued Assets /4	7.1%	5.9%	8.3%	7.3%	8.2%
Rate on Capital Employed /5	6.1%	1.9%	7.2%	3.7%	8.6%
Net Profit on Equity	6.1%	1.9%	7.2%	3.7%	5.6%
Self-Financing Ratio (3-years Avg.)/6	5.9%	-12.0%	17.4%	-3.3%	-5.3%
Debt Service Coverage/7	1.05	0.81	1.24	0.96	1.31
Interest Coverage/8	1.28	2.32	2.37	2.39	2.75
Debt/Equity Ratio/9	49.8%	57.1%	49.9%	59.0%	75.1%

1/ Operational expenses excluding depreciation / operational revenues
2/ Total operational expenses (including depreciation & prov. for d/a) / operational revenues
3/ Operating income on net average fixed assets plus one sixth of cash operating expenditures
4/ Operating income on net average revalued fixed assets in operation
5/ Profit before interest and taxes / total equity and reserves
6/ Cash available from operations / 3-year average capital expenditures
7/ Operating cash flow divided by debt service (principal plus operational interest)
8/ Profit before interest and taxes / total interest (operational and capitalized)
9/ Long-term debt / (long-term debt plus total equity)

Table 6B: Key Performance Indicators for Project Operation - Sources and Applications of Funds
i) Appraisal

	1992	1993	1994	1995	1996	1997
SOURCES OF FUNDS:						
Income Before Interest Charges	7733	9597	11437	12914	14991	20224
+Depreciation & Depletion	7024	7944	10880	12407	14537	16962
+Depreciation Other Assets	213	231	243	243	243	243
+Net Disposal of Fixed Assets	0	0	0	0	0	0
-Other Cash Non-Oper. Expenses	225	185	191	196	202	208
OPERATING CASH FLOW	14745	17587	22369	25368	29569	37221
LESS:						
Incr. Working Capital Excl. Cash (+)	(3015)	(218)	240	33	(1504)	(978)
Incr. Other Assets/Liabilities	(546)	118	107	116	125	135
Increase in Oil Taxes (Refunds)	3098	(1000)	(2000)	(4000)	(3253)	0
Tax and Dividends Paid	91	97	104	111	119	128
Other Cash Expenses	619	1589	0	0	0	0
CASH AVAIL. BEFORE DEBT SERVICE	14499	17000	23917	29107	34081	37937
Principal Payments 1/	8155	7664	12728	13172	13198	13340
Operational Interest	5093	4774	6638	7753	7867	9042
TOTAL DEBT SERVICE	13248	12438	19366	20925	21065	22382
NET INTERNAL CASH GENERATION	1251	4562	4551	8182	13016	15554
Generation (Excluding BOTs)	4552	19335	21360	12125	14610	9676
Transmission	2407	5523	10071	16215	16484	15439
Island Grid (Rural)	1456	555	606	334	358	407
Engineering	973	826	854	761	783	895
Other & Taxes	3407	4952	7447	6179	5940	6194
Interest Capitalized	680	1323	1352	2390	3780	4300
TOTAL CAPITAL EXPENDITURES	13475	32513	41690	38004	41954	36912
BALANCE TO BE FINANCED	12224	27951	37139	29822	28938	21358
SOURCES OF FINANCE:						
EQUITY CONTRIBUTIONS	854	4300	1325	1348	1372	1396
LOAN FINANCING:						
Ongoing Loans	9995	18973	22809	7390	2638	166
Loan Restructuring	5509	0	0	0	0	0
Loans under Negotiation	0	2655	5067	12778	16142	9360
Foreign Loans to be Obtained	0	0	3890	5784	11458	15864
Local Loans & Proposed Bonds	0	0	2000	2000	1000	0
TOTAL BORROWING	15504	21627	33765	27952	31238	25391
TOTAL FINANCING	16358	25927	35090	29300	32610	26787
INCREASE (DECREASE) CASH & TEMP.	4134	(2023)	(2049)	(522)	3672	5429
% Capital Expend. On Net Assets	14.4%	28.5%	30.1%	25.2%	24.5%	19.5%
% Loan Financing of Capital Expend.	115%	67%	81%	74%	74%	69%
Debt Service Ratio	1.09	1.37	1.24	1.39	1.62	1.69
Self-Financing Ratio	9%	14%	11%	22%	31%	42%
Self-Financing/Avg. 3Y Capital Exp.	7%	16%	12%	20%	33%	42%

1/ Includes the debt buyback in 1992 of P1,823 million

Table 6B: Key Performance Indicators for Project Operation - Sources and Applications of Funds
ii) Actual

	1992	1993	1994	1995	1996
SOURCES OF FUNDS:					
Income Before Interest Charges	7078	6665	11981	11544	13318
+Depreciation & Depletion	7081	9418	7546	11082	12482
+Depreciation Other Assets	146	165	816	250	582
+Net Disposal of Fixed Assets	6	3	0	(22)	(2)
+Other Cash Non-Oper. Expenses	(335)	543	1493	685	(931)
-Other Cash Non-Oper. Expenses	2249	(507)	2476	(280)	(1168)
OPERATING CASH FLOW	16225	16287	21306	23240	24281
LESS:					
Incr. Working Capital Excl. Cash (+)	(1461)	6706	(2243)	(785)	4790
Incr. Other Assets/Liabilities	1152	9313	7389	7460	9118
Increase in Oil Taxes (Refunds)	0	(7018)	(5188)	(6861)	(6286)
Tax and Dividends Paid	0	0	0	2300	0
Other Cash Expenses	1503	(1552)	(1652)	1718	(548)
CASH AVAIL. BEFORE DEBT SERVICE	15031	8838	23000	19388	17207
Principal Payments 1/	9121	6111	11625	12941	11671
Operational Interest	5209	4795	6977	7350	6607
TOTAL DEBT SERVICE	14330	10806	18602	20291	18578
NET INTERNAL CASH GENERATION	701	(2068)	4398	(903)	(1371)
Generation (Excluding BOTs)	6128	18128	24635	6155	21931
Transmission	2975	4401	4876	8656	
Island Grid (Rural)	1508	510	786	553	
Engineering	666	1172	714	1013	
Other & Taxes	2602	1704	1632	2670	
Interest Capitalized	777	1442	1169	1558	1384
TOTAL CAPITAL EXPENDITURES	14858	27357	33812	20605	23315
BALANCE TO BE FINANCED	13955	29425	29414	21508	24686
SOURCES OF FINANCE:					
EQUITY CONTRIBUTIONS	410	4350	815	2300	0
FOREIGN GRANTS	40	388	952	600	325
LOAN FINANCING:					
Ongoing Loans	11272	23995	27598	17377	24877
Loan Restructuring	2866	n/a	n/a	n/a	n/a
Loans under Negotiation					
Foreign Loans to be Obtained					
Local Loans & Proposed Bonds					
TOTAL BORROWING	14138	23995	27596	17377	24877
TOTAL FINANCING	14588	28733	29383	20277	25202
INCREASE (DECREASE) CASH & TEMP.	633	(692)	(51)	(1231)	516
% Loan Financing of Capital Expend.	96.47%	87.71%	81.62%	84.33%	106.70%
Debt Service Ratio	1.05	0.81	1.24	0.86	0.93
Self-Financing Ratio	5%	-8%	13%	-4%	-6%
Self-Financing/Avg. 3Y Capital Exp.	14%	-23%	39%	-13.2%	-17.6%

1/ Includes the debt buyback in 1992 of P1,823 million

Table 6C: Key Performance Indicators for Project Operation - Energy Sector Plan Implementation Status

