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PERFORMANCE AUDIT REPORT

INDIA

PRIVATE POWER UTILITIES (BSES) PROJECT
(LOAN 3344-IN)

June 29, 1999

*Operations Evaluation Department
Sector and Thematic Evaluations Group*

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Currency Equivalents (annual averages)

Currency Unit = Indian Rupee (Rs.)

1988	US\$1.00	Rs. 14.5
1989	US\$1.00	Rs. 16.7
1990	US\$1.00	Rs. 17.8
1991	US\$1.00	Rs. 25.9
1992	US\$1.00	Rs. 25.9
1993	US\$1.00	Rs. 31.4
1994	US\$1.00	Rs. 31.4
1995	US\$1.00	Rs. 33.0
1996	US\$1.00	Rs. 35.7
1997	US\$1.00	Rs. 36.5

Abbreviations and Acronyms

BSES	BSES Ltd. (formerly Suburban Electrical Supply Ltd.)
CRZ	Coastal Regulation Zones
DTEPA	Dahanu-Taluka Environmental Protection Authority
FGD	Flue gas desulfurization
GOI	Government of India
GOM	Government of Maharashtra
ICR	Implementation Completion Report
MOEF	Ministry of Environment and Forestry
MPCB	Maharashtra State Pollution Control Board
NEERI	National Environmental Engineering Research Institute
NGO	Non-governmental organization
OED	Operations Evaluation Department
PCR	Project Completion Report
SAR	Staff Appraisal Report

Fiscal Year

Government: April 1 – March 31

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June 29, 1999

MEMORANDUM TO THE EXECUTIVE DIRECTORS AND THE PRESIDENT

**SUBJECT: Performance Audit Report on India
Private Power Utilities (BSES) Project (Loan 3344-IN)**

Attached is the Performance Audit Report prepared by the Operations Evaluation Department (OED) on the above project. The loan, for the amount of US\$200 million equivalent to the Bombay Suburban Electric Supply Ltd. (BSES), was approved in FY91 and closed, as scheduled, on December 31, 1996. A total of US\$5 million was canceled. The IFC cofinanced the project with a loan of US\$50 million.

The primary objective of the project was to finance a 500 MW coal-based thermal power plant at Dahanu, 120 miles north of Bombay, and associated transmission lines, as well as to support the strengthening of the BSES medium- and low-voltage distribution network.

OED rates the project's overall outcome as marginally satisfactory, its sustainability as likely (respectively satisfactory and likely in the ICR), and its institutional development (ID) as substantial (as in the ICR). The project was effectively implemented within the Staff Appraisal Report's estimated schedule and budget and the generation plant is operating at a plant availability of 90 percent, which is extremely good for a thermal power plant. It is in substantial compliance with the Government of India (GOI) environmental guidelines on emissions. Distribution losses also declined from 14.9 to 11.2 percent. Institutionally, the project enabled BSES to expand from a simple power distribution entity to a fully integrated power company, with operations in generation, transmission, and distribution. This investment was also instrumental in helping BSES expand its equity base and borrowing capacity, and brought private sector ownership from 34 percent before implementation to 67 percent after implementation.

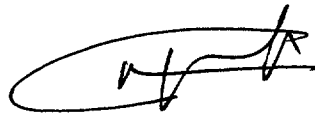
The project's overall outcome rating was downgraded to marginally satisfactory because of the negative environmental impact on the surrounding wetlands, which was not identified at the time of appraisal: the large quantity of ash generated by the domestic coal used in the boilers is stored in specially built ash-ponds that have been built on converted estuarial wetlands. Although the audit rates the borrower's (BSES) performance as satisfactory (as does the ICR), it notes that the performance of the government of Maharashtra was less than satisfactory in the critical area of environmental supervision and reporting. OED rates the Bank's overall performance as satisfactory (as does the ICR), although it notes that the Bank should have taken more care to identify the wetlands issue at appraisal and to follow up with BSES on the Bank's environmental standards for plant operation during the implementation completion review mission.

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The major lessons from this project are:

- The Bank's current policy of supervising projects only until the loan is fully disbursed and closed is inadequate to confirm continued compliance with the Bank's environmental guidelines. For environmentally sensitive projects the Bank needs to continue to supervise after the loan is disbursed. For projects where operating procedures can have a significant environmental impact, agreement should be reached during the appraisal process on the environmental monitoring data to be collected, verified by an independent environmental agency, and submitted to the Bank during the project's operational phase.
- The Bank did not object to the GOI proposal to have the Dahanu plant switch from coal to natural gas when gas became available, even though the shift to gas would result in a high-cost, rather than a least-cost power plant. The Bank needs to be sure that proposals for future actions that appear to be environmentally attractive are also realistic and economically viable. The use of gas at Dahanu, including restructuring the facility into an expanded, gas turbine combined cycle plant, should be carefully reviewed from technical, economic, financial and environmental perspectives. The use of gas would be environmentally favorable, since it would greatly reduce SO₂ air pollution and eliminate ash disposal.
- The MPCB has failed to meet its obligations to supervise and report on the project's compliance with GOI environmental guidelines. The Bank should make successful implementation of environmental agreements a central issue in its ongoing dialogue with the national and local governments, and should avoid lending for any further environmentally sensitive projects where governments have not fulfilled their existing obligations.

Attachment

A handwritten signature in black ink, consisting of a large, sweeping oval shape followed by several vertical and horizontal strokes.

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This report was prepared by Messrs. Richard Berney (Consultant) and Bekir Onsural (Senior Environmental Specialist), who audited the project in September/October 1998. Mr. William Hurlbut edited the report. Ms. Soon-Won Pak provided administrative support.

Principal Ratings

	<i>ICR</i>	<i>Audit*</i>
Outcome	Satisfactory	Marginally Satisfactory
Sustainability	Likely	Likely
Institutional Development	Substantial	Substantial
Borrower Performance	Satisfactory	Satisfactory
Bank Performance	Satisfactory	Satisfactory

Key Staff Responsible

	<i>Task Manager</i>	<i>Division Chief</i>	<i>Country Director</i>
Appraisal	Argun Ceyhan	Jean-Francois Bauer	Heinz Vergin
Completion	Argun Ceyhan	Jean-Francois Bauer	Robert Drysdale

Preface

This is a Performance Audit Report (PAR) on the Private Power Utilities (BSES) Project (Loan 3344-IN) for the Bombay Suburban Electric Supply Ltd.,* for which the World Bank approved a loan of US\$200 million equivalent on June 13, 1991. The loan was closed, as scheduled, on December 31, 1996, with US\$5 million unused and canceled.

This report is based on the Implementation Completion Report (ICR) prepared by the South Asia Region and issued on June 12, 1997, the Staff Appraisal Report, loan documents, project files, and discussions with Bank staff. In addition, an Operations Evaluation Department (OED) mission visited India in September 1998 to discuss the effectiveness of the Bank's assistance with the Government of India (GOI) and the various project implementation agencies. The cooperation and assistance of government officials and management and staff of the BSES Ltd. are gratefully acknowledged.

The Bank loan financed a 500 MW coal-fired power plant and associated transmission facilities, as well as an expansion of BSES's distribution facilities in Mumbai. It was successfully implemented and is operating as planned. The Audit focused on the environmental performance of the project since it commenced full operation, and on the State government's institutional arrangements for continued review of and reporting on compliance with India's and the Bank's environmental guidelines.

Following standard OED procedures, the draft of this PAR was sent to the borrowers for comment. Those comments are included as Annex B.

* In September 1992, Bombay Suburban Electricity Supply Ltd. changed its corporate name to BSES Ltd. The acronym BSES is used for both corporate names in this report.

1. Project Objectives and Description

1.1 In accordance with the Bank's 1988 Energy Policy paper, the South Asia Region began to orient its support to the energy sector in India toward encouraging private sector participation. Two projects were put forward: an expansion of the generation capabilities of the Tata Electric Companies¹ and the project under review, which would assist BSES to build its first power generation plant. The objective of the BSES project was to strengthen private sector participation in the power sector by helping BSES grow from a small regional distribution company to a fully efficient, integrated generation, transmission, and distribution power company, and thereby was to provide additional generation, transmission, and distribution capacity in the Mumbai area to meet increasing demand for electricity.

1.2 The project components included two 250 MW coal-based thermal power units, two 220 kV transmission lines (105 km), three medium-voltage receiving substations to BSES's license area in Mumbai, and the strengthening of BSES's medium- and low-voltage distribution network.

