

CHAPTER-III

REVIEWS IN RESPECT OF STATUTORY CORPORATION

Procurement, performance and repairs of energy meters in Madhya Pradesh State Electricity Board

Highlights

Management of meters requires establishment of a sound system for judicious procurement, proper maintenance and timely repair of meters so that optimum benefits are achieved from the meters procured for installation/replacement in the service of consumers.

Failure to include price-reduction clause in the contract agreement for procurement of meters resulted in forgoing a saving of Rs.2.17 crore.

(Paragraph 3.1.8)

Acceptance of unreasonable conditions put forth by suppliers without assessing financial implications led to forgoing a saving of Rs.5.87 crore.

(Paragraph 3.1.9)

Failure to enforce price-reduction on belated supplies led to extra expenditure of Rs.63 lakh.

(Paragraph 3.1.10)

Similarly, the undue deferment of opening of tenders and acceptance of offers for inspection of belated supplies of meters resulted in forgoing savings of Rs.3.63 crore and extending undue benefit to suppliers to that extent.

(Paragraph 3.1.12)

Procurement of meters based on unrealistic assessment led to extra expenditure of Rs.3.47 crore and locking up of funds entailing loss of interest.

(Paragraph 3.1.13)

Conventional meters were procured at a cost of Rs.8.77 crore even after the decision to go in for static meters, rendering the purchase unwarranted.

(Paragraph 3.1.15)

Premature replacement of electro-mechanical meters (with imported components) resulted in expenditure of Rs.5.15 crore being rendered largely unproductive.

(Paragraph 3.1.18)

Introduction

3.1.1 Energy meters are either static or electro-mechanical equipments installed in system network to measure the quantum of flow of energy at different points in the system to ascertain energy sold to each consumer. The meters are of five types, viz. single phase, poly phase, low tension, high tension (trivector) and feeder meters. The first four types are installed at supply points for measuring energy supplied to consumers. Feeder meters are installed at sub-stations for recording the energy received through incoming feeder and energy supplied through outgoing feeder to consumers. These meters are also installed at generating stations and sub-stations for preparing energy account and determining system losses.

In order to assess the quantum of energy sold, the Madhya Pradesh State Electricity Board (Board) is required to instal and maintain correct energy meters on each point of supply of energy to consumers for measuring the energy sold as per Section 26(2) of the Indian Electricity Act, 1910.

As of March 2003, there were 45.12 lakh metered consumers (including domestic and agricultural), while unmetered consumers numbered 18.84 lakh (8.27 lakh agricultural and 10.57 lakh single light consumers).

Organisational set up

3.1.2 Member Transmission and Distribution (T&D) is responsible for assessing the requirement, procurement and supply of meters, assisted by Executive Director, Operations and Maintenance (O&M), two Chief Engineers (Purchase) and (Stores) at Board's Head Office at Jabalpur and Regional Chief Engineers/Executive Engineers of seven¹ Area stores in the State.

Scope of Audit

3.1.3 Mention was made in paragraphs 3A.6.4, 3A.6.5 and 3B.6A(iii) of Audit Reports (Commercial) of the Comptroller and Auditor General of India, Government of Madhya Pradesh for the years 1999-2000 and 2001-02 respectively regarding loss due to non-reimbursement of transmission and distribution losses by Government, ineffective checks on meters installed at consumers' premises and 'Energy Audit' which were yet to be discussed by Committee on Public Undertakings (COPU) (March 2003).

¹ Bhopal, Gwalior, Indore, Jabalpur, Ratlam, Sagar and Ujjain

The present review conducted during November 2002 to March 2003 covers the aspects relating to assessment of requirement, procurement, installation of meters and replacement of defective meters for the five years up to 2002-03. The review is the outcome of test-check of records relating to Head Office at Jabalpur and test-check of records of Executive Director (O&M), Chief Engineer, Purchase & Stores, five² out of seven Area stores and field offices at these places.

The audit findings were reported to the Government / Board in August 2003 with the request to attend the meeting of Audit Review Committee for State Public Sector Enterprises (ARCPSE) so that the view point of Government/Management was taken into consideration before finalising the review. The meeting of ARCPSE was held on 26 August 2003. Government was represented by Secretary, Energy Department and the Board was represented by Member (Finance), Secretary and Chief Engineer (Purchase). The review was finalised after incorporating Government/Board's views.

Plan for metering

3.1.4 In view of load growth in domestic and commercial single phase consumers, the Board felt (September 1999) the necessity of using static meters so that correct consumption could be recorded and revenue collected accordingly. Board, therefore, decided to procure static meters. Later on, Board concluded (October 2000) that the quantity of static meters being procured for 1999-2000 was too small to meet the target of 100 per cent metering. It, therefore, intimated (October 2000) to the Government that at least 14.25 lakh (1.75 lakh three phase and 12.50 lakh single phase) electronic meters would be required. Government approved (November 2000) the purchase of 22.10 lakh meters including meters required for agriculture, high tension (HT) and low tension (LT) industrial services with the stipulation that 100 per cent metering should be completed in respect of all categories of consumers in a phased manner by December 2001 as follows:

Sl. No.	Category of consumers	Energy meters required	Implementation by		Scheduled period of completion
			Board's manpower	Outside contractor (s)	
1.	11 KV feeders	8,706	8,706	--	March 2001
2.	HT feeders	800	800	--	March 2001
3.	LT Industry (up to 25 HP)	90,000	90,000	--	March 2001
4.	Commercial (single phase)	75,000	75,000	--	March 2001
5.	Commercial (three phase)	2,50,000	2,50,000	--	May 2000
6.	Domestic (three phase)	10,000	10,000	--	March 2001
7.	Domestic (single phase)				
(a)	New consumers	10,00,000	4,00,000	6,00,000	June 2001
(b)	Replacement	5,00,000	2,50,000	2,50,000	December 2001
8.	Agricultural				
(a)	Consumers	2,00,000	1,50,000	50,000	30 September 2001
(b)	Transformers	75,000	75,000	--	30 June 2001

² *Bhopal, Gwalior, Indore, Jabalpur and Sagar*

Total	22,09,506	13,09,506	9,80,000	
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As the Board could not complete the aforesaid work as per the schedule, extension was granted by the Government up to 30 June 2002.

Assessment of requirement

3.1.5 Requirement of meters for each year was assessed by the Executive Director (O&M) with the assistance of Regional Chief Engineer and respective O&M divisions. The procurement of meters was done by the Chief Engineer (Purchase) at Head Office at Jabalpur. The requirement of meters was assessed on the basis of estimated number of new connections to be released, number of defective/damaged meters to be replaced and meters to be provided to unmetered domestic, commercial, industrial and agricultural consumers. However, the Board's capacity to instal meters was not considered in assessing requirements. This resulted in excess procurement of meters involving extra expenditure as discussed in paragraphs 3.1.13 and 3.1.14.

Purchase procedure

3.1.6 Purchase orders for energy meters were finalised at the head office of the Board at Jabalpur, based on indents received from the actual end-users through the Executive Director (O&M).

Central Purchase Committee of the Board at Jabalpur undertook the work of invitation of tenders, evaluation of rates and submitting proposals to the competent authority in accordance with Board's Purchase Regulations 1959 which *inter alia* provide that all purchases for a value above rupees two lakh were to be made by inviting tenders; purchases up to Rs.50 lakh were to be approved by purchase committee, purchases between Rs.50 lakh and rupees one crore by the Chairman and the whole-time member concerned in consultation with Member (Finance), and purchases exceeding rupees one crore each by full Board. During 1998-2003, Board placed purchase orders for various types of meters valuing Rs.329 crore.

Test-check of these purchase orders revealed instances of excess/unwarranted procurement, failure to include provision for price reduction resulting in forgoing of savings, unnecessary purchase of electro-mechanical meters, non-levy of penalty, avoidable transportation charges, etc. These are discussed in succeeding paragraphs.

Procurement of meters

3.1.7 The table indicates the details of meters procured during the last five years up to 31 March 2003:

Sl. No.	Category of meters	Rating of meters	Quantity procured (In lakh)	Value (Rupees in crore)
1.	High precision electro-mechanical meters	LT single phase	1.00	8.46
2.	Mechanical poly phase	LT three phase	0.38	2.55
3.	Electronic	LT single phase	26.50	198.22
4.	Electronic	LT three phase	5.21	94.21
5.	LT trivector electronic	LT trivector	0.13	9.57
6.	HT trivector electronic (for energy audit)	HT trivector for HT consumer/EHT sub-station	0.13	16.12
Total			33.35	329.13

Non-inclusion of price reduction provision and consequent extra expenditure

Failure to apply reduced rates resulted in forgoing saving

3.1.8 To take advantage of price reduction, it has been the practice of Board to include a price reduction clause³ in the purchase orders for other materials. Without, however, including such a provision, the Board placed (November 2000) orders tender specification (TS 2347) on four suppliers for purchase of single-phase (SP) and three-phase (TP) electronic meters at f.o.r. destination prices of Rs. 999.85 and Rs. 2,267.52 per meter respectively. The meters were scheduled to be supplied during 29 January-June 2001. Subsequently (February 2001), another tender (TS 2389) for purchase of SP/TP meters was opened on 7 February 2001. It was noticed (June 2002) in audit that the prices of SP/ TP meters against the subsequent tender (TS 2389) opened on 7 February 2001 were Rs. 888.95 and Rs.1,861.14 i.e. lower by Rs. 110.90 and Rs. 406.38 per meter respectively as compared to prices of meters against TS 2347.