Issues/Areas of Action	Required Action	Implementing Agency/Schedule	Status (by end - November 1997)
A. GENERAL/INSTITUTIONAL			
1) Energy Sector Coordination	Establish the Department of Energy (DOE)	President/Congress, December 1992.	Done.
	Formalize DOE organization.	DOE Secretary, March 1993.	Done.
2) Privatization	Propose clear congressional policy statement on private sector involvement in energy projects.	ECC/President	Done.
a) NPC/Power Sector	Complete OEA-commissioned study of privatization options	OEA-Price Waterhouse, November 1992.	Done.
	Submission of privatization plan.	DOE, NPC, September 1993.	Done.
	Approval of privatization plan.	Cabinet, March 1994.	
	Continue BOT approach for new projects; conduct bidding and come up with short list for the 900 MW and 200 MW BOT coal plants for Luzon and Mindanao.	NPC, June 1993.	1000 MW Sual Coal Fired Plant (CEPA) Energy Conversion Contract Signed - May 20, 1994. Mobilization - April 9, 1995. 200 MW Mindanao Coal Fired Plant (HARBIN) negotiations ongoing.
	Complete evaluation of bids.	October 1993.	10 contracts for 2300 MW already signed with the private sector. Other than the ABB BTO's (600 MW) all are BOT contracts.
	Awarding of contracts.	December 1993.	
3) Oil Industry Deregulation	Congressional policy statement on oil industry deregulation.	President/Congress, December 9, 1992.	Done (DOE Law).
	Complete ERB Energy Pricing Study.	ERB/IDP, June 1993.	Final study issued in March 1993.
	Complete industry cost structure study.	DOE/K&M, August 1993.	Draft report submitted March 1993.
	Recommend presidential endorsement of bill amending OPSF's law to effect automatic price adjustments.	DOE/ERB/OP, September 1993.	Done.

Table 6C: Key Performance Indicators for Project Operation - Energy Sector Plan Implementation Status (continued)

Issues/Areas of Action	Required Action	Implementing Agency/Schedule	Status (by end - November 1997)
	Set maximum oil industry rate of return.	ERB/Oil Companies, September 1993.	Done. ERB set a 10.6% average ROR for Oil Companies (April 16, 1993)
	Submit program for oil decontrol and other deregulation activities.	DOE, 1996.	Republic Act No. 8180, Oil Deregulation Law approved on March 29, 1996, but the law was declared unconstitutional by the Supreme Court on November 5, 1997, and is therefore invalid. Congress approved a new and more competitive deregulation law in February 1998.
	Approval of deregulation program.	Cabinet, 1996.	- do -
	Recommend presidential endorsement of ERB charter to allow decontrol of oil prices.	ERB/OP, 1996.	- do -
	Deregulate dealership activities (deregulation measures non-price related would be advanced whenever feasible).	DOE, 1996.	- do -
	Remove inter-fuel price subsidies.	DOE/ERB, 1996.	- do -
	Draft bill rationalizing the tariff tax component of petroleum product prices.	DOE/ERB/OP, 1996.	- do -
	Recommend presidential endorsement of draft bill.	DOE/OP, 1996.	- do -
	Submit petroleum import/export liberalization schedule.	DOE/ERB, 1996.	- do -
4) Single Price-Regulatory Body for Utilities	Legislation placing NPC and REC's under ERB price regulation.	Congress/President.	Done. DOE Law in operation.
5) More Efficient Approval System for Energy Projects	Presidential directive to DAR, DA, NEDA, DENR, November 1992.	ECC, DAR, NEDA, DENR, November 1992.	Done.
	Agreement between DENR and RDC regarding approval requirements and time limit for action.	DENR/RDC, June 1993.	Done. Latest guidelines for ECC processing issued in July 1994.
	Agree to approve power projects on a program basis instead per individual projects.	NPC/NEDA, June 1993.	Completed March 1993.
	NPC to develop standard BOT contracts for various power plant technologies.	NPC/NEDA, September 1993.	Model contracts for coal, diesel and gas turbines already developed.
	Approval of standard contracts.	NEDA-ICC. One month after completion of contract by NPC.	

Table 6C: Key Performance Indicators for Project Operation - Energy Sector Plan Implementation Status (continued)

Issues/Areas of Action	Required Action	Implementing Agency/Schedule	Status (by end - November 1997)
B. POWER SECTOR			
1) Availability and Reliability of Supply	Ensure completion of fast track projects.	NPC/DOE, October 1993.	6 BOT contracts in operation.
	Ensure implementation of power development program.	NPC/DOE, ongoing.	PDP approved by ICC and presented to the Cabinet in May 1993.
	Submit plan to rehabilitate or retire/replace aging plants.	NPC, December 1993.	Done. Table 4.3.1 of 1995 PDP.
	Evaluate and approve NPC plan and allocate funding for technical assistance.	NEDA. January 1994.	Done. OPSF and PAGCOR grants approved.
	Adopt rehabilitation or retirement plan for old plants.		Rehabilitation of Sucat 2 & 3 completed.
2) NPC's Financial Viability	Conduct more effective public information program on the need for NPC rate increase.	NPC/Cabinet, Oct-Dec 1992.	Effective public information on price increase in place.
	Decision on acceptable rate of return base methodology.	ERB, September 1993.	Done. February 1993.
	Motion for early resolution by the Supreme Court of NPC fuel tax exemption cases.	NPC, May 1993.	Tax exemption cases of NPC were resolved by the Supreme Court favorably for NPC in the case of Maceda vs. Macaraig (197 SCRA 771).
	Approve automatic foreign exchange adjustment formula.	NPC, May 1993.	Formula applied once exchange rate exceeded P28/dollar.
	Implement rate adjustment to meet loan covenants. Develop annual projection of rate increase or decrease investment and overall financial requirement.	NPC, December 1992. NPC, end of each year.	NPC implemented tariff increase of P0.18/kWh from March 26, 1993, and additional P0.03/kWh from July 1993.
	Propose to DBM the level of government equity infusion to NPC. Submission of proposal for annual equity infusion to NPC.	NPC, March each year. DBM, June each year.	Approved for 1993. P3 billion from OPSF in 1993 approved by RA 7639, in addition to the P1 billion annually
	Executive support of bill proposing equity infusion to NPC.	DOE.	Done.
	Complete operational efficiency improvement study.	NPC/World Bank, December 1993.	First phase report completed in March 1993. Draft report for Second Phase completed end of June 1993.

Table 6C: Key Performance Indicators for Project Operation - Energy Sector Plan Implementation Status (continued)

Issues/Areas of Action	Required Action	Implementing Agency/Schedule	Status (by end - November 1997)
3) Rate Restructuring (Demand charges and direct connections)	Complete nationwide consultation, especially in Bacolod, Cebu and Mindanao.	NPC, August 1993.	Ongoing.
	Implement rate restructuring down to distribution level.	NPC/Cabinet, NEA/RECs, ERB/PUs, December 1993.	Done.
4) Bataan Nuclear Power Plant (BNPP)	Complete negotiations with Westinghouse.	NPC-BNPP, December 1992.	Negotiations failed. Other options including BOT are being considered.
	Decision on BNPP operation.	Cabinet, March 1993.	Conversion of BNPP to 1500 MW gas fired plant (BOT) approved. Bidding date to be announced.
5) Improve Electricity Distribution Efficiency	Set limit to distribution loss that can be recovered through tariff.	NEA/ERB/ECC, ongoing.	ERB Resolution 91-22 has set to reduce losses permitted in tariffs from 14% to 10% in 5 years.
	Presidential endorsement of anti-pilferage bill.	ECC/OP, March 1993.	Done. (RA # 7832).
6) Energy Efficiency Standards	Finalize standards for power intensive appliances.	OEA/BPS-DTI, June 1994.	Building efficiency guidelines published March 1993.
C. DOWNSTREAM OPERATIONS			
1) Refinery Expansion	Decide price adjustment for non-crude increase	ERB, May 1993.	Done.
	Firm up PNOC expansion plans.	PNOC/DOE, January 1994.	Studies ongoing.
2) Coal Import Liberalization	Implement financial/technical support program for local coal.	OEA, January 1994.	Initial program formulated.
	Reduce volume and tariff restriction.	DOE/ERB/NEDA, June 1994.	All coals in temporary exclusion list until June 1996. Anthracite and lignite having a 0% tariff and bituminous 10% tariff to 1999 and 5% thereafter.
3) Institutionalize Energy Conservation	Executive endorsement of DOE bill with provisions for continuation of energy conservation program.	President.	Done (DOE Law).
D. UPSTREAM OPERATIONS			
1) Geothermal Law to Encourage Private Sector Participation	Recommend presidential endorsement of pending legislation on geothermal royalties and development.	DOE/PNOC/OP, June 1993.	Senate hearings on SB 423 and 366 in April 1993. Still pending.
2) Improved Incentives for Oil and Gas Exploration	Recommend presidential endorsement of pending legislation on oil and gas development.	DOE/OP, June 1993.	

