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Report No. 14887

IMPLEMENTATION COMPLETION REPORT

INDIA

INDIRA SAROVAR HYDROELECTRIC PROJECT
(LOAN 2416-IN)
(CREDIT 1613-IN)

(SPECIAL FUND CREDIT SF.20-IN)

JULY 24, 1995

Energy and Infrastructure Operations Division
South Asia Country Department II

COUNTRY EXCHANGE RATES AND ABBREVIATIONS

Currency Unit = Rupee (Rs)
Exchange rate used in the Staff Appraisal Report Rs 10.0 = US$ 1

Year	Rupees/US$	SDR/US$
1983 (Project Preappraisal Starts)	10.10	1.069
1984 (Project Appraisal)	11.36	1.025
1985 (Project Approved and Becomes Effective)	12.37	1.016
1986	12.61	1.174
1987	12.96	1.293
1988	13.92	1.345
1989	16.23	1.282
1990	17.50	1.357
1991	22.74	1.368
1992	25.90	1.410
1993	26.20/30.50	1.397
1994	31.40	1.432
1995	32.30	1.538

Average Rate during project implementation period: US$ 1 = Rs. 21.60
Government of India and MPEB Fiscal Year : April 1 - March 31

Measures and Equivalents

1 Kilometer	= 1,000 meters (m) = 0.6214 miles (mi)
1 Meter (m)	= 30.37 inches (in)
1 Cubic meter (m^3)	= 1.31 cubic yard (cu yd) = 25.25 cubic feet (cu ft)
1 Hectare (ha)	= 10,000 m^2 = 2,471 acres (ac)
1 kilogram (kg)	= 2.2046 pounds (lb)
1 ton (t)	= 1 metric ton = 2,200 lb.
1 Kilocalories (kcal)	= 3.968 British thermal unit (Btu)
1 Kilovolt (kV)	= 1,000 volts (V)
1 Kilovolt-ampere (kVA)	= 1,000 volt-amperes (VA)
1 Megawatt (MW)	= 1,000 Kilowatts (kW) = 1 million watts
1 Gigawatt-hour (GWh)	= 1,000,000 kilowatt-hours (kWh)

ABBREVIATIONS AND ACRONYMS

CEA	:	Central Electricity Authority
CWC	:	Central Water Commission
DOE	:	Department of Environment
DOF	:	Department of Forestry, Government of India
DRP	:	Dam Review Panel
GOI	:	Government of India
GOMP	:	Government of Madhya Pradesh
GSI	:	Geological Survey of India
IBRD	:	International Bank for Reconstruction and Development
IDA	:	International Development Association
LRMC	:	Long Run Marginal Cost
MPEB	:	Madhya Pradesh Electricity Board
NHPC	:	National Hydro-Electric Power Corporation
NTPC	:	National Thermal Power Corporation
PAP	:	Project Affected Persons
R&R	:	Rehabilitation and Resettlement
REB	:	Regional Electricity Board
REC	:	Rural Electrification Corporation
SEB	:	State Electricity Board

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IMPLEMENTATION COMPLETION REPORT

Preface

This is the Implementation Completion Report (ICR) for the Indira Sarovar Hydroelectric Project[1/] in India. Ln. 2416-IN in the amount of US$157.4 million, Special Fund Credit SF-20-IN, and IDA Credit 1613-IN, in the amount of SDR134.4 million (US$143 million equivalent), were approved on May 17, 1984.

On June 13, 1988, the Bank and the Association canceled US$139,974,974 under Ln.-2416-IN, and SDR 108,989,000 under SF. 20-IN, following cancellation, upon mutual agreement with GOI, of the hydro-power plant component of the project. Thus, the loan amount and the credit amount were reduced to US$17,425,026 and SDR25,411,000, respectively, for the implementation of the remaining components of the project. The loan was closed on June 30, 1993, against the original schedule of September 30, 1991. The credits were closed on June 30, 1994, against the same original schedule. Total disbursements under the loan, the special fund credit and the IDA credit were US$9,077,807, SDR510,678 and SDR5,346,361 equivalent respectively. The undisbursed balance of US$8,347,219 equivalent was canceled on November 3, 1993. The undisbursed balances of SDR12,500,322 of SF 20-IN and of SDR7,053,639 of Cr.1613-IN were canceled on October 31, 1994, and November 16, 1994, respectively, following closing of the loan and the credits.

The ICR (Preface, Evaluation Summary, and Parts I and III) was prepared by the Energy and Infrastructure Operations Divisions, Country Department II of the South Asia Regional Office. Part II was prepared by the Borrower.

Preparation of this ICR by the Bank and the Borrower commenced during the Bank's completion mission in November 1994. It is based on the revised guidelines for ICRs, the Staff Appraisal Report (No. 4909-IN), the Loan and Project Agreements, the Credit Agreements, supervision reports, correspondence between the Bank and the Borrower, and internal Bank memoranda.

1/ The project was formerly called the Bodhgaht Hydroelectric project, but in honor of Mrs. Indira Gandhi, the name was changed to Indira Sarovar Hydroelectric project.

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IMPLEMENTATION COMPLETION REPORT

Evaluation Summary

Objectives

1. The original objectives of the project were: (i) to assist the Government of India (GOI) in meeting the electricity demand in the State of Madhya Pradesh and in the Western Region of India through the addition of 500 MW of hydro-power capacity; (ii) to assist GOI in achieving more efficient use of existing thermal power stations through the implementation of a pilot program of thermal plant rehabilitation in Madhya Pradesh; and (iii) to improve Madhya Pradesh Electricity Board's (MPEB) operations by expanding and modernizing its data processing facilities.

Restructuring of the Project

2. The project became effective on June 18, 1985. The Project's hydro-power component was estimated to cost about US$637.6 million out of a total project cost of US$722.8 million. Following public concern with the environmental and rehabilitation and resettlement (R&R) impacts of the Indira Sarovar dam and the associated hydropower plant, it was agreed with GOI in June 1988 to cancel this component. Consequently, Bank funding was reduced from US$344.2 million to about US$45 million. (About US$299.6 million equivalent, at the current exchange rate, was canceled). The remaining project components included renovation of three aged MPEB thermal power plants, including consultancy services for the same, and upgrading of the data processing facilities in MPEB.

Implementation Experience and Results

3. Ln. 2416-IN was closed on June 30, 1993, and the Credits 1613-IN and SF-20-IN were closed on June 30, 1994. Implementation of the physical components of the thermal plant rehabilitation was also delayed because: (a) Central Electricity Authority (CEA) drew out the clearance of the award to a foreign consulting firm for more than two years; (b) several candidate units were available for component inspection much later than planned due to MPEB's inability to shut down the units in the face of pressing demand for power; and (c) the procurement process took significantly longer than planned. The implementation of the software development and training in the data processing facilities component were not financed by the credits. Because of implementation delays, the restructured project was scheduled to be completed only by the end of

1996. The financial covenants provided for MPEB to earn a minimum rate of return of 3% on its investments. This was only accomplished with subsidies from the Government of Madhya Pradesh (GOMP). Since 1991, GOI's policy has been that the agricultural tariff be raised to a minimum of 50 paise/kWh. In February 1994, GOMP abolished the agricultural tariff altogether for pump sets less than 5 HP, in contravention of the stated policy of GOI, even though a government comprising the same political party as in the Center had just taken office in the State of Madhya Pradesh. The Bank therefore, decided not to entertain GOI's request for further extension of the closing date for the Credits. During the first half of 1994, the Bank was engaged in a delicate policy dialogue with GOI on the need to restructure the state power sector. The refusal of extending the closing date of the credits meant to reinforce the Bank's message, that we would not get involved in states which do not apply rational tariff policies.

4. As of credit closing (June 1994), none of the original or restructured project objectives had been achieved. The pilot thermal rehabilitation component was only 40% complete, and the upgrading of the data processing facilities was approximately 60% complete. MPEB is continuing the implementation of these components with its own resources.

Main Findings and Key Lessons Learned

5. The State Power Sector in India needs to function on commercial principles. The original objectives of the project were very narrow. The performance of the subject project and other SEB projects has had the Bank to shift its strategy to advocate radical restructuring of the State Power Sector in India.

6. Careful project preparation is key to the success or failure of a project. First, the project was approved, and its implementation started without agreement on the design basis of the dam. The project was processed for a loan before review of the design by experts. The expert committee made various recommendations for changes in the design which CWC contested. MPEB and the Bank agreed on a concrete dam, while the CWC insisted on a rock-fill dam, the design for which was developed by CWC itself, thus resulting in long delays. Second, environmental impacts of the project were assessed and resettlement and rehabilitation plans for the Project Affected Persons (PAP) were detailed, but public consultations were not held nor the required clearances were taken from all stakeholders. The Department of Forestry (DOF) and the PAPs raised objections after project implementation had already started. The lack of resolution on these two key issues led to the cancellation of the hydropower component of the project.