³ In case price of the material happens to be lower in the next tender, the same would be made applicable for the balance quantity of the first tender with effect from the date of opening of price bid of the next tender.

Failure to include price reduction provision resulted in forgoing a saving of Rs.2.17 crore.

As the price reduction clause was not included in the tender, the Board could not give effect to the reduced price on the quantity of 73,000 SP and 33,500 TP meters supplied during 7 February-31 March 2001. The price reduction was effected only from April 2001. As a result, the Board had to forgo Rs.2.17 crore on meters supplied during this period.

Board replied (September 2003) that looking to the huge future requirement for 100 per cent metering, it was decided to process next tender for procurement in a phased manner. Further, there was no financial loss as the meters were procured at reduced rates within the delivery schedule.

The reply was not tenable as (i) procurement of meters at reduced prices would in no way have hampered 100 per cent metering, (ii) despite the purchase of meters, Board did not achieve 100 per cent metering, and (iii) the price-reduction clause was duly included in the orders for the meters placed in June 2002.

Acceptance of unreasonable conditions of suppliers and consequent delay in opening of price bid led to forgoing saving

3.1.9 The Board placed (October 2001) a letter of intent on 10 firms to meet assessed requirement of four lakh SP meters (TS 2396) at the L1⁴ rate of Rs.796.90 per meter quoted by Elymer International and Elymer Electrics, both of New Delhi. Another firm, HPL Socomec, Delhi, in response to Board's enquiry during negotiations informed (10 October 2001) the Board of their willingness to supply three lakh SP meters at Rs.756 per meter, as this was the lowest rate in respect of a tender floated by Gujarat State Electricity Board. Other firms viz, HPL Socomec, Delhi, and TTL, New Delhi, also agreed to supply three lakh and 1.60 lakh meters respectively at this rate, Board, however, placed (October 2001) orders on these two firms for only one lakh SP meters each.

Subsequently, Elymer International and Elymer Electrics too agreed (3 November 2001) to supply the meters at the rate of Rs.756 per meter subject to two conditions that (a) at least 2 lakh SP meters should be ordered on each of them and (b) no price reduction would be accepted by them till completion of delivery schedule in January 2002. Without considering the future financial implications of agreeing to such conditions and despite being aware of downward trend in price, Board accepted the conditions imposed by the two firms and also placed, on the same day, orders for two lakh SP meters each on them. Thus, Board procured two lakh SP meters in excess of the number (four lakh) required.

The Board also approved (October 2001) a proposal (TS 2416) for procurement of six lakh SP and 1.40 lakh TP meters. When the price bids of this tender specification (TS 2416) for TP meters were opened on 24

⁴ L1, L2, L3 etc = The first lowest, the second lowest, the third lowest tender, etc

November 2001, Board deferred the opening of price bids for SP meters. The revised price bids of SP meters were opened on 15 February 2002 and the lowest price received was Rs.609.30 per meter i.e. lower by Rs.146.70 compared to the earlier rate of Rs.756 per meter.

Acceptance of conditions put forth by suppliers without assessing financial implications, led to forgoing saving of Rs.5.87 crore.

Board received four lakh SP meters from Elymer International and Elymer Electrics during 24 November 2001 to 15 February 2002 (i.e. dates between the opening of bids for TP and SP meters respectively). Had the Board not accepted the conditions imposed by these two firms for non-reduction of price till January 2002, it could have saved Rs.5.87 crore.

Board replied (September 2003) that the question of calling and opening price bids for SP meter (TS 2416) before January 2002 did not arise. Further, even if the bid had been opened in November 2001, that price could not have been applied as per conditions agreed to by the Board.

The reply was not tenable due to the following reasons:

- The Board should not have agreed to the conditions of Elymer, in view of the forthcoming opening of price bids of next tender (TS 2416), and also the decreasing trend in prices of meters.
- The indented requirement of four lakh SP meters was being fulfilled by the unconditional post-tender offer of HPL Socomec (for supply of three lakh meters) and TTL, Delhi (for 1.60 lakh meters). Hence, acceptance of conditional offer of Elymer Electric and Elymer International was not in the interest of Board.
- Genus Overseas, Jaipur, and EMCO, Thane, had also agreed to supply, unconditionally, meters at the lowest rates. Had orders been placed on these firms for purchase of remaining two lakh meters, Board would have been able to invoke the price reduction clause (TS 2416) on the balance quantity of previous order (TS 2396).
- In its own interest, Board should have opened the original price bids for SP meters (TS 2416) to ascertain the magnitude of reduction in the revised price bids (TS 2416), which was not done.

Thus, acceptance of conditions put forth by Elymer Electrics and Elymer International was imprudent and unjustified, and also tantamount to extension of undue benefit to these firms.

Failure to enforce reduced price for belated supplies resulted in extra expenditure

3.1.10 Board placed (March 2001) orders for purchase of 2.81 lakh TP meters on nine suppliers at Rs. 1861.44 per meter (TS 2389). The delivery was to be completed by July 2001. The Board also opened (November 2001) another proposal (TS 2416) for procurement of an additional 1.40 lakh TP meters.

The price of TP meters on the bids opened on 24 November 2001 was Rs. 1,609 (i.e. lower by Rs. 252.14 per meter).

Failure to insist upon reduced price even on belated supplies resulted in extra expenditure of Rs.63 lakh.

It was noticed in audit that 1,02,500 out of 2.81 lakh TP meters against TS 2389 were supplied after the scheduled delivery period ending July 2001. Of these 25,000 meters were offered for inspection during 26-29 November 2001 when the reduced price against TS 2416 was known to the Board, on 24 November 2001. Moreover, Chairman ordered (April 2001) that in case meters were offered for inspection, suppliers be asked to accept the reduced price. However, Board did not effect the price reduction on these belated supplies. Failure to enforce price-reduction resulted in avoidable extra expenditure of Rs.63 lakh.

Board stated (September 2003) that since the date of offer for inspection of 25,000 meters was well before the date of opening of price bids of TS 2416, the question of imposing reduced rate did not arise.

The reply was not tenable as (i) the scheduled delivery period of the order had already expired, and (ii) even the proposed date of inspection was and actual inspections were done after opening of the price bids of TS 2416.

Non-recovery of liquidated damages for belated supply of meters

3.1.11 In tune with its decision to replace conventional meters and achieve 100 per cent metering by December 2001, Board opened (January 2001) tenders (TS 2389) and placed (March 2001) orders for supply of five lakh SP and 2.81 lakh TP meters on eight and nine firms respectively, to be completed by July 2001. According to clause 4 of the purchase order, liquidated damages, subject to a maximum of 10 per cent of materials not delivered, was leviable in case of belated supplies.

Board did not recover liquidated damages of Rs.88 lakh on belated supplies.

It was noticed (June 2002) in audit that 55,000 TP meters were supplied in February-March 2002 i.e. seven months after the scheduled delivery period of July 2001. Board did not, however, levy and recover the liquidated damages of Rs.88 lakh⁵ in respect of these meters.

Board replied (September 2003) that imposition of price reduction clause and levy of penalty would not be justified, especially when Board's work was not affected.

The reply was not tenable as (i) the amendment order (December 2001) effecting the reduction of rates did not stipulate any change in the original terms and conditions i.e. for levy of damages on the belated supply, and (ii) the Board had recovered liquidated damages for delayed supply as well as price reduction in purchase of SP meters from India Meters, Chennai, and EMCO, Thane.

⁵ 10 per cent of 55000 meters at Rs.1609 per meter

Delay in opening of tenders and acceptance of offers for inspection of belated supplies

3.1.12 In respect of TS 2416, Board placed (December 2001 and March 2002) orders for the supply of SP and TP meters, duly incorporating therein the price reduction clause. The delivery against these orders was to be completed between April and June 2002.

In an obvious bid to avoid invocation of price reduction clause by Board, the tenderers in respect of another tender - TS 2414 (most of them were suppliers against TS 2416 also) requested (13 July 2002) the Board to extend the opening of bids for TS 2414 scheduled for 15 July 2002. Though the Board was aware (September 2001) of declining trend in prices of meters, it acceded (8 July 2002) to the request and deferred the opening of bids to 25 July 2002.

Surprisingly, when the suppliers offered the meters (which should have been delivered by April-June 2002) for inspection between 27 June and 20 July 2002, the Board, instead of postponing acceptance to avail of the benefit, if any, of the price-reduction clause accruing to it, carried out the inspection of the balance quantities immediately on 24 July 2002, a day before the extended date of opening of bids for TS 2414. Even the delivery instructions were issued on 25 July 2002 itself, the day of opening of bids. Thus, when the Board was aware that prices of meters were decreasing in every tender and TS 2414 was to be opened on 25 July 2002, its action to accept the offer of inspection before 25 July 2002 lacked prudence, to say the least, and was also against its financial interests.

The Board accepted 1.95 lakh SP meters and 11,000 TP meters which were offered for inspection after the expiry of delivery schedule.

The Board's deferment of opening of bids by ten days coupled with its failure to defer acceptance of offers of inspection of balance quantities (which were behind schedule and could easily have been rejected by it) was tantamount to extending undue benefit to the suppliers to the extent of Rs.3.63 crore being the price differential on the balance quantity.

Board replied (September 2003) that since offer of inspections against the orders in respect of the earlier tender (TS 2416) was received prior to the date of opening of price bids (25 July 2002) of next tender (TS 2414), the question of deferring the acceptance of offer for inspection and imposing reduced rate did not arise.

