CHAPTER – III

3. REVIEWS RELATING TO STATUTORY CORPORATION

3.1 REVIEW ON INCOMPLETE TRANSMISSION SCHEMES OF BIHAR STATE ELECTRICITY BOARD

Highlights

The transmission system should keep pace with the generating capacity so as to ensure proper voltage, minimum system losses for efficient evacuation of power. In Bihar State Electricity Board, it was not commensurate the increased power availability for sale in the state.

Sixteen schemes including ten schemes spilled over from V to VIII five year plans remained incomplete for one to 19 years after investment of Rs 91.42 crore.

(Paragraph 3.1.1)

Due to inadequate transmission link, surplus power available in south Bihar could not be transmitted to north Bihar. As a result per capita consumption in north Bihar during 1997-98 and 1999-2000 was 19.26 and 23.21 units against all India average of 348.50 units.

(Paragraph 3.1.6)

The Board failed to draw full share of 700 mega watt from central grid and had to pay Rs 973.36 crore as fixed charge without availing its share of power.

(Paragraph 3.1.7)

The Board failed to complete 16 schemes due to lack of planning. This led to cost overrun of Rs 50.41 crore and loss of potential revenue of Rs 2620.79 crore.

(Paragraph 3.1.11)

Due to non-synchronisation of related schemes, Rs 46 crore invested on completed schemes remained blocked.

(Paragraph 3.1.12)

Construction of Purnea-Begusarai transmission line could not be completed due to delay in implementation of court order and procurement of materials. This resulted in locking up of Rs 20.15 crore.

(Paragraph 3.1.13)

Due to defective planning of construction of Biharsarif-Fatuah-Hazipur transmission line, 11 towers at Ganga crossing collapsed and the Board suffered loss of Rs 35.11 crore.

(Paragraph 3.1.15)

Equipment for Begusarai grid substation procured much before requirement became obsolete due to improper storage and the Board sustained loss of Rs 2.98 crore.

(Paragraph 3.1.18)

Introduction

3.1.1 The transmission system is an important and essential link between the power generating source/ receiving source and the ultimate distribution point. The optimum utilisation of the power generated/ purchased is not possible without paying adequate attention to the transmission system. For efficient functioning of transmission system, it must be ensured that there is least wastage in transmitting the power. Electricity is generated at the generating stations at 11 KV and is stepped up by power transformers to 132/220/400 KV for transmission to sub-transmission and distribution sub-stations and is stepped down to 33/11 KV at grid sub-station. The transmission system should keep pace with generation by having proper length of transmission and distribution lines, size of transformers and conductors, proper voltage and power factor in order to strengthen the transmission system.

In Bihar State Electricity Board (Board) during IX five year plan (FYP) (1997-2002), against approved outlay of Rs 1549.67 crore, actual expenditure on generation, transmission and distribution schemes was Rs 45.17 crore, Rs 55.41 crore and Rs 171.34 crore, respectively. Sixteen schemes including 10 schemes spilled over from V to VIII five year plans remained incomplete for one to 19 years after investment of Rs 91.42 crore (Annexure 12).

During the last three years ending 31 March 2001, total investment on transmission network was Rs 52.51 crore (Board's accounts for 2001-02 and 2002-03 were not yet ready).

Organisational set up

3.1.2 The Transmission wing of the Board has been working under Member, Transmission and Distribution. The Transmission wing is responsible for

planning, execution and erection of the transmission lines with the help of eleven Chief Engineers of Transmission wing. There is one Chief Engineer (Planning) who formulates different schemes of the Board and submits them to the Planning Commission for approval.

Scope of Audit

3.1.3 Growth of transmission network, transmission and distribution (T&D) system and physical and financial performance of power sector in VII FYP of the Board was reviewed and included in Audit Reports (Commercial) for 1995-96 and 1998-99 respectively. These reviews are yet to be discussed by the Committee on Public Undertakings (COPU).

The present review conducted during December 2002 to March 2003 covers sixteen transmission schemes comprising transmission lines and Grid sub-station approved by the Board of Members (BOM) and remaining incomplete as on 31 March 2003 as per Annexure 12. The objective of the review is to evaluate the effectiveness of the Board in completing the transmission schemes for smooth and safe transmission of power from point of generation/purchase to distribution end.

The audit findings, as a result of test check of records, were reported to Government and the Board in June 2003 with specific request for attending the meeting of Audit Review Committee for State Public Sector Enterprises (ARCPSE) so that view point of Government / Board was taken into account before finalising the review. The meeting of ARCPSE was held on 22 September 2003 where Government was represented by the Secretary to the Energy Department and Board was represented by Member (Transmission and Distribution) and Member (Generation). The review was finalised after considering the views of the Government and Board.

Transmission network

3.1.4 In Bihar there are two sources of power viz. own generation and purchase. Major portion of power purchased from central sector[*] and other sources[$] is transmitted through Biharsarif grid. Power generated in Muzaffarpur Thermal Power Station (MTPS) and Barauni Thermal Power Station (BTPS) is transmitted through 132 KV transmission lines connecting Muzaffarpur, Samastipur and Barauni 132/33 KV grid sub-station (GSS). A small quantity of power purchased from Chukha Hydel Project is transmitted through 132 KV transmission line from Purnea to Barauni grid sub-station. Barauni and Biharsarif grid are interconnected by an old and unreliable cable over Ganga crossing at Hathidah. A map showing transmission and distribution network of Board is placed at Annexure –13.

[*] National Thermal Power Corporation, Damodar Valley Corporation, Chukha Hydel Project.
[$] West Bengal State Electricity Board

Availability of power and growth of transmission system in the State are detailed below:

	1998-99	1999-2000	2000-01	2001-02 (provi-sional)	2002-03 (provi-sional)
A. Generation/Purchase (MU)[1]					
(i) Net generation	788.07	592.49	627.32	594.54	460.57
(ii) Purchases	4,058.20	4,611.03	4,693.69	5,667.98	5,511.53
Total energy available for sale (i)+(ii)	4,846.27	5,203.52	5,321.01	6,262.52	5,972.10
B. Transmission lines (CKMS)[2]	4,617.73	4,685.73	4,685.73	4,685.73	4,691.73
C. Standard/norm for transmission lines per MU of energy available (CKMS)	13.33	13.33	13.33	13.33	13.33
Transmission lines per MU of energy available (CKMS)	0.95	0.90	0.88	0.74	0.78

From the above it may be seen that the transmission lines available ranged between 0.74 and 0.95 CKMS per MU against the norm of 13.33 CKMS per MU. It is evident from the above that there was inadequate development of transmission system.

Growth of transmission network

Inadequate development of transmission network led to higher transmission loss of Rs 175.94 crore.