7. Clear definition of the roles and functional responsibilities of concerned government agencies is critical to successful project implementation. CWC and CEA had the responsibility to oversee the implementation of the project, but both got mired in trying to find active roles for themselves in project implementation with the result that the project suffered inordinate delays.

8. Strict adherence to Bank Standard Bidding Documents saves time. Procurement of goods and services under the rehabilitation and data processing upgrade components of the project could be completed very expeditiously owing to the use of the Bank's Standard Bidding Documents, which drastically reduced the review and approval time. The entire procurement process went on

very smoothly. The above lessons have been taken into account in recent Bank operations in India. Preparation of bidding documents for major contract packages in accordance with the Bank's Standard Bidding Documents for the Procurement of Works and Goods, is now a condition of loan negotiations.

9. The project implementation delay has been extremely expensive for MPEB. If the projected capacity improvements and efficiency gains are quantified, the loss would equate to roughly one billion rupees a year, or approximately 600 GWh of energy, based on an improvement of 5% in generation efficiency at an average plant load factor of 60%.

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IMPLEMENTATION COMPLETION REPORT

PART I: PROJECT IMPLEMENTATION ASSESSMENT

EVALUATION OF PROJECT OBJECTIVES

Project Context

1. In the 1950s and 1960s, both installed capacity and power generation managed to keep pace with the nation's demand for power, growing at an average annual rate of about 11%. Since 1970, however, the situation deteriorated. Delays in the commissioning of new power plants, operating and maintenance problems which were mostly due to lower than expected coal quality, and insufficient investment under severe budget constraints, led to a critical shortage of power. As of March 1983, India's total installed generating capacity, including non-utility power stations, was about 38,100 MW. As a result of accelerated agricultural development, there was a remarkable growth of power consumption in the rural areas where more than 80% of India's population lived. India's national power plan indicated that over the thirteen-year period from 1981-1994, utility generating capacity should grow at an average annual rate of about 9.5%, to a total of about 106,000 MW. Of this, about 59,000 MW (56%) were to be thermal, 44,000 MW (41%) hydroelectric, and 3,500MW (3%) nuclear.

Accelerating Power Development and Production

2. In September 1982, the Central Electricity Authority (CEA) completed a 15-year least-cost expansion plan for the regional power systems in India. The results of the plan indicated that in general, among the different options, the one emphasizing hydroelectric power development was usually the least-cost solution. The Bodhghat Hydroelectric Project, as it was called at that time but later renamed as the Indira Sarovar Hydroelectric Project, was compared with other options, such as a coal-fired thermal power plant, and a gas turbine plant for peaking capacity, and was reconfirmed as the most-preferred solution.

3. The Western Region, in which the project is located, comprises the states of Gujarat, Madhya Pradesh, Maharashtra and the Union Territories of Goa, Daman and Diu, and Dadra and Nagar Haveli. In 1983, the total installed utility capacity in the Western Region was about 10,045 MW, out of which 1,841 MW was shared by MPEB that included as much as 90% in thermal

power generation by plants owned and operated by MPEB. Although interconnections between states in the region had been established, operations were not yet fully integrated due to operational constraints in Madhya Pradesh.

PROJECT ACHIEVEMENTS

Overview

4. The primary objectives of the project were not achieved. Due to environmental concerns raised after project implementation had already commenced, the hydroelectric power component of the project was canceled. However, implementation of the remaining sub-components included in the original scope of the project, comprising a pilot program for rehabilitation of MPEB's thermal power plant and upgrading of data processing facilities, continued. But even these sub-components could not be implemented in full due to substantial delays that occurred in project implementation and because the Bank could not accept Government of India's request for a further extension of the loan and credit closing dates owing to unacceptable sectoral policies of GOMP with respect to agricultural tariffs. The remaining work in respect of power plant rehabilitation, as well as the data processing facilities upgrade, continue to be implemented by MPEB with the help of other available resources.

Physical Objectives

5. The primary objective of the project was to assist Government of India to expand the country's power supply at least cost by optimizing the development of India's hydroelectric-power potential. The project, located in the Bastar district in the State of Madhya Pradesh, was designed to increase the power generation capacity in the Western Region, and in the State of Madhya Pradesh in particular, through the construction of a 500 MW hydroelectric station on the Indravati river, at Bodhghat.

6. In addition to the primary objective of increasing the generating capacity of the state and the Region, the project was also to support the following objectives:

(a) more efficient use of existing plants, through the implementation of a pilot program of thermal plant rehabilitation in Madhya Pradesh and;

(b) improving the efficiency of MPEB operations by expanding and modernizing its data processing facilities to cope with commercial and managerial needs of MPEB.

Bodhghat Hydroelectric Power Plant Component

7. After site investigations spanning over several years, the project was formally adopted by Government of India in 1979. The Central Water Commission (CWC) was responsible for the civil engineering aspects of the project and CEA for the electrical and mechanical design. Both organizations had experience in similar projects as they had served, for several decades, as the engineers for many hydroelectric-power and irrigation schemes in India. The engineering for the

hydroelectric plant, with detailed construction drawings, was completed, albeit a delay of about two years, at a level sufficient to permit invitation of bids.

8. During appraisal in June 1983, the Bank used specialists in geology, hydrology and concrete dams to assist the mission in carrying out the technical review of the project. It was concluded that the project was technically sound and the proposed layout and design of the project was endorsed. However, to ensure design quality and least-cost development, the Bank requested a thorough techno-economic review of the proposed project, pursuant to which MPEB appointed a Dam Review Panel (DRP) in July 1983. The DRP consisted of independent experts to oversee the technical design and construction aspects of the project. The panel, in its first meeting in August 1983, concurred with the general layout of the project, but recommended a number of design modifications, as well as location of the dam, to improve the reliability and economy of the project. A major modification proposed was a change of the gravity rock-fill structure design for the dam to a concrete structure.

9. Based on the DRP recommendations, the Bank requested a change in the dam construction methodology from gravity rock-fill to concrete. The study for this change in design showed that costs vs. benefits would be almost the same; however, the concrete dam would have definite advantages over the rock-fill design in such areas as leakage, earthquake protection, and stability against soil settlement. In particular, the construction period promised to be significantly shorter. MPEB also agreed to change the design of the dam in accordance with the DRP recommendations. CWC, however, continued to advocate the original plan because neither CWC nor local contractors had enough experience in the design of concrete structures. CWC's overriding interest appeared to be to ensure that the civil works contract, as well as the consultancy thereof, were captured by local contractors only. As a matter of fact, CWC wanted to secure the consultancy contract for itself which caused a serious conflict of interest. CWC's continued opposition to accepting the proposed design changes caused lengthy project delays. In the end, however, CWC relented, but simultaneously, new concerns were raised in respect of the environmental impacts of the project.

Environment, Resettlement and Rehabilitation

10. Based on the initial environmental impact assessment (EIA) and an agreed rehabilitation resettlement plan (R&R), the project had been cleared by Government of India's Department of Environment, the Department of Forest and Wildlife, and the Wildlife Wing of Madhya Pradesh State Forest Department, and the Bank. However, when it was thought that the controversy over the design of the dam had been resolved, the Government of India Department of Forest raised fresh environmental concerns. It contended that the forest area to be lost by submergence following the construction of the dam, could not be compensated and that this would inflict unacceptable misery on the Project Affected Persons (PAPs), whose livelihood depended on the forest resources, notwithstanding the fact that much of their operations comprised illegal logging. The project would have affected about five percent of the forest area in the region. The issue to be resolved was whether the reforestation plan proposed by the Government of Madhya Pradesh (GOMP), was adequate to compensate for the forest lost to the project; in particular, could the Sal trees be reproduced artificially (a hardwood used for furniture and construction and

constituting about 20% of the trees projected to be lost). Sal is not an endangered species, but its artificial reproduction has been somewhat unsuccessful. As a consequence of the uncertainties raised by the Government of India Forest Department and the unanswered questions, MPEB suspended the implementation of the entire project in October 1985, just before the award of major civil works contracts was to be made.

11. During appraisal, the Bank accepted Government of India's estimate that 2300 families, 75% of whom were tribals, would be affected by the construction of the dam and the hydroelectric power station. MPEB had prepared the R&R plans setting priorities for the transfer of the PAPs in a sequence consistent with the progress of construction of the project. In 1982, GOMP constituted a rehabilitation committee chaired by the Bastar Divisional Commissioner to implement the R&R plans. This committee was represented by district level officers for Revenue and Tribal Welfare, other concerned departments and elected representatives of the PAPs. MPEB had selected four adjoining tribal areas where state land was available to compensate those affected by the project. Sufficient provision for funding was made in the project estimates for acquisition of land and properties, as well as for the construction of housing and related infrastructure facilities, to relocate and resettle the PAPs.