The reply was not tenable as:

- no justification was adduced by the Board for extending date of opening of price bids (TS 2414) by another 10 days from 15 to 25 July 2002 and inspection of meters offered against past tender (TS 2416) during this extended period; and
- TS 2416 included price reduction clause and rates were expected to be lower in TS 2414 as compared to the earlier tender (TS 2416). The

Undue deferment of opening of bids for next tender and acceptance of offers for inspection of belated supplies led to the Board forgoing savings in expenditure of Rs.3.63 crore.

offer of inspection of 1.95 lakh SP meters and 11,000 TP meters after the scheduled delivery period was already over should not have been accepted especially as most of the meters (excepting 38,000 SP meters) were offered for inspection even after the Board's decision (8 July 2002) to postpone the opening of bids from 15 to 25 July 2002.

Extra expenditure due to procurement of meters based on unrealistic assessment

3.1.13 In respect of a proposal for purchase of meters (October 2001) from Chief Engineer (Purchase & Stores), the Member (Finance) opined that as rates of electronic meters were on a decreasing trend in view of ever-reducing costs, Board should procure meters only for three to four months at a time. The reduction in price of meters was also evidenced by the following data:

Tender specification number	Date of opening of tender	Price per meter (Rs.)	Date of opening of price bids
2347	15 April 2000	999.85	9 October 2000
2389	24 January 2001	888.95	7 February 2001
2396	2 May 2001	756.00	18 September 2001
2416	24 November 2001	609.30	15 February 2002
2414	23 November 2001	669.30 (with box)	25 July 2002

Board's procurement of meters without regard to pace of installation and downward trend in prices resulted in forgoing savings of Rs.3.47 crore.

Taking actual installation of meters (during April-September 2001) into account, the average monthly installation worked out to only 93,315 meters. However, the Board placed (March 2002) orders (TS 2416) for supply of six lakh SP meters (at 1.5 lakh meters per month for four months) at Rs.823.40 per meter (inclusive of Rs.214.10 being the cost of box). The supplies were received by March 2002.

Had the Board restricted the purchase to 3,75,000 meters (4 x 93315) to match its installation capacity, it could have procured the balance quantity of 2.25 lakh meters at a lower cost in the subsequent tender (TS 2414) and thereby saved Rs.3.47 crore. Besides, the excess procurement also resulted in blocking of funds entailing loss of interest.

Board replied (September 2003) that prior to the placement of orders, the quantities to be procured were assessed on the basis of targets fixed and not on the basis of pace of installation. The finalisation of tender has to undergo various stages, hence actual orders for TS 2414 could be placed only in October 2002.

The reply was not tenable as (i) looking to the downward trend in prices of meters, orders should have been placed for the minimum requirement matching with pace of installation, (ii) Board's abnormal delay of 11 months from the date of tender in November 2001 to October 2002 in finalising tender TS 2414 could not be construed as a ground for not restricting the minimum

requirement in the earlier purchase, and (iii) the actual installation was only 76,530 meters per month during April -September 2002 against the procurement of six lakh meters. The Board also did not specify the exact difficulty in following its Member (Finance)'s advice in its own financial interests.

Excess procurement of three-phase meters

3.1.14 As on 30 September 2001, the Board had a stock of 28,845 three-phase meters sufficient for two months. During this period, the user-wing of the Board (Executive Director (O & M)) indented monthly requirement of 35,000 TP meters. Orders were accordingly placed (December 2001) for supply of 1.40 lakh TP meters for meeting the requirement of four months on Elymer Electric, New Delhi (90,000 meters), HPL, NewDelhi (30,000) and Genus Overseas, Jaipur (20,000).

After approval of the Board, the Chairman desired that orders for additional 50,000 meters be placed on other two firms (HPL: 30,000 and Genus Overseas: 20,000) due to delayed supplies by Elymer Electric against previous tenders. As Member (Finance) was in favour of placing orders for only 1.40 lakh meters, the order placed in December 2001 was kept in abeyance till ratification by the Board. Without assessing the actual requirement, the Board subsequently (January 2002) placed orders for an enhanced quantity of 1.90 lakh meters (1.40 lakh as originally approved and additional 50,000 as desired by Chairman) at Rs.1,609 per meter.

Excess procurement of meters without assessing the actual requirement, led to locking up of Rs.8.05 crore.

It was noticed (March 2003) in audit that average installation of TP meters during April-September 2002 was only 11,309 meters per month and as of 30 November 2002, the Board had 1.06 lakh TP meters still to be installed. At this rate, it would take further 9.37 months to exhaust the stock. Thus, the additional procurement of 50,000 meters lacked justification and only resulted in locking up of Rs.8.05 crore⁶.

While accepting (September 2003) the facts, Board replied that subsequently in the meeting of the Executive Committee of the Board, it was decided to place orders for 1.90 lakh meters to cope up with the target set by State Cabinet.

The reply was not tenable as Cabinet decision should have only prompted the Board to increase the pace of installation and not to purchase quantities in excess of its capacity to instal, and that too at a substantial extra cost. Board did not adduce any justification for not restricting the procurement to 1.40 lakh as decided earlier.

⁶ 50,000 x Rs.1609

Unwarranted purchase of electro-mechanical meters

3.1.15 The State Cabinet/Board decided in November 2000 to replace the electro-mechanical meters and also to instal electronic meters to achieve 100 per cent metering. Despite being aware of this, Board placed orders for 70,000, and 30,000 electro-mechanical meters (TS 2337) in September 2000 and January 2001 respectively.

It was noticed (July 2002) in audit that by November 2000, Board had received only 10,000 out of 70,000 electro-mechanical meters ordered (September 2000) and order for 30,000 electro-mechanical meters was placed (January 2001) after Government's approval for procurement of electronic meters. In view of the Board's decision (November 2000) to procure electronic meters alone for achieving the aforementioned objectives and the changed scenario, it should have cancelled orders for at least 90,000 conventional (electro-mechanical) meters (which were received after November 2000). Board's failure to do so resulted in unwarranted procurement of electro-mechanical meters at the cost of Rs.8.77 crore.

Procurement of conventional meters even after decision to go in for electronic meters rendered the purchase valuing Rs.8.77 crore unwarranted.

Board replied (September 2003) that in the primary stage of installation of electronic meters, it was not advisable to do away with high quality meters which were procured by other SEBs.

The reply was not acceptable as (i) in view of the latest developments in the State, the Board should have procured high quality electronic meters, as was indeed done subsequently, and (ii) the cost of an electronic meter of comparable rating/capacity with additional benefit of more precise recording of consumption, during January 2001 worked out to only Rs.888.95 as against Rs. 974.32 of an electro-mechanical meter. This indicated that the procurement of conventional meters had also resulted in extra expenditure of at least Rs.77 lakh⁷.

Unwarranted procurement of conventional meters

3.1.16 The Board placed (October 1997) an order on India Meters Limited, Chennai, for procurement of 10,000 SP electro-mechanical meters at Rs.455 (f.o.r. destination, exclusive of ED and taxes) per meter to be delivered by March 1998. The firm did not even commence the supply by this date. In March 2000, the Board issued despatch instructions to the firm for supply of 7507 meters which were not, however, supplied.

Despite being aware of the latest development, the Board, instead of cancelling the purchase order, issued despatch instructions once again in December 2000 for supply of 7507 electro-mechanical meters. This time the firm obliged and delivered the meters in August 2001.

⁷ 90,000 x Rs.85.37

Purchase of conventional meters even after switching over to electronic meters led to purchases worth Rs.41.02 lakh becoming unnecessary.

Failure of the Board to cancel the much-delayed supplies especially in view of the Cabinet decision resulted in unwarranted purchase of meters valuing Rs. 41.02 lakh.

Board replied (September 2003) that on formation of Chhattisgarh State Electricity Board, the order meant for Area store, Raipur, was amended as for Jabalpur store in December 2000.

The reply was not tenable as the Board reiterated the earlier despatch in December 2000 when the State of Chhattisgarh had already come into existence.

Failure to ascertain reasonability of prices

3.1.17 The Board opened (May 2000) the price bids in respect of TS 2337 and finalised the tenders, without ascertaining the reasonability of price quoted by L1 through other sources like comparable rates obtained by other SEBs, etc. Orders were placed (September 2000 and January 2001) accordingly for one lakh meters on VXL Limited, West Bengal (70,000) and Schlumberger, Indonesia (30,000) at Rs.808 per meter.

Failure to ascertain reasonability of prices led to Board finalising orders involving extra cost of Rs.60 lakh.

Audit scrutiny revealed (March 2003) that (a) other SEBs like KPTC⁸ and APTC⁹ during January to May 2000 had procured the same type of meters and paid Rs.748 per meter to VXL Limited for meters supplied, and (b) the terms and conditions of payment were also similar. Thus, had the Board ascertained the reasonability of prices and finalised tenders accordingly, it could have saved Rs.60 lakh.

Board stated (September 2003) that there was no practice or logic to compare prices obtained by other SEBs for individual tenders and these were collected only for general assessment.

The reply was not tenable as (i) Board did obtain prices from other SEBs which were not apparently considered for evaluation, and (ii) the Board, in its own interest and in the interest of its consumers who would be made to pay for even its avoidable failures, should establish a system of collecting/sharing information from/with its counterparts in other States.

⁸ *Karnataka Power Transmission Company Limited.*

⁹ *Andhra Pradesh Transmission Company Limited.*

Premature replacement of electro-mechanical meters with imported components

3.1.18 Board placed (October 1997) an order for supply of 70,000 SP high quality electro-mechanical meters (with imported components) on India Meters, Chennai, at Rs. 610 per meter. The guarantee period of these meters was five-and-a-half years. The high quality meters were installed during November 1999 to January 2000.