3.1.5 During the last five years ending 31 March 2003, the growth of 400, 220 and 132 KV transmission network were nil, 52 and 22 CKMS, respectively. Only a scheme of 220 KV GSS and three numbers 132/33 KV GSS were constructed for evacuation and transfer of bulk power generated from own plants as well as purchased from other sources. The growth of transmission system and availability of power of the Board during the last five years up to 2002-03 are detailed below:

Sl. No.	Particulars	1998-99	1999-2000	2000-01	2001-02 (provi-sional)	2002-03 (provi-sional)
1.	Installed capacity (MW)[4]	559.20	559.20	559.20	559.20	559.20
2.	Transmission line (in circuit kms) 400 KV line	75	75	75	75	75
3.	220 KV line (CKM)	911.02	963.02	963.02	963.02	963.02
4.	132 KV line (CKM)	3,631.71	3,647.71	3,647.71	3,647.71	3,653.71
5.	Grid sub-station (No capacity in MVA)					
	(a) 220/132 KV	9/1150	10/1200	10/1200	10/1200	10/1200
	(b) 132/33 KV	85/1800	88/2000	88/2000	88/2000	88/2000

[1] Million unit
[2] Circuit Kilo meters
[4] MW-Mega watt

Power handled, power supplied and transmission loss						
1.	Total power handled (Million unit available)	4,846.27	5,203.52	5,321.01	6,262.52	5,972.10
2.	Total power supplied to area board, HT consumers and neighbouing system (MU)	NA	NA	NA	5,580.52	5,318.32
3.	Transmission loss (MU)	NA	NA	NA	682.00 (10.89 per cent)	653.70 (10.94 per cent)
4.	Transmission loss in excess of norms of 4 per cent (MU)	NA	NA	NA	431.48	414.46
5.	Loss (Rs in crore)*	NA	NA	NA	89.74	86.20

The Board had not laid down norms for system losses at various stages of transmission. As against the norm of 4 per cent approved by Central Electricity Authority (CEA), transmission loss ranged between 10.89 and 10.94 per cent during the last two years ending 31 March 2003. Total transmission loss in excess of norms was Rs 175.94 crore during 2001-03.

The Board had not analysed reason for such excess transmission loss. However, audit scrutiny revealed that due to non introduction of 400 KV line, non completion of a number of 220 KV lines and 220/132 KV grid sub-stations, bulk power was evacuated and transmitted to long distances through 132 KV lines resulting in higher transmission loss.

Inadequacy of transmission system in north Bihar

3.1.6 A mention was made in paragraph 3A.4.1 of Audit Report (Commercial) 1994-95 that according to World Bank Report (August 1994), evacuation of power from Biharsarif sub-station to the rest of Bihar might prove to be a bottleneck until the transmission lines from Biharsarif to Begusarai and Begusarai to Muzaffarpur and Purnea were completed. It was seen that construction of Begusarai-Purnea, Muzaffarpur–Begusarai and Begusarai GSS though taken up during 1987-1989 could not be completed after spending Rs 49.88 crore (March 2003). Thus, due to non-completion of the lines / GSS, the Board had failed to provide adequate transmission network for import and export of power to north and south Bihar.

Against the demand of 300 MW of power, the Board could transfer only 80 to 100 MW of power to north Bihar. At present north and south Bihar is connected by 132 KV Biharsarif -Barauni line through 132 KV Barauni-Hathidah single cable capable of transmitting only 45 MW of power. Though

* Transmission loss x average selling rate per MU (Rs 2.08 per KWH)

the Board had constructed 75 and 963.02 CKMs of 400 and 220 KV transmission lines, optimum utilisation of these lines could not be done for want of matching grid sub-station (GSS).

Due to inadequacy of power infrastructure in the state only 37 per cent of villages could be electrified compared to the all India average of 86.6 per cent (2002-03). Further, per capita consumption of power in Bihar during 1997-98 and 1999-2000 was 131.65 and 131.57 units respectively, against all India per capita consumption of power of 348.50 units (1997-98). During the same period per capita consumption of power of north Bihar was only 19.26 to 23.21 units. Thus, due to inadequate development of transmission and distribution network, electrification of villages and per capita consumption of power in the state remained far below all India average, which is indicative of poor development of transmission system.

In reply the Board stated (October 2003) that the Board had adequate capacity to transmit power between north and south Bihar.

The reply is not tenable as the existing transmission network is weak and old. The Board could not charge 400 and 220 KV transmission lines at its required capacity after completion of construction for want of matching grid sub-station. As a result the existing network could not draw required power from the grid to meet the demand.

Avoidable payment of fixed charges

Board paid fixed charges of Rs 973.36 crore to central grid without availing full share of power.

3.1.7 The state of Bihar had a share of about 700 MW power from the power stations of National Thermal Power Corporation (NTPC) of eastern region available at Biharsharif (south Bihar). The transmission link between south and north Bihar had capacity to transmit 80-100 MW that too in a very unreliable manner. The main reason of inadequacy is that the existing system is very old and there has not been any strengthening of the system in the past. Due to this inadequacy, the system could not draw its full share of power. Against its share of 700 MW the Board could draw only 400-450 MW. Irrespective of its capacity to draw its share of power from NTPC units, the Board was liable to pay fixed charges to the Government of India (GOI). The Board had paid fixed charges of Rs 2,503.629 crore for withdrawal of 18,740 MKWH[*] of power against allocation of 30,660 MKWH during the last five years ending March 2003. Thus, due to inadequate development of T&D system, the Board could not draw its share and had to incur avoidable expenditure of Rs 973.36[$] crore.

In reply the Board had stated (October 2003) that payment of fixed charges to NTPC for non drawal of its full share of power is not relevant as the Board had drawn rather more power than its allocated share.

The reply is not tenable as the capacity of the grid of the Board at Biharsarif to draw power from NTPC was only 480 MW and average drawal from NTPC

[*] MKWH –Million unit
[$] Total fixed charges / share of power from central grid x units not drawn

during the last five years ending 31 March 2003 was only 427.85 MW. Thus, fixed charges were paid without availing full share of power of 700 MW.