12. Pursuant to a request from the Department of Forestry (DOF) under agreement with the Bank, in December 1985, MPEB furnished a report on the detailed R&R plan for the PAPs as well as for forest and wild life protection. The report contained considerable details regarding physical works, implementation schedules and cost estimates. The report also proposed a fully staffed unit under the Chief Engineer of Indira Sarovar Project to carry out the proposed plan. However, in the absence of public consultation and the lack of dissemination of information, the PAPs expressed serious concerns with the social and environmental impacts of the project. Also, interdepartmental clearances within the government hierarchy had not been secured. The lack of resolution of this issue led to the cancellation of the hydroelectric power component of the project.

Restructuring of the Project

13. In light of the environmental concerns raised by the DOF and the PAPs, Government of India appointed a group of experts to undertake a fresh review of the proposed project, which was completed in late 1986. The findings of the reassessment were submitted to Government of India's Cabinet Committee for a final decision. In mid 1987, the matter was referred to the Prime Minister's Office which commissioned the Secretary of Environment to chair a task force responsible for making a final recommendation. Finally, Government of India canceled the hydroelectric-power component of the project in June 1988, followed by the amendment of the agreements in February 1989. As a consequence, the Bank canceled US$139,974,974 equivalent from Loan 2416-IN, and US$108,989,000 from Special Fund Credit SF20-IN. The remaining components, the thermal plant rehabilitation and upgrading of the data processing facilities, continued to be implemented.

Pilot Thermal Plant Rehabilitation Component

14. Recognizing that the rehabilitation of older, derated power plants can restore design capacity as well as efficiency at a much lower cost per kW of installed capacity than new power plants, and in light of the prevailing situation where a number of generating units in the MPEB utility system were suffering from loss of design capacity and performance efficiency, MPEB prepared a tentative rehabilitation plan for its thermal power plants including cost estimates, during appraisal. This assessment was used in defining the scope of the rehabilitation component of the project, and the identification of the rehabilitation program along with an implementation plan. However, much of the generating equipment as well as the auxiliaries included for rehabilitation, were of foreign origin. The inspection methodology for rehabilitation also required certain special tests and procedures for which local capability was yet to develop. The Bank therefore, required the appointment of consultants with international experience in power plant rehabilitation. Based on Bank procedures for the selection of consultants, Bechtel Overseas Limited was selected. But CEA withheld approval of the consultancy services. The reason for CEA's resolute refusal to approve the contract was that it believed the expertise to be provided under the contract was already available in the country and that CEA itself was qualified to provide the services. Once again, the conflict of interest issues were totally ignored. It was only after the Bank indicated that the loan would otherwise be canceled if the selected consultant's contract was not approved did CEA finally approve Bechtel's contract. Two precious years were lost in this process.

15. In accordance with their terms of reference, Bechtel had responsibility to identify candidate units for rehabilitation based on a thorough analysis of the operating history of the individual generating units and actual performance tests, followed by inspection and metallurgical assessment of the equipment components. The findings helped develop a more definitive identification of equipment repair, replacement or upgrade options, and the finalization of the scope and timing of the rehabilitation program, albeit some delays. Generating units at Satpura, Korba and Amarkantak power stations were included in this rehabilitation program.

16. Implementation of the physical components of the thermal plant rehabilitation was considerably delayed because: (a) some candidate units were offered for component inspection much later than planned due to MPEB's inability to close them in the face of pressing demand for power; and (b) the procurement process took remarkably longer than planned. For example, bids for the consulting services for thermal plant rehabilitation and upgrading of the data processing facilities were invited on January 22, 1986, and February 15, 1986, respectively, while the actual awards were made on May 15, 1991 and December 13, 1991, respectively which was caused by CEA's refusal to approve the appointment of international consultants. The final report by the consultants on the diagnostics was submitted in December 1992, except for one unit in Korba power station (Unit 5), which could not be offered for inspection as scheduled. The consultant's report in respect of this unit was submitted in March 1993. The bidding process for the required equipment, parts and instrumentation proceeded expeditiously and was completed by the end of June 1993, at which time the Loan 2416-IN was closed.

17. The upgrading and expansion of MPEB's data processing facilities was also designed to be carried out with the assistance of qualified consultants in defining the scope and priority of proposed new computer applications or the expansion of existing ones. Additional objectives included formulating a plan to implement the recommendations, including the selection of appropriate computing software and hardware; establishing a training program for MPEB staff; and implementing the expanded data processing system. The selected consultant, TCS, submitted its final report to MPEB in December 1993. However, computer technology is continuously evolving in terms of both hardware and software and this has induced redesign of the system to keep abreast of the state-of-the-art technology. When completed, this system is designed to provide an effective management interface with MPEB's commercial accounting system.

Procurement

18. For the pilot thermal rehabilitation and the data processing facilities components, the Bank guidelines were strictly adhered to by MPEB for procurement against twenty contracts involving international competitive bidding. This was facilitated by the use, without exception, of the Bank's Standard Bidding Documents for the Procurement of Goods. All contract awards, however, were won by local firms for an amount estimated at US$12.39 million. The average procurement time per contract--from the issuance of bid documents to contract award--was remarkably rapid and smooth. Detailed implementation schedules until the completion of the project components are shown in Table 12A and 12B in Part III.

MPEB's Financial Performance

19. Under the Loan Agreement, MPEB was required to achieve a contribution to investment of not less than 20% of average capital expenditure in FY88 and subsequent years, which was later amended to achieving a 3% ROR. In general, the ROR is a 'profit performance' criterion, and is a useful measure of a mature utility's performance under normal operating conditions. The criterion is not a direct indicator of cash generation. Furthermore, the criterion rapidly loses its significance when the utility is saddled with very high debt service charges and has difficulties with revenue collection, manifested by high levels of accounts receivable. In addition, the criterion has room for manipulation of the result by changing the depreciation rates, and by claiming 'paper' subsidies which invariably are not paid in full, nor in a timely manner. Under these circumstances, the utility could well provide a satisfactory ROR (or 'paper profit'), but be short of cash to pay even its debt service charges.

20. During FY1984/85, MPEB's financial performance was relatively satisfactory, with a rate of return of 10% and a self financing ratio of 16%. The target self financing ratio of 20% by FY87 was achieved with an increase in tariffs by an average of 12.8% in FY85/86. This situation, however, quickly deteriorated due to inadequate and infrequent tariff increases. During FY89 through FY91, MPEB barely achieved the 3% rate of return, clearing the statutory requirement of the Electricity Supply Act of 1948. But in the FY93 and FY94, GOMP had to provide MPEB with a rural electrification (RE) subsidy of a total of Rs 4.06 billion to enable MPEB to earn the required 3% ROR. The account for FY94/95 have been finalized and GOMP has agreed to provide a RE subsidy of Rs 3.2 billion to enable MPEB to earn the required ROR. The tariff structure itself imposes severe burdens on industrial consumers, while favoring the largest

consumer group, i.e., the agricultural consumers. Instead of any effort to correct this situation, and in violation of specific Government of India recommendations to impose a minimum of paise 50/kWh as the tariff for the agricultural sector, GOMP lifted the agricultural tariff on February 1, 1994, and raised the industrial tariff to off-set the loss of revenue.

Economic Performance

21. The economic benefits arising from the expansion of hydroelectric power potential was estimated at appraisal as about 11% on the internal rate of return, which was likely to be significantly higher if consumer surplus was fully taken into account and indirect benefits accruing to the Indian economy were considered. However, this exercise was no longer relevant with the cancellation of the hydroelectric power component of the project.

22. The thermal rehabilitation component was designed to serve two objectives, namely, restoration of lost capacity and improvement of thermal efficiency. Both of these could have helped MPEB in generating revenue, if the project components were implemented as planned. The loss, if quantified, would amount roughly to one billion Rupees a year, or approximately 600 GWh per year of energy, based on 5% gain in generation efficiency at an average plant load factor of 60%.

Macroeconomic Impact

23. The project would have met the demands of unserved power in the region. Critical shortages of power resulted in frequent load shedding, brownouts and imposition of limits of power consumption by the industry. The cumulative loss suffered by the national economy as a result of the cancellation of the hydroelectric power component of the project has been colossal.

Institutional Development

24. The project included a study of electricity metering practices, designed to provide the basis for the formulation of a rational metering policy. MPEB had billing and collection problems stemming from their current metering practices, even though the problems were not as acute as in some other SEB's of India. The study was completed and workshops were held in February 1993 for Phase-I and in July 1993 for Phase-II to impart training to the MPEB staff.

MAJOR FACTORS AFFECTING PROJECT PERFORMANCE

Factors Within the Scope of Government Control

25. The hydroelectric power plant design: CWC was about two years behind schedule in completing the design of the rock-fill dam. Since this organization was primarily responsible for designing hydroelectric power projects in India, its accumulated backlog appeared to impact on its performance. Also, CWC's persistent refusal to accept the recommended design change for the dam, which indicated positive benefits, was difficult to explain. Government should have intervened immediately to break the impasse.