Without taking into consideration the working condition/ guarantee period of the meters installed, the Board, under a decision of November 2000, replaced these meters by electronic meters during January-June 2001 i.e. after utilising them for less than two years.

Test-check (February and March 2003) in five¹⁰ out of eight¹¹ Area stores where these meters were received, revealed that the replaced high quality meters were kept along with other discarded meters, with little possibility of differentiation. The premature replacement of the high quality meters even before expiry of the guarantee period resulted in expenditure of Rs.5.15 crore (including duties and taxes) becoming largely unproductive.

Board replaced high quality meters valuing Rs.5.15 crore even before expiry of guarantee period.

Board replied (September 2003) that it was not true that while installation of electronic meters, all these meters were replaced. However, the audit observation would be verified and responsibility fixed for the lapse.

The reply, being general, in nature was not tenable as (i) removal of these costly meters even before expiry of guarantee period was not in the interest of Board, and (ii) no instructions were issued to field staff for their non-removal or for their segregation after removal for early identification.

System deficiencies

In the course of audit, the following deficiencies in the system of procurement, evaluation and placement of orders were noticed:

Irregular procurement

3.1.19 According to Board's delegation of financial powers, in case tenders were finalised at rates other than the price offered by L1¹² and the value of order exceeded rupees one crore, approval of all the members of Board (i.e. the full Board) was to be obtained before placement of orders. It was noticed

¹⁰ Bhopal, Gwalior, Indore, Jabalpur and Sagar

¹¹ Barwaha, Raipur and Ujjain

¹² L1= First lowest tender

(May 2003) that in respect of TS¹³ 2239 opened in April 1997, the Board placed orders for supply of 5.48 lakh meters (value: Rs.27.26 crore) on firms other than LI, ranging from Rs.341.54 per meter to Rs.506.46 per meter on a decision (1997) by resident members¹⁴ of the Board alone without indicating the reasons for placing orders on these firms at higher rates.

The decision of resident members was yet to be ratified by the full Board (September 2003).

The purchase of meters at the rates other than L1 also resulted in extra commitment of Rs.3.49 crore to Board.

Non-adherence to purchase procedures

3.1.20 During the scrutiny of tenders, it was noticed that orders were placed on some firms which did not satisfy the eligibility criteria fixed by the Board and stipulated in the tender specification, while some others were rejected on the same ground, as detailed below:

TS 2347 and 2389

One firm TTL, Delhi, was rejected on the ground that it did not satisfy the eligibility criteria of being registered with Power Finance Corporation. Though two firms viz. Elymer Electricals Limited and Elymer International also did not satisfy this criterion, the Board placed orders on them. Board's reply of September 2003 was silent about the audit observation.

TS 2347

Though documentary evidence in support of satisfactory performance in the past was a pre-requisite, it was not insisted upon in the case of Elymer International. Board stated (September 2003) that the firm was considered as it satisfied all the conditions. The reply was not tenable as the firm did not satisfy the condition relating to evidence in support of satisfactory performance.

¹³ *Tender Specification*

¹⁴ *Chairman, Member (Finance) and the Member concerned are competent to finalise purchase of up to Rs.one crore at a time.*

TS 2414

Sample testing was to be done at independent laboratory at ERDA¹⁵, Vadodra, or CPRI¹⁶, Bhopal. However, Nakoda Meters, Raigarh, whose meters failed all tests at these laboratories, were allowed by the Board to get the meters tested at NPL¹⁷ and ERTL¹⁸, New Delhi. Board replied (September 2003) that as Nakoda Meters was the only SSI unit in the State, they were given one more opportunity to improve their sample meter. The reply was not tenable as the firm's meters failed in all the tests conducted by IRDA and CPRI and allowing them further opportunities not envisaged in tender specifications was tantamount not only to compromising on quality of meters but also to extending undue favour to get their meters tested at NPL and ERIL on their own request.

TS 2347 and 2389

According to Board's purchase procedures, maximum quantity was to be ordered on L1 and thereafter, if required, on others at the same price. The Board rejected (in respect of TS 2347) the offers of Namtech, Bangalore to supply at L1 price but allowed this facility to Genus Overseas, Jaipur, (not L1) for supply of single phase meters.

Similarly offers in respect of TS 2389 from TTL Delhi and India Meters, Bangalore, to supply at L1 prices were rejected but Elymer International and Elymer Electricals were allowed relaxation and orders were placed on them.

Board stated (September 2003) that there was no such enumeration in tender specification. Further, as per the works inspection report of Committee formed for this purpose, the firms were awarded ratings based on their quality control. The reply was not tenable as the Committee did not offer any recommendations. The quantity allocations to various suppliers were made arbitrarily without any basis and had no relevance to the Committee's report.

Suppliers' rating card

3.1.21 There is no such practice of maintaining suppliers' rating cards in the Board. In the absence of proper system of suppliers' rating, decisions for awarding the contracts were taken on recommendations made by purchasing authority based on their own judgement in respect of suppliers.

¹⁵ ERDA- Electrical Research and Development Association

¹⁶ CPRI- Central Power Research Institute

¹⁷ NPL- National Physical Laboratory

¹⁸ ERTL- Electrical Regional Test Laboratory

Performance of meters

Failure of meters

3.1.22 Madhya Pradesh State Electricity Regulatory Commission (Commission) prescribed (March 2002) norm for failure of meters at two per cent of total meters installed. However, the rate of failure had always been more than this norm during the last five years ended 31 March 2003 as detailed below:

(Numbers in lakh)

Year	Number of meters installed at the year-end	Number of meters failed during the year	Percentage of failure	Number of failed meters in excess of two per cent	Average cost of repair per meter Rs.	Excess repair cost (Rs. in lakh)
1998-99	44.34	2.76	6.22	1.87	163	304.81
1999-2000	43.49	2.83	6.51	1.96	183	358.68
2000-2001	35.67	4.95	13.87	4.23	130	549.90
2001-2002	40.62	4.81	11.84	3.99	297	1,185.03
2002-03 (up to December 2002)	43.39	3.50	8.07	2.63	297	781.11
Total						3,179.53

Failure of meters was much higher than the norm of two per cent fixed by Commission.

Board's failure to exercise greater quality control and effective pre-receipt testing contributed to the abnormally high rate of failure and consequent extra repair cost of Rs.31.80 crore.

While accepting (September 2003) the facts, Board replied that the norm of two per cent was very high for it.

The reply was not tenable as the norms prescribed by the Commission had to be observed.

Delay in replacement of stopped/defective meters

3.1.23 According to instructions (May 2001) of the Board, stopped/defective (S/D) meters should be replaced within two months of their identification. Audit scrutiny (January 2003) of the records for 1998-2002, however, revealed that:

Delay in replacing defective meters, besides leading to loss of revenue, also defeated the objective of installing electronic meters.

- There were large number of S/D meters awaiting replacement for more than 12 months. The numbers of such meters ranged between 1.45 lakh (26.6 per cent) and 0.57 lakh (42.9 per cent) out of total number of S/D meters at the beginning of the year, during the last four years up to March 2002.
- Test-check of records of four¹⁹ regions further revealed that the incidence of non-replacement of S/D meters was alarmingly high in Gwalior region and ranged from 38,134 meters (81 per cent) in 1998-99 to 61,239

¹⁹ Bhopal, Gwalior, Jabalpur and Ujjain

(86 per cent) in 2000-01, and in Bhopal from 7530 (40 per cent) in 1998-99 to 16,488 (61 per cent) in 2000-01. In Jabalpur and Ujjain, too, the default ranged from 28 to 49 per cent, and 26 to 62 per cent respectively.

Non-replacement of these meters within prescribed time schedule resulted in possible loss of revenue due to adoption of average billing, unauthorised use of energy, etc. Besides, this also defeated the objective of installing electronic meters to record accurate consumption.

While accepting the facts, Board stated (September 2003) that the programme of installing electronic meters on a large scale led to delay in replacement of defective meters, and the position would be improved upon.

Repair of meters -- delay in testing of removed meters

3.1.24 Consequent on Board's policy of procuring only electronic meters, it had directed (May 2001) all Regional Chief Engineers that old mechanical meters removed from the service be re-tested, calibrated and strapped up at its meter testing laboratories. It was expected that in that process, 80 to 90 per cent of the meters could be re-used.

Audit scrutiny (February 2003) revealed that the Board was yet to get 16.98 lakh meters tested as of 31 July 2002 as indicated below:

(Numbers in lakh)

(i) Number of conventional meters removed	20.15
(ii) Meters lying in field offices	11.52
(iii) Meters received by Area stores	8.63
(iv) Meters tested	3.17
(v) Meters found good	1.92
(vi) Meters to be tested ((ii)+(iii)-(iv))	16.98

Delays in (a) ensuring despatch of released meters from field to Area stores, and (b) testing even the meters received at Area stores, resulted in non-identification of the still-useful meters, besides adversely affecting their usability by passage of time.

While accepting the facts, Board stated (September 2003) that all-out efforts were being made to test the maximum number of meters.

Energy audit

3.1.25 Energy audit aims at accounting for energy received and sent out at each stage of power system to determine separately the technical losses (occurring due to inherent characteristics of conductors and equipments used in the system) and commercial losses (occurring due to pilferage of energy, defective meters, meter-reading errors and un-metered supply of energy and energy not accounted for), as also at determining the extent of such losses at each stage/location.

According to the Memorandum of Understanding (May 2000) between Government of India, Ministry of Power, and Government of Madhya Pradesh, energy audit was one of the reforms programmes in the Power Sector. To reduce system losses, energy audit was taken up at all levels including the sub-stations up to 33/11 KV level. This included metering of all supplies by December 2001.