Targets and actuals

3.1.8 Financial and physical targets vis-à-vis actuals there against of transmission system for last five years ending 31 March 2003 were as under:

Financial outlay and actual expenditure

Year	Proposed	Revised outlay	Actual expenditure	Percentage of expenditure to revised outlay	Percentage of curtailment in revised outlay
	(Rupees in crores)				
1998-99	100	70	12.72	18.17	30
1999-2000	112.88	20	18.91	94.55	82.28
2000-01	50	63.38	20.88	32.92	--
2001-02[#]	152	26.74	--	--	82.40
2002-03[#]	56.15	200	--	--	--

Physical targets and actual achievements

Year		400 KV line ckm	220 KV line ckm	132 KV line ckm	220/132 KV GSS nos.	132/33 KV GSS nos.
1998-99	Target Achievement Percentage of achievement to target	Nil Nil Nil	Nil Nil Nil	Nil Nil Nil	3 Nil Nil	4 Nil Nil
1999-2000	Target Achievement Percentage of achievement to target	Nil Nil Nil	90 52 57.77	352 16 4.54	3 1 33.33	4 3 75
2000-01	Target Achievement Percentage of achievement to target	Nil Nil Nil	646 Nil Nil	336 Nil Nil	2 Nil Nil	1 Nil Nil
2001-02	Target Achievement Percentage of achievement to target	Nil Nil Nil	584 nil nil	100 nil nil	2 nil nil	1 nil nil
2002-03	Target Achievement Percentage of achievement to target	Nil Nil Nil	172 Nil Nil	46 6 13.04	51 Nil Nil	85 Nil Nil

[#] Figure for 2001-02 and 2002-03 under compilation by the Board

It would be observed from the above tables that

- achievement of the physical and financial targets for implementation of transmission lines and GSS of various capacities during the five years ending 31 March 2003 was far below the target;
- during 1998-99, 2000-01 and 2001-02 achievement was nil in respect of transmission lines and GSS;
- physical targets were not revised according to revised financial outlay;
- during the last five years ending 31 March 2003 the percentages of physical achievement to target were nil, 57.7, 4.54 and 13.04 per cent in respect of 400, 220 and 132 KV transmission lines and
- during 1999-2000 only one 220/132 KV and three 132/33 KV GSS were constructed.

Monitoring

Lack of monitoring and improper planning led to non-completion of schemes.

3.1.9 A mention was made in paragraphs 3A.7.5 and 3A 5 of Audit Reports (Commercial) for 1994-95 and 1995-96 about the absence of regular monitoring at the head office of the transmission projects. It was noticed that the Board did not introduce any system of network planning based on programme evaluation and review technique (PERT) chart or critical path method (CPM) indicating scheduled date of commencement and completion of each activity for regular monitoring and control over construction of the projects/ schemes. The abnormal delays in completion of projects were not analysed by the Board on a systematic basis.

Incomplete transmission schemes

Ten schemes spilled over from V to VIII FYP after investment of Rs 75.90 crore.

3.1.10 The Board had undertaken 98, 52 and 46 transmission schemes (including spilled over schemes of V to VI FYPs) which were approved by the Planning Commission during the three FYPs (VII to IX). The Board completed 60 schemes.

There were 16 incomplete transmission schemes as on 31 March 2003. Annexure-12 indicates details of estimated / actual cost, scheduled/ actual date of completion, time and cost overrun in respect of these 16 schemes which are yet to be completed and are discussed below. Out of 16 schemes, three, four, one and two schemes were pending since V,VI,VII and VIII FYPs respectively.

Further scrutiny in audit revealed that seven out of 16 schemes were incomplete for more than 15 years and one scheme was incomplete for more

than five years. Detailed break up of the schemes and actual expenditure incurred for the last four (V-VIII) FYPs are detailed below:

Five year plan	No. of incomplete transmission schemes		Actual expenditure (Rs in crore)
Period	Transmission lines	Grid sub-station	
V 1975-80	1	2	3.42
VI 1980-85	2	2	61.55
VII 1985-90	1	--	--
VIII 1997-02	--	2	10.93
Total	4	6	75.90

In reply the Board stated (October 2003) that the schemes could not be completed due to paucity of fund.

The reply is not tenable as the Board had no definite plan/programme to complete the schemes originally planned for. Board's failure in completing the schemes was due to improper planning, lack of monitoring, defective survey, non- receipt of clearance, blocking up of funds in idle and obsolete equipments procured in advance. The Board had spent Rs 272.12 crore during three FYPs (VII to IX) on execution of transmission schemes.

Time and cost overrun

Lack of planning led to cost overrun of Rs 50.41 crore and loss of potential revenue of Rs 2620.79 crore.

3.1.11 Due to lack of planning and non synchronisation of related activities, the Board had failed to complete five numbers of transmission lines and 11 numbers of GSS after lapse of one year eight months to 19 years 9 months resulting in cost overrun of Rs 50.41 crore. Thus, investment on these schemes had failed to generate anticipated revenue of Rs 2,620.79 crore to the Board (Annexure-12).

Mismatching in construction

Due to non synchronisation the Board locked up Rs 46.00 crore.

3.1.12 Grid sub-stations (GSS) and transmission lines are to be constructed simultaneously to achieve the anticipated benefit. But, the Board had failed to construct the related schemes simultaneously. Mismatching in construction of transmission schemes is detailed in Annexure-14. It would be seen from the Annexure that three schemes completed after investment of Rs 24.20 crore remained unutilised due to non- synchronisation of related four schemes after incurring expenditure of Rs 21.80 crore. Thus, the investment of Rs 46 crore of the Board remained blocked.

The Board stated (October 2003) that GSS at Dehri on Sone is in operation at its own rated voltage and capacity since long.

The reply of the Board was not tenable as the 220 KV transmission line was charged at 132 KV for want of matching infrastructure at the GSS. Reply relating to other three cases of mismatching construction was not furnished by the Board.

Incomplete transmission lines

Construction of Purnea- Begusarai transmission line (VI FYP)

3.1.13 Under the existing T&D system of the Board, Purnea is connected with 132 KV GSS at Barauni Thermal Power Station (BTPS), Barauni through 132 KV single circuit (S/C) transmission line. Existing system is very old and susceptible to frequent breakdowns. In order to establish a suitable alternative for transmission of power in north Bihar, and also to avail central sector power from Chukha Hydel Project, construction of 220 KV Purnea-Begusarai line (384 CKM) was included in the VI FYP (1980-85) at an estimated cost of Rs 10.02 crore which was revised (2002-03) to Rs 29.51 crore.

Due to lack of proper planning the Board deferred the scheme after investment of Rs 20.15 crore.

The work order was placed in 1986 on a private company, the work was stopped in 1989 for want of revision of price variation terms, non-availability of towers and line materials. The terms of the contract were revised in March 1999 in pursuance of a High Court order of August 1996. Though materials were procured in 2000, the contractor sought extension up to May 2004. No stringing work was undertaken and the scheme had been shifted to non-priority sector after spending Rs 20.15 crore for no reason on record. Additional capital outlay of Rs 9.36 crore would be required for completion of the scheme.