26. Environmental Impacts: The environmental concerns raised by the Department of Forestry after project implementation had already started, indicated a lack of interdepartmental coordination within the Government. This matter should have been fully resolved at project appraisal stage.

27. Power Plant Rehabilitation: CEA took more than two years to approve the consultancy contract for this project sub-component. Its desire to secure the consultancy contract for itself, presented a serious conflict of interest issue. The implementation of power plant rehabilitation was thus unnecessarily delayed for which the economic price to pay has been very heavy. In this case also, Government should have intervened to remove this bottleneck.

Factors Within the Scope of Government of Mahya Pradesh Control

28. *ROR covenant and agricultural tariff.* MPEB was able to meet the ROR covenant with increasing Government subsidies. Effective steps to adjust the tariffs to lower cost of supply were not taken in a timely manner. Also, in violation of the Government of India recommendation to have a minimum tariff of 50 paise/kWh for the agricultural sector, MPEB abolished the agricultural tariff completely. This was one of the contributing factors for the refusal by the Bank to entertain Government of India's request for further extension of the loan and credit closing dates.

SUSTAINABILITY

29. The power plant rehabilitation component, even though incomplete at the time the loan and the credits were closed, are clearly sustainable because of the inherent benefits it is expected to bring. The generating units included in the rehabilitation scheme will regain lost capacity as well as performance efficiency. The data processing facility upgrade, when completed, will similarly improve MPEB's efficiency in terms of management control and the supervision of commercial accounting operations.

30. Under the legal covenants of the loan and credits, MPEB was also required to raise the level of consumer cash security deposits to reach the equivalent of two months sales by the fiscal year 1989/90. This covenant was satisfied. Bill collection proceeded in a satisfactory manner for new consumers.

31. In order for GOMP to reduce arrears in electricity bill payments of its departments and undertakings, GOMP has decided to pay to MPEB Rs 15 million every month against an average monthly bill of Rs 13 million. However, this measure would not help reduce the receivables within a reasonable time-frame. Even though there is a commitment to restore the agricultural tariffs in a year's time, uncertainty remains. Meanwhile, there are no plans to increase tariffs in the near future to help reduce government subsidies.

32. The implementation by MPEB of the commercial accounting system (CAS) started in April 1985, albeit at a slow pace. The consultants completed their work in August 1986, compared to the original schedule of January 1986. MPEB established a CAS implementation team consisting of experienced accounting staff and consultants to assist in solving problems

arising in headquarters and field offices during the period of implementation. However, because of the delay in implementing the data processing facility upgrade, the CAS interface with the system could not be provided. This interface is yet to be accomplished.

Bank Group Performance

33. The performance of the Bank in respect of project preparation and appraisal cannot be qualified as satisfactory. Specifically, appraisal was unsatisfactory because the project was processed, negotiated, and presented to the Board for approval without ensuring environmental and design issue clearances from all concerned departments. Also, after cancellation of the hydroelectric component, the Bank should not have waited for as long as two years for CEA to agree to the consultancy contract for power plant rehabilitation. These components should have been canceled as CEA's posturing indicated a total lack of interest in implementing the plant rehabilitation program and the upgrading of MPEB's data processing facilities. However, once these remaining components were finally cleared by the CEA, project implementation by MPEB went on smoothly and expeditiously. The Bank maintained excellent relations with the beneficiary throughout the execution of this part of the project despite some inevitable tensions created by the eventual decision of the Bank not to extend the loan and credit closing dates.

Borrower Performance

34. The performance of GOI institutions was inadequate. Both CWC and CEA caused long project delays. The position taken by CWC regarding the design of the dam and the position taken by CEA regarding the consultancy contract were both undermined by conflict of interest. These agencies finally agreed to proceed with project implementation in accordance with agreed principles only after the Bank threatened cancellation of the loan and the credits. Regarding the environmental management requirements, the uncertainty over the construction of the hydroelectric component of the project was the result of inadequate preparation and lack of interdepartmental consultation within the government. Also, adequate public consultation should have been held with the affected communities to convince them of the benefits of the project and gain their confidence. In the end, the environmental concerns raised by the Government of India Department of Forestry and the PAPs led to the costly cancellation of GOMP MPEB the hydroelectric component of the project.

35. GOMP followed inadequate tariff policies which led to the progressive weakening of MPEB's finances. In the end, the politically based decision of canceling agricultural tariffs on pumps of less than 5HP led to the closing of the credit before any component was completed. MPEB attempted to implement the project within the constraints of limited autonomy.

ASSESSMENT OF OUTCOME

36. The outcome of the Project is unsatisfactory because it has failed to meet the primary objectives of the project.

MAIN FINDINGS AND LESSONS LEARNED

37. The key lessons that emerged from the Project are the following:

- *The original objectives of the project were very narrow* . They reflected the Bank's approach to power sector lending in India at the time. The loan performance of the subject project and other SEB projects has had the Bank to shift its strategy to advocate radical restructuring of the state power sector in India.

- *Careful project preparation is important to the ultimate success or failure of the Project.* The design of the dam was performed by CWC, but the technical parameters and construction methodology were not reviewed by an independent panel of experts. This review was undertaken after project appraisal that resulted in the recommendation by the committee to change the basic design of the dam from rock-fill to concrete structure. This was contested by CWC with resulting uncertainties and long delays.

- *Environmental assessment and resettlement and rehabilitation plans must be completed and finalized before project appraisal.* Even though the EA was done and R&R plans were developed, adequate public consultation was not held with the PAPs, nor were inter-departmental clearances obtained to firm up the plans. DOF raised concerns with regard to the project's environmental impacts after project implementation had already commenced. The lack of resolution over this issue as well as over the design of the dam led to the cancellation of the hydroelectric power component of the Project.

- *Roles and responsibilities of Stakeholders should be fully defined at the project preparation stage*. Overlapping responsibilities created major confusion in the implementation of the project. The responsibilities of CWC and CEA should have been defined and their respective roles as central organizations overseeing project implementation should have been fully delineated to avoid the conflicting positions taken by these agencies.

- *Strict adherence to the Bank's Standard Bidding Documents saves time*. Procurements under the rehabilitation and data processing upgrade components were completed very expeditiously. While MPEB has a lot of credit to take for this outcome, it was possible only because MPEB used the Bank's SBD for Goods and for Works which drastically reduced the review and approval cycle of the bidding documents. It is for this purpose preparation of bidding documents in accordance with the Bank's SBD has now been made mandatory in recent Bank operations in India for all contract packages financed by the Bank.

PART II: STATISTICAL TABLES

Table 1: Summary of Assessments *

A. Achievement of Objectives	*Substantial*	*Partial*	*Negligible*	*Not applicable*
Macro policies	☐	☐	☐	■
Sector policies	☐	☐	☐	■
Financial objectives	☐	☐	■	☐
Institutional development	☐	■	☐	☐
Physical objectives	☐	■	☐	☐
Environmental objectives	☐	■	☐	☐
Public sector management	☐	☐	☐	■
Private sector development	☐	☐	☐	■

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	☐	■	☐

E. Assessment of Outcome	*Highly satisfactory*	*Likely to be Satisfactory*	*Unsatisfactory*	*Highly Unsatisfactory*
	☐	■	☐	☐

* This assessment is only for the Pilot Thermal Rehabilitation and Upgrading of the data processing facilities component.

Table 2. Related Bank Loans/Credits

None.