The metering points for energy audit were as follows:-

1.	EHV sub-stations	2,396
2.	Sub-transmission sub –stations	
(a)	33/11 KV , 3 KV metering equipment and meters	2,634
(b)	11 KV metering equipment and meters	5,391
		10,421

Energy meters in EHV sub-stations on all 2396 metering points have already been installed. In case of sub-transmission 33/11 KV sub-stations and feeders, these meters had been installed in over 98 per cent locations. Thus, most of the energy meters had already been installed by March 2003 for recording the energy input. At present, the energy input to an area is worked out based on recordings by the energy meters installed at various locations, which are compared with energy billed during for the same period based on R-15 documents (Revenue document) of the Board and the difference is treated as energy loss.

Central Electricity Authority (CEA) has prescribed the norm for energy losses at 15 per cent.

The table given below lists the areas where the energy loss (in percentage) exceeded even 50 per cent during energy audit as recorded:-

Name of Division/ Circle/Region	Month/percentage of loss					
	January 2002	February 2002	March 2002	April 2002	May 2002	June 2002
Gwalior (City Circle)	70.34	69.23	65.68	78.02	74.25	77.38
Bhopal (City Circle)	60.83	51.48	54.01	60.95	54.96	56.86
Bina (O&M Division)	63.88	---	---	54.93	60.58	60.47
Chhattarpur (O&M Division)	58.06	51.60	53.22	60.06	66.32	56.99

Prithivipur (O&M Division)	59.83	56.71	62.54	70.01	63.88	63.69
Tikamgarh (O&M Division)	57.97	55.91	63.86	61.17	54.05	57.66
Rewa (North) (O&M Division)	54.16	57.61	61.18	62.25	--	--
Rewa (South) (O&M Division)	57.76	--	61.07	62.06	--	63.44
Maihar (O&M Division)	53.34	--	---	--	--	--
Anoopur (O&M Division)	56.05	--	69.33	55.71	--	--
Damoh (North) (O&M Division)	39.08	--	--	--	76.23	74.63
Damoh (South) (O&M Division)	36.06	--	--	--	51.39	59.18

It was also evident that during January-June 2002, energy loss in Bhopal circle ranged from 51.48 to 60.95 per cent and that in Gwalior circle from 65.68 to 78.02 per cent. Test-check of records of O&M divisions under East Zone, however, revealed that the percentage of theft in all the ten O&M divisions ranged from 36.06 to 76.23 per cent. Further, in Indore region, prior to installation of electronic meters during 1998-2001, energy loss was 10.17 to 18.10 per cent but after installation of new electronic meters, it had gone up to 33.37 per cent in 2001-02 and 31.24 per cent in 2002-03 (up to December 2002).

Before implementing the reforms programme involving procurement/installation of energy meters, the Board had not identified the following :

- Metering of un-metered consumers (during 2001-02, 21.08 lakh out of 64 lakh consumers were un-metered consumers).
- Replacement of stopped/defective meters.
- Controlling increased theft of power.
- Replacement/renovation of service lines and fixing of terminal covers and sealing thereof. Even after installation of 90-95 per cent new electronic meters, terminal sealing was yet to be provided in the network.
- Upgradation of sub-transmission and distribution network.
- Checking of connections by field officers as per norms fixed by the Board.

Conclusion

Assessment and procurement of meters was not commensurate with objective of 100 per cent metering, 'Price reduction clause' was not included by Board in some tenders to avail of benefit of falling prices, and thereby opportunity to achieve savings in expenditure was lost. Excess quantity of meters than the Board's capacity to instal was procured leading to locking up of scarce funds

and consequent loss of interest. In the process of 100 per cent metering, high quality electro-mechanical meters were removed prematurely rendering the investment on them largely unproductive. Moreover, there were delays in removing and repairing stopped/defective meters resulting in potential loss of revenue to the Board.

Therefore, concerted efforts are required to be taken to streamline the system of procuring meters and also for timely replacement/repair of defective meters with a view to improving the Board's revenues and thereby achieving the main objective of 100 per cent metering.



**Operational performance and maintenance of
Sanjay Gandhi Thermal Power Station, Birsinghpur**

Highlights

Sanjay Gandhi Thermal Power Station (Station) Birsinghpur of Madhya Pradesh State Electricity Board has an installed capacity of 4x210 MW. Its Power House I was commissioned in March 1993 (Unit I) and March 1994 (Unit II) at a cost of Rs.830 crore and the Power House II in February 1999 (Unit III) and November 1999 (Unit IV) at a cost of Rs.980 crore.

The actual generation of power during 1998-2003 ranged between 69.4 and 85.6 per cent , (Power House I) and 82.1 and 86.9 per cent (Power House II) of the possible generation. Even in comparison with the Central Electricity Authority norm of 80 per cent plant load factor, there was loss of generation of 3792.54 million units with consequential potential loss of revenue of Rs.758.51 crore.

(Paragraph 3.2.4)

Low thermal efficiency of the two Power Houses resulted in excess consumption of 64.12 lakh million kcal and 42.69 lakh million kcal of heat respectively involving extra expenditure of Rs.199.48 crore.

(Paragraph 3.2.6)

Taking average calorific value of coal for respective years into account, Power House I and II consumed excess coal valuing Rs.27.36 crore during 1998-2003.

(Paragraph 3.2.9)

Due to non-finalisation of fuel supply agreement with South Eastern Coalfields Limited, the Station incurred avoidable expenditure of Rs.35.64 crore on grade difference in coal supplied.

(Paragraph 3.2.10)

During 1998-2003 the Station consumed 15090.387 KL oil in excess of prescribed norm resulting in extra expenditure of Rs.37.73 crore.

(Paragraph 3.2.13)

Coal handling plant constructed in January 2000 at a cost of Rs.42 crore could not be utilised so far (March 2003).

(Paragraph 3.2.14)

Station's failure to develop alternative source coupled with its placing order for maintenance for five years at a stretch without ascertaining reasonability of rates resulted in avoidable extra expenditure of Rs.2.63 crore.

(Paragraph 3.2.19)

Introduction

3.2.1 The Sanjay Gandhi Thermal Power Station (Station), Birsinghpur (district Umariya), of the Madhya Pradesh State Electricity Board (Board) has an installed capacity of 4 x 210 mega watt (MW). The project report of Power House-I (PH I) was approved by the Central Electricity Authority (CEA) in October 1979 and Planning Commission in July 1980 at an estimated cost of Rs.200.32 crore (2x210 MW). The Power House was commissioned in March 1993 (Unit-I) and March 1994 (Unit-II) at a cost of Rs.830 crore.

Power House-II (PH II), sanctioned by the Planning Commission in March 1989 at an estimated cost of Rs.493.00 crore (2x210), was completed in February 1999 (Unit-III) and November 1999 (Unit-IV) at a cost Rs.980.00 crore (2x210).

Organisational set up

3.2.2 The Chief Engineer, who is accountable to the Board, through Member (Generation) is the overall in charge of the Station, assisted by other engineering and accounts staff.

Scope of Audit

3.2.3 The present review conducted during November 2002 to April 2003, covers operational performance of the Station for the last five years up to 31 March 2003. The audit findings as a result of test-check of records of the Chief Engineer and operational, maintenance and service divisions, were sent to Government/Board on 29 July 2003 with the request to attend ARCPSE²⁰ meeting so that the view point of Government/Board was taken into account before finalizing the review. The meeting was held on 26 August 2003. Government was represented by the Secretary, Energy Department, and the Board by Member (Generation) and Executive Director (Operation & Maintenance). The review was finalised after considering the views of the

²⁰ *Audit Review Committee for State Public Sector Enterprises.*

Government and the Board. The results are set forth in the succeeding paragraphs.

Operational performance

Generation

3.2.4 Based on the installed capacity, actual running hours etc. the performance of the Station (PH I & II) for five years ended 2002-03 is tabulated below:

Sl. No.	Particulars	1998-99	1999-2000	2000-01		2001-02		2002-03	
		PH-I	PH-I	PH-I	PH-II	PH-I	PH-II	PH-I	PH-II
1.	Installed capacity (MW)	210x2	210x2	210x2	210x2	210x2	210x2	210x2	210x2
2.	Total hours available in a year	17520	17568	17520	17520	17520	17520	17520	17520
3.	Generating capacity (MUs) ²¹	3679.20	3679.20	3679.20	3679.20	3679.20	3679.20	3679.20	3679.20
4.	Actual running hours	14017	13408	13533	15685	11374	14499	14499	16957
5.	Possible generation w.r.t. hours actually run (MUs)	2943.57	2815.68	2841.93	3293.85	2388.54	3044.79	3044.79	3560.97
6.	Actual generation (MUs)	2518.14	2308.14	2063.33	2860.88	1656.58	2558.51	2302.96	2924.90
7.	Shortfall in generation(MUs)	425.43	507.54	778.60	432.97	731.96	486.28	741.83	636.07
8.	Percentage of actual generation to possible generation	85.55	81.97	72.60	86.85	69.35	84.03	75.64	82.14
9.	Plant load factor ²² (per cent)	68.44	62.73	56.08	77.76	45.03	69.54	62.59	79.45
10.	Plant availability factor (percentage)	80.01	76.32	77.24	89.53	64.92	82.76	82.76	96.79
11.	Auxiliary consumption (MUs)	252.10	235.91	215.97	283.34	187.72	273.41	252.42	296.88
12.	Percentage of auxiliary consumption to actual generation	10.01	10.22	10.46	9.90	11.33	10.69	10.96	10.15
13.	Auxiliary consumption in excess of 10 per cent (MUs within brackets)	0.01 (0.29)	0.22 (5.10)	0.46 (9.64)		1.33 (22.06)	0.69 (17.56)	0.96 (22.12)	0.15 (4.39)

Audit analysis revealed the following:

²¹ *Generating capacity means required generation during total hours available in a year.*

²² *Plant load factor is the percentage of actual generation to generating capacity.*

There was shortfall in generation of 3792.54 MU valued at Rs.758.51 crore even after making allowance for low load operation.