Delay in implementation of court's order and procurement of materials required for the construction work resulted in locking up of Rs 20.15 crore. There was time overrun of 17 years and cost overrun of Rs 10.13 crore (Annexure–12) due to lack of monitoring and proper planning. Thus, the intended objective of improving the power supply by linking north and south Bihar has not been achieved so far (March 2003), despite expenditure of Rs 20.15 crore due to delay in completion of the scheme.

The Board stated (October 2003) that the transmission line could not be completed due to paucity of fund.

The reply of the Board is not tenable as the scheme was deferred without any recorded reason.

Construction of double circuit line between MTPS and Begusarai GSS (VI FYP)

3.1.14 Presently Muzaffarpur Thermal Power Station (MTPS) is connected with 132/33 KV GSS at BTPS, Barauni through 132 KV Samastipur GSS. Excepting Samastipur GSS there is no other alternative source available for import/export of power.

A mention was made in paragraph 3A.7.4 (d) of Audit Report (Commercial) for the year 1994-95 that MTPS-Begusarai line for evacuation of power from MTPS and also to establish an alternate arrangement for stable power supply was deferred in October 1993 after expenditure of Rs 11.79 crore due to collapse of eleven numbers of towers at river crossing at Fatuah.

After a lapse of ten years, the Board decided (December 1997) to complete the transmission line and placed an order on Sun Steel Industries at a cost of Rs 5.36 crore for composite work of supply of tower members, erection and commissioning of left over work (approximate route length 123.5 Kms) within 15 months. The Board purchased 756 KMs of conductor at a cost of Rs 11.11 crore during May 2000 to November 2001. The contractor executed the work valuing Rs 1.63 crore. The balance work could not be completed due to non-supply of cement, delay in payment of crop compensation and necessary clearance from different authorities. Stringing of conductors could not be taken up as erection and foundation works were yet to be completed.

Allotment of work without survey and non supply of materials led to idle investment of Rs 22.35 crore and cost overrun of Rs 17.66 crore.

Thus, allotment of work without survey of alignment, preparation of drawings, arrangement of materials, and resurvey had resulted in idle investment of Rs 22.35 crore on construction, materials and resurvey (March 2003) and there has been cost overrun of Rs 17.66 crore and time overrun of 17 years (Annexure-12). Besides, delay in construction and consequential re-alignment of route resulted in avoidable expenditure of Rs 73 lakh on 13 numbers additional towers.

The Board admitted (October 2003) that the work had been delayed mainly on account of re-routing, re-survey and required clearance.

Construction of transmission line over Ganga crossing at Fatuah

3.1.15 A mention was made in paragraph 3A.4.1 of Audit Report (Commercial) for the year 1995-96, that 220 KV double circuit (D/C) Biharsarif- Fatuah- Hajipur D/C line with Ganga river crossing at Fatuah with 11 numbers of well foundations was constructed at a cost of Rs 35.11 crore by Kamani Engineering Company in August 1991 which collapsed in May 1993.

Defective planning led to collapse of towers and loss of Rs 35.11 crore.

A committee comprising representatives of Central Electricity Authority (CEA), Power Grid Corporation India Limited (PGCIL) and the Board was constituted (December 1994) to investigate the reason for failure and to offer suggestions for rehabilitation. After detailed investigation the committee arrived (December 1994) at a conclusion that existing well foundations were

not suitable for 220 KV double circuit (D/C) tower to bear the load of conductor and wind pressure as these foundations were suitable for 220 KV single circuit line with deer conductor.

On the advice of CEA, it was decided (May 1999) to construct 220 KV single circuit (S/C) line on the existing well foundations and another independent 220 KV S/C line crossing at the river adjacent to the previous one. Tenders were invited in March 1997 for design, manufacture and supply of towers and all line materials, erection, testing and commissioning of the line on turn key basis. Tender was cancelled (December 2001) as the Board had failed to take suitable decision in this regard. No further action was taken by Board as of March 2003. Thus, the Board had failed to take suitable decision to restore the most important link between north and south Bihar for more than ten years. Thus, due to defective planning the Board had sustained loss of Rs 35.11 crore.

Thus, due to non-completion and non-restoration of construction of the aforesaid three schemes, the Board could not provide adequate transmission link between north and south Bihar.

The Board stated (October 2003) that after provision of required fund, action for rehabilitation of the Ganga crossing overhead transmission line at Fatuah would be initiated.

The reply is not tenable as the Board had approved outlay of Rs six crore during VIII FYP but no action was taken by the Board (September 2003).

Construction of Arrah-Khagaul transmission line (route length 36.2 KM)

3.1.16 A work order was placed (January 1999) on Bihar Transmission Limited (BTL) at a cost of Rs 1.40 crore for supply of 220 KV D/C tower, 132 KV D/C assorted tower members (128), templates and other materials including erection of 132 KV D/C Arrah-Khagaul transmission line (36.2 Kms). The work was to be completed within March 2001 i.e. 18 months from the date of issue of order.

The contractor could not start the work till December 1999 due to non availability of route profile, foundation drawing, cement and way clearance. Upto January 2002 erection of towers and foundations for 127 and 32 numbers could be completed within the extended period of completion June 2002.

After spending Rs3.25 crore the scheme had been shifted (January 2002) to non-priority group for no reason on record. No decision had been taken by the Board either to complete the construction or to utilise the same as an additional source of power (March 2003). Additional capital outlay of Rs 6.75 crore would be required for completion of the scheme.

Due to non-availability of route profile, materials and shifting of priority Rs 3.25 crore was locked.

Due to non availability of route profile, foundation drawing, cement to the contractor and failure of the Board in taking a definite plan and programme for execution of the scheme, fund of Rs 3.25 crore was locked up with consequential loss of interest of Rs 46 lakh.

The Board stated (October 2003) that the priority of the work of construction was shifted mainly due to fund constraint.

The reply is not tenable. The Board stopped construction because PGCIL had also taken up construction of 220 KV Arrah-Khagaul transmission line for central grid.

Construction of Jamui-Jhajha transmission line

3.1.17 Railway track between Patna and Jhajha section was to be electrified by the end of March 1999 for which traction power was required at Jhajha and Lakhisarai. The Board placed (January 1998) an order on Sun Steel Industries (P) Ltd., Kolkata for composite work of manufacture, galvanizing and supply of complete set of 132 KV D/C transmission line towers with fasteners including towers accessories and complete erection of 132 KV D/C transmission line from Board's grid sub-station at Jamui to railway traction sub-station at Jhajha (route length 32.25 KM approx) at a cost of Rs 1.66 crore under railway deposit scheme.