2. Implementation and Results

2.1 *The physical objectives* of the project have been fully achieved. The project was commissioned and put into commercial operation within five months of its original schedule. The completion of the second of the two transmission lines was held up by delays in obtaining some of the right of way, but this did not affect project implementation. In FY98, the average plant load factor reached 85 percent and availability reached 90 percent, an excellent record for a thermal power plant.² BSES has also been highly successful on the distribution side. Distribution losses declined from 14.9 percent in FY94 to 11.7 percent in FY98.

2.2 *Institutionally*, the project enabled BSES to grow from a simple power distribution entity to an integrated power company operating in generation and transmission as well as in distribution. It has been able to expand its equity base and its borrowing capacity. As agreed at project appraisal, new equity offers on the Indian stock exchange have raised the company's private sector ownership from 34 percent before the project to 67 percent after. In addition to the equity flotation, BSES has floated convertible debentures for Rs. 3,500 million (about US\$110 million), which were oversubscribed by a factor of three. Financial performance has also improved substantially. Between FY94 and FY98 company profits increased from US\$23 million to US\$66 million, while return on net fixed assets increased from 6.1 percent to 12.8 percent.

2.3 The ICR rates project outcome as satisfactory and institutional development as substantial. It rates sustainability of the physical benefits as likely (as long as BSES can obtain sufficient fuel of proper quality), and sustainability of the institutional improvements as highly likely. Bank and borrower performance are rated as satisfactory.

1. Loan 3239-IN approved by the Board in October 1990.

2. Load factors of 70% and availability of 80% are considered good for coal-fired power plants in industrialized countries. In India, the average is considerably lower.

2.4 The ICR identifies several major lessons:

- A utility should undertake early public consultations on the project's likely social and environmental impacts in a transparent manner. BSES's proactive approach to addressing the environmental issues allowed it to make design changes at an early stage (including relocating the plant farther from the high-tide line), and withstand court challenges.
- Employment of experienced consultants helped the utility complete the project in a timely manner and minimized the number of permanent staff needed to do the job.
- Coal supply and transportation by railways should be linked under commercially enforceable contracts to ensure timely supply of coal of adequate quality. A commitment by India "to ensure adequate supplies of suitable fuel" is insufficient.
- BSES has had excellent results from using higher quality coal (washed and imported). This approach should be encouraged elsewhere.

3. Issues Raised by the Performance Audit

Environmental Issues

3.1 Environmental issues have played a central role in project appraisal and implementation. Almost from its inception in 1987, the BSES project was challenged on environmental grounds by two non-governmental organizations (NGOs), who contended that the plant was to be built in the only non-industrialized, agricultural area north of Mumbai. Furthermore, they argued that stack emissions (particularly SO₂) would cause significant damage to the environment and to the region's extensive chickoo fruit plantations, that the plant was being built within the intertidal zone (the area between high and low tide), and that the project would endanger fragile wetlands and local marine life.

3.2 Nevertheless, in July 1988, the Government of Maharashtra (GOM) approved site clearance, and in March 1989 the GOI Ministry of Environment and Forests (MOEF) approved the plant design with several provisions: that the major facilities be moved within the site to at least 500 meters from the high-tide line; that a flue gas desulfurization unit (FGD) and a 99.5 percent efficient electrostatic precipitator be installed; and that the boiler be designed for multiple fuel use, so that it could use natural gas if it became available. The two local NGOs subsequently challenged these clearances in the courts. The Bank delayed formal project appraisal and Board presentation until the court cases were resolved. In December 1990, the Mumbai High Court rejected the NGO petition and approved the project. The decision was appealed to the Supreme Court of India, where it was confirmed in March 1991.

3.3 At about the same time that the Supreme Court was ruling on the validity of the environmental permit for the Dahanu plant (February 1991), the MOEF issued a notification establishing the Coastal Regulation Zones (CRZ), and regulating industrial activities in those zones. To conform with these regulations, the project's environmental clearance stipulated that

the plant had to be 500 meters from the high-tide line. There was considerable controversy about the definition of this high-tide line because of the presence of tidal creeks. The Maharashtra State Hydrographer resolved the issue by defining the high-tide line as the dike periphery that had been built to control water flow (in 1983) when the marshland on which the plant was to be built was converted to a salt-pan. In addition, in response to continued NGO pressures, the GOI, in late June 1991, issued a Notification declaring Dahanu-Taluka an Ecologically Fragile Area. Because the approval for the Dahanu power plant was, however, grandfathered. The Dahanu-Taluka area is the first and, to date, the only location outside declared nature reserves to achieve this status in India.

3.4 Both the Bank and BSES took a proactive stand on environmental issues. Even before OD4.00 became operative in October 1989, the Bank insisted on a full environmental review and implementation action plan. BSES drew up a detailed environmental monitoring program, reviewed and approved by the Bank, and hired a senior environmental specialist to implement the program. During loan negotiations in 1991, the Bank reached an agreement with the GOI and GOM that the Maharashtra State Pollution Control Board (MPCB), as an independent government entity, would have responsibility for auditing and reporting on the environmental performance of the power plant. Specifically, the agreement stated that MPCB would semi-annually evaluate the monitoring data prepared by BSES, and would prepare a brief written report (in English and in Marathi) comparing the monitoring data to the requirements of the GOI, GOM, and the World Bank, and would recommend any needed changes to the BSES monitoring program. Furthermore, the parties agreed to the timely release of these reports to all interested parties, including local and national organizations as well as the World Bank Group.

Air Quality standards

3.5 Encouraged by the Bank, BSES reopened the question of the FGD in 1990, arguing that installation was unnecessary because the power plant would meet the most stringent environmental standards (those of California), without an FGD. Air dispersion models showed that under the worst-case scenario, the maximum ground-level concentration of SO₂ would be only 3.2 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) in a 24-hour period, compared to the Indian environmental standard of 30 $\mu\text{g}/\text{m}^3$ for environmentally sensitive areas. The Bank had reviewed these models during appraisal, and based on their results, supported the BSES request to eliminate the requirement for an FGD, which was expected to cost more than US\$39 million (over 6 percent of total project cost). The Bank took the position that BSES would have to comply with the GOI environmental standards and install the FGD if the GOI continued to require it, but that Bank funds could not be used to finance the FGD, because the Bank considered it unnecessary. In a letter to the GOI, dated January 21, 1991, the GOM requested that BSES be exempt from the requirement to install an FGD, as long as the Dahanu plant met the environmental standards of increasing the ground-level concentration of SO₂ by less than 5 $\mu\text{g}/\text{m}^3$ (averaged over 24 hours).³

3.6 The GOI continued to defer the decision on this matter until the Bank informed BSES in early 1993 that in the absence of a MOEF waiver, BSES would have to sign a contract for the FGD by the end of the year (for it to be in operation at plant commissioning). If procurement had

3. This was the standard set by the United States Environmental Protection Agency for the prevention of significant deterioration of air quality.

not been initiated by that time, BSES would be in violation of the loan covenants and the Bank would have had to suspend disbursements. Shortly thereafter, the MOEF decided that the FGD requirement would be waived until air quality measurements for the first 12 months of plant operation could be taken and reviewed, and MPCB could confirm that the plant was meeting the approved standards. This procedure, which the Bank supported, has been applied to all subsequent NTPC coal fired power projects. However, this was an extremely contentious decision with the NGOs, who took the matter back to the courts.

3.7 In 1996, the Supreme Court again rejected the NGO petition. To forestall further direct appeals on what they considered technical issues, the court instructed the GOI to establish an independent, statutory authority, the Dahanu-Taluka Environmental Protection Authority (DTEPA), to monitor and protect the ecologically fragile Dahanu-Taluka area on a continuous basis and to consider and hear all environmental issues in this area. In the order, the Supreme Court stated that the DTEPA should “consider and implement the ‘Pre-cautionary Principle’ and the ‘Polluter Pays Principle’.” In its first major case in September 1998, the DTEPA ruled that the establishment of a “mega” port in Taluka was contrary to the law and would not be permitted. This first major victory of the NGO community traced its roots to the activist stand taken on the Dahanu thermal power plant. The DTEPA currently has under consideration recommendations made by the National Environmental Engineering Research Institute (NEERI) that BSES should be required to install an FGD, and that it should be required to shift from coal to natural gas as soon as this becomes physically feasible. The Audit supports the Bank’s position that an FGD is not needed as long as the SO₂ emissions from the Dahanu plant are below 30 µg/m³. Dahanu’s status as a notified area makes it unlikely that there will be any significant additional sources of SO₂ emissions.