Table 3. Project Timetable

Item	*Date Planned*	*Date Revised*	*Date Actual*
Identification			Sep-82
Preparation	Spring 1983		Jun-83
Pre-appraisal mission	May-83		
Appraisal mission	Jun-83		Oct-83
Loan/Credits Negotiation	Apr-84		Apr-84
Board Approval			17-May-84
Loan/SF Credit Signature			1-Mar-85
IDA Credit Signature			24-Sep-85
Loan/SF Credit Effectiveness	31-Aug-84		18-Jun-85
IDA Credit Effectiveness			7-Nov-85
Cancellation of the Indira Sarovar Hydroelectric Power Project Component			13-Jun-88
Loan Closing	30-Jun-92	30-Jun-93	30-Jun-93
Credits Closing	30-Jun-92	30-Jun-93	30-Jun-94

Table 4. Loan and Credits Disbursements
Cumulative, Estimated and Actual

Bank Fiscal Year and Semester	*Estimated in SAR (million US$)* Semi-annual	Cumulative	*Actual (million US$)* Semi-annual	Cumulative	*Actual % of Estimated* Semi-annual	Cumulative
1985 - I	3.2	3.2	0.4	0.39	12.3	0.1
- II	21.2	24.4	0.0	0.4	0.0	0.1
1986 - I	21	45.4	1.7	2.1	8.0	0.7
- II	18	63.4	1.5	3.6	8.3	1.2
1987 - I	27	90.4	0.8	4.4	3.1	1.5
- II	30	120.4	0.5	4.8	1.5	1.6
1988 - I	36	156.4	0.2	5.1	0.6	1.7
- II	27	183.4	0.3	5.3	1.0	1.8
1989 - I	33	216.4	0.1	5.4	0.2	1.8
- II	36	252.4	0.1	5.5	0.2	1.8
1990 - I	12	264.4	0.0	5.5	0.2	1.8
- II	12	276.4	0.0	5.5	0.0	1.8
1991 - I	9	285.4	0.0	5.5	0.0	1.8
- II	6	291.4	0.0	5.5	0.0	1.8
1992 - I	3	294.4	0.5	6.0	17.4	2.0
- II	6	300.4	1.9	7.9	31.4	2.6
1993 - I			1.2	9.1		3.0
- II			0.5	9.6		3.2
1994 - I			0.0	9.6		3.2
- II			2.1	11.7		3.9
1995 - I			3.3	15.0		5.0

Table 5. Key Indicators for Project Implementation

Key Indicators for project implementation and operations were not defined in the Staff Appraisal Report or the President's report at the time of the Loan approval in 1984.

Table 6. Studies Included in the Project

No.	*Title of Study*	*Objective*	*Status*	*Impact of Study*
1.	Review the design concept of the dam and associated structures.	The main purpose of e panel was to review the design concept of the dam and its associated structures and the adequacy and, safety of their design.	Done	Not applicable to the project due to hydroelectric power cancellation.
2.	Impact on ecology due to Bodhghat project	The ecological back trop area, configuration, geology, rock and soil climate, water regime, land use and forest, forest survey results, wild life status, project impact on biotic environment, on biotic environment mitigating the impact.	Done	Reported to the government for conclusion.
3.	A study of impacts of Bodhghat Hydel project upon wild life and related human aspects with special reference to wild buffalo conservation in Bastar.	Survey the Flora and Fauna and to examine in particular the likely impact on wild buffalo conservation in the area.	Done	Reported to the government for conclusion.
4.	Study report on anticipated.	1. Likely effects on the ecology on the loss of centuries old, natural, multistoried, thick and diverse vegetative cover existing over a large contiguous area.	Done	Reported to the government for conclusion
		2. Likely success of the effort for regeneration of SAL needs to be established to the full satisfaction of the efforts.	Done	Reported to the government for conclusion
5.	Ecological impact of Bodhghat project. A review	a) Impact on environment covering all component like forest, wild life, microclimate of the region etc.	Done	Reported to the government for conclusion
		b) Impact on the social-cultural and economic life of populace of regions.	Done	Reported to the government for conclusion
		c) Proposed rehabilitation plans for the families which would be displaced.	Done	Reported to the government for conclusion
		d) Development effects of the dam.	Done	Reported to the government for conclusion
		e) Broad assessment of the benefits and cost of the project.	Done	Reported to the government for conclusion

6.	I.S.H.P. - An environmental appraisal	A study of Flora/Fauna in the submergence area to particularly identify endangered species.	Done	Reported to the government for conclusion
7.	Life assessment study for Pilot Thermal Rehabilitation	Extension in schedule life, improvement in PUF, availability and safety measures recapturing of lost generation capacity.	Done	Identified candidate power plants for rehabilitation
8.	Coal sampling and testing	To assist life extension program recommended by Bechtel. Coal quality improvement.	Done	Identified candidate power plants for rehabilitation
9.	Life assessment study for TG sets.	To carry out non-destructive testing and various other special test to assess condition of machine and residual life.	Done	Identified candidate power plants for rehabilitation
10.	Identification of needs for upgradation of data processing unit of MPEB (Phase I).	Identification of information needs to top, middle and base levels of management in various functional areas of generation, transmission, distribution, materials management, finance and accounts, construction, personnel and planning and identification of computer applications necessary to fulfill the information and operational needs. Tangible and intangible benefits to be derived from various applications and modifications of existing computer applications with a view to integrate these with overall objectives of Board's data processing.	Done	Identified necessary hardware and software
	Planning for implementation (Phase II)	Recommendation of the priority for the computerization of various identified applications and formulate of plan of action on the basis of approved priorities.		
11.	Workshop on metering billing and collection	Phase I: Focused principally on defining the problems besetting the SEB in this important revenue related area.	Done	Successfully trained MPEB's staff.
		Phase II. Focused principally on the solutions to the identified problems.	Done	

Table 7A. Project Costs

	Estimated *		*Actual* **	
	Rs Million	*US$ Million*	*Rs Million*	*US$ Million*
	Total	*Total*	*Total*	*Total*
Land and Relocation	220.0	22.0	9.7	0.4
Preliminary Works	143.0	14.3	28.8	1.3
Dam	1875.5	187.6	13.9	0.6
Water Conductor System	492.8	49.3	30.4	1.4
Power House Civil Works	108.9	10.9	50.2	2.3
Tail Race Duct and Channel	236.5	23.7	0.0	0.0
Miscellaneous Civil Works	22.0	2.2	0.0	0.0
Turbo-generators and Auxiliaries	1501.9	150.2	0.0	0.0
Station auxiliary Services	98.1	9.8	0.0	0.0
Step-up Transformers	89.3	8.9	0.0	0.0
Switchyard and Transmission Lines	67.6	6.8	0.0	0.0
Thermal Plant Rehabilitation	350.0	35.0	1464.7	46.6
Training, Consultation and DPU Upgrading	30.0	3.0	408.7	13.0
Total Base Cost	**5235.6**	**523.6**	**2006.3**	**65.8**
Physical Contingencies	578.6	57.9	12.3	0.4
Price Contingencies	1413.7	141.4	0.0	0.0
Total Project Cost	**7227.9**	**722.8**	**2018.6**	**66.2**
Interest during construction	0.0	0.0	287.2	9.1
Bank	414.1	41.4	0.0	0.0
Other	1728.9	172.9	0.0	0.0
Front-end Fee on Bank Loan	4.0	0.4	0.0	0.0
Total Financing Required	9374.9	937.5	2305.8	75.4

* This is for the large project, including Indira Sarovar Hydroelectric Power and the thermal rehabilitation and update of data processing, etc.

** This is for thermal rehabilitation and update of data processing etc.

Table 7B. Project Financing

IBRD/IDA	US$ 75.4 M
GOMP/MPEB	US$ 60.4 M

Table 8: Status of Legal Covenants

Text Refer.	Description of Covenant	Comments	Status
4.02	MPEB to carry out a study on metering practices in selected states and exchange views with the Bank on recommendation arising from the study.	The Phase I of workshop on billing & collection was conducted on 5 and 6 02/93. The Phase II of the workshop was held on 07/93.	Compliance after delay
2.01b	Madhya Pradesh relending to MPEB under terms acceptable to Bank (not less than 7.5% per annum).	GOMP relent to MPEB without loan repayment.	Complied partially
2.05d	MPEB furnish a Completion Report to the Bank within 6 months after closing date.		Complied partially
3.02	MPEB shall take out insurance against risks in such amounts as will be consistent with appropriate practice.		Complied partially
3.03	MPEB to submit to the Bank certified financial statements within 9 months of FY end and auditor's report within 12 months.		Complying
3.05	Control energy losses in accordance with program to be agreed with Bank. RAM 10/92: MPEB to forward to Bank action plan to reduce T&D losses to 14% in five years.		Complied
3.06	Increase cash security deposits to equivalent of 2 months sales by FY90.		Complied
3.07	Achieve contribution to investment of not less that 20% of average capital expenditure in FY88 and subsequent years (amended to achieving a 3% ROR).		Complied
RAM 1 (10/92)	MPEB to send final documents relating to commercial section of model bid documents in respect of Procurement of Goods and Procurement of Mechanical and Electrical works for Bank's record.		Complied
RAM 2 (10/92)	MPEB's consultants to review technical specifications for the instrumentation and control systems. copy of MPEB's proposal concerning consultant selection to be sent to Bank.		Complied
SAR 3.35	Furnish quarterly progress report for quarters by mid-January, April, July and October.		Complied

Table 9. Staff Input

	Planned		*Actual*	
Stage of Project Cycle	*Weeks*	*US$*	*Weeks*	*US$*
Through appraisal			0.4	
Appraisal-Board			10.7	
Board-Effectiveness			66.6	
Supervision			55.6	
Cancellation	14		7.7	
Total			**141**	

Table 10. Economic and Costs and Benefits

Due to the amendment and cancellations of the loan and the credits during the course of the implementation, it is not possible to make reasonable IERR comparison between the original and the revised project scope.