According to the work order entire work under this contract was scheduled to be completed within five months from the date of placement of order. In case of delay, penalty of two per cent of value of order was to be imposed for every delay of 15 days or part thereof subject to a maximum of five per cent of the contract value. The Board was to arrange the right of way/ necessary working clearance of tree and other obstruction on either side of the alignment of the line. Jungle clearance/tree cutting if any, along the line was also to be arranged by the Board.

Due to defective survey and lack of clearance by the Forest Department there was loss of potential revenue of Rs 4.55 crore.

After completion of 70 per cent of foundation, erection of railway traction towers, the construction work had been stopped since March 1999 for want of necessary clearance/ permit of the Forest Department.

Due to non-availability of necessary clearance an alternate route was approved (August 2002). The cost of the work has also been revised to Rs 7.69 crore. The work is yet to be completed (March 2003) though Rs 1.55 crore has been spent. Thus, due to delay in completion of the work, the Board had lost potential revenue of Rs 4.55 crore.

The Board stated (October 2003) that original route of the line was finalised considering that clearance from Forest Department would be obtained.

Incomplete grid sub-stations (GSS)

Advance procurement of equipments led to loss of Rs 2.98 crore due to damage /obsolescence of equipment and unproductive investment of Rs 4.40 crore.

Construction of grid sub-station at Begusarai (VI FYP)

3.1.18 The construction of 220/132 KV grid sub-station at Begusarai was sanctioned and included in VI plan period (1980-85) at a cost of Rs 3.41 crore which was further revised (2002-03) to Rs 17.18 crore. A mention was made in paragraph 3A.7.2 of the Audit Report (Commercial) 1995-96 on idle

investment of Rs 2.98 crore on procurement of equipment for construction of the grid sub-station. Contractual guarantee period of all these equipment had expired. After completion of foundation work and procurement of equipment at a cost of Rs 7.38 crore, the work has been left incomplete since June 1997.

It was further noticed (January 2003) in Audit that considering importance of the GSS, Best and Crompton (B&C) and ABB were requested (May 2000) by the Board for physical inspection of the equipment. After inspection, both the firms submitted (August 2000) their report stating that the equipment had become obsolete and certain parts had either been stolen or damaged. As such, rehabilitation of the equipment would not be economical. Additional capital outlay of Rs 9.80 crore would be required for completion of the scheme.

Thus, due to improper planning and procurement of equipment much before their requirement and improper storage, Board's fund of Rs 7.38 crore were not only locked but also Board had to sustain loss of Rs 2.98 crore on account of damaged/ obsolete equipment. The objectives for providing stable power to north Bihar could not be achieved. Besides, due to delay in construction there had been cost overrun of Rs 3.97 crore and time overrun of 17 years and potential revenue loss of Rs 987.34 crore.

The Board stated (October 2003) that due to paucity of fund the work could not be completed.

The reply of the Board is not tenable as the work had been delayed due to improper planning and blocking of Board's fund in idle and obsolete equipment procured in advance.

Construction of grid sub-station at Hajipur (VI FYP)

3.1.19 A mention was made in paragraph 3A.7.4 of Audit Report (Commercial) for 1991-92 that for smooth transmission of bulk power from MTPS to Hajipur and to reduce system loss, the Board sanctioned (1984-85) construction of 220/132/33 KV grid sub-station including installation of two numbers of 100 MVA transformers at Hajipur at an estimated cost of Rs 2.38 crore. The work was scheduled to be completed by March 1990. After completion of the GSS it was to be linked with the associated link line viz. MTPS-Hajipur-Bidupur and Kutupur to provide adequate T&D network for stable power supply.

Due to non completion of GSS, Rs 11.67 crore were locked up.

Main constraints in completion of the sub-station were selection of site in low lying land, delayed preparation of drawing of civil works and non procurement of materials. The Board had spent (December 2002) Rs 11.67 crore on acquisition of land and construction of 75 per cent of foundation work and 60 per cent of erection work. No further work was taken up by the Board (March 2003). However, construction of associated transmission link line i.e. MTPS- Hajipur-Bidupur and Kutupur had been completed (November 1998) at a cost of Rs 1.72 crore. These lines were kept charged through connection with other transmission lines, to avoid theft of conductors. The quantum of loss of

energy on charged lines without commercial use could not be ascertained for want of requisite information.

A revised estimate for Rs 9.46 crore (equipment Rs 45 lakh, materials Rs 8.01 crore and control room Rs one crore) was submitted (September 2001). In the draft X Plan a provision for Rs 10.15 crore has been made under revised estimate. Further the Board had to spend Rs 1.84 crore towards idle pay and allowances on maintenance of an office at Hajipur for the last 17 years.

The Board was deprived of potential revenue of Rs 987.34 crore.

Delay in preparation of drawings, non procurement of equipment, poor planning and non-synchronisation of construction of GSS with the associated link lines had not only locked up Board's fund of Rs 11.67 crore but also had deprived the area with the expected benefit (i.e. smooth transmission of bulk power reducing system losses) with resultant loss of potential revenue of Rs 987.34 crore to the Board.

The Board stated (October 2003) that the work could not be completed due to paucity of fund.

The reply of the Board is not tenable due to the fact that the delay was due to wrong selection of site, delayed preparation of drawing and poor planning.

Construction of grid sub-station at Banka (V FYP)

3.1.20 Banka district was being fed from Sultanganj grid sub-station through only one 33 KV feeder which had a total route length of more than 100 Kms comprising six numbers of 33/11 KV power sub-stations. Although Banka is located in close proximity of Kahalgaon Super Thermal Power Station (a unit of NTPC) but the district had been suffering from acute shortage of power due to inadequate T&D network. Considering the demand of the area, construction of a 2x20 MVA, 132/33 KV GSS at Banka and associated 132/33 KV S/C Lalmatia-Banka transmission line was included in V FYP at an estimated cost of Rs 42.35 lakh.

The construction of the GSS was taken up during 1987 and construction of foundation of structures (90 per cent), equipments, erection of structure (60 per cent), control room (upto three feet above plinth level) and store shed (upto roof level) was completed (July 1991) at a cost of Rs 52 lakh including cost of land (Rs 13.55 lakh). The site of the sub-station is situated near a river and was submerged in the year 1995-96. No work was taken up by the Board to complete the construction of GSS since July 1991 for reasons not on record. On being requested by the Board (December 1999), PGCIL submitted (March 2000) their offer with an estimated cost of Rs 18.38 crore including change of site which was not accepted by the Board.

Subsequently it was decided (December 2000) by the Board that PGCIL would have to bear additional cost for shifting and also to reimburse the cost of construction already incurred by the Board which was not accepted by PGCIL.

The work is yet to be taken up either by the Board or by PGCIL. Thus, due to non-completion of construction of 132 KV sub-station, its inter connection with 220/132 KV Lalmatia sub-station could not be done. Additional capital outlay of Rs 17.96 crore would be required for completion of the scheme.