3.8 The Audit mission found that the maximum 24-hour ambient SO₂ levels around the plant are in the range of 15-25 µg/m³, which complies with India’s national standards.⁴ As of the time of the Audit mission (September 1998) MPCB had yet to provide feedback to BSES, MOEF, or the Bank on its findings of compliance or non-compliance with these environmental standards.⁵ It issued the original consent to operate “No Objection Certificate,” which is valid for one year, on June 13, 1990, but never renewed this permit or asked Dahanu to make any changes in its operation.⁶

4. This is substantially above the 5 µg/m³ proposed by MPCB when it recommended that the FGD would not be needed. However, that standard was based on the assumption that other industries might also generate SO₂, and now that the Dahanu-Taluka area has been designated as an environmentally fragile area, no new polluting industries can be established. Therefore, SO₂ levels should not increase, as long as BSES continues to operate its plant in a satisfactory manner.

5. MPCB has explained, in a letter to OED dated February 10, 1999, that while it had suggested the 5 µg/Nm³ quota of SO₂ for the single source of BSES, this was not accepted by MOEF, which maintained the 30 µg/Nm³ quota for ambient air. MPCB also stated in this letter that it has monitored the ambient air quality in Dahanu-Taluka and has found that it meets the MOEF standard. This letter is attached as Annex A.

6. MPCB also notes in its letter that it has not published the environmental monitoring data because the GOI, at the direction of the Supreme Court, has constituted a separate Authority for monitoring the implementation of the Notification of the Dahanu-Taluka region (as an environmentally sensitive region where no additional pollution-creating industries can be built).

Institutional Support for Monitoring Environmental Compliance

3.9 With the encouragement of the Bank, BSES has taken a proactive stand on environmental emissions monitoring and control, and has substantially complied with all environmental standards established by the Indian authorities. To emphasize the importance it places on environmental issues, it established an executive-level Committee of Directors on Environment, with three independent non-executive Members of the Board of Directors, plus the Director (Technical). Its achievements in this area include:⁷

- It has financed a series of laboratory and field studies on the impact of SO₂ on chickoo trees. These studies have demonstrated that the trees are unaffected by the ambient levels of SO₂ found in the Dahanu area;
- It has installed a continuous, on-line monitoring of the flue gas from its stacks and three permanent ambient air quality monitoring stations at locations considered to be at highest risk (plus a mobile monitoring van for random surveillance in surrounding villages), and has provided the Bank with semi-annual due diligence reports;
- It has operated its facilities within the state's proscribed norms for substantially all environmental parameters, and it continues to heighten staff awareness of the importance of environmental protection by prominently displaying its monitoring results;
- It has plant 10-12 million mangrove seedlings on the perimeter of its facilities to stabilize the creek shorelines, and established a 100-meter greenbelt around its plant and colony facilities; and
- It has become a pioneer in the use of washed coal for steam power plants. It built a coal washing facility (a joint venture) at the pit-head to supply the Dahanu plant and other interested private industries.

3.10 Unfortunately, MPCB has not been as active in monitoring and enforcing environmental standards as the Bank expected. It has yet to fulfill the obligation made at loan negotiations to audit the environmental data provided by BSES and to publish the results of its audit. Only one report on the results of BSES monitoring of the Dahanu plant has been made public. This report, prepared in 1994, covered the baseline environmental data collected in 1993. Only after the Bank's repeated expressions of concern that the information was not being made public did BSES bypass MPCB and publish this information. BSES has provided all the appropriate environmental data to MPCB and the Bank at regular six-month intervals since the plant began to operate in 1996, as it agreed to do under the environmental guidelines, and has published this information in local newspapers. However, MPCB has not made its review of this information available to the Bank or to the public. In fact, MPCB has not released any environmental findings

7. In its comments on this report, BSES notes that the Dahanu station has been awarded ISO 14001 Certification for upkeep of the environment and has received environmental performance awards from the Maharashtra Chamber of Commerce, the Indian institute of ecology and Environment, and the International Greenland Society.

or relevant related data since the plant was commissioned in 1996. Thus, the element of providing an independent verification of the data reliability has failed to materialize.⁸

3.11 Without independent verification by MPCB, Bank staff are now confronted with the problem of how to assure the Bank's Board of Directors that the loans made to investment projects will continue to comply with the Bank's environmental requirements. The Bank did not consider this risk factor during appraisal. Although the GOM agreed during negotiations that MPCB should have a central role in supervising the project's environmental compliance, the Bank never appraised MPCB's institutional capability and commitment to carrying out its roles.⁹ For OED, this unfortunate situation raises two critical issues. First, what can the Bank do when a government entity fails to fulfill its agreed obligations after the investment project has been completed? Second, how can the Bank expect to know whether the obligations are, or are not, being met after the loan has been fully disbursed and closed if the Bank stops supervising the project upon completion of loan disbursement?

3.12 *Recommendations.* Where independent institutions, such as the MPCB are expected to play a central role in environmental monitoring, they need to be included in project design in a way that they will acknowledge and accept ownership of their environmental role. One way to accomplish this goal would be to include in the project an institutional strengthening component for the state pollution control entity. This would ensure that the Bank would look carefully at the institutions' needs and capacity during the project design and appraisal process. Participation in the loan negotiations would also provide an opportunity for greater ownership of their role in project implementation.

3.13 When a government institution is unwilling or unable to meet its agreed obligations, the Bank should consider it a serious breach of trust and should treat it accordingly. The only way to accomplish this is for the Bank to refrain from any future lending that might require similar compliance and monitoring of environmental standards. In response to MPCB's failure to implement its monitoring responsibilities, the Bank should refrain from lending to any project in Maharashtra for which MPCB would be responsible for environmental clearances and supervision, until MPCB takes the actions needed to meet its existing commitments to monitor and report on the Dahanu power plant.

3.14 The issue of how the Bank would confirm that BSES is maintaining its environmental commitments should have been raised during the ICR mission, and been reflected in the section of the ICR dealing with Future Operations. This was not done. The aide memoire of the ICR mission mentions a follow-up study of the aquatic resources surrounding the power station site, but otherwise discusses only what environmental management and monitoring had been carried out in the past. The Audit found that the BSES environmental staff and operational management at the site had been focusing all their efforts on monitoring and compliance with GOI/GOM regulations, but were unaware of the details of the environmental compliance agreement reached with the Bank during loan negotiations, and the recommended monitoring plan in the SAR, because these documents had not been transmitted to them by the project development team.

8. MPCB claims that it was not proper to publish data about environmental monitoring while an environmental case against BSES was pending in the Supreme Court. This case was resolved at the end of 1996. See Annex B for the full text of MPCB's full comments.

9. The Bank subsequently provided a loan to strengthen MPCB, but judging from the results of this project to date, the strengthening has not been very successful.

Thus, although the ICR concludes that the project was in compliance with the applicable environmental policies and guidelines of the Bank Group, there is no framework for assuring that the borrower will continue to be in compliance with contractually agreed environmental standards. However, even if a framework had been agreed upon, the Bank would still be unable to meet this obligation to the Board, since it stopped supervising the project after loan disbursement closed. *OED recommends that where project operation involves environmentally sensitive issues, the Bank should reach agreement with the project sponsors, during project preparation, on a specific, detailed set of environmental monitoring data required during the project's operational phase, and on a program for gathering this data, verifying it through an independent environmental agency, and transmitting it to the Bank as was done with this project. Commitment to this program should be confirmed during the ICR review mission in the context of the project's future operational plan. OED further recommends that the Bank should monitor this program during sector strategy reviews, environmental discussions, or other public sector governance reviews, or through short, annual supervision missions focused exclusively on environmental compliance to verify the efficacy of the environmental agency's efforts, and take appropriate action in cases of lack of compliance.*

Land Use and Wetlands Policy

3.15 Site selection followed a long and detailed process, with a governmental commission reviewing the process and approving the final choice. Nine locations were considered, seven landlocked and two coastal. In addition to meeting the power plant's physical requirements (adequate water supply, access to rail transport for coal deliveries, etc.) the primary considerations of the review was to find a site that would minimize the impact on the local population and on the surrounding environment. The former problem was considered the most critical. A coastal site on the outskirts of Mumbai was selected as the most appropriate, but when BSES went to negotiate the purchase of the land, the Municipality of Mumbai informed them that they had to look for another site because this one was too close in, and had already been allocated for further residential expansion. The Dahanu site was then identified and chosen because of its similar characteristics to the original site. It is surprising that it was not included in the original selection search and review.