Table 6C: Key Performance Indicators for Project Operation - Energy Sector Plan Implementation Status (continued)

Issues/Areas of Action	Required Action	Implementing Agency/Schedule	Status (by end - November 1997)
3) Continued Exploration Momentum Generated by Recent Oil Discoveries	Conduct aggressive campaign to attract more oil explorations.		Done.
4) Promote Development and Utilization of Renewable Energy Technologies	Intensify research and development of alternative/renewable energy technologies.	DOST-PCIERD/OEA/PNOC/ NEA. Ongoing.	Ongoing.
	Promote utilization of cost-effective alternative energy systems.	OEA/NEA. Ongoing.	Ongoing.

Energy Sector Plan - Proposed Legislation

Issues/Areas of Action	Required Action	Implementing Agency/Schedule	Status (by end - November 1997)
1) Energy Sector Coordination	Enact legislation creating the Department of Energy.	President/Congress (December 9, 1992)	Done. RA #7638, An act creating the Department of Energy.
2) Oil Industry Deregulation	Enact legislation amending the OPSF Law.	December 1993.	RA #8180, Oil Industry Deregulation Act was passed in 1996, but subsequently declared unconstitutional by the Supreme Court. in November 1997. Congress approved a new and more competitive deregulation law in February 1998.
3) Single Price-Regulatory Body for Utilities	Included in the DOE Law. Enact into law ERB charter amendment.	December 1992. June 1994.	Done. Done. RA #'s 7638, 8180, 7832 & 8184.
4) NPC Financial Viability	Approve annual equity infusion to NPC. Enactment of law authorizing OPSF equity infusion to NPC.	December each year.	Done. RA #7639, an Act providing payment in part of OPSF to NPC.
5) Improve Electricity Distribution Efficiency	Enact effective anti-power pilferage legislation. Enact law authorizing increase in NEA capitalization.	December 1993. March 1994.	Done. RA #7832, Anti-Pilferage of Electricity & Theft of Electric T/L Materials.
6) Rationalize Oil Prices	Enact law rationalizing the tariff and tax component of petroleum products.	1996.	Done. RA #8184, an Act Restructuring Excise Tax on Petroleum Products.
7) Energy Conservation	Refile and enact law institutionalizing energy conservation.	December 1993.	Done. EO #123, Institutionalizing the Committee on Power Conservation and Demand Management
8) Geothermal Law	Enact law to encourage private sector participation in geothermal development.	December 1993.	Pending (SB #726 and SB #888).

Table 7: Studies Included in Project

Technical Assistance	Purpose as defined at appraisal/redefined	Status	Impact of study
Efficiency and Operational Improvement Study	(From SAR): To improve NPC's institutional systems	Final report completed August 1993	Although the NPC Board decision to restructure the Corporation and divest the organization of many of its key functions has superseded some of the recommendations of the EOIS, much of the study's analysis has validity for whatever entity provides NPC's services. Actions on some recommendations were put on hold, pending the outcome of the current restructuring process. Once the restructuring is well advanced, NPC intends to reassess the EOIS recommendations that are pending, and implement those that are still valid. Technical assistance provided both by the Bank and ADB to support these efforts has been made available under the scope of the Transmission Grid Reinforcement project (Loans 3996-PH and 3997-PH).
Consultancy Service for Bataan Rehabilitation	(From SAR): To prepare an action plan to establish the appropriate methods and specifications for the optimal and environmentally sound rehabilitation of the Bataan thermal power plant	Consultancy contract terminated May 1995	Although this contract was terminated prematurely, due to the cancellation of the project component for rehabilitating the Bataan thermal plant, the portion of the contract that was utilized enabled NPC to revise its maintenance procedures for the Bataan plant. The recommendations of the report were instrumental in the plant achieving an increase in firm capacity from 43 percent prior to 1993, to 87 percent on average for the first half of 1997. Forced outages have been reduced from 24 percent in 1993 to 4 percent by early 1997. Further, NPC's 1996 Report on the Results of Operation show that the plant now has an associated return on its rate base of over 50 percent.
Master Plan Study for EHV Transmission	To determine/verify the feasibility of developing an EHV network for the Luzon Grid and formulate an optimum schedule for superimposing the EHV system on the existing 230 kV network; to upgrade the analytical tools for transmission planning and to provide technology transfer to NPC engineers in this field	Final report completed April 1995	The Master Plan allowed NPC to evaluate various options for transmission system development, in particular, in examining options for the Northwestern 500 kV extension in Luzon, subsequently funded under the Transmission Grid Reinforcement project. In addition, the study assessed the technical and economic viability of a link between Leyte and Mindanao. As a result of the recommendations of the study, this link will be funded by a US$250 million loan from ADB with a commissioning date targeted for 2003. Once completed, all of NPC's major transmission grids will be fully interconnected. A key factor in the success of this component was in having a member of the consultancy team work onsite alongside NPC's counterparts for a six month period, since there was a considerable transfer of knowledge to staff during this time.

Table 7: Studies Included in Project (continued)

Technical Assistance	Purpose as defined at appraisal/redefined	Status	Impact of study
Contracting & Economic Dispatching of Private Power Study	To develop effective criteria, guidelines and procedures for soliciting, evaluating and selecting new private power projects; to establish clear operating criteria, procedures and guidelines that promote system security and economic operation	Final report completed August 1995	The main impact of this study, being an extension of the Transmission Master Plan Study, was as a precursor to later studies. In particular, the study identified possible frameworks for an open access transmission tariff (OATT), the development of which was subsequently funded under the Loan, and the need for drafting a Transmission Grid Code. A Grid Code has since been developed by NPC with assistance from the National Grid Corporation (NGC) of the UK. As a result of the study, NPC did recognize the need for dispatching generating plant to more closely reflect the marginal costs of operation, and to some extent NPC modified the generation merit order accordingly. In addition, the study formed the basis for the detailed design of the National Load Dispatch Center (NLDC), subsequently funded under the Transmission Grid Reinforcement project. Further, it identified a need to modernize many of the outstation transducers and protection facilities to upgrade their capacity for higher speed, accuracy and reliability.
Comprehensive Tariff Study and Strategy	To develop an open access transmission tariff (OATT), and assist in obtaining its approval by the Energy Regulatory Board (ERB); to develop associated model transmission service contracts with independent power producers (IPPs)	Final report completed December 1997	The OATT (i.e., wheeling tariff) developed under this component of the project was approved by ERB in June 1997. Two IPPs, First Gas (1050 MW) and Quezon Power (433 MW), have signed bilateral contracts with Meralco on the basis of being able to wheel power through NPC's transmission network, under the terms of the OATT. In addition, Meralco is also planning to sign contracts for Magellan's proposed 300 MW development in Batangas, and a 100 MW cascading hydro system at Axor in Benguet, both applying the OATT. The contractual aspect of the study has been less useful to NPC, as an important lesson which project staff have learned is that it is important to develop contracts themselves (although the study did provide NPC with some useful ideas).
NW Luzon EHV Consultancy	To perform an overvoltage switching surge study; to prepare tender documents for substations and lines	Consultancy completed September 1995	This contract (in combination with the Transmission Master Plan Study) prepared the background analysis and documents necessary for the Northwest Luzon transmission improvement component of the subsequent Transmission Grid Reinforcement project.