- Net available hours for generation in respect of Power House-I were 14,017 in 1998-99 which decreased to 11,374 in 2001-02 indicating that outages had increased. These, however, had improved to 14,499 in 2002-03. Similarly, actual running hours in Power House-II decreased from 15,685 in 2000-01 to 14,499 in 2001-02 and thereafter increased to 16,957 in 2002-03.
- As compared to possible generation, actual plant load factor generation was less during all the five years. CEA had fixed a norm of 80 per cent plant load factor (PLF) for thermal stations. The shortfall in generation during the period as per the norm worked out to 3792.54 million units (MUs) valued at Rs.758.51 crore.
- The percentage of PLF for PH-I was 68.44 in 1998-99 which decreased to 45.03 in 2001-02. Thereafter, it improved to 62.59 in 2002-03.
- The percentage of plant availability factor also decreased from 80.01 (1998-99) to 64.92 (2001-02) and thereafter increased to 82.76 (2002-03).
- As per Detailed Project Report, the auxiliary consumption was to be 10 per cent. The auxiliary consumption in PH-I was, however, higher than 10 per cent. During 1998-2003, the excess consumption was 59.21 MUs valued at Rs.11.84 crore.

Auxiliary consumption in excess of norm of 10 per cent worked out to 59.21 MUs valued at Rs.11.84 crore.

The management attributed (April 2003) the low load operation of PH-I to frequent outages of high pressure (HP) heater, boiler tube leakages, interruption in coal supply at coal handling plant and coal mills besides low vacuum in condenser.

Audit scrutiny (March 2003) of the minutes of meeting between suppliers of the boiler and Board, on 3 May 2001 at Birsinghpur, revealed that the drum pressure and load on unit was restricted to 120-140 MW due to boiler tube leakages which could be attributable to metallurgical failure or choking of white deposits found on the inner surface of the tube, adversely affecting the heat transfer, and resulting in higher metal temperature causing premature failure of tubes. Accumulation of undesired deposits in tubes indicated lack of proper care to suitably treat the water before pumping it into boilers from the water treatment plant. This was due to non-commissioning of a Demineralisation plant since 1998 despite having incurred an expenditure of Rs.3.65 crore on it, as detailed in paragraph 3.2.17 *infra*.

Generation cost per unit

3.2.5. The table below indicates the Power House-wise unit cost of generation for the five years up to 2001-02:

Year	(Paise per unit)	
	PH - I	PH - II
1997-98	173.95	--
1998-99	177.45	--
1999-2000	213.18	177.09
2000-01 (Provisional)	180.91	175.69
2001-02 (Tentative)	237.54	202.88

The high unit cost of generation at Power House-I, though constructed at a lower capital cost five to six years earlier and with the consequential benefits of higher depreciation and lower interest costs, was due to low generation, and excess consumption of coal and fuel. Unit cost of power for the year 2002-03 could not be worked out due to non-finalisation of accounts.

Board replied (September 2003) that due to frequent tube leakages and partial loading of the unit, consumption of coal and oil had increased leading to high cost of generation. Further, the Station was supplied with coal from Rewa-Korea mines at a distance of 350 km which also accounted for high cost.

Non-utilisation of heat due to lesser thermal efficiency

3.2.6 The thermal efficiency of a Power House is an index of the efficiency of conversion of thermal energy into electrical energy. The table below indicates the thermal efficiency of the two Power Houses during the last five years up to 2002-03:

Excess heat consumption by Power House I

Sl. No.	Particulars/Units	Unit	1998-99	1999-2000	2000-01	2001-02	2002-03
1.	Average consumption						
(a)	Coal (Kg/kwh)	I	0.6991	0.7064	0.7332	0.8108	0.8285
(b)	Oil (Kg/kwh)	I	0.0026	0.0024	0.0060	0.0059	0.0060
		II	0.0048	0.0026	0.0056	0.0073	0.0046
2.	Average heat value						
(a)	Coal (Kcal/kg)	I	4,356	4,346	4,212	3,847	3,819
		II	4,356	4,346	4,212	3,847	3,819
(b)	Oil (Kcal/kg)	I	10,000	10,000	10,000	10,000	10,000
		II	10,000	10,000	10,000	10,000	10,000
3.	Heat rate of fuel consumed						
(a)	Coal (Kcal/kg) 1(a)x2(a)	I	3,045.28	3,070.01	3,088.24	3,119.15	3,164.04
		II	3,053.12	3,066.10	3,083.18	3,150.31	3,079.64
(b)	Oil (Kcal/kg) 1(b)x2(b)	I	26	24	60	59	60
		II	48	26	56	73	46
4.	Total heat consumed: Kcal/kwh 3(a)+3(b)	I	3,071.28	3,094.01	3,148.24	3,178.15	3,224.04
		II	3,101.12	3,092.10	3,139.18	3,223.31	3,125.64
5.	Thermal efficiency percentage²³	I	28.00	27.80	27.32	27.06	26.67

²³ Thermal efficiency percentage 860 multiplied by 100 and divided by the heat consumed

		II	27.73	27.81	27.40	26.68	27.51
6.	Consumption of heat at designed thermal efficiency (33.80 per cent) Kcal/kwh	I	2,544.00	2,544.00	2,544.00	2,544.00	2,544.00
		II	2,544.00	2,544.00	2,544.00	2,544.00	2,544.00
7	Consumption of excess heat due to lower thermal efficiency (kcal/kwh) (4-6)	I	527.28	550.01	604.24	634.15	680.04
		II	557.12	548.10	595.18	679.31	581.64
8	Generation (MUs)	I	1,213.924	1,166.203	927.711	809.243	1,152.351
		II	1,304.221	1,141.935	1,135.619	847.343	1,150.606
9	Total excess heat consumed (M/Kcal) (7x8)	I	6,40,077.78	6,41,423.31	5,60,560.09	5,13,181.45	7,83,644.77
		II	7,26,607.60	6,25,894.57	6,75,897.71	5,75,608.57	6,69,238.47

- Notes: 1. One litre of oil has been taken to be equal to 910 grams.
2. Thermal efficiency at 33.80 per cent has been worked out taking the heat rate of 2544 Kcal/kwh fixed for PH-I in the Project Report.

Excess heat consumption by Power House II

Sl. No.	Particulars/Units	Unit	2000-01	2001-02	2002-03
1.	Average consumption				
(a)	Coal (Kg/kwh)	III IV	0.7064 0.7170	0.8205 0.8149	0.8193 0.8144
(b)	Oil (Kg/kwh)	III IV	0.0023 0.0029	0.0026 0.0033	0.0025 0.0020
2.	Average heat value				
(a)	Coal (Kcal/kg)	III IV	4,212 4,212	3,847 3,847	3,819 3,819
(b)	Oil (Kcal/kg)	III IV	10,000 10,000	10,000 10,000	10,000 10,000
3.	Heat rate of fuel consumed				
(a)	Coal (Kcal/kg) 1(a)x2(a)	III IV	2,975.36 3,020.00	3,156.46 3,134.92	3,128.91 3,110.19
(b)	Oil (Kcal/kg) 1(b)x2(b)	III IV	23.00 29.00	26.00 33.00	25.00 20.00
4.	Total heat consumed: Kcal/kwh (3(a)+3(b))	III IV	2,998.36 3,049.00	3,182.46 3,167.92	3,153.91 3,130.19
5.	Thermal efficiency percentage	III IV	28.68 28.21	27.02 27.15	27.27 27.47
6.	Consumption of heat at designed thermal efficiency (33.106 per cent) Kcal/kwh	III IV	2,600 2,600	2,600 2,600	2,600 2,600
7	Consumption of excess heat due to lower thermal efficiency (kcal/kwh) (4-6)	III IV	398.36 449.00	582.46 567.92	553.91 530.19
8	Generation (MUs)	III IV	1,413.467 1,447.416	1,325.960 1,232.549	1,403.314 1,521.585
9	Total excess heat consumed (M/Kcal) (7x8)	III IV	5,63,068.714 6,49,889.784	7,72,318.662 6,99,989.228	7,77,309.658 8,06,729.151

- Notes: 1. One litre of oil has been taken to be equal to 910 grams.
2. Thermal efficiency at 33.106 per cent has been worked out taking the heat rate of 2598 Kcal/KWH fixed for PH-II in the Project report.

It would be seen that against the projected efficiency of 33.80 per cent, the efficiency of the two units of Power House-I during the last five years up to 2002-03 ranged only between 26.67 and 28 per cent. In respect of Power House II, the actual thermal efficiency ranged between 27.02 and 28.60 per cent against the projected efficiency of 33.106 per cent.

Low thermal efficiency led to extra expenditure of Rs.199.48 crore.

The Units I and II should have consumed 2544 Kcal heat per kwh of electricity generated at 33.80 per cent thermal efficiency. However, due to lower thermal efficiency, the Units consumed heat ranging between 3071.28 and 3224.04 Kcal/kwh. The excess consumption of 527.28 to 680.04 Kcal of heat

aggregating to 64.12 lakh million Kcal resulted in extra expenditure of Rs. 119.75 crore. Similarly, Units III and IV registered excess consumption of 42.69 lakh million kcal of heat valued at Rs.79.73²⁴ crore. Thus, the total loss on account of lower thermal efficiency worked out to Rs.199.48 crore.