3.16 BSES, GOI, GOM, and the Bank spent considerable effort on site selection investigation and review. In early 1989, the Bank environmental staff reviewed the site selection process and concluded that "generally the site selection process appears to have been completed in a technically acceptable manner," and that "while it appears that Dahanu may be the best site (of the 10 sites evaluated), the lack of additional environmental and socio-economic information on alternative sites makes a more positive statement on the site selection process impossible." To assure itself that the choice of the Dahanu site was appropriate, the Bank, in mid-1989, commissioned a consultant study to determine whether the selected location was superior to the next two or three best available sites, from the environmental and social prospective. This review concluded: (a) that off-coastal sites would have a problem with obtaining sufficient cooling water; (b) that the Dahanu site had the advantage that it would require no resettlement; (c) and finally, the first coastal site approved by the government review commission would have had the same or similar potential for impacts on the marine and estuarine fauna as does the Dahanu site, (although no evaluation was made of either site to confirm this assertion).

3.17 The Bank's preappraisal mission in 1990 visited several of the potential sites and validated the choice of the Dahanu site as being the closest site to Mumbai with adequate unproductive

land and sufficient water, no settlement, and good access. While noting these advantages, the mission aide memoire was silent on the one major environmental negative of this site: that while the 216 hectares where the plant was to be sited had been degraded by previous use as a salt pan for salt production, and was therefore “unproductive” land, the 536 hectares set aside for the ashponds were undisturbed wetlands. Nor was this fact mentioned in any subsequent Bank documentation, including the Environmental Assessment Executive Summary provided in the SAR.¹⁰ In fact, the SAR justified the entire land conversion on the basis of the already degraded state of the land on which the plant was to be built. It was already a barren wasteland, owing to salt aggregation during its use as a salt-pan.

3.18 Staff who were involved in the original environmental review have explained that when the project was appraised, it was believed that loss of five square kilometers of wetlands (the ash disposal area) as a reasonable tradeoff for avoiding the need to displace and resettle local populations. This may have been an acceptable position at that time.¹¹ Unfortunately, this trade-off was never carefully assessed, and no survey was undertaken to determine this extent of the Dahanu wetlands. What is of concern to the Audit is the apparent lack of due diligence in applying existing Bank policy in terms of both: (a) thorough site assessment, and (b) establishing the possible need for compensatory strategies for the conversion of undisturbed wetlands. Issues such as tradeoffs between environmental and resettlement imperatives need to be brought to the attention of Management (and the Board) so that choices can be made in a transparent manner. It should be noted, in addition, that if such a tradeoff became standard Bank policy, then there would be little protection for wetlands, since they are, by definition, areas without settled populations.

3.19 In addition, the Environmental Audit overlooked that fact that a significant portion of the 216-hectare plot used to build the plant had to be raised by about one meter to eliminate the possibility of flood damage, and that a significant amount of landfill would be required. The

10. The Environmental Assessment Executive Summary provided in the SAR characterizes the project land as follows: “The major impact on the terrestrial environment is the permanent commitment of 816 ha of land to the proposed facilities. However the area affected is not particularly valuable or unique from an environmental standpoint, in both a local or regional context.” And: “The soils on the site tend to be saturated because of the site’s proximity to sea level and the natural cover has been removed by a variety of land uses. The current use involves commercial salt production. The site is not considered a valuable natural habitat because of its current condition.” However, the 1987 Environmental Audit prepared by BSES (and approved by the government) appears to contradict this view. It states that “Only cultivation of salt in a small portion (of the land earmarked for the ash ponds). But the land hasn’t yet been developed for this purpose except about 25 acres.” And the BSES subsequent 1988 Environmental Impact Assessment - Supplemental Report states: “At Agwan village approximately 350 hectares of land belongs to State Govt. from which around 300 hectares are leased as salt pans to various agencies. About 10 hectares only have been developed for salt cultivation. Remaining land remains undeveloped.” Finally, the Bank consultant’s October 1989 report states: “The areas not developed for salt (are) covered with grass. At the time of my visit limited grazing was observed in or near the area slated for development of the slurry ponds.”

11. The Bank’s position on wetlands has continued to involve. The guidelines of OPN 11.02 state only that for wildlands under a hundred square kilometers or for an “insignificant portion” of a specific ecosystem, where development of wetlands is justified, then the less valuable lands should be converted rather than the more valuable. OP 4.04 (which is a conversion of OPN 11.02, Wildlands to the OP format) says: “The Bank does not support projects involving the significant conversion of natural habitats unless there are no feasible alternatives for the project and its siting, and comprehensive analysis demonstrates that overall benefits from the project substantially outweigh the environmental costs.” There is still some lack of clarity about what constitutes “a *significant portion* of a specific ecosystem.” Qualified professionals differ on the definition of “significant portion.” It would be useful for the Bank to clarify its policy on this matter.

questions of where this landfill was to come from, and what environmental standards were to apply to the removal process, were therefore not reviewed.

3.20 The SAR explained that leaching from the ash disposal ponds would be controlled by lining these ponds with clay, and that groundwater quality would be monitored. BSES later reported that this lining was not necessary because, according to its technical consultants, the local soil used for the embankments had a high clay content and was already impervious. However, the Audit mission found significant of seepage through the dykes around the ash ponds. BSES explained to the mission that the seepage could be the result of improper compacting during dyke construction and has confirmed that they will compact the dykes to fix the seepage. Review of the revised ashpond design by an independent authority might have identified the likelihood of such a problem, and provided for improved construction. The Audit also found that there were no test wells near the ponds to determine what impact the seepage might be having on local groundwater. It should be noted that the Audit found no evidence that heavy metals were leeching from the ash; nor was there any evidence that the aquatic wildlife was being harmed by effluents from the plant; nor have fishermen complained about any change in water quality in the creeks.¹²

3.21 **Conclusions.** While most environmental issues were thoroughly reviewed and satisfactorily resolved, Bank approval of ground use decisions on basic land-use tradeoffs were possibly based on incomplete ecological information, and precluded a full analysis of project design options and/or wetlands compensation strategies. The Bank's appraisal mission should have identified the land to be used for the ashponds as undisturbed wetlands, reported this fact, and presented the rationale for using it. The Bank might then have tried to work out some compensating program, such as one in which BSES would purchase an equivalent coastal wetland scheduled for development (such as the original proposed plant site), and dedicate it as an undisturbed "national park" in perpetuity, an approach that would have been consistent with Bank guidelines for wildlands and wetlands. The Bank should also have insisted on an independent soil testing to substantiate the claim by BSES design consultants that a clay liner for the ashponds was not necessary. Finally, the Bank should have evaluated the issue of landfill requirements and where the material would come from.

3.22 **Recommendations.** The Bank has limited options for influencing decisions on the future use of the area currently allocated and approved for ash disposal. Nevertheless, the Bank should ask BSES to study the technical, social, and financial feasibility of shifting the site of any planned new ashponds to an area that is not as environmentally sensitive as the current ashpond area. In addition, the Bank should request that BSES install monitoring wells between the ashponds and the creek and implement a periodic testing program for heavy metals and other potential groundwater contaminants. If contaminants are found, BSES should be required to construct future ashponds with impervious liners.

Coal Supply

3.23 The project was designed to use low-quality India coal, supplied by train from mines about 1,400 miles away. Despite the GOI guarantee to "take, or cause to be taken, all such actions as

12. In its comments on this report, BSES has noted that it has, subsequently, installed a piezometer (groundwater monitoring well) at the ash pond.

would be necessary to ensure the availability of adequate supplies of suitable fuel,” the mine that was assigned the long-term supply linkage did not open as scheduled, and the mines with short-term, replacement linkages were unable to supply the required coal quantities. The supply of coal during the first year of operation was erratic. In addition, the supply of coal wagons was often problematic, and the railroad often shifted coal supplies among consumers based on their interpretation of the optimum use of those limited cars. When the deficiencies in coal production and coal transport became apparent during the first year of plant operation (and the plant had to shut down for 53 days due to insufficient coal), BSES turned to imported supplies from Australia and Indonesia. Large ships bring the coal to within 8-10 km of shore, where it is transferred to barges and brought about 3 km up the Dahanu Creek. This coal had only one seventh the ash of domestic coal currently in use. It can be used efficiently in its boilers up to a ratio of about 1 to 2 with domestic coal. With the decline in import duties from 30 to 10 percent, and the recent decline in international coal prices in line with the drop in international petroleum prices, imported coal has become highly competitive with domestic coal on India’s western coast, and BSES would like to continue to import about 30 percent of its coal requirements.

3.24 The Bank failed to use the project to support the establishment of strong, enforceable contractual relations between the private sector and GOI commercial institutions. For instance, given the weak financial condition of the state railway system, it might have been appropriate to include, as part of the project investment, the purchase of wagons that could be dedicated to the coal transport requirements of BSES. Instead, the Bank appears to have assumed that the existing standard framework would be adequate to resolve all problems in due course. It therefore made the minimum guarantee requirement, that contracts should be signed one year before project completion. This project provided an opportunity for the Bank to help establish a framework agreement for commercialized coal supply contracts. If it had done so, it would have significantly improved the institutional infrastructure that will be needed to support the growth of private sector, coal-fired thermal power generation. Unfortunately, the Bank did not take up the challenge.