Table 8A: Project Costs
(US$ million)

WORKS	Appraisal Estimate			Latest Estimate		
	Local	Foreign	Total	Local	Foreign	Total
TRANSMISSION EXPANSION AND REINFORCEMENT	8.3	99.1	107.4	11.1	81.3	92.4
Transmission Lines	7.8	78.6	86.5	8.9	65.2	74.1
Substation Equipment	0.5	20.5	20.9	2.2	16.1	18.3
BATAAN POWER PLANT REHABILITATION	4.4	25.0	29.4	N/A	N/A	N/A
INSTITUTIONAL DEVELOPMENT	0.3	1.5	1.8	-	3.1	3.1
Master Plan Study for EHV Power Transmission				-	0.5	0.5
Contracting and Economic Dispatching of Private Power Study				-	0.5	0.5
Comprehensive Tariff Study and Strategy Project				-	0.6	0.6
Consultancy Services for Bataan Rehabilitation of Bataan 1 & 2				-	0.9	0.9
NW Luzon EHV Consultancy				-	0.2	0.2
Efficiency and Operational Improvement Study (Japan Grant)	-	0.5	0.5	-	0.5	0.5
TAXES AND DUTIES	5.7	0.0	5.7	-	-	-
INTEREST DURING CONSTRUCTION	0.0	15.0	15.0	-	-	-
TOTAL COST	18.7	141.1	159.8	11.1	84.4	95.5

Table 8B: Project Financing
(US$ million)

Source	Appraisal Estimate			Latest Estimate		
	Local	Foreign	Total	Local	Foreign	Total
IBRD	-	110.0	110.0		51.6	51.6
National Power Corporation	18.7	30.6	49.3	11.1	32.3	43.4
Japan Grant	-	0.5	0.5		0.5	0.5
TOTAL	18.7	141.1	159.8		84.4	95.5

Table 9: Economic Costs and Benefits

Year	Capacity Cost	Fuel Cost	O&M Cost	Trans-mission Cost	Total Cost	Power Generation (GWh)				Losses	Total Sales	Luzon Avg Rate	Sales Revenue	Net Sales Benefit	Avoided Outage Costs	Net Benefit +Outage
	(Mil P)	(Mil P)	(Mil P)	(Mil P)	(Mil P)	Enron Pinam	Enron Subic II	FPP Bauang	ABB A&B	(%)	(GWh)	(P/kWh)	(Mil P)	(Mil P)	(Mil P)	(Mil P)
1993	1850	1657	108	829	**4444**	330	141	-	906	6.0%	1294	1.71	**2213**	-2231		-2231
1994	4295	4570	413	971	**10249**	793	754	166	2422	5.5%	3907	1.86	**7256**	-2994	1950	-1044
1995	4665	3040	870	412	**8987**	785	794	1328	2733	6.7%	5260	1.80	**9477**	490	5200	5690
1996	4449	3640	947	116	**9152**	667	638	1047	2483	3.2%	4678	1.80	**8433**	-719		-719
1997	4123	2464	1080	73	**7740**	631	747	992	732	7.6%	2866	2.08	**5970**	-1770		-1770
1998	5082	4685	713		**10480**	828	510	759	2790	6.7%	4557	2.55	**11621**	1141		1141
1999	5352	2195	629		**8176**	417	372	305	1167	6.9%	2105	2.61	**5494**	-2681		-2681
2000	5629	2252	647		**8527**	490	422	304	1261	6.7%	2310	2.95	**6815**	-1712		-1712
2001	5912	2272	662		**8845**	414	373	283	1086	6.5%	2015	3.10	**6249**	-2596		-2596
2002	6222	1837	659		**8718**	130	107	282	1075	6.7%	1486	3.28	**4876**	-3842		-3842
2003	5789	2083	598		**8470**	187	169	282	1075	6.7%	1597	3.38	**5400**	-3070		-3070
2004	5286	2094	469		**7849**		235	282	1075	6.7%	1485	3.50	**5196**	-2653		-2653
2005	5584	2171	485		**8240**		205	278	1075	6.7%	1457	3.87	**5637**	-2603		-2603
2006	5900	2430	513		**8844**		300	278	1075	6.7%	1541	3.85	**5935**	-2909		-2909
2007	5900	2430	513		**8844**		300	278	1075	6.7%	1541	3.85	**5935**	-2909		-2909
2008	5286	2430	513		**8230**		300	278	1075	6.7%	1541	3.85	**5935**	-2295		-2295
2009	3090	2430	513		**6034**		300	278	1075	6.7%	1541	3.85	**5935**	-99		-99
2010	3090	2430	513		**6034**		300	278	1075	6.7%	1541	3.85	**5935**	-99		-99
2011	3090	2430	513		**6034**		300	278	1075	6.7%	1541	3.85	**5935**	-99		-99
2012	3090	2430	513		**6034**		300	278	1075	6.7%	1541	3.85	**5935**	-99		-99
2013	3090	2430	513		**6034**		300	278	1075	6.7%	1541	3.85	**5935**	-99		-99
Net Present Values at Discount Rates Shown																
10%					70592								56036	**-14556**	5518	**-9037**
12%					61845								49136	-12710	5256	-7454
14%					54735								43526	-11208	5010	-6198

Year	Plant Factor (%)			
	Enron Pinam	Enron Subic II	FPP Bauang	ABB
1993	36%	15%	-	25%
1994	86%	80%	9%	45%
1995	85%	84%	71%	50%
1996	73%	67%	56%	46%
1997	69%	79%	53%	13%
1998	90%	54%	40%	51%
1999	45%	39%	16%	21%
2000	53%	45%	16%	23%
2001	45%	39%	15%	20%
2002	14%	11%	15%	20%
2003	20%	18%	15%	20%
2004		25%	15%	20%
2005		22%	15%	20%
2006-13		32%	15%	20%

Assumptions

1) O&M cost includes the cost of purchased power above minimum offtake requirements
2) Losses explicitly include station losses in addition to transmission losses
3) Fast track transmission investment for 1992 (P2 million) is considered sunk

Notes

1) Data from 1993-1996 are actuals
2) Plant factors from NPC estimates - November 1997
3) IRR calculation is infeasible given the high negative NPV
4) Avoided costs from SAR. Using reassessed avoided costs (para. 20) results in a positive NPV of P7.0 billion (based on a 10% discount rate), but an IRR of 3.5% (due to reversed cost-benefit flows)

Table 10: Status of Legal Covenants

Agreement	Section	Covenant Type	Present Status	Original Fulfillment Date	Revised Fulfillment Date	Description of Covenant	Comments
Guarantee	3.02(a)	9	C			Report on progress of ESP.	In compliance.
	3.02(b)	9,10	C			Review PDP annually and implement.	In compliance.
	3.02(c)	9,10	CP	12/31/93		Review EOIS and implement.	Some recommendations pending until internal restructuring complete.
Loan	3.02	9,10	C			Review PDP annually and implement.	In compliance.
	3.03	9,10	CP	12/31/93		Review EOIS and implement.	Some recommendations pending until internal restructuring complete
	3.04	6,7	C	12/31/93		Obtain clearances for rehabilitation of Bataan.	Related project component canceled.
	3.05	9	C	12/31/93		Furnish monthly procurement reports and quarterly implementation reports beginning on December 31, 1993.	In compliance.
	3.06(b)	5	C	12/31/93		Recruit consultants for Bataan rehabilitation.	Related project component canceled.
	3.06(c)	12	CP			Establish rules and procedures for private sector participation.	Some aspects awaiting passage of Omnibus Bill.
	5.01(b)	1	CD			Annual Report audited each fiscal year.	Complied with after delay.
	5.02	2	C	12/31/92		Annual return not less than 8%.	In compliance for FY96 due to several favorable one-off factors.
	5.03	2,10	C	12/31/93		Revalue assets.	In compliance.
	5.04(a)	2	C			NPC may not incur debt unless forecast indicates >1.3 debt service ratio.	In compliance for FY96.
	5.05	2,10	CP	12/26/93		NPC to implement demand charges satisfactory to the Bank.	Demand charges implemented, and additional tariffs pending ERB approval.