The low thermal efficiency was mainly due to high pressure heater outages, restriction in load due to I.D. fan vibrations, low vacuum, milling system outages, interruptions in coal supply, and air heater choking/less air in the air heater and flue gas path. Management had not taken remedial action to rectify these deficiencies.

While accepting (September 2003) the Audit findings, the Board stated that remedial action was being taken.

Outages

Planned outages

3.2.7 Thermal stations have outages which may be 'planned' and/or 'forced'. While planned outages are necessitated to attend to maintenance work of boilers etc., forced ones are caused by unforeseen factors involving also lack of adequate and timely preventive maintenance work. Thus, the Board has to ensure that stoppage of units for planned outages does not exceed prescribed time, and the forced outages are minimized to the extent possible.

The *Annexure 15* indicates hours available, hours operated and outages during the last five years up to 2002-03:

It would be seen from Annexure that the percentage of shutdown to available hours in respect of four units ranged from 2.82 to 41.05. These are discussed in subsequent paragraphs.

Forced outages

Central Electricity Authority (CEA) had prescribed the norms for forced outages as 10 per cent of the available hours. It was however noticed that the forced outages were in excess of these norms in respect of Unit I (1999 to 2002) and Unit II (2000-03) as detailed below:

	1999-2000	2000-01	2001-02	2002-03
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²⁴

Workings:

Total Excess heat consumed =4269305.197 Million Cal
 Divided by 4000 i.e. calorific value of coal as per project report
 $4269305.19 \div 4000 = 1067.33$ m kg
 Multiplied by 10^6 to change it into kg= $1067.33 \times 10^6 = 1067330000$ kg
 Divided by 1000 to change into MT= $1067330 \times \text{Rs.}747$ per MT= Rs.79.73 crore.

	Power House I	UNITS					
		I	I	II	I	II	II
1.	Available hours	8784	8760	8760	8760	8760	8760
2	Permitted outages (10 per cent of available hours)	878	876	876	876	876	876
3	Forced outages-actual	946	1398	1091	1756	1573	1403
4	Excess forced outages (3-2)	68	522	215	880	697	527
5	Generation loss (MUs)	14.28	109.62	45.15	184.80	146.37	110.67
6	Generation loss (Rs. in crore)	2.86	21.92	9.03	36.96	29.27	22.13

The excess hours (2,909) lost due to forced outages led to loss of generation of 610.89 MUs valued at Rs.122.17 crore.

Board replied (September 2003) that due to high demand, the units could not be taken out for rectifying defects for a long time and as such only breakdown maintenance could be carried out.

The reply was only indicative of inadequate preventive maintenance system. Further, the loss of generation was not compatible with the high demand.

Excess time taken for overhauling

3.2.8 Kulkarni Committee appointed by GOI recommended (April 1975) the norm of 28/30 days for regular overhauling of boiler. The unit-wise details of time fixed and taken for overhauling of generators and loss of generation due to excess time taken are given in *Annexure 16*.

It would be seen that the Station took 155 days more to complete the annual overhauling in respect of the four units. Failure to adhere to the time schedule, resulted in loss of generation of 547.28 MUs with consequent revenue loss of Rs.109.46 crore.

Management attributed (September 2003) the excess time taken to the following:

- (a) A forced shutdown of long duration is treated as capital overhauling, hence more time was taken; and
- (b) Extra works were required to be done after opening of machines/boiler, resulting in more time being taken.

The reply was not tenable as the Station authorities could have assessed the actual problems/defects through timely/regular maintenance and thus avoided the additional time taken.

Excess time taken for overhauling led to loss of generation of 547.28 MUs valued at Rs.109.46 crore

Consumption of coal

3.67 lakh MT coal was consumed in excess of norms involving extra expenditure of Rs.27.36 crore.

3.2.9 According to the Detailed Project Report (DPR), the heat rate required to generate one unit of power for PH-I was 2544 Kcal/Kwh and for PH-II 2598 Kcal/Kwh with boiler efficiency at 86 and 86.4 per cent respectively. The consumption of coal as per these standards vis-à-vis the coal actually consumed and excess consumption of coal are given in *Annexure 17*. It would be seen from the Annexure that during 1998-2003, there was excess consumption of 3.67 lakh MT coal valued at Rs.27.36 crore²⁵ in the Station. Compared with the standards indicated in project reports and by giving allowances for low calorific value of coal received at the plant, the excess consumption was on the rise and had increased from 3.13 per cent in 1998-99 to 6.03 per cent in 2001-02 and decreased thereafter to 1.12 per cent in 2002-03 in respect of PH-I. The PH II had excess consumption of coal only in 2001-02.

Management attributed excess consumption of coal to repetitive failure of plant super heaters and economiser and condenser tubes leading to heat loss in the furnace. The excess consumption has not, however, been got investigated for initiating necessary remedial measures (March 2003).

Loss due to grade difference in coal supplied

3.2.10 Even after nearly ten years of commissioning of the power station, the Board has not entered into any Fuel Supply Agreement (FSA) with South Eastern Coalfields Limited (SECL) for supply of coal. Coal was being supplied from various mines of SECL and payments therefor made on the basis of useful heat value (UHV) and weight declared by SECL. In the absence of FSA, there was no joint sampling, at loading and unloading points and coal samples were, therefore, tested by the Board on its own at Board's laboratory. This did not serve useful purpose as the test results were not acceptable to SECL.

Audit scrutiny revealed (March 2003) that during September 2001 to September 2002, there were huge variations between the declared grades and actual grades of coal received at the station. The Board had, however, been making payments for higher grades of coal while it had received low quality coal with lesser UHV. Thus, Board's failure to execute FSA with SECL resulted in its incurring avoidable expenditure of Rs.35.64 crore on grade difference. The losses for the period prior to September 2001, could not be assessed in audit for want of details, not made available by Board in spite of being called for.

²⁵ PH I: 2.73 lakh MT; Value Rs.20.36 crore PH II: 0.94 lakh MT; Value Rs.7.00 crore

Non-finalisation of FSA and consequent acceptance of coal without joint sampling resulted in loss of Rs.35.64 crore.

Management stated (September 2003) that all-out efforts were being made for finalisation of FSA.

Loss due to rejection of claims for stones and shales

3.2.11 During 2000-01, Board received 40.45 lakh MT coal (cost: Rs.390.32 crore). Of this, 21000 MT (cost : Rs. 2.02 crore) was found to contain stones and shales. The Board lodged (May 2001) a claim with SECL for refund, which was, however, rejected (June 2002) on the ground that any unilateral measurement by Board, in the absence of FSA, was not acceptable.

During 2001-03, the Station received 29875 MT (value:Rs. 2.89 crore) of stones and shales as coal. Due to non-execution of FSA and rejection of its earlier claims, Board did not even prefer any claim for it with SECL. Hence, it had to bear further loss of Rs. 2.89 crore on this account too.

Management accepted (September 2003) the audit findings.

Acceptance of stones and shales as coal led to loss of Rs.4.91 crore.

Avoidable payment of surcharge to Railways

3.2.12 Railway freight was being paid either by demand drafts or through credit note-cum-cheque facility at loading point up to March 1997. With the introduction of advance freight payment scheme (April 1997), an advance payment equal to one month's freight was to be deposited, with the Railways, allowing the payment of freight at destination station without the levy of 15 per cent surcharge. The Board had also given an undertaking that the Station would keep one month's freight payment deposited as advance for availing of the benefit of the scheme, and kept deposited Rs. 2.84 crore under the scheme up to June 2000. As the traffic increased, Railways demanded additional cash security of Rs. 6.67 crore, to maintain the security deposit at the level at par with the volume of traffic.

As the Board did not make the enhanced deposit, Railways started levying surcharge with effect from September 2002 on freight charges beyond Rs.2.84 crore. The surcharge for September 2002 worked out to Rs.69 lakh. In other words, the short deposit of Rs.6.67 crore was costing the Board over 24 per cent per annum.

Management replied (September 2003) that the matter was still under discussion with the Railways.

The Board paid Rs.69 lakh as surcharge due to failure to avail advance freight payment.

Fuel oil consumption

Excess consumption of fuel oil

3.2.13 The fuel oil is required for ignition and to give support to furnace stability. As per norms prescribed by GOI, the consumption of fuel oil per kwh of electricity generated was 3.5 ML. The table below indicates oil consumption at Power House I (Units I & II), compared with norms fixed by GOI during five years up to 2002-03.

Excess consumption of oil

Particulars	1998-99		1999-2000		2000-01		2001-02		2002-03	
	I	II								
Consumption of oil as per norms(3.5 ML/kwh)	4,248.734	4,564.773	4,081.710	3,996.772	3,246.988	3,974.666	2,832.350	2,965.700	4,033.228	4,027.121
Actual consumption (KL)	3,513.772	6,807.699	3,040.209	3,270.934	6,095.237	7,048.695	5,208.750	6,763.150	4,784.561	4,019.066
Excess consumption (KL)	--	2,242.926	--	--	2,848.249	3,074.029	2,376.40	3,797.45	751.333	--
Gross generation (MU)	1,213.924	1,304.221	1,166.203	1,141.935	927.711	1,135.619	809.243	847.343	1,152.351	1,150.606
Value of excess consumption (Rs. in crore) at the rate of Rs.25 per litre	--	5.61	--	--	7.12	7.69	5.94	9.49	1.88	--
Percentage of excess consumption of oil	--	49.13	--	--	87.71	77.34	83.90	128.04	18.62	--

Excess consumption of oil resulted in extra expenditure of Rs.37.73 crore.