Receiving Terminal for Imported Coal

3.25 BSES is currently using a small, temporary facility (initially used to unload plant equipment) for unloading the coal before it is transferred by truck a few hundred yards to the plant. BSES applied for, but did not receive permission to build a permanent terminal facility closer to the plant, because, under the strict interpretation of the CRZ and Dahanu-Taluka Ecologically Fragile Zone regulations are quite strict and the terminal was not part of the originally sanctioned project (at the time imported coal was not considered a politically or financially feasible alternative to domestic coal), the DTEPA denied permission to build this facility. BSES is therefore continuing with what would appear to be a “permanently temporary” facility, clearly a less than optimal solution.

3.26 OED believes that DTEPA should take into consideration broad environmental impacts of its decisions on such issues as building a more permanent, and ecologically more sound permanent coal unloading facility. Coal imports can reduce the volume of ash by 30 percent. A permanent loading facility could, therefore, be justified on environmental grounds, since the environmental benefits from the reduction in land needed for ash disposal are likely to more than compensate for the disturbance created by the new terminal facility. Importing coal also reduces the amount of coal transported 1,400 km on an overburdened national rail system. However, if DTEPA is unwilling to consider the broader economic and environmental benefits from the

introduction of a new facility, BSES may have to look for alternative ways to import the coal, such as shipping the it through existing ports and moving it to the plant site by rail.

Use of Barges

3.27 Barges are used to transship coal from the freighter to the plant. The coal importing company hires independent barge owners for this purpose. Implementation appears to be poorly organized and has created hazardous conditions for local fishermen. The problems include: (i) operating at night without lights, which creates a danger of colliding with other vessels; (ii) operating without defined channels, which can create traffic jams at the harbor's mouth and makes it more likely that they will encounter and destroy finishing nets; and (iii). operating without well-defined, written operating and emergency procedures, which makes it more likely to have spills and accidents and less likely that they will be able to react quickly and efficiently when emergencies do occur. One barge has already sunk at sea because of damage received while loading under inappropriate weather conditions.

3.28 **Recommendations.** To improve the safety of barge traffic OED recommends that (a) barges be equipped with and use full running lights and a forward search light; (b) the channel be marked with buoys to establish inbound and outbound lanes, thereby reducing traffic congestion; and (c) detailed written and posted operating and emergency procedures be established with the assistance of the appropriate marine safety bodies.¹³

Conversion to Gas

3.29 Because of the opposition to the use of coal, the plant was designed so that it could burn natural gas, with the understanding that if gas became available, the plant could be converted at minimal cost. The SAR included this option as an important environmental asset. However, the Oil and Natural Gas Corporation (ONGC) has, to date, been unable to provide gas to BSES. There has never been a gas surplus (at prices substantially below their fuel oil equivalent), and the GOI's priority uses are, first for fertilizers, then for petrochemical, and then for combined-cycle plants, which have an energy utilization efficiency of over 50 percent, compared with the maximum efficiency of a boiler generator of about 32 percent. BSES has, several times, officially requested ONGC that gas be made available.

3.30 While gas is not currently available to the Dahanu power plant, it may become available in the next few years through one of several LNG import schemes currently being planned. However, this gas is expected to be sold at international prices, which are five or six times the current price for local gas of Rs. 16 per million BTU. BSES strongly opposes any efforts to force it to use this imported gas at its existing Dahanu facilities, because the cost would drive BSES electricity prices to levels that would be insupportable in the market. OED supports this position.

3.31 **Conclusions.** Shifting the Dahanu power plant from coal to natural gas would entail high financial costs for BSES, costs that would have to be passed on to its customers. Technically, large-scale coal-fired boilers (especially one with an oversized design so that it could use low-quality India coal) become inefficient, high-cost generating plant if they have to use natural gas.

13. In its comments on this report, BSES notes that it has issued instructions to coal handling contractors to provide suitable lights.

They have capital costs substantially greater than do combined-cycle plants of the same size, and are about one third less efficient in their use of gas. Given the high economic and financial cost of converting a coal fired thermal power plant from coal use to natural gas use, the Bank should have rejected the inclusion of a gas burner option. Such a plant could never be part of a least-cost power development program if it were to use gas. The idea of a dual-fired plant appears to have been introduced without any analysis of the economic costs of implementing it, probably because no one thought that gas would ever become available. Even the most cursory analysis would have shown that it could not make economic sense.

Expansion of Capacity

3.32 However, there could, possibly, be a way to economically shift to gas within the context of an expansion of generating capacity at Dahanu. BSES would like to expand its generating capacity, and had requested permission to expand the Dahanu plant by installing a second 500 MW coal-fired plant. Such an expansion would be cost effective because it would allow the more efficient use of many subsidiary facilities. It had received preliminary permission for this plant expansion from the GOM, even though such an expansion would be contrary to the GOI plant approval, and the GOI's February 1991 coastal zone regulations, and the June 1991 Notification declaring Dahanu an Ecologically Fragile Area. The request was rejected by the DTEPA, however, and BSES is planning a new naphtha-fired plant farther north.

3.33 An expansion of generating capacity at the Dahanu site, using gas turbine generators when LNG becomes available, might yet prove to be acceptable to all parties, if it were to eliminate the need to use coal as a primary fuel. This could be accomplished through the addition of large-scale gas turbines and the conversion of the existing plant to the second stage of a combined-cycle gas-fired plant. The use of gas instead of coal would be greatly preferred from the environmental standpoint. It would resolve the issues of ash disposal and ashponds, coal transport over 1,400 km, coal import and transport by barges, the strengthening of the jetty, and SO₂ and particulate emissions. However, the critical determining factors would be the technological and economic feasibility of such a conversion and its impact on the price of electricity to BSES consumers. If technically and economically feasible, DTEPA and the various NGOs and civic organizations would all have to agree that a 1000 MW expansion that allowed an economical shift to gas was within the spirit of the environmental concerns of the Dahanu Notification and the CRZ regulations, even if it is not strictly within the construction approval norms. Therefore, OED recommends that BSES consider commissioning a detailed feasibility study of the conversion option and discuss the results with all concerned local parties.

Support for Tribal People and Local Economy

3.34 The Bank, GOI, and GOM agreed to include a project component that would directly assist local tribal people. This program, as proposed in the SAR, was to be financed by bilateral agencies, not by the Bank or the BSES. It failed to materialize because the bilaterals were focused on helping the indigenous tribal people, and the implementation studies concluded that since the power plant had no direct negative impact on indigenous people, and since tribal people made up more than 75 percent of the local population, the best way to help tribal people would be to support broad improvements at the village level, including water availability and improved roads. However, because the recommendations were not focused on specific problems of tribal castes, the normal bilateral funding sources could not be tapped, and no other sources were available.

3.35 BSES has, on its own, taken steps to fulfill its social responsibility for helping the local population. It has contributed to community welfare at Dahanu by developing community drinking water facilities, streetlights, and roads; participating in an adult education program; providing stipends to support higher studies by local students (20 per year); and constructing two primary schools. It has established a Junior College of Science at Dahanu by adding to the existing College of Arts and Commerce. It has also supplied equipment for biology and physics/chemistry laboratories. The new science curriculum started in the 1997 academic year, but the building that is supposed to house these laboratories is still under construction. Consequently, the labs are being housed in the existing Arts and Commerce building. It is hoped that BSES will be able to complete its science building in the near future. To strengthen the program, BSES might also consider allowing some of its technical staff to assist in teaching the science curriculum.¹⁴

3.36 *Conclusion.* Adding a social project component that was expected to provide benefits for an inadequately defined group that did not suffer any harm from the project greatly increased project complexity and, when nothing was accomplished, created some resentment among members of the local community. The Bank was searching for a solution before it had identified a problem. Too much effort was spent because the Bank decided that it would be a good thing to do something, without figuring out what could or should be done. While the Bank should support efforts by large borrowers to ensure that some of the benefits of the project will accrue to the local populations, it should avoid adding components that are more of a wish than a promise.