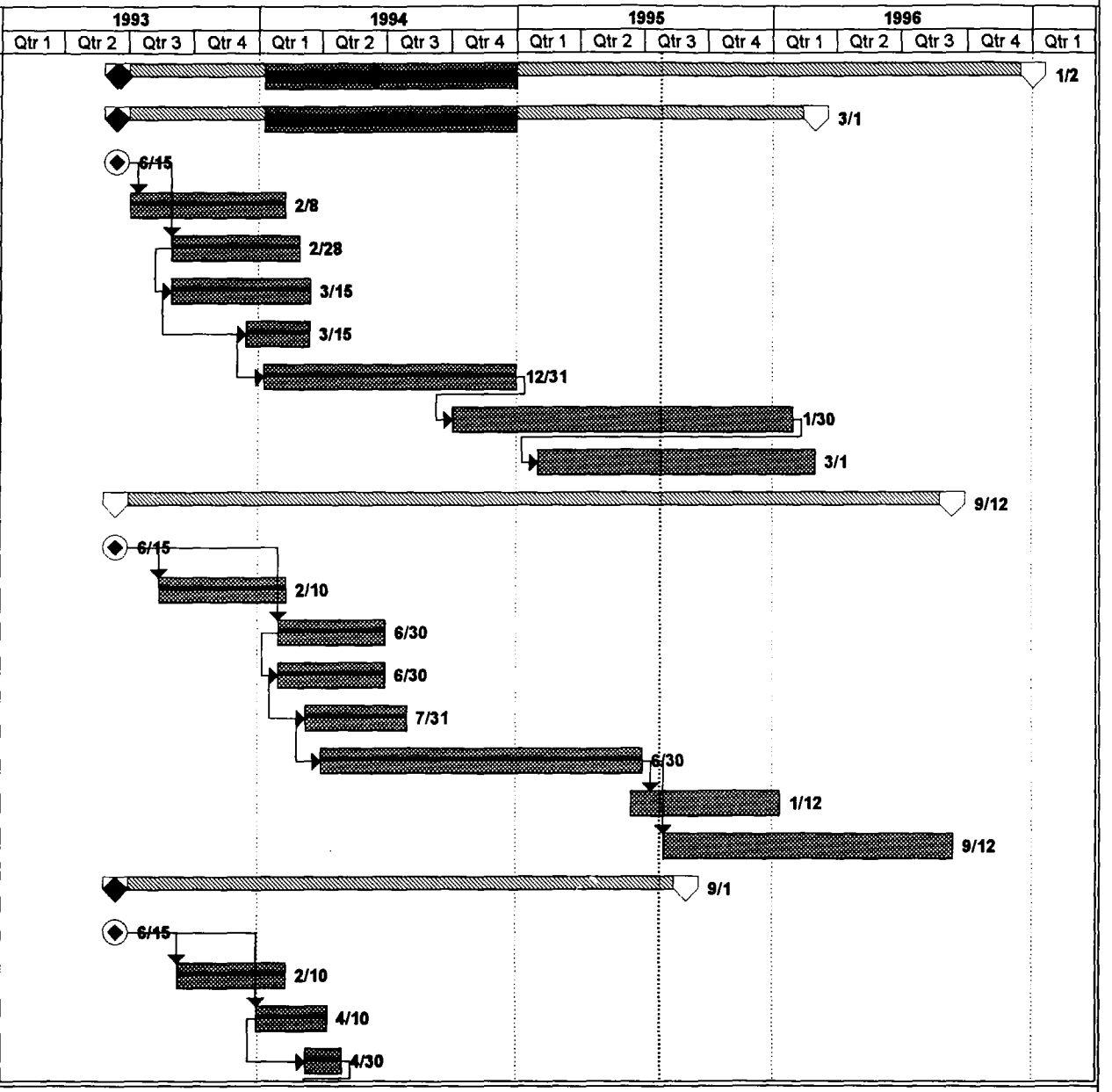
Table 11. Proposals for Private Power Project in Madhya Pradesh

S.No.	*Names of the Projects*	*Capacity MW*	*Name of the Company*
1	Gwalior (Diesel PP)	120	Wartsila Diesel - Finland
2	Ratlam (Diesel PP)	120	GVK Power Limited
3	Bhilai PPs	500	SAIL , Larsen & Turbo, and CEA
4	Tava HEP (Captive)	12	HEG Ltd.
5	Duel Fuel Naptha based - Gas based	330	SRINV Limited, Bombay
6	Korba East PPS - Coal based	500	Daewoo Corporation, South Korea
7	Raigarh PPs - Coal based	1000	Jindal Strips
8	Maheshwar HEP - Coal based	10x40	S Kumars
9	Korba West Extension U-5&6 TPS	2x210	Mukund Limited
10	Pench TPS	2x210	Century Power
11	Bina TPS - Coal based	1000	Grasim Industries Limited
12	Birsinghpur TPS - Coal based	500	Houston Industries Energy India, Gujarat & Ambuja Cement
13	Korba West TPS	2x250	Company name not readily available with MOP also

INDIA
MPEB - Indira Sarovar Hydroelectric Project
Pilot Thermal Rehabilitation Project Component - Detail Project Implementation

Table - 12A: Detail Implementation Schedule

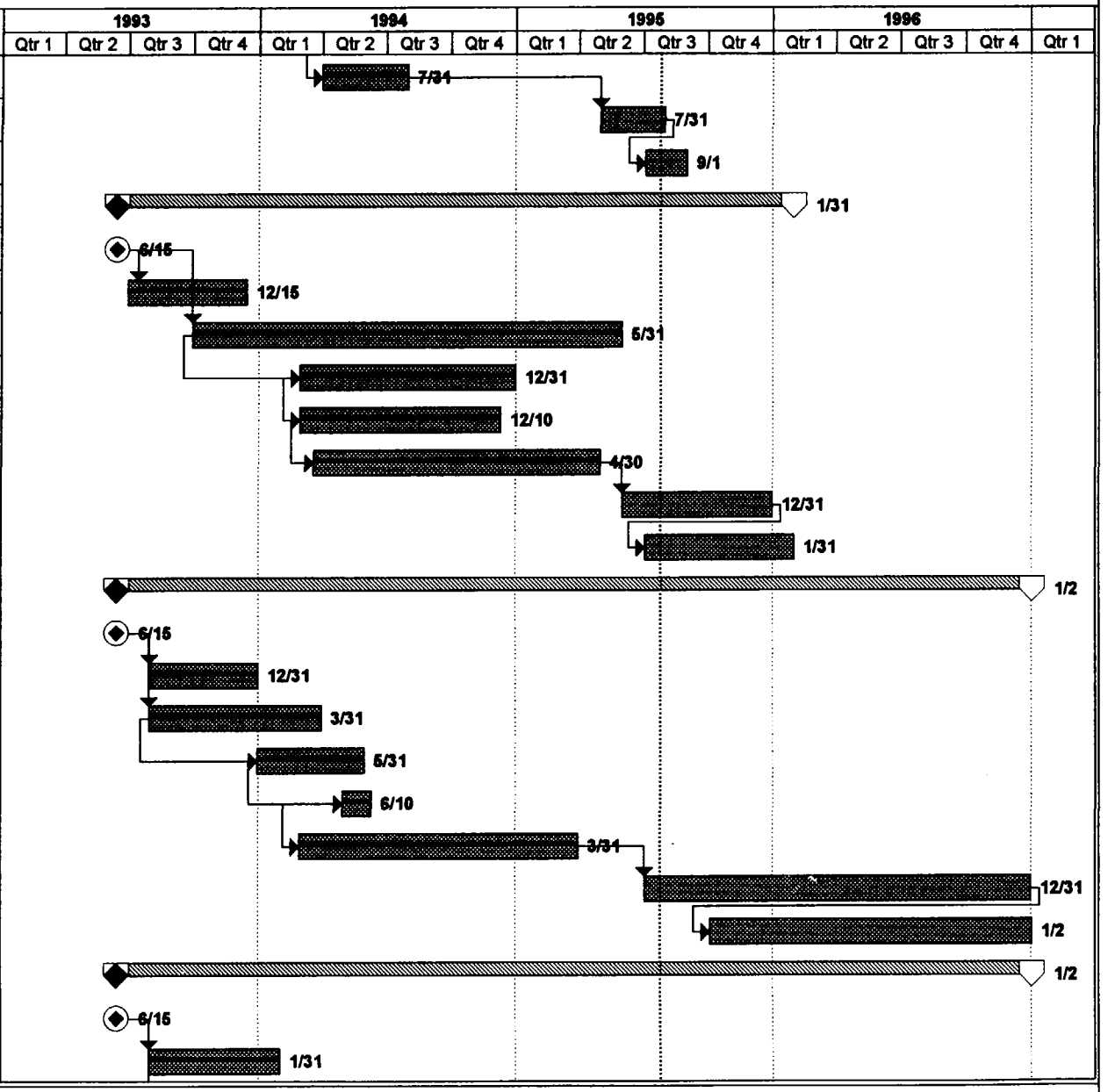
ID	Task Name
1	**Thermal Power Plant Rehabilitation**
2	**Control & Instrumental Equip. (Kota)**
3	Letter of Intent
4	Engineering
5	Procurement of raw material
6	Manufacturing
7	Inspection/Testing
8	Delivery
9	Installation
10	Test & Commissioning
11	**Control & Instru. Equip. (Keltron)**
12	Letter of Intent
13	Engineering
14	Procurement of raw material
15	Manufacturing
16	Inspection/Testing
17	Delivery
18	Installation
19	Test & Commissioning
20	**UPS Syst. for C&I Equip. (Kota)**
21	Letter of Intent
22	Engineering
23	Procurement of raw material
24	Manufacturing