C = Covenant complied with
CD = Complied with after delay
CP = Complied with partially
NC = Not complied with

Covenant type:
1 = Account/Audits
2 = Financial performance/revenue generation from beneficiaries
3 = Flow and utilization of project funds
4 = Counterpart funding
5 = Management aspects of project or executing agency
6 = Environmental covenants
7 = Involuntary resettlement
8 = Indigenous people
9 = Monitoring, review, and reporting
10 = Project implementation not covered by categories 1-9
11 = Sectoral or cross-sectoral budgetary or other resource allocation
12 = Sectoral or cross-sectoral policy/regulatory/institutional action
13 = Other

Table 11: Compliance with Operation Manual Statements

Statement number and title	Description and comment on lack of compliance
None	No significant lack of compliance with applicable Bank manual statements observed

Table 12: Bank Resources: Staff Inputs (as of December 1997)

Stages of project cycle	Staffweek Actual	Amount US$('000)
Through Appraisal	10.8	39.5
Appraisal-effectiveness	8.6	26.2
Supervision	48.9	145.9
Completion	12.0	30.8
TOTAL	80.3	242.4

Note: Two ICR missions were launched, the first, in August 1996 was prior to a request for extension of the loan closing date

Table 13: Bank Resources: Missions

Stages of Project cycle	Month/ Year	Number of Persons\1	SW in Field:	Specialized Staff skills Represented	Performance rating Implement. Progress	Performance rating Developt. Objectives	Types of Problems
Supervision I	6/94	1		PE	S	S	As a consequence of various generation projects being canceled the scope of work was revised and some items completed using alternative financing. There was expected to be a delay in disbursements while NPC awaited the outcome of these developments before proceeding with procurement.
Supervision II (limited mission)	7/95	3		PE, FA, PM			The mission took part in a DOE-sponsored conference on power sector reform, and commented on the proposed Omnibus Bill. NPC requested a loan reallocation to finance conductors under the Leyte-Luzon 500 kV rehabilitation project. Instead this was included under the scope of the Transmission Grid Reinforcement project, and US$55.45 million of the loan was canceled in August 1995.
Supervision III	12/95	3		PE, ES, PM	S	S	The mission requested early action be taken by NPC to advise the Bank how the uncommitted loan balance would be used.
Supervision IV (limited mission)	6/96	2		PE, EE			Included supervision of tariff studies.
ICR I (limited mission)	8/96	1		ES			First ICR mission prior to request for loan extension.
Supervision V (limited mission)	2/97	1		PE			Loan extension for delayed communications contract and tariff studies. Cancellation of additional US$2.95 million.
ICR II	11/97	2		ES, OO	S	S	Final ICR mission.

EE - Energy Economist; ES - Energy Specialist; FA - Financial Analyst; PE - Power Engineer; PM - Project Management Specialist; OO - Operations Officer

APPENDICES

PHILIPPINES
POWER TRANSMISSION AND REHABILITATION PROJECT
(LOAN NO. 3626-PH)

AIDE MEMOIRE

1. A World Bank mission comprising Mr. Calum Gunn (EASEG) and Mr. Leo Rodaje (EACPF) visited the Philippines from November 14 - November 21, 1997, to begin preparation of the Implementation Completion Report (ICR) for the Power Transmission and Rehabilitation Project (Loan No. 3626-PH). The Borrower for the project is the National Power Corporation (NPC) and the loan amount was originally US$110 million equivalent. Two cancellations (paras 9-10) have been made, US$55.45 million in August 1995 and an additional US$2.95 million in January 1997, reducing the final loan amount to US$51.6 million. The original loan closing date was December 30, 1996, but there has been one extension, and the revised closing date is now December 31, 1997.

2. The mission team explained to NPC that the ICR process is designed to improve the quality and effectiveness of the Bank's lending by: (i) providing feedback from implementation experience to improve future lending strategies and design of future operations; (ii) helping to ensure greater development impact and sustainability of the project during the operation phase; (iii) reinforcing self-evaluation, including development impact assessment, by the Bank, the Borrower and the Government; (iv) meeting the accountability and transparency in the Bank's activities; and (v) maintaining a record of the implementation experience of the Bank financed operations to facilitate assessment of the development impact.

3. The mission collected data from NPC in order to update the tables in the Staff Appraisal Report (SAR) for incorporation into the ICR, comprising: (i) the project quarterly report for June - September, 1997, which updates implementation progress, and procurement and disbursement status; (ii) total project cost breakdowns; (iii) project monitoring indicators; (iv) data to recalculate the project's internal rate of return; (v) NPC's income statements, balance statements, and sources and applications of funds over the project period; (vi) NPC's draft 1997 Power Development Program; and (vii) the implementation status of the Energy Sector Plan.

4. The mission team indicated that NPC should also prepare a summary of the findings of its own evaluation of the project, in less than ten pages, and requested that this be submitted to the Bank by December 15, 1997. The team outlined to NPC that the evaluation summary should include: (i) an assessment of the project objectives, design, implementation, and operations experience; (ii) an evaluation of NPC's own performance during the evolution and implementation of the project, with specific emphasis on lessons learned that may be relevant in the future; and (iii) an evaluation of the performance of the Bank during the evolution and implementation of the project, including the effectiveness of the relationship between NPC and the Bank, again with special emphasis on the lessons learned.

5. During the course of the mission, the team met with NPC's current and previous Project Directors for the project and their staff, and also representatives from NPC's Generation Planning Division, Transmission Planning Division, Financial Review and Management Accounting Division, Financial Strategic Planning Division and Electricity Tariff Division. The team

received feedback on the implementation of the various components of the project, and NPC's finances, as is outlined below.

6. **Transmission Expansion and Reinforcement**. The main objective of the project was to alleviate the critical power shortages in Luzon that were being experienced in 1992 and 1993 (the period of project identification and appraisal), through: (i) a transmission system expansion and reinforcement program that would bring power to Manila from"fast track" generation plants; and (ii) the rehabilitation of the Bataan thermal generating plant. In terms of resolving the power crisis, the project responded to immediate needs by facilitating the transmission of over 1200 MW within Luzon, and to the Metro Manila region in particular. However, as part of the ICR process, the mission team explained to NPC that this achievement must be evaluated in the context of the project's actual economic costs and benefits. Hence, the internal rate of return for the project will be recalculated on the basis of the information provided to the mission team, upon returning to Bank Headquarters.

7. The construction of the 91 km Hermosa-Bocaue-Balintawak line, completed in June 1994, and the associated expansion of the Balintawak and Manila substations, were both necessary to evacuate power generated from the Subic and Bataan regions to Manila. The temporary 42 km Limay-Hermosa dual circuits, financed retroactively and completed prior to loan signing, transmitted up to 600 MW of power from the Bataan combined-cycle plant to the Hermosa substation. In addition, the 5 km Subic-Olongapo line, completed in February 1994, and the expansion of the Olongapo substation, allowed the transmission of up to 100 MW from the Enron-Subic II plant through to the Hermosa substation.

8. In Northern Luzon, the 3 km Payocpoc-Bauang line, completed in March 1994, allowed the export of around 200 MW from First Private Power's Bauang plant. The construction of the 20 km Pinamucan-Batangas line, completed prior to loan signing, and the expansion of the Batangas and Binan substations, and the Calaca and Makban switchyards, connected up to 100 MW from the Enron-Pinamucan plant into the grid. (From late 1996, this component also allowed power from the 700 MW Pagbilao plant to be transmitted to Manila). Finally, the rehabilitation of the 37 km Kalayaan-Tayabas line, completed in November 1995, and the expansion of the Dolores substation, were essential to bringing north up to 200 MW from the geothermal plants in Southern Luzon. This process of transmitting power from south to north has been continued through the scope of the Leyte-Luzon (Loan No. 3746-PH) and the Transmission Grid Reinforcement projects (Loan No. 3996-PH and Loan No. 3997-PH).