Due to non-completion of GSS, the Board has been deprived of potential revenue of Rs 197.46 crore.

Thus, non- completion of construction of the GSS even after lapse of more than 17 years, the area had been deprived of adequate supply of power and consequential loss of revenue to the extent of Rs 197.46 crore to the Board. Further, the Board had made an idle investment of Rs 52 lakh on incomplete work with resultant loss of interest to the extent of Rs 74 lakh on locked up fund.

The Board stated (October 2003) that the construction was stopped due to paucity of fund.

The reply of the Board is not tenable as the Board stopped the work after completion of major portion of construction without any recorded reason.

Construction of grid sub- station at Kishanganj (V FYP)

3.1.21 Power supply to Kishanganj is presently being made through 33 KV feeder from Purnea grid sub-station which is located at a distance of about 80 Km. In case of interruption it takes much time in locating the fault and also in restoration of power. In addition, there has been low voltage problem in the area. With a view to overcome these problems and also for development of the area, construction of a grid sub-station at Kishanganj was conceived during V FYP which has spilled over to IX FYP.

Improper planning and non synchronisation of related works led to locking of Rs 2.75 crore.

Construction of 2x20 MVA 132/33 KV grid sub-station at Kishanganj was sanctioned in the V FYP at an estimated cost of Rs 1.15 crore which was revised to Rs six crore during VIII FYP. Most of the construction works including erection of towers and sub-station structures except erection of equipment were completed (1994-95) at a cost of Rs 2.75 crore. Construction of associated transmission link line between Dalkhola-Kishanganj was not taken up by the Board till March 2003.

For completion of construction of the GSS, State Government allotted (2002-03) Rs 3.14 crore. Work was to be completed within 18 months. Board had requested (April 2002) the Government for additional fund of Rs 10.64 crore to complete the construction. No further action was taken by the Board or by the Government in this regard (March 2003).

Improper planning and lack of monitoring resulted in unproductive investment of Rs 2.75 crore. The Board also had to shoulder interest liability of Rs 2.64 crore (calculated at the rate 12 per cent for eight years). Besides, there has been time overrun of sixteen years and cost overrun of Rs 1.60 crore (Annexure – 12) in the project. In addition the Board sustained loss of potential revenue of Rs 185.85 crore since April 1995.

The Board stated (October 2003) that the work could not be completed due to paucity of fund.

The reply is not tenable. The Board had stopped the work as the construction of associated transmission line had not been taken up.

Construction of grid sub-station at Kudra (VIII FYP)

3.1.22 Considering the increased demand of the area, decision to construct one 132/33 KV grid sub-station including installation of one 20 MVA transformer at Kudra, was taken in December 1988. The construction work was taken up in April 1989 in the vacant plot of land belonging to the Board which was adjacent to 33/11 KV power station at Kudra. As per programme, the construction was to be completed by September 1991 but the said work is still incomplete as the scheme was not in the priority list of the Board.

It was seen that 90 per cent foundation work of 132 KV and 33 KV equipment, transformer bay and erection of structure and 60 per cent of cable trenches were completed (February 1993). After releasing payment, defects in construction were detected and the control room collapsed (June 1992). The construction work was abandoned (February 1993) after expenditure of Rs 43.02 lakh.

A revised estimate of Rs 2.50 crore had been made (December 1998) for commissioning of this grid sub-station. However, no decision in this regard has been taken by the Board so far (March 2003).

It was further noticed that a departmental enquiry was instituted (September 1994) against the officers of the Board associated with the construction of the sub-station and it was found that the construction was useless and the officers were found responsible. No responsibility has been fixed.

Non-monitoring of construction resulted in wasteful expenditure of Rs 43.02 lakh and loss of potential revenue of Rs 33.58 crore.

Thus, the Board had made wasteful expenditure of Rs 43.02 lakh due to non monitoring the execution of construction of the sub-station, besides the Board was deprived of potential revenue of Rs 133.58 crore.

The Board stated (October 2003) that the work could not be completed due to paucity of fund.

The reply is not tenable as the Board had to abandon the work after expenditure on the said construction.

Construction of grid sub-station at Digha

3.1.23 Considering increased load demand of Patna and adjoining areas and also with a view to improve and ensure uninterrupted transmission of power, the Board planned (1998) to construct a grid sub-station at Digha.

Administrative approval for construction of grid sub-station and associated link line from Khagaul to Digha was accorded in July 1998. The work was awarded to a firm in April 2000 at a cost of Rs9.89 crore to be completed by August 2001. The contractor executed (December 2001) 90, 50 and 100 per cent of foundation, erection of structures and construction of store shed respectively.

A field survey carried out (December 2001) by the Railway and the Board found that the proposed GSS at Digha was coming in the approach way of proposed Railway bridge over river Ganga. The Board before taking up the project did not consult Railway Authorities about their future projects/schemes for necessary clearance. After incurring expenditure of Rs 1.74 crore the work had been suspended since December 2001.

The Railway requested (March 2002) the Board to shift the project to another site and agreed to pay compensation for shifting of the sub-station to a new site to be arranged by the Railway.

The Board prepared (August 2002) a statement of Rs 3.20 crore for claiming compensation from railway due to abandonment of work and shifting of site. Payment of compensation is pending, as no claim in this regard has been preferred by the Board (March 2003).

Abandonment of work led to locking of Rs 1.74 crore and loss of potential revenue of Rs 45.98 crore.

Due to taking up construction work without proper survey and necessary clearance or enquiry from appropriate authority, the Board had not only made idle investment of Rs 1.74 crore but also suffered loss of potential revenue of Rs 45.98 crore (August 2001 to March 2003). Due to shifting of the GSS to a new site, the Board would have to bear expenditure of Rs 1.30 crore on dismantling, shifting, damages etc. Thus, desired objective to meet increased load demand of Patna remained unfulfilled.

The Board stated (October 2003) that at the time of construction of the GSS, there was no proposal for construction of Railway bridge at Digha.

The reply of the Board is not tenable as the Board did not make any enquiry before taking up the construction. Further, the railway has neither provided a new site for the sub-station nor has the Board been compensated for the loss.

Construction of grid sub-station at Katra and associated 132 KV transmission line

3.1.24 Construction of one 132/33 KV grid sub-station including installation of 2x50 MVA transformers and associated 132 KV transmission line at Katra was awarded (April 2000) to Andrew Yule and Company Limited (AYCL) on turn key basis. Cost of the work was Rs 7.36 crore and the work was scheduled to be completed by July 2001. Land measuring 6.6 acre was acquired (November 1999) from Patna Municipality Corporation at a cost of Rs 6.40 crore. Construction of foundation for structures and equipment was started (September 2001) after more than a year of approval of its layout.