INDIA
MPEB - Indira Sarovar Hydroelectric Project
Pilot Thermal Rehabilitation Project Component - Detail Project Implementation

Table - 12A: Detail Implementation Schedule

ID	Task Name
25	Delivery
26	Installation
27	Test & Commissioning
28	**HP Heaters (Larsen & Toubro)**
29	Letter of Intent
30	Engineering
31	Procurement of raw material
32	Manufacturing
33	Inspection/Testing
34	Delivery
35	Installation
36	Test & Commissioning
37	**ST Rotor Blades for Satpura (BHEL)**
38	Letter of Intent
39	Engineering
40	Procurement of raw material
41	Manufacturing
42	Inspection/Testing
43	Delivery
44	Installation
45	Test & Commissioning
46	**ST Rotor Blades for Korba East (BHEL)**
47	Letter of Intent
48	Engineering

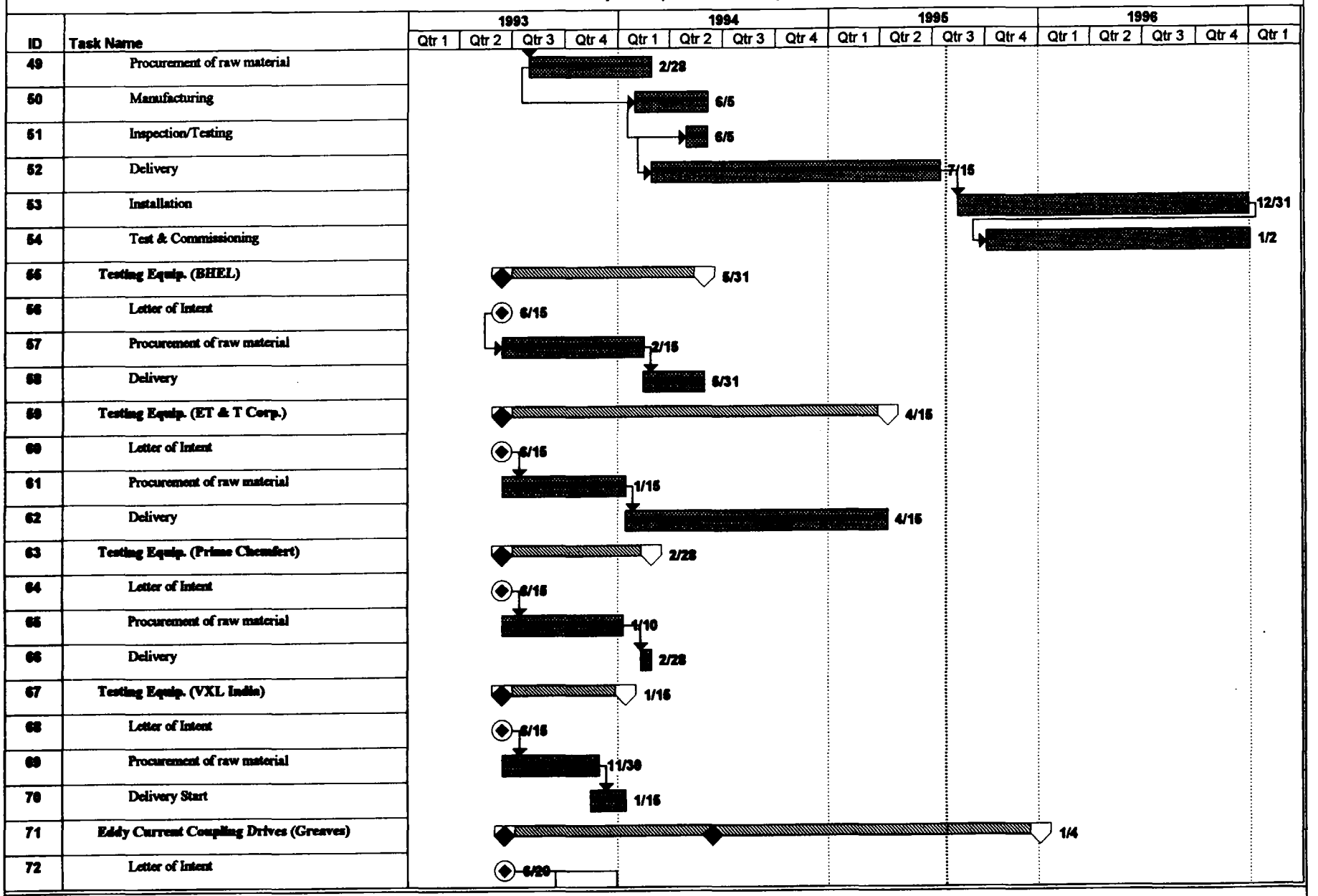


INDIA

MPEB - Indira Sarovar Hydroelectric Project

Pilot Thermal Rehabilitation Project Component - Detail Project Implementation

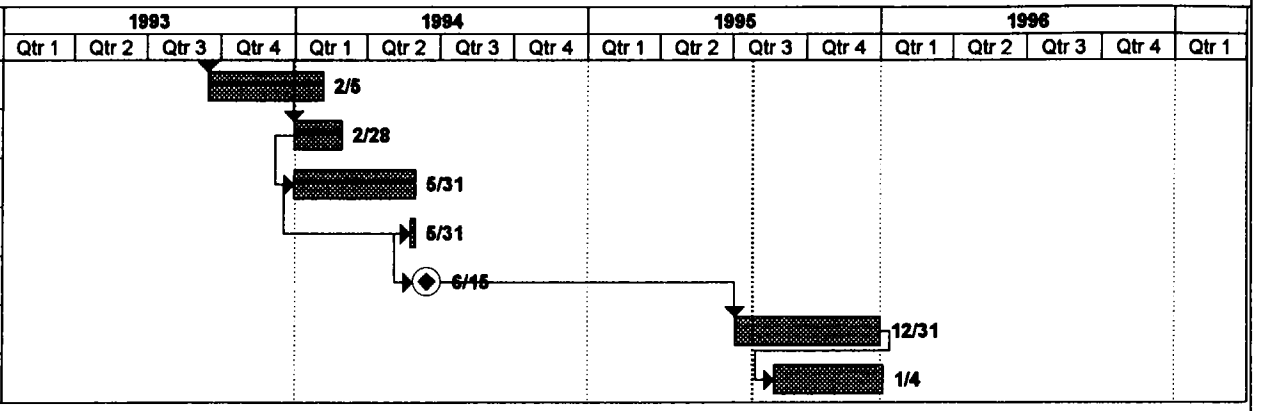
Table - 12A: Detail Implementation Schedule



INDIA
MPEB - Indira Sarovar Hydroelectric Project
Pilot Thermal Rehabilitation Project Component - Detail Project Implementation