9. Since a proposed 600 MW BOT development by Magellan did not materialize during the project period, this necessitated the postponement of the planned transmission reinforcement measures in the Batangas area. Therefore, that part of the loan which related to these works was canceled at the same time as the component for the Bataan thermal plant rehabilitation (para. 10).

10. **Bataan Thermal Plant Rehabilitation**. Prior to the project, the Bataan thermal plant (225 MW) had been operating at less than half its capacity and experienced frequent outages. Its rehabilitation under the project scope was intended to restore the plant to full capacity. This component of the loan in its entirety, including the remaining portion of the associated consultancy contract, was canceled in August 1995, the justification being that the rehabilitation would still be performed through divesting the plant to the private sector on a Rehabilitate-Operate-Maintain (ROM) basis. As yet, this has not occurred, and therefore this component has not been completed. However, the portion of the related consultancy contract that was utilized

did enable NPC to improve its maintenance procedures for the Bataan plant. NPC indicated to the mission that the recommendations of this consultancy report were instrumental in the plant achieving an increase in rated capacity and a reduction in unplanned outages.

11. **Efficiency and Operational Improvement Study**. In addition to the physical objectives relating to the power crisis, the project had the objective of strengthening NPC's institutional capacity through an Efficiency and Operational Improvement Study (EOIS) financed by the Japan PHRD Grant Facility and managed by the Bank. Unfortunately, the NPC staff involved in implementing the recommendations of this study were not available to meet with the mission team. The team requested that NPC prepare an evaluation of the EOIS and submit it to the Bank by December 1, 1997, indicating: (i) the extent to which the objectives of the terms of reference for the study (SAR, Annex 6) were met; (ii) a summary of the study's recommendations; (iii) the actions taken by NPC to implement those recommendations; and (iv) an evaluation of the usefulness of the study in improving NPC's organizational structure and operational efficiency.

12. **Master Plan Study for EHV Transmission**. This consultancy study was intended to improve NPC's capacity to plan its future transmission requirements. NPC planning staff rated this component of the project as exceeding their objectives. The master plan allowed NPC to evaluate various options for transmission system development, in particular, in examining options for the northwestern 500 kV extension in Luzon, subsequently funded under the Transmission Grid Reinforcement loan. In addition, the study assessed the technical and economic viability of a link between Leyte and Mindanao. As a result of the recommendations of the study, this link will be funded by a US$250 million loan from ADB with a commissioning date targeted for 2003. Once completed, all of NPC's major transmission grids will be fully interconnected. NPC indicated that a key factor in the success of this component was in having a member of the consultancy team work onsite alongside NPC's counterparts for a six month period, and that there was a considerable transfer of knowledge to staff during this time.

13. **Contracting and Economic Dispatching of Private Power Study**. NPC indicated that the main worth of this consultancy study was as a precursor to later studies. In particular, the study identified possible frameworks for an open access transmission tariff (OATT), the development of which was subsequently funded under the loan (para. 14), and the need for drafting a Transmission Grid Code. A Grid Code has since been developed by NPC with assistance from the National Grid Corporation (NGC) of the UK. As a result of the study, NPC did recognize the need for dispatching generating plant to more closely reflect the marginal costs of operation, and to some extent modified the generation merit order accordingly. In addition, it formed the basis for the detailed design of the National Load Dispatch Center (NLDC), subsequently funded under the Transmission Grid Reinforcement loan.

14. **Comprehensive Tariff Study and Strategy Project**. This consultancy study consisted of two phases: (i) the development of an OATT, or "wheeling" tariff, and assistance in obtaining its approval by the Energy Regulatory Board (ERB); and (ii) the development of associated model transmission service contracts with independent power producers (IPPs). This latter component has not yet been completed, and is as yet only in draft form. The final report will be submitted to NPC shortly (para. 21). However, NPC indicated that this aspect of the study has been less useful to them, as an important lesson which project staff have learned is that it is important to develop contracts themselves (although the study provided them with some ideas). The OATT developed under this component of the project was approved by ERB in June 1997. Two IPPs, First Gas (1050 MW) and Quezon Power (433 MW), have signed bilateral contracts

with Meralco on the basis of being able to wheel power through NPC's transmission network, under the terms of the OATT. In addition, Meralco is also planning to sign contracts for Magellan's proposed 300 MW development in Batangas, and a 100 MW cascading hydro system at Axor in Benguet, both applying the OATT. First Gas also might expand its development (by an additional 500 MW).

15. **NPC's Finances**. The mission also discussed NPC's financial position over the project period. A key objective of the project was ensuring NPC's financial viability to undertake the investments necessary to alleviate the power crisis and to meet future demand growth. Moreover, the mission indicated to NPC that the Corporation's current and future financial position is a critical factor in rating the project's sustainability in the ICR.

16. NPC agreed with the conclusions made during the recent visit of a Bank financial specialist (September 1997) which indicated that the key financial problem is the Corporation's continuing reliance on foreign borrowing. This has meant that NPC has continued to remain greatly undercapitalized, as was recognized prior to the initiation of the project, and requires a substantial injection of equity. The situation has been further exacerbated by the recent devaluation of the peso.

17. NPC's bulk tariffs were restructured during project appraisal and as conditions of loan effectiveness, in order to improve NPC's revenue. The restructuring included a base rate tariff increase, and the application of automatic adjustments for the cost to NPC of fuel (i.e., petroleum products, coal and geothermal steam), purchased power and foreign exchange rate fluctuations. Unfortunately, the formula initially approved by ERB for the purchased power adjustment would have had a negative impact on NPC's revenue had it been applied, and it was not until 1996 that NPC was able to have a more favorable methodology approved. This was applied for Luzon customers last year, and contributed to a major improvement in NPC's average rate. The adjustment will also be applied to NPC's Visayas and Mindanao customers from the beginning of 1998, and is estimated to result in an additional revenue of P180 million per month. (The extension of the adjustment to these customers was delayed as the revised formula would still have had a negative impact in 1997).

18. Another tariff change, intended at least initially to be revenue neutral, was introduced as a covenant under the loan. This was the application of a higher demand charge component in the bulk tariff for Meralco and other customers. Because the split of demand and energy charge components was approved by ERB based on historical data, and NPC's customers have in most cases subsequently improved their load factors, this change resulted in a negative impact to NPC.

19. NPC also indicated to the mission other factors that have had or will have a negative impact on the Corporation's financial position, including: (i) the recent application to ERB for a lower base tariff, in an attempt to improve market share; (ii) the relatively higher cost of IPP contracts and non-NPC geothermal projects;[1] (iii) project implementation delays (for the Leyte-Cebu and Leyte-Luzon projects), resulting in high advance payments; and (iv) recent drought conditions, resulting in a more expensive generation mix.

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[1] For 1996, the average cost of NPC's plants was reported as 1.3658 P/kWh, whereas the average for non-NPC plants was 1.9853 P/kWh, of which the geothermal plants cost 1.6826 P/kWh.

20. **Bank Performance**. In responding to the power crisis, structuring the loan in such a way as to allow substantial retroactive financing enabled NPC to begin construction of essential transmission lines. With respect to its finances, NPC indicated that Bank involvement was particularly helpful in ensuring ERB's approval of the tariff increases and adjustments during project appraisal and, during supervision, in facilitating the consultancy study on the OATT. Although formal supervision was light, implementation review missions on other NPC loans allowed continuing dialogue on project progress. The presence of a local procurement specialist at the resident mission in the early stages of the project was also helpful. However, NPC expressed concerns, common to all Bank-funded projects, regarding the time required to receive "no objections" from the Bank, and that changes in accountable Bank officers can result in conflicting responses to issues.