4. Ratings

4.1 *OED rates the overall outcome of the project as marginally satisfactory and sustainability of project benefits as likely.* On the technical level, the project was highly successful. The new generation facilities have enabled BSES to reduce the amount of power purchased from the state grid, and will help shield BSES from the potential institutional and financial problems of MSEB. The power plant load factor increased from 73 percent in FY97 to 85 percent in FY98, all technical operating parameters were better than the operating norms for the Dahanu equipment configuration. The plant is in substantial compliance with India's current environmental regulations. The project's overall outcome was downgraded to marginally satisfactory because, when judged against the criteria established at appraisal and presented to the Board, it fell short on environmental grounds, in that it has a significant, unexpected negative environmental impact on the surrounding wetlands. Sustainability was rated as likely because, after taking into account the loss of the five square kilometers of wetlands, the project is not expected to create any further damages. In fact, in the long run, environmental protection of Dahanu-Taluka region is likely to have been considerably strengthened by its new status as a Notified Ecologically Fragile Area, which was achieved, at least in part, through the efforts of the local NGOs to resist the building of the power plant. This Notification will greatly impede the conversion of its agricultural and agricultural lands to industrial use.

4.2 *OED rates the project's institutional development impact as substantial.* The success of this project has given BSES the financial strength and technical confidence to take on a wide range of new power-related investment activities in other Indian states. In conjunction with joint

14. In its comments on this report, BSES notes that the building has been completed and is being used for classes.

venture partners, it is in the process of implementing generation projects in Kerala (160 MW), Gujarat (57 + 108 MW), and Tamil Nadu (250 MW), and is bidding for generation projects in Andhra Pradesh and distribution privatization projects in Orissa and the Union District of Delhi. BSES has established itself as a significant actor in India's drive to expand private sector participation in the power sector.

4.3 *OED rates Bank performance as satisfactory.* Project design and appraisal were satisfactory from an environmental standpoint, in that a major effort was made to ensure that the plant would meet emission control requirements, and the Bank's efficient supervision helped ensure that the project was completed on time. Nevertheless, OED believes that the significant issue of the use of undisturbed salt marsh wetlands should have been raised and debated during the appraisal process. In addition, the weak relationship established with MPCB, and the lack of adequate supervision of this relationship, and most important, the lack of adequate mechanisms for monitoring compliance after the project went into operation, leaves serious questions about the Bank's ability to ensure compliance with the high environmental standards it requires in projects it finances.

4.4 *OED rates the borrower performance as satisfactory.* BSES implemented its project as agreed and has worked hard to meet the agreed environmental standards.

5. Conclusions and Policy Lessons

5.1 The Bank did not object to the GOI proposal for switching the Dahanu plant from coal to natural gas when gas becomes available. But if this switch were to take place, the justification for supporting the investment would be destroyed, because the plant would no longer qualify as a least-cost generation option. The Bank needs to be sure that proposals for future actions that appear to be environmentally attractive are also realistic and economically viable. *Bank appraisals should, therefore, include an economic evaluation of all proposed future changes in the way the project is to be operated.* This evaluation would ensure that uneconomic options are not included in the project design just to make it appear more environmentally friendly than it actually is. The most economical solution for switching to imported gas would probably be to add gas turbine generators and convert the existing plant for use in a second-stage heat recovery boiler in a combined-cycle operation, and the Bank should encourage BSES to carry out a thorough feasibility study on this option.

5.2 The Bank's current policy of supervising projects only until the loan is fully disbursed and closed is inadequate to confirm compliance with the Bank's environmental guidelines. *For projects where operating procedures can have a significant environmental impact, agreement should be reached during the appraisal process on the environmental monitoring data to be collected, verified by an independent environmental agency, and submitted to the Bank during the project's operational phase.* The Bank should continue to review this data after loan closing, in the context of its country sector work program. Short, focused supervisions should be considered to verify the efficacy of the environmental agency's efforts.

5.3 The MPCB has failed to meet its obligations to supervise and report on the project's compliance with GOI environmental guidelines. *The Bank should make implementation of environmental agreements a central issue in its ongoing dialogue with the national and local government, and should decline lending for any further environmentally sensitive projects where*

governments have not fulfilled their existing obligations. The Bank needs to be convinced that the GOM will comply with its environmental commitments before it agrees to any new projects in Maharashtra requiring similar environmental supervision and reporting commitments.

5.4 The social-action project component, which was intended to “do something” for the indigenous tribal population, lacked focus. Consequently, local expectations were raised, and then disappointed when nothing was accomplished. *Social action programs should only be included in projects when there is an agreement on their specific objective.* For the Bank, the primary objective should be to ensure that the standard of living of groups affected by the project would not decline. These groups need to be clearly identified, and an action program needs to be fully formulated before the project is presented to the Board.

Basic Data Sheet

PRIVATE POWER UTILITIES (BSES) PROJECT (LOAN 3344-IN)

Key Project Data (amounts in US\$ million)

	<i>Appraisal estimate</i>	<i>Actual or current estimate</i>	<i>Actual as % of appraisal estimate</i>
Total project costs	653.3	613.6	94%
Loan amount	200.0	195.0	97%
Cofinancing (IFC)	50.0	50.0	100%
Cancellation	-	5.0	-
Date physical components completed	12/31/98	4/97	-
Economic rate of return ²	22%	15.7%	-

Cumulative Estimated and Actual Disbursements

	<i>FY91</i>	<i>FY92</i>	<i>FY93</i>	<i>FY94</i>	<i>FY95</i>	<i>FY96</i>	<i>FY97</i>
Appraisal estimate (US\$M)	-	46.5	84.5	152.7	175.1	197.5	200.0
Actual (US\$M)	-	32.6	76.7	128.8	165.4	176.6	195.0
Actual as % of appraisal	-	70.1	90.8	84.3	94.5	89.4	97.5

Date of final disbursement: 05/17/95

Project Dates

	<i>Original</i>	<i>Actual</i>
Identification		January 1989
Preparation	March 1989	
Preappraisal	September 1989	October 19, 1990
Appraisal	November 1989	February 11, 1991
Negotiations	April 1990	May 6-10, 1991
Board approval	July 1990	June 13, 1991
Signing		July 12, 1991
Effectiveness	October 12, 1991	July 29, 1991
Project completion	December 31, 1995	April 1997
Closing date	December 31, 1996	December 31, 1996

Staff Inputs (staff weeks)

	<i>Planned</i>		<i>Actual</i>	
	Weeks	US\$('000)	Weeks	US\$ ('000)
Through Appraisal	30		94.2	249.1
Appraisal-Board	6		21.2	66.2
Supervision	24		57.1	189.1
Completion	10		3.8	14.7
Total	71		176.2	519.1

Mission Data

	<i>Date</i> <i>(month/year)</i>	<i>No. of</i> <i>persons</i>	<i>Staff days</i> <i>in field</i>	<i>Specializations</i> <i>represented</i> ¹	<i>Performance</i> <i>Rating</i> ²	<i>Types of</i> <i>problems</i> ³
Through appraisal						
Appraisal through Board approval						
Board approval through effectiveness						
Supervision	11/91	2	2	E, EC		
	11/91	2	2	E, EC		
	2/92	2	3	E, FA		
	10/92	2	5	E, FA		
	6/93	3	6	E, EN, FA	2	Env, Studies
	10/93	3	4	E, EN, FA	1	Env
	2/94	5	4	E, FA, ENSP	1	Env
	6/94	5	3	E, FA, EN	1	
	11/94	3	3	E, EN	1	
	7/95	2	2	E, EN	1	
	11/95	3	2	E, FA	1	
	3/96	2	4	E, EN	1	
	10/96	1	2	E	S	
	2/97	1	2	E	HS	
Completion	11/96	1	5	E		

1. E= Engineer; FA = Financial Analyst; EC = Economist; ENSP = Environmental Specialist; SP = Specialist

2. 1 = No or minor problems; 2 = Moderate problems; 3 = Major problems; HS = Highly Satisfactory; S = Satisfactory

3. Env = Environmental; I = Implementation delays; IN = Institutional problems; PR = Procurement delays

Other Project Data

Borrower/Executing Agency:

FOLLOW-ON OPERATIONS			
<i>Operation</i>	<i>Credit no.</i>	<i>Amount</i> <i>(US\$ million)</i>	<i>Board date</i>
None			

Comments from the Borrower

S. S. DUA

B. Sc., Engg. (Elect.) FIPE, FIE
Director (Tech.)



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PPU/001/SSD/99

25th June, 1999.

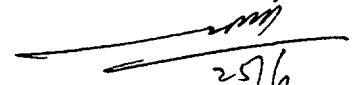
Dear Mr. Ingram,

Sub : INDIA – Private Power Utilities (BSES) Project (Ln 3344 IN)
Draft Performance Audit Report :

Further to our letter dated 19.05.1999, we are enclosing herewith our comments on the various issues raised in the Performance Audit Report of the Bank. We feel grieved to note that your audit team has termed Performance Audit Report of Dahanu T.P.S. as "down graded to marginally satisfactory". As you are aware, BSES has all along made all possible efforts to maintain the performance so that Dahanu T.P.S. should become ideal station. We hope the bank will re-consider the report in the light of our comments.