It would be seen from the above table that the actual consumption of oil was generally higher than the norm and the excess consumption ranged between 18.62 and 128.04 per cent. Management attributed the increase in consumption of fuel oil to poor backing and pressure part leakages. However, no remedial measures were taken to rectify the deficiencies. Oil valuing Rs.37.73 crore was consumed in excess during 1998-2003 due to non observance of norms prescribed by GOI.

Management replied (September 2003) that excess consumption was due to increased number of trippings of Units I and II, outage of ID fan, milling system and restriction of drum pressure as silica contents were high.

The reply was hardly tenable in view of the fact that had remedial steps been taken in time, the excess oil consumption could have been avoided.

Procurement of materials

Construction of coal handling plant for Units III and IV

3.2.14 Board placed (February 1998) an order for design and engineering, manufacture, supply, erection, testing and commissioning of coal handling plant (CHP) with a capacity of 1200 MT per hour for Units III and IV on Krupp Industries (India) Limited, Pune, at a total cost of Rs. 42 crore. The plant was constructed by the firm in January 2000. It could not, however, be put into operation due to non-completion of work of railway yard by

Despite extra expenditure on manual unloading, Board failed to effectively pursue the Railways which resulted in avoidable recurring annual expenditure of Rs.1.17 crore.

Railways, Though, the approval from Railways was received in September 2002 itself, the work was yet to be completed (March 2003). Consequently, the coal rakes were still unloaded manually through contractors at Rs.3.72 per MT. During the three years up to 2002-03 (September 2002), the Station received 94,69,259.62 MT coal and spent Rs.3.52 crore on manual unloading. Though the Board was thus put to extra financial burden due to delay in completion of railway yard, it had not taken concerted steps to pursue and ensure speedy completion of the work by Railways. The failure resulted in avoidable recurring expenditure of Rs.1.17 crore per annum towards manual unloading, in addition to Rs.5.88 crore per annum towards interest (at 14 per cent on the locked up investment of Rs. 42 crore).

Board while attributing (September 2003) the delay to Railways, stated that the work would be completed in November 2003.

The reply was not convincing as the Board failed to effectively pursue the matter after it had placed the order in 1998.

Idle locomotive

Purchase of locomotive, without assessing its immediate use, led to locking up of Rs.1.90 crore.

3.2.15 Despite being aware that the railway yard work was not completed, the Board placed (January 2002) an order for supply of a 700 HP 120 tonne diesel hydraulic locomotive for wagon tripper on SAN Engineering & Locomotive Company Limited, Bangalore. The locomotive was received and commissioned in July 2002. However, in the absence of railway yard and non-availability of loaded wagons, the loaded wagon test could not be conducted and consequently, the locomotive has remained idle. Purchase of locomotive, without ensuring the possibility of its immediate use, resulted in locking up of Rs.1.90 crore with consequential loss of interest of Rs.26.76 lakh per annum (at 14 per cent).

Board admitted (September 2003) that locomotive could not be put to use due to non-availability of railway siding for wagon tripper.

Avoidable purchase of spares for stand-by system of ash handling plant

3.2.16 Despite being aware that the existing stand-by system of ash handling plant commissioned in March 1993 was not being put to use, the Superintending Engineer, Mechanical Maintenance Division-I of the Station, submitted (August 2000) a proposal for urgent purchase of spare parts for existing stand-by system of at an estimated cost of Rs.59 lakh.

The Board accordingly procured (February 2001) spares from DCIPS Limited, Kolkata, on a single tender basis (being the original manufacturer of the

Purchase of spares for a stand-by system, yet to be used, resulted in avoidable expenditure of Rs.59 lakh.

system) and received the spares in March 2002. The stand-by system has not, however, been put to use as the main system had been in operation since its commissioning, without any problems. Thus, purchase of spares for a stand-by system, which was yet to be put to use, resulted in avoidable expenditure of Rs.59 lakh.

Management stated (September 2003) that due to shortage of spares, one of the two streams was taken out of service and its spares were utilised in the other stream system. Further after receipt of the spares, these were fitted in the systems.

The reply was not convincing as the stand by system was never put to use. Moreover, the log book indicating the use of spares too was not made available to Audit for verification.

Non-installation of Demineralisation plant

3.2.17 An order for supply of materials for Demineralisation (DM) plant was placed (March 1998) on Indocan Engineering System Limited, Pune, for Rs.4.19 crore, inclusive of cost of main equipment (Rs. 3.80 crore), mandatory spares (Rs.38.10 lakh), tools and tackles (Rs.0.50 lakh) and transit insurance (Rs.0.05 lakh). The supply was to be completed by September 1998. Order for erection, testing and commissioning of DM plant of two streams was also placed

(April 1998) on the same firm for Rs.15.05 lakh with the stipulation to complete the work by September 1998. The firm completed supply of material worth only Rs.3.51 crore (against order placed in March 1998) and carried out erection work for Rs.14.44 lakh for only one stream by March 2000. Therefore, the Board cancelled (February 2003) the order and forfeited the firm's bank guarantee of Rs.1.32 crore.

Thus, the material meant for construction of the second stream worth Rs.1.75 crore (approximately) received could not be put into service and were lying idle/unutilised. As the lone DM plant had to meet the needs of both power houses, the non-commissioning of second DM plant had adversely affected the heat transfer and caused premature failure of tubes with undesired deposits therein, resulting in low generation as referred to in paragraph 3.2.4 *supra*.

The management stated (May 2003) that negotiations were held with another firm for completion of second stream including supply of balance materials and proposals were already submitted (October 2002) to the Board for approval, which was awaited. The fact remains that no finality was reached and the thermal station continued to function with attendant problems.

Non-commissioning of DM plant resulted in idling of machinery worth Rs.1.75 crore, besides the attendant operating problems.

Idle pipes

Idle investment in pipes resulted in loss of interest of Rs.19.76 lakh.

3.2.18 Without assessing immediate requirement, the Station purchased (December 2000), 6781.05 metre MS ERW pipes (code No. 713-06-414-884-02) valued at Rs.1.01 crore but immediately issued only 2,480 metre for use. The balance 4301.05 metre valuing Rs.71 lakh were lying unused even as of June 2003. This resulted in locking up of Rs.71 lakh with consequent loss of interest of Rs 19.76 lakh (at 14 per cent for two years).

Management replied (September 2003) that pipes for worst-affected areas were replaced/utilised immediately and balance were due for replacement. Further, these pipes would be utilised shortly.

The reply was not acceptable as even after a lapse of two-and-a-half years, the Station could not utilise the pipes which indicates that the purchase was not essential.

Maintenance of power house

Undue benefit to contractor

3.2.19 The operation and maintenance (O&M) contract for two ash handling plants (AHP) had been awarded to DC Industrial Plant Services Limited, Kolkata (DCIPS) since commissioning, on the ground of being the original equipment manufacturer.

While according approval to the contract in respect of Power House-I, Member (Finance) opined (May 2000) that the rates offered by the firm were very high and hence directed to develop alternative sources within a year. Despite this, O&M contract in respect of Power House-I was placed (June 2000) on DCIPS on a long term basis, for five years, at Rs. 13.50 lakh per month, with an escalation of 7.5 per cent every year.

Award of contract at a stretch for five years resulted in extra expenditure of Rs.2.63 crore.

It was noticed (March 2003) in audit that in respect of Power House-II the firm submitted its offer (February 2001) initially at Rs.13.75 lakh per month but subsequently reduced it to Rs.8.20 lakh due to submission of tender by another contractor of Mumbai at Rs.8.20 lakh per month. However, the emerging competition was not encouraged and AHP contract for Power House-II too was awarded (January 2002) to DCIPS at the competitor's lower rate of Rs.8.20 lakh per month. Thus, failure to develop alternative source, coupled with placing the order for five years at a stretch, has resulted in an avoidable extra expenditure of Rs.2.63 crore (*Annexure 18*), up to March 2003, and was tantamount to extending undue benefit to the contractor; this would go up to Rs.4.41 crore by May 2005, the month up to which the contract was awarded.

Management replied (September 2003) that the units III and IV were commissioned five years after commissioning of the units I and II, and the cost of maintenance increased according to the age of the plant.

The reply was not tenable as the life span of a plant was 35 to 40 years and the Board's contention that over a period of five years, the operation and maintenance expense would increase by as much as 65 per cent (Rs.13.50 lakh compared to Rs.8.20 lakh) fails to carry conviction. Further, it was clearly an instance of discouraging competition, instead of encouraging it as also advised by the Member (Finance), which was not a healthy trend.

Conclusion

The Station commissioned to meet the growing demand for power is badly afflicted with problems of frequent forced outages and excess time taken for planned outages. While measures were not taken to keep consumption of fuel oil within limits, steps were also not taken to execute fuel supply agreements with coal suppliers to contain extra expenditure due to payment for shales/stones and low grade coal. Further, non/delayed commissioning of locomotive, rail weigh-bridge, second stream of demineralisation plant, etc. besides denying the Station of the benefits expected of them, resulted in avoidable extra burden towards interest.

Therefore, concerted steps are required to be taken for reducing the hours lost on forced outages, finalising the fuel supply agreement with coal suppliers and containing the consumption of coal and fuel oil with a view to improving performance of the Power Station. Efforts should also be made to put to use the idle equipment so that the money invested bear fruit to the Board.