21. **Project Components to be Completed**. The only components of the project which remain to be completed are the final submission of the second phase of the tariff study (para. 14), and the supply of telecommunications equipment related to the NLDC facilities (para. 13) within the scope of the Transmission Grid Reinforcement project. NPC assured the mission that these components will be completed prior to loan closure.

22. **Operational Plan**. NPC and the mission agreed to continue using NPC's monitoring indicators (SAR, Annex 13) as measures of the ongoing sustainability of the project. Since the physical objectives relating to the resolution of the power crisis have been met, these indicators, which relate to NPC's financial position and management efficiency, satisfactorily reflect accordance with the institutional and financial objectives of the project.

23. **Acknowledgment**. The mission wishes to express its appreciation for the cooperation and hospitality extended to the mission team by NPC staff.

BORROWER'S
IMPLEMENTATION COMPLETION REPORT (ICR)

FOR

WORLD BANK LOAN NO. 3626 – PH

POWER TRANSMISSION & REHABILITATION PROJECT

NATIONAL POWER CORPORATION

A. STATEMENT/EVALUATION OF PROJECT OBJECTIVES

The main objectives of the project were to alleviate power shortages in Luzon through (a) a transmission and reinforcement program needed to bring power to Manila from the "Fast Track" generation plants and (b) the rehabilitation of the Bataan thermal generating plant. It will also improve the performance of the energy sector through the approval by the Government, in cooperation with the Bank, of an Energy Sector Plan covering policies, institutions and implementing mechanisms. In addition it will ensure the financial viability of NPC to undertake a massive and long overdue investment program and improve its institutional setup.

The project will have the following major components: (a) expansion of the transmission system in the Bataan/Batangas areas west of Metro Manila: (b) provision of goods and materials (conductors, insulators and supports) to reinforce the transmission system; (c) rehabilitation of the two units (Unit #1, 75 MW and Unit #2, 150 MW) of the Bataan oil-fired thermal power plant; (d) consulting assistnace to prepare a master plan to develop the 500 kV extra high voltage (EHV) system and rehabilitate the Bataan thermal plant; and (e) improvement of NPC's institutional systems.

B. ACHIEVEMENT OF PROJECT OBJECTIVES

In the Bataan area, the construction of the 42 km. Limay –Hermosa transmission lines 1 and 2 which were completed in April 1993 and December 1993 respectively, enabled the evacuation of up to 600 MW of power from the Bataan combined cycle power plants to Hermosa Substation; the 5 km. Subic-Olongapo T/L completed in February 1994, evacuated power of up to 100 MW from the Enron II power plant through Hermosa Substation ; and the completion of the 91 km. Hermosa-Bocaue-Balintawak line in June 1994 and the expansion of its associated substations finally brought the power from Bataan area to Metro Manila.

In Bauang, La Union area, the completion of the 3 km. Payocpoc-Bauang line in March 1994, made possible the transmission of power of up to 200 MW from First Private Power Plant to the Luzon Grid

In the Batangas area, the completion of the 20 km. Pinamucan-Batangas line in April 1993, enabled the transmission of up to 100 MW from Enron I power plant to the grid.

In Quezon province, the rehabilitation of the 37 km. Kalayaan-Tayabas line which was completed in November 1995 and the expansion of Dolores Substation, enabled the transmission of up to 200 MW from the geothermal plants in Bicol and Pagbilao thermal plant.

The following projects and consultancy services under the loan were completed:

A. TRANSMISSION SYSTEM EXPANSION AND REINFORCEMENT

I. Transmission Lines (Supply and Erection)

a. Limay-Hermosa Line 1, 42 km, SC - Completed April 1993
b. Pinamucan-Batangas, 20 km, SC - Completed April 1993
c. Limay-Hermosa Line 2, 42 km, SC - Completed December 1993
d. Subic-Olongapo, 5 km, DC - Completed February 1994
e. Payocpoc-Bauang, 3 km, SC - Completed March 1994
f. Hermosa-Bocaue-Balintawak, 91 km, SC, SP - Completed June 1994
g. Kalayaan-Tayabas 500 KV Rehab. 37 km, DC, ST - Completed November 1995

II. Substations Expansion (Supply) - Delivered March 1995

a. Balintawak S/S
b. Dolores S/S
c. Makban A Swyd
d. Makban B Swyd
e. Binan S/S
f. Batangas S/S
g. Calaca Swyd
h. Olongapo S/S
i. Manila S/S
j. Spares

B. TECHNICAL ASSISTANCE/CONSULTANCY

a. Master plan Study for EHV Power Trans. (PROMON) - Completed April 1995
b. Contracting Economic Dispatching of Private Power Study (PROMON) - Completed July 1995
c. Consultancy Services for Bataan Thermal Power Plant Units 1 & 2 (EBASCO) - Contract cancelled on May 9, 1995.
d. NW Luzon Contracting Consultancy (EBASCO) - Completed July 1996

C. MAJOR FACTORS AFFECTING THE PROJECT

Problems/Causes of delay

1. In Procuring Goods and Works

    a. Failure of suppliers to comply with the provisions of the contract.
    b. Delay in the delivery of supplies.

2. In Construction Management
    a. Changes in work specifications/contract conditions.
    b. Poor quality of contractors work.
    c. Right-of-way problems.

3. In Loan utilization
    a. Failure to comply with the banks procurement guidelines.
    b. Additional candidate projects under the loan disapproved by the Bank.

Solution to the Problem:

1. Suppliers should be made aware of the requirements of the contract specially the delivery schedule and its consequencies if the requirements are not complied with.
2. The right-of-way should be cleared first before a project could start the construction.

D. PROJECT SUSTAINABILITY

Prospects of project sustainability appears to be very good. The power crisis has been resolved in Luzon. The combined efforts by the Independent Power Producers (IPP) who put up the new power plants and the construction/erection of the critical transmission line projects by NPC led to a substantial capacity addition to the grid in 1993 and 1994 that eventually ended the power crisis.

Transmission line and generation projects laid out in NPC's Power Development Program (PDP) (1994-2005) are being implemented to meet the projected growth in demand for power in the next eight years notwithstanding the reforms in NPC to carry forward the process of orderly energy growth, such as; a) restructuring of NPC and privatization of various generating plants; b) creation of an independent transmission company which will provide IPP's with open access to the power market and thus introduce competition among power suppliers; and c) development of adequate projects suitable for private participation.

E. BANK PERFORMANCE

The Bank's performance in administering the implementation of the Project was generally satisfactory.

F. BORROWER PERFORMANCE

The performance of the Borrower/Implementing Agency (NPC), was generally satisfactory. However, NPC had to cancel a total of $ 58.4 million from the loan due to the cancellation of the Rehabilitation of Bataan Thermal Plant 1 & 2 Project and the deferment of the 600 MW Magellan Utilities project which led to the cancellation of the transmission line project in the Batangas area. The remaining $ 51.6 million were contracted out by NPC before the closing of the loan.

G. ASSESSMENT OF OUTCOME

The Project is considered to be very successful because it has fully achieved its objective that is to alleviate power shortage in Metro Manila

H. FUTURE OPERATION

NPC Management, in its effort to direct the overall employee efforts towards the achievement of the corporate mission of providing efficient, reliable and economic to the country, developed adopted in 1995 the Productivity Enhancement Program (PrEP) a mechanism to reward good performances. The program components and brief description of the procedures follows:

1. Performance Targets

   Within the first quarter of every year, NPC sets its annual corporate performance targets which should result from consultation and discussion with all the functional groups.

a. Capacity Addition		1996 Targets
-generation capacity in megawatts	=	940 MW
-transmission lines in circuit kilometers	=	637 ckm
-substation capacity in million volt-ampere	=	580 MVA
b. System Efficiency	=	97.48 %
c. Reliability Indicator	=	99.87 %
d. Operating Ratio	=	0.79
f. Others		

Each work group (i.e. functional group/regional center, department and division) shall prepare its performance targets and work program in support of the corporate target. Such targets and standards shall be agreed upon by both the head of the work group and his/her immediate superior, and confirmed by the next higher supervisor.