With kind regards,

Yours sincerely


25/6
S.S. Dua
Director (Technical) 

Encl : As above.

Mr. Gregory K. Ingram,
Manager,
Sector and Thematic Evaluation Group,
Operations Evaluation Dept.,
1818, H Street NW,
Washington DC, 20433
U.S.A.
Fax No.(202) 522-3123

SUB : INDIA : PRIVATE POWER UTILITIES (BSES) PROJECT (LOAN 3344-IN) : COMMENTS ON THE PERFORMANCE AUDIT REPORT OF BSES DAHANU PROJECT :
REF : WORLD BANK COMMUNICATION DT: 3.5.1999 ENCLOSING THE MEMORANDUM TO THE EXECUTIVE DIRECTOR AND THE PRESIDENT OF THE BANK :

We make a note of bank's operation team's comments about the performance of BSES's Dahanu Project, which is presently operating at an availability exceeding 90%. It has also highlighted BSES's efforts to bring down the losses from 14.9% to 11.2% and operating the station with a PLF of exceeding 70%. Although this meant as an excellent performance, your operational team has, despite all this, concluded that the overall performance of BSES's project as a marginally satisfactory. For this they have identified reason as due to negative environmental impact on the surrounding wet land, which according to them was not identified at the time of the project appraisal. Your OED group has also identified that MPCB has failed its obligation to supervise the report on the project compliance with GOI environmental guidelines.

We have very carefully examined comments made in the OED report and have to submit the following for your kind considerations.

At the outset, we do not agree with the conclusions drawn in the report that there is a negative environmental impact on the surrounding wet land. Further, we also do not agree that proper appraisal was not made in this regard during project stage. In this regard we would like to submit the following for your kind considerations :-

As you are aware, there were considerable discussions at the time of selection of site between us and GOM. Our site selection team had identified and recommended site close to Bassein (Vasai) much nearer to Mumbai City. After extensive investigations this site had a definite advantage due to nearness to BSES's licensed distribution areas and would result in considerable saving due to transmission line etc. The GOM, however, did not agree to this proposal on the plea that this was falling within the limits of BMRDA. It was only after considerable discussions and dialogue, the present site was cleared. The present site was duly inspected by the then Principal Secretary, Department of Environment and Energy, GOM who had fully examined all the relevant issues in details pertaining to this site. Only after he was fully satisfied the GOM consented to allot this piece of land. A copy of the relevant document in this respect dt: 30th August, 1989 is appended for your reference as Annexure -1.

On getting consent BSES made complete EIA studies and a Detailed Project Report outlining the layout of the power project equipments and ash disposal area were submitted to CEA, which was fully scrutinised by CEA, GOI as well as MOE&F and the project report was duly approved.

CRZ regulations became applicable in the year 1991. This necessitated identifying the High Tide Line (HTL), although the layout was finalised the same was modified in keeping with the HTL, which was duly certified by the Hydrographer, GOM. The Bank was duly informed of this development.

As regards ash disposal yard, no such construction of building etc. was envisaged and as such identification of HTL was not considered necessary. This should not at this stage be construed as lapse.

BSES however, carried out aquatic baseline studies for this area including ash disposal area by engaging services of NEERI in 1991-92. In their report NEERI opined after their first reconnaissance survey, that they did not anticipate any fish breeding in the zone reserved for ash dumping. In their final report, they had brought out that ash disposal site was identified as marshy area with ridges and furrows. They had also observed three major plant species in this area, density was maximum for *Acanthus sp.* followed by *Salvadora sp.* and *Avicennia marina*. However, only about 10% of this area is covered by these small shrubs and remaining portion is either grassy or barren. This status therefore concludes that the ash disposal area was a barren land and was ecologically not significant since any fish breeding was not anticipated.

The entire ash handling and disposal layout was designed in consultation with the reputed consultants M/s. Development Consultants Pvt. Ltd. As regards ash disposal yard, the entire design was finalised in consultation with Central Design Organisation of GOI, which is authority for such types of design.

BSES carried out soil investigation studies through VJTI, who had on soil investigation opined that the soil in the proposed ash pond area was impervious. However, as desired by the Bank, BSES has now installed piezometer at ash pond to monitor the water quality.

The Bank's environmental specialist Mr. Alfred Picardi was fully apprised of all these aspects. He also had discussions with the Member Secretary, MPCB and other officials of Energy and Environment Departments, GOM. The abstracts from BTO report of Mr. Picardi, Special Environmental Consultant to the World Bank dt: 2.6.93 is reproduced below for your reference.

Para - 3.3.3 " The project has undergone extensive environmental review by the Bank, Indian High Courts, and the MPCB. According to the Executive Secretary of MPCB, (phone interview with Mr. D.R. Rasal on 20th April 1993,) the wetland issue has been evaluated. These evaluations were made on the basis of locating the ash pond site to South (undisturbed marsh).

Para 5.0 - Summary of phone interview with D. R. Rasal, Executive Secretary MPCB. "The location of ash pond has been cleared with the State of Maharashtra, and the wetland issues have been examined."

MPCB had clearly indicated that location of ash pond was cleared by the State Government and that the wetland issue has been fully examined.

From the above, it will be seen that BSES had then taken all necessary due precautions in the matter of selection of ash pond area and that no efforts were left.

As regards small breach noticed by your operations team during their visit to the plant, which was incidentally a very heavy rainy day. It may be stated that this was only accidental and sealed promptly. We feel it would not be proper to draw a hard conclusion on this observation.

In the Report, it is pointed out that landfill was obtained from independent contractors, without BSES control. In this regard, it is to submit that the landfill material was obtained from borrow pits of BSES land only through various independent contractors, which were then worked for BSES on the Dahanu Project site. This aspect can as well be verified even now from the borrow pits which are still existing. This was also brought to the notice of your team, who have also taken photographs of the same.

Your OED team has recommended that leaching in the pond could be controlled by lining these ponds with clay. In this regard, it is to submit that BSES has gone ahead with the advise from the CDO who are the authority on the designs. All the same Bank's observation made in the report would be brought to the notice of CDO for their comments and if approved by them a suitable correction can be incorporated. Audit report brings out that there are no test well near the pond to determine the impact of seepage. Apart from this small instance, your team did not find any harmful effect on the aquatic life. Neither there have been any complaints in this regard.

The bank has expressed feasibility of establishing a new ash pond. However, we are of the opinion, in view of the various aspects as covered above, there is no such necessity to shift the ash pond area to any new location particularly since BSES has been fully complying to the various statutory requirements.

On the issue of wetland, some NGOs have been raising objections. However, this is right from the inception stage of the project and has been dealt with in the various judgements of the High Courts and Supreme Court, of which the Bank is fully aware. The same group has been offensive right from the beginning and has also gone to the extent of approaching WWF, U.K. We have already comprehensively replied to the bank on the issues raised by the NGO.

Further we are glad to mention that BSES has done its best to maintain the environmental standards and the quality. We are glad to inform you that Dahanu station has been awarded ISO 14001 Certification for the upkeep of the environment. Besides this, BSES has also been awarded following certifications, copies of these are appended as Annexure-2.

- 1) International Greenland Society Golden Award for Environment.
- 2) Maharashtra Chamber of Commerce Environmental Award
- 3) Institute of Ecology and Environment Award

Comments on the MPCB :

As regards comments on the MPCB, MPCB has failed to meet its obligation to supervise the report on the project compliance. It is to submit that MPCB has been regularly monitoring impact on the environment while plant is in operation at full rated capacity. Their teams have been regularly visiting and carried out environment impact assessment. Further, MPCB has very wide areas to cover and they have been functioning generally in the orbit of their guidelines. Environment has become a very sensitive issue, they have to keep themselves vigilant in strictly fully monitoring the same. Further MPCB was satisfied that BSES had been publishing the environmental audit report regularly in the local newspapers. We may mention it here that against this compliance no such response was received from any individual. In our opinion, it would therefore be improper to implicate MPCB in this regard.

Comments on the barge movement for the coal traffic, These have been noted and necessary instructions have been issued to the coal handling contractors to provide suitable lights.

The report also brings out that BSES should switch over to the use of gas. In this regard, it is to submit that BSES had corresponded with the concerned authorities of GOI, viz. Ministry of Petroleum, for the linkage of gas for this project right from the inception stage. This was, however, not approved. We had again approached them in the year 1997, however, the same was again refused. Copies of these letters are appended herewith for your reference.
Annexure - 3

In order to satisfactorily contain the impact of environment within the approved parameters of the environment, BSES has taken various measures as listed below :

- i) Providing 275 Mtrs. high stack to minimise the emission level on the ground.
- ii) BSES has provided well designed ESP having efficiency of 99.9% even when one field is out.

iii) In order to reduce the impact due to sulphur in coal, BSES has resorted to use only high quality imported coal having very high CV and very low sulphur contents. Further, Indian coal has only negligible sulphur content, less than 0.3 to 0.4%, BSES has all along been ensuring that the impact due to SO_x is maintained within the stipulated norms and so far there has not been any violation.

iv) BSES has established its own coal washery unit at the colliery end which has already been taken in operation.