Table - 12A: Detail Implementation Schedule

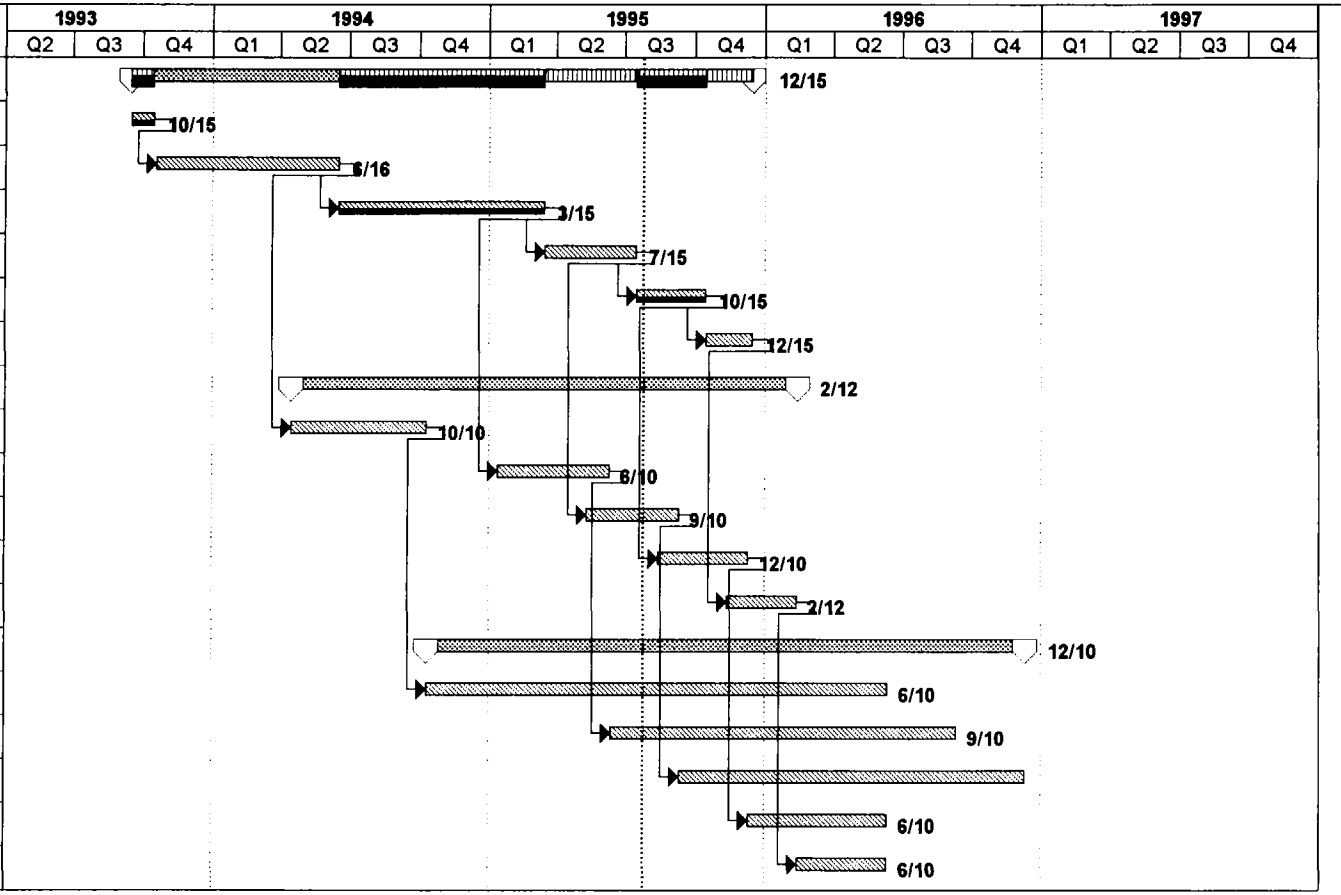
ID	Task Name
73	Engineering
74	Procurement of raw material
75	Manufacturing
76	Inspection/Testing
77	Delivery
78	Installation
79	Test & Commissioning



INDIA
MPEB - Indira Sarovar Hydroelectric Project
Data Processing Facilities Upgrading - Detail Project Implementation

Table 12B: Detail Implementation Schedule

ID	Task Name
1	**Development**
2	Phase 0
3	Phase 1
4	Phase 2
5	Phase 3
6	Phase 4
7	Phase 5
8	**Pilot Implementation**
9	Phase 1 functions
10	Phase 2 functions
11	Phase 3 functions
12	Phase 5 functions
13	
14	**Main Implementation**
15	Phase 1 functions
16	Phase 2 functions
17	Phase 3 functions
18	Phase 4 functions
19	Phase 5 functions



Project: Upgrading the Data Processin
Date: 7/24/95

Task — Summary — Rolled Up Progress
Progress — Rolled Up Task
Milestone — Rolled Up Milestone

APPENDIX 1: Borrower Contribution to the Implementation Completion Report

A. Preface

1. The loan and credits were made to India in March 1985 for on-lending to Madhya Pradesh Electricity Board via Madhya Pradesh state government. The main objective of the project was to provide additional power generation capacity in Madhya Pradesh and thereby in Western Region of India and to strengthen the Board's data processing facilities.

2. However, at a later stage, the Loan 2416-IN and Credit SF-20 were canceled as Indira Sarovar Hydroelectric (Bodhghat) Project could not continue due to environmental constraints and a portion of Loan 2416-IN and Credit SF-20-IN were revived for rehabilitation of thermal plants and upgradation of data processing facilities. In addition to above Credit 1613-IN was also revived for meeting the aforesaid objectives.

B. Comments on the Analysis in Part-I

3. The analysis made by the Bank under Part-I is comprehensive and has covered all the important aspects and is generally in order. Nevertheless, there are certain issues which need to be further examined keeping in view the background of developments as they took to better appreciate the events. These are as follows:

Reference to para 24 and 25:

It is to point out that MPEB took the minimum time for procurement. The consultant's report for the Pilot Thermal Plant Rehabilitation (PTPR) was received in February 1993 where as MPEB had already initiated the procurement process. World Bank approval for issue of Notification for Invitation to Tender (BIT) was received in the last week of January 1993 and NIT was issued in the second week of February 1993. Bids were opened from March 23, 1993 to March 31, 1993 and bid evaluation reports were sent to World Bank vide our letter dated May 15, 1993. The World Bank approved the evaluation reports between May 28, 1993 and June 21, 1993. Letter of intents were issued between June 16, 1993 to June 22, 1993. For Data Processing World Bank approved evaluation report on June 22, 1993 and LOI was issued on June 23, 1993. From the above it is very clear that the work was done expeditiously.

Comments by Madhya Pradesh Electricity Board and Endorsed by the Government of India

Environment, Resettlement and Rehabilitation.

4. In an area of 8149 hectares compensatory afforestation has been completed. The project involved displacement of 8775 persons comprising of 1748 families (1981 census). An elaborate report for compensatory afforestation and resettlement of oustees was submitted to

the Department of Environment and Forest, Government of India in Dec. 1986, making liberal provisions for displacement and rehabilitation including development of a model village for the ethnic tribal groups coexistence. However, due to abandoning of the project as no displacement took place, hence resettlement and rehabilitation was not required.

5. In the context of thermal renovation/modernization and upgrading of data processing facilities there is no additional impact on the environment, as the work is being carried out at already existing power houses. As such the question of resettlement and rehabilitation of population does not arise.

Final Payments

6. The loan was originally scheduled to be closed on June 30, 1992. Since the project configuration underwent major revision due to environmental impact of the project and as such the revised project configuration was approved in February 1989. Thereafter the Bank decided to extend the loan closing date till June 30, 1993 for Loan 2416-IN and till June 30, 1994 for Credits. 1613-IN and SF-20 IN. The total disbursements till closing date for Loan 2416-IN is US$ 9.078 million, for Credit 1613-IN is US$ 5.273 million and for Credit SF-20-IN is US$ 0.511 million.

7. The balance payments to the contractors for completion of the project shall be arranged by MPEB and are likely to continue till June 1997 (that is till erection and commissioning of the activities covered under this scheme).

Procurement

8. This nature of thermal rehabilitation project as also upgrading of data processing facilities was undertaken for the first time by MPEB. As such consultants have been appointed, Overseas Bechtel, Inc. USA for Pilot Thermal Rehabilitation work and Tata Consultancy Services (TCS), New Delhi (India) are for Upgradation of Data Processing Facilities.

9. Pilot Thermal Rehabilitation Project component. After the receipt of Bechtel's final report in February. 1993 and based on their recommendations, the activities were identified, planned and the notification of NIT was issued. After obtaining clearance/concurrence, from appropriate agencies including the Bank, contracts for seven packages were awarded in June 1993. Approximately 36% of the supplies have been procured before the closing date of credits.

10. *Upgradation of Data Processing Facilities.* Further, on the basis of the report submitted by TCS, the package were identified for international competitive bidding with approval of World Bank, right from preparation of specifications. The orders worth Rs. 186.2 million were placed for hardware, software, peripherals and consultancy for development of software. The total package is to be completed by December 1996. Approximately 75% of hardware has been procured till June 1994.

Evaluation of Borrowers Own Performance

11. Pilot Thermal Rehabilitation Project has been carried out for the first time in MPEB and as such apart from achieving the basic objectives, it has also given a valuable experience to the engineers and workers of MPEB. Besides this project has also provided an opportunity for MPEB to gain experience in procurement through ICB procedures which could be later on prove very useful in execution of other projects.

12. Within the short time available, MPEB has performed well for the procurement of goods under the project. Contractors were persuaded to complete the supplies within the stipulated contractual delivery period. In spite of fact that scheduled delivery period up to December 1997 was concurred by the Bank, the credits have been closed abruptly. Had the credits been extended, as expected, the balance expenditure could also have been reimbursed by the World Bank and thus MPEB could have avoided difficult cash availability situation which had to be faced due to midway closure of the loan.

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