2. Performance Standards

Performance indicators are indicators of desirability and acceptability in relation to targets established. The targets are expressed in terms of average or normal expectation or as an ideal expectation. To ensure common understanding in the performance standards and to forestall confusion in the assessment of actual performance standards for the ratings of Outstanding, Very Satisfactory and Satisfactory shall be established in each performance factor at the time of target setting.

3. Performance Evaluation and Appraisal

Every six (6) months, an evaluation of performance will be conducted and the accomplishments will be appraised by the Management Committee and reviewed by the NP Board and , at the national government, the Government Corporations Monitoring and Coordinating Council. In assessing achievement level of performance targets, the actual performance shall be compared against standard set.

4. Performance Incentive Bonus

The actual performance levels on the corporate and group targets shall determine the actual amount of bonus to be granted.

The overall corporate performance for the period January-November 1996 reached a SATISFACTORY level. Based on this performance and consistent with the pertinent orders from the national government (24 March 1994 Memorandum Order No. 198 of Malacañang), the NP Board approved the grant of two (2) month performance bonus to all qualified NPC officials and employees.

It is worthy to take note that this PrEP is to a great extent assures the corporation from its employees a continuous effort to strive for good performance due to the incentive bonus component of the program. From the utility operations, point of view this effort for good performance is manifested by maintaining the reliability and efficiency of NPC generating units.

I. KEY LESSONS LEARNED

The most important lesson to be learned from this project is that in case of conflict the specific provision of the loan agreement prevails. To illustrate, It has been noted that a contract for the supply of transmission line insulator assembly was denied funding under the loan by the Bank due to conflict in the procurement procedure followed by NPC against Bank's guidelines on procurement process.

The transmission line projects under the loan were completed generally on schedule. This happened because there was a common appreciation of the situation that there was power crisis besetting the country. That situation has brought together all concerned NPC functional groups to a very coordinated effort that resulted to the completion of critical transmission line projects generally on schedule. A well defined goal/objective combined with cooperation and proper coordination are key factors in the project implementation.

Appendix C

REPUBLIKA NG PILIPINAS
Pambansang Korporasyon Sa Elektrisidad
(NATIONAL POWER CORPORATION)

WB-HQ/OPD-PMO/98- 26
March 10, 1998

MR. MOHAMMAD FARHANDI
Acting Chief, Infrastructure Operations Divisions
The World Bank
1818 H. Street, N. W.
Washington D. C., 20433, USA
Fax No. (202) 477-2743

Attention: **Mr. Calum Gunn**

Subject: **Implementation Completion Report (ICR)**
Power Transmission Rehabilitation Project- IBRD 3626

Dear Mr. Farhandi:

This refers to the Bank's " Draft Report" on the subject matter. It is informed that the Engineering Group has no other comments on the technical or engineering aspect of the report considering that what is written in the ICR was the result of round table dialogue and discussions with Engineering concerned groups during the November, 1997 ICR Mission of the Bank.

This is to confirm also my request to include in your final report that NPC has also embarked on other flagship programs such as Reliability Central Maintenance (RCM), Total Quality Management (TQM), and the like intended to achieve continues performance improvement.

Attached for your reference is the March 5, 1998 letter of Ms. M. M. Pajarillo, Vice President, Finance & OIC to Mr. M. Farhandi, containing NPC's comments on the aide memoire released on February 1998 by the Energy Sector Mission of the Bank. Please take note that some of the comments are applicable to the subject ICR.

Very truly yours,

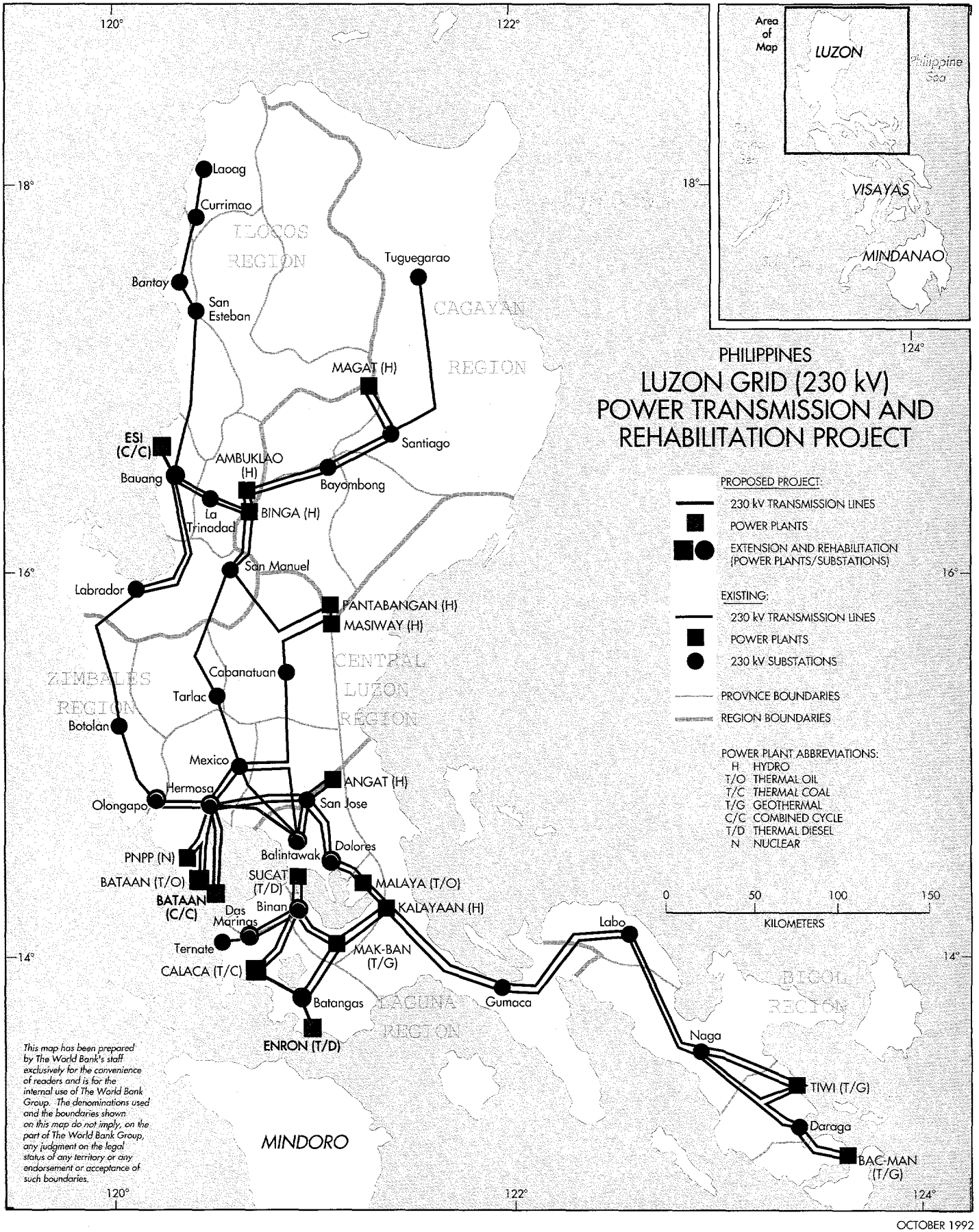
MEDARDO T. NUÑEZ
Officer-In-Charge
IBRD 3626, PTRP

Office Address:
Cor. Quezon Avenue & Agham Road
Diliman, Quezon City
P.O. Box 10183

Cable Address
NAPOCOR PM
Telex: 40120

Tel. Nos.
92-13-541 571
551 580
561

IBRD 24234



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OCTOBER 1992