BSES engaged the services of expert Botanist Dr. S.B. Chapekar, who has advised on growing green belt around the power project. BSES has also taken assistance from FDCML for extensive tree plantation.

In view of all these measures and in view of the fact that BSES has all along been operating the station within limits of approved parameters, in our opinion change over to gas or LNG at this stage is not necessary and increase in the cost of generation due to use of LNG will unnecessarily reflect in additional burden to the consumers. This aspect be examined.

The construction of Junior College of Science has been completed by BSES few months back. It is now a two storied building and classes have already started in the new building. Also laboratory has been established in the existing college building since 1997 with the understanding with the society running the college. Laboratory has been set up in the existing building on permanent basis. BSES takes part in the college activities by representing the college governing body and management body. The Audit teams observation for assisting in teaching the science curriculum is highly appreciated by BSES and will extend full support to the college authority as and when need arises.

In view of the foregoing, we request you to consider the conclusions arrived at in OED's report.

MAHARASHTRA POLLUTION CONTROL BOARD

Grams : "PREPOLL"
 Tel. No. : 269 23 45 / 261 43 48
 : 261 44 59 / 267 91 07
 : 267 05 14 / 267 08 85
 Fax (022) : 261 23 20



Shri Chhatrapati Shivaji Maharaj,
 Municipal Market Bldg., 4th Floor,
 Mata Ramabai Ambedkar Roac.,
 Mumbai-400 001

No. MPC/WB/ B-3546

Date : 23 -6-1999

To,

Mr. Gregory K. Ingram, Manager,
 Sector and Thematic Evaluation Group
 Operations Evaluation Department,
 The World Bank,
 1818 H. Street, N.W.
 Washington, D.C. 20433

Sub : India Private Power Utilities (BSES) Project
 (Loan 3344-IN) Draft performance audit report.

Ref : This office letter No. MPCB/B-890,
 dated 10-02-1999.

....

Dear Sir,

We have gone through the draft performance audit report on 'India Private Power utilities (BSES) Project' prepared by the World Bank for presentation to the Board of Executive Directors. Very critical remarks about publication of data regarding environmental monitoring by the Maharashtra Pollution Control Board have been mentioned in this draft report. We would like to clarify in this matter as below.

There has not been any direct communication from World Bank about requirement about external audit of environmental monitoring done by BSES, by MPCB and publishing the data regarding environmental monitoring by the Govt. of Maharashtra. The project proponent M/s. BSES Ltd. had communicated the terms of environmental audit as below -

1. The MPC Board will, on a semi annual basis evaluate the monitoring data provided by BSES.
2. MPC Board will prepare brief written report (in English and in Marathi) comparing the monitoring data to the requirements of Govt. of India, Govt. of Maharashtra and the World Bank, as well as to design information. This report will be prepared within 30 days at the end of the semi annual period.

3. The MPC Board will recommend the modifications to the BSES monitoring programmes in their written report and
4. Govt. of Maharashtra will release the MPC Board audit report within 30 days of report completion (i.e. within 60 days of the end of the semi annual period) to interested parties including local and national organisations as well as World Bank.

We have on record a letter written by Mr. Jean Francois Bauner, Chief Energy Operations Division India Dept., dated 30-11-1993, written to Secretary-Energy Dept., Govt. of Maharashtra, mentioning the following requirements. "An external audit of BSES's monthly monitoring data with subsequent publication release of audit report would be undertaken by MPC Board and audit report would be released to all interested parties".

The environmental monitoring data was being submitted by BSES to the MPCB. The data was being compiled and audited by MPCB and communicated to Secretary, Environment Dept., Govt. of Maharashtra from time to time. We have also released an advertisement in the local news-papers viz. 1) Dahanu Times, Dahanu (2) Bulandwarta, Dahanu (3) Navshakti, Mumbai, mentioning that, "the data about environmental monitoring carried out by BSES duly audited by MPCB will be available to the public for perusal in the office of the MPCB at Mumbai and at the office of the BSES Co.Ltd., Mumbai". Instead of publishing voluminous data in the news-papers we had, through public notice, informed the public about availability of the data. We had informed about this arrangements to the Secretary, Env. Dept., Govt. of Maharashtra vide this office letter No.AP/M-10, dated 12-01-94. The Secretary, Env. Dept., Govt. of Maharashtra had in turn informed about this arrangements to the World Bank under his letter dated 4th March, 1994. There was no clarification received on this as to what is exactly required to be done by MPC Board- publishing the data or making it available to interested parties.

With reference to our advertisement in the news-papers, we had received queries from M/s. Vigilance Organisation of Women, C/o 213, Irani Road, Dahanu Road, Dist. Thane, and M/s. Marathi Vidyan Parishad, Vidyan Bhawan, Sion-Chuna Bhatti, Mumbai. The information required by these organisation was furnished.

The Board has also carried out environmental monitoring to cross check the environmental monitoring done by BSES by collecting samples of waste water discharged by the unit and monitoring the ambient air quality near the BSES Power Plant at Dahanu.

Non government organisations like Bombay Environmental Action Group and Dahanu Taluka Environment Protection Group had filed Writ Petitions in the Hon. High Court of Judicature at Mumbai in the year 1989 and 1990 respectively. After decision by Bombay High Court going against them, they had also filed Special Leave Petition in the Hon. Supreme Court in the year 1991. One more Writ Petition was also filed by Indian Society for Enviro Legal Action, in the Supreme Court in the year 1993. These litigations were being fought in the court till end of 1996. Subsequently, a separate authority for monitoring the implementation of the notification issued on 20-6-1991 by Govt. of India (MoEF) for controlling the development in Dahanu taluka was appointed by MoEF. In view of these litigations, it was not proper to publish data about environmental monitoring certifying the ambient air quality being within the standards prescribed by MoEF for sensitive area. During the pendency of the cases in the Hon. Supreme Court, the Hon. Supreme Court itself had asked, initially, the MPCB to carry out door to door survey of the units in Dahanu taluka and submit the report to it. After submission of this report by MPCB, Hon. Supreme Court had asked Central Pollution Control Board to undertake this exercise again on their own. CPCB had carried out the similar survey and submitted its report to the Hon. Supreme Court. The Hon. Supreme Court had thereafter asked National Environmental Research Engineering Institute, Nagpur to carry out the studies in Dahanu taluka and submit its report. Upon submission of the report by NEERI, the Hon. Supreme Court had decided the cases and asked MoEF to appoint an Authority to monitor the implementation of notification dated 20-6-1991 and the Courts' orders.

It will be clear from the above, that we had followed up with the BSES for the compliance of the conditions of the consent with respect to the provision of the pollution control arrangements and environmental monitoring requirements. We have also carried out the environmental monitoring on our own and submitted the necessary information to the Hon. Supreme Court. Naturally, this information was also available to the petitioners- NGOs group from Dahanu tahsil. We had also made known to the public through advertisement in the news-papers as mentioned earlier, that as the monitoring data will be available with the Board and BSES for perusal.

On page no.8 of the report, it has been mentioned in the foot-note that, "World Bank has recently dropped hazardous waste management project just prior to negotiations because of its concern that MPCB would be unable to implement the necessary supervision."

We have been interacting with officers of World Bank on various occasions and there was absolutely no indication/hint given by anybody about this. There is no communication from the World Bank to that effect. In fact, the Board was anxiously waiting for the implementation of this project. We therefore, strongly object for the critical remarks being mentioned in the World Bank report.

We are enclosing herewith data about environmental monitoring carried out by MPCB, copy of the advertisement given in the local news-papers in this respect and the copy of the letter written to Secretary, Env. Dept., Govt. of Maharashtra by the Board and the letter written by Secretary, Env. Dept., Govt. of Maharashtra to the World Bank officials in this respect.

We hope that, you will drop the critical remarks about performance of MPCB and Govt. of Maharashtra mentioned in your draft report.

Thanking you,

Yours faithfully,



(K. H. Mehta)
Member Secretary

D.A.: As above

Copy submitted for information to -

1. Chairman, MPCB, Mumbai.
2. Secretary, Environment Deptt., Govt. of Maharashtra,
Mantralaya, Mumbai-400 032.
D.A.: As above