After execution of foundation of equipment and structures and one store shed, the contractor proposed (January 2002) for shifting of switchyard, which was not acceptable to the Board as this would involve demolition of foundation and store shed and its reconstruction at a new place. Further, the lay out of the grid sub-station was approved keeping in view proper utilisation of land. The contractor stopped work since November 2001 and did not resume work even within the extended period of execution (December 2001).

As per terms of work order, supply of structures should have commenced after 75 per cent completion of foundation and supply of equipment should have commenced after completion of 75 per cent erection of structure. But AYCL ignored the terms and conditions of the work order and informed (December 2001) that they had executed the work of Rs 4.10 crore against total contract value of Rs 7.36 crore. The payment was withheld by the Board as 75 per cent erection of structures was not complete. However, the project is not now in the priority list of Board (December 2001).

Observing meagre progress of work, further extension of time (i.e. up to 31 March 2003) was not considered by the Board. No penalty was imposed by the Board.

Non completion of the scheme led to loss of potential revenue of Rs 48.40 crore.

Due to non-completion of the project and associated 132 KV transmission line the objective of the Board to meet increased demand of the area remained unfulfilled. Expenditure of Rs 10.50 crore remained unproductive with consequential loss of revenue to the extent of Rs 48.40 crore (from August 2001 to March 2003).

The Board had stated (October 2003) that the GSS at Katra was proposed to meet the demand for power of the eastern part of Patna and adjoining areas. Presently the load is being met by existing sub-stations.

The reply is not tenable as the Board had failed to meet increased demand due to non-completion of the scheme.

Conclusion

In the absence of proper planning and effective monitoring system 16 transmission schemes could not be completed. Deferment of schemes after incurring expenditure and part completion of schemes led to locking up of scarce resources. Due to mismatching in construction, even completed schemes could not be utilised. In the absence of adequate transmission network, the Board had to pay fixed charges to central grid without availing its share of power. Further, due to inadequate development of transmission system the Board had sustained excess transmission loss.
The Board needs to take the following measures:

- **Out of the incomplete schemes, prioritise schemes especially those relating to linking Biharsarif grid with the power deficit areas of north Bihar.**
- **Proper planning should be made to avoid spill over of the schemes and locking up of fund.**
- **Ensure completion of transmission schemes as per their schedule.**
- **Avoid cases of mismatching construction.**

The matter was reported to the Government (June 2003); their reply had not been received (October 2003).

3.2 REVIEW ON PERFORMANCE OF COAL HANDLING PLANTS INCLUDING BOWL MILLS OF THERMAL POWER STATIONS OF BIHAR STATE ELECTRICITY BOARD

Highlights

The generation of electricity in Bihar State Electricity Board is presently carried out by two thermal power stations namely Baruani Thermal Power Station (BTPS) and Muzaffarpur Thermal Power Station (MTPS). Against installed capacity of 540 mega watt (MW) of six units, only two units of 110 MW each were available for generation of electricity at minimum operation level.

(Paragraph 3.2.1)

Due to poor quality of coal and poor maintenance of equipment, the plant was not available for generation for 23,647 hours during five years ending 31 March 2003. This resulted in loss of generation of 6,286.52 million unit (MU) valued at Rs 249.61 crore.

(Paragraph 3.2.5)

Due to higher percentage of ash in coal and non-adherence to the Statutory requirement of capital maintenance, 13.97 lakh metric tonne (MT) of coal valued at Rs 143 crore was consumed in excess of the norm.

(Paragraph 3.2.9)

Due to ruptured furnace casing, worn out burner tips and defective oil guns, 44,229.49 kilo liter (KL) furnace oil and 19,029.45 KL of light diesel oil were consumed in excess of the norm in BTPS and MTPS resulting in loss of Rs 43.62 crore to the Board during last five years ended 31 March 2003.

(Paragraphs 3.2.10 and 3.2.11)

The Board failed to produce the electronic printout of weight from in-motion weighbridges installed at thermal power stations and thus claims of Rs 6.61 crore on account of short receipt of coal and freight was not accepted by the coal company causing loss of the Board's fund.

(Paragraphs 3.2.14)

Though the Board had its own railway siding at BTPS an avoidable payment of Rs 2.07 crore was made to the Railways on account of siding charges.

(Paragraph 3.2.18)

Introduction

3.2.1 Generation of power in the Bihar State Electricity Board (Board) is presently carried out by two thermal power stations, namely, Barauni Thermal Power Station (BTPS) and Muzaffarpur Thermal Power Station (MTPS) having installed capacity of 365[*] mega watt (MW) and 220 [#] MW respectively. At BTPS three units of 15 MW each were retired from operation in February 1983, October 1985 and November 1985 respectively. Further two units of 50 MW each were under continuous shutdown since March 1995 and April 1996 respectively due to non-installation of electrostatic precipitator. As a result, only two units of 110 MW units (derated to 105 MW) each were available for operation at BTPS. However, at both BTPS and MTPS only one unit could be operated at a time, that too, at minimum operational level due to shortage of coal, poor performance of coal handling plant and bowl mills resulting in loss of generation of electricity, as discussed in the succeeding paragraphs.

Organisational set-up

3.2.2 The General Manager cum Chief Engineer of the power station is overall incharge of the management of the thermal power station including coal handling plant, bowl mills and ash and rejects handling system. He is assisted by Electrical Superintending Engineers, Electrical Executive Engineers and Electrical Assistant Engineers of the respective divisions.

Scope of Audit

3.2.3 The review aims at evaluation of the efficiency of the Board in operation of the coal handling plant including bowl mills and ash handling system to get optimum generation. For this purpose, records relating to procurement, service, performance and repairs of various equipment relating to coal handling plant, bowl mills and ash handling system for the period 1998-99 to 2002-03 were test-checked during January to May 2003.

The audit findings, as a result of test check of records were reported to Government and the Board in June 2003 with specific request for attending the meeting of Audit Review Committee for State Public Sector Enterprises (ARCPSE) so that view point of Government / Board was taken into account before finalising the review. The meeting of ARCPSE was held on

[*] 365 MW (3x15 MW + 2x50 MW+ 2x110 MW)
[#] 220 MW (2x110 MW)

22 September 2003 where Government was represented by the Secretary to the Energy Department and Board was represented by Member (Transmission and Distribution) and Member (Generation). The review was finalised after considering the views of the Government and Board.

Operation of coal handling plant and bowl mills

3.2.4 The coal handling plant consists of two streams of conveyors and its associated equipment. The coal wagon is emptied by wagon tipplers as well as manually. There are two wagon tipplers at MTPS side by side and one at BTPS so as to discharge coal into a common hopper. Coal received from common hopper is fed to common surge hopper in the crusher house through conveyor system and vibrating feeders from where it is fed to any of the two crushers. Coal crushed from run-of-mine (ROM) size to below 20 mm in the crusher is fed to bunker. In case coal is not required in bunker, it is diverted to stockyard.

The raw crushed coal is delivered from the bunkers to the independent raw coal feeders, which deliver coal at a volumetric controlled rate to the bowl mills where the coal is pulverized by the spring loaded rollers. The drying and transporting of pulverized coal from the mills are done by hot air to the furnace for burning of coal.

A flow chart showing the operation of coal handling plant and bowl mills is attached at Annexure-15.

Outages of the thermal power plants

3.2.5 Outage means shutdown of the thermal power plant or the period during which the generating unit is not available for power generation. The details of total forced outages and outages due to problems in coal handling plant and bowl mills are given below:

Year	1998-99	1999-2000	2000-01	2001-02	2002-03	Total
BTPS						
(i) Total forced outages of the plant (hours)	8,029	10,757	9,466	9,668	10,982	48,902
(ii) Outages due to problems in CHP only (hours)	105	607	39	41	1	793
(iii) Outages due to problems in bowl mills only (hours)	1,862	371	361	4,422	991	8,007
(iv) Loss of generation due to outages at (ii) & (iii) (MU)	119.04	36.33	14.66	117.61	30.19	317.83
(v) Value of loss of generation (Rs in crore)	23.92	7.54	4.09	45.36	8.42	89.33

MTPS						
(i) Total Forced outages of the plant (hours)	5,036	6,414	6,205	9,291	8,465	35,411
(ii) Outages due to problems in CHP only (hours)	--	--	781	1092	273	2146
(iii) Outages due to problems in bowl mills only (hours)	520	2,587	3,276	3,501	2,817	12,701
(iv) Loss of generation due to outages at (ii) & (iii) (MU)	218.62	1,029.61	1,825.98	1,861.11	1,033.37	5,968.69
(v) Value of loss of generation (Rs in crore)	4.39	24.20	50.94	51.92	28.83	160.28

There were outages of the thermal power plant due to problems in coal handling plants and bowl mills for 23,647 hours valued at Rs 249.61 crore.

It would be seen from the above table that forced outages for 8800 hours at BTPS valued at Rs 89.33 crore and for 14,847 hours at MTPS valued at Rs 160.28 crore occurred due to problems in coal handling plants (CHP) and bowl mills. The main reasons for such forced outages noticed by audit were poor quality of coal mixed with stones, boulders, mud and other foreign materials causing frequent interruptions of coal flow in bowl mills and resulting in fire out in boilers and low steam pressure and heavy coal rejects, damage to coal handling system and parts of bowl mills.

Unnecessary operation of a coal handling plant at BTPS

Avoidable expenditure of Rs 28.79 lakh was incurred on coal handling plant.

3.2.6 BTPS has two coal handling plants. With the closure of five units and operation of one out of two units of 110 MW, only one coal handling plant was sufficient to meet coal handling requirement. However, Audit noticed that the Board had been operating both the coal handling plants. This has resulted in extra expenditure of Rs 28.79 lakh on hiring of labour force through private contractors during 1998-2003.

The Board stated (October 2003) that the new CHP was designed keeping in view the existence and continuation of old CHP system. This is not tenable as the project report of 2x110 MW units clearly mentioned that its CHP would be independent of the existing one.

Procedure for procurement of coal

3.2.7 The quantum of coal to be supplied to the thermal power station is determined through a linkage committee of Ministry of Energy (MOE), Government of India. Coal is received at BTPS and MTPS by rail from Eastern Coalfields Limited (ECL), Central Coalfields Limited (CCL) and Bharat Coking Coal Limited (BCCL).

Shortfall in receipt of coal

3.2.8 Against the allotment made by the standing linkage committee, actual quantity of coal received at BTPS and MTPS during the last five years upto 2002-03 are detailed in the table below:

Year	Allotment of coal by linkage committee (MT)	Actual receipt of coal (MT)	Shortfall in receipt of coal (MT)	Percentage of shortfall
BTPS				
1998-99	7,05,000	4,77,541	2,27,459	32
1999-2000	7,50,000	3,84,607	3,65,393	49
2000-01	5,40,000	3,86,893	1,53,107	28
2001-02	6,90,000	4,41,527	2,48,473	36
2002-03	4,95,000	1,95,914	2,99,086	60
Total	**31,80,000**	**18,86,482**	**12,93,518**	**41**
MTPS				
1998-99	5,70,000	3,36,128	2,33,872	41
1999-2000	7,50,000	4,11,479	3,38,521	45
2000-01	6,30,000	3,35,573	2,94,427	47
2001-02	6,90,000	3,63,374	3,26,626	47
2002-03	4,80,000	2,03,041	2,76,959	58
Total	**31,20,000**	**16,49,595**	**14,70,405**	**47**

Shortfall in receipt of coal was 28-60 per cent of allotment.

It would be seen from the table that the shortfall in actual receipt of coal ranged between 28 and 60 per cent at BTPS while at MTPS, it was between 41 and 58 per cent. The reasons for shortfall in receipt of coal were defaults on the part of the coal companies, reluctance on the part of the thermal power stations to accept coal from certain collieries, etc. The position deteriorated sharply in 2003 due to insistence of coal companies to raise the amount of advance paid. Due to shortfall in coal receipt against the allotment made by the linkage committee the generation of electricity was affected adversely and both the units of each plant could not run simultaneously.

There was no agreement between the Board and coal companies and as such Board had no legal remedy to force the coal companies to supply coal. Coal India Limited had proposed to the Board to enter into a fresh agreement with its subsidiaries but the Board did not follow up it losing an opportunity to bind them legally.

The Board stated (October 2003) that shortfall in receipt of allotted coal was mainly due to low production of coal in the linked collieries coupled with inadequate allotment of wagons by railways. Board's contention is not tenable as

the linkage committee makes allotment after taking the demand of units, position of production of linked collieries and availability of railway wagons.

Excess consumption of coal

Coal valued at Rs 143.00 crore was consumed in excess of norms due to grade slippage.

3.2.9 As per Detailed Project Reports (DPR) of BTPS and MTPS, for generation of one unit (KWh) of electricity, 0.52 kg of coal (calorific value 4600 k.cal/kg) and 0.45 kg of coal (calorific value 5600 k.cal/kg) respectively was required. The boiler of these plants were designed to consume slack coal of grade D but the coal received at these thermal power stations were generally E, F and even G (ungraded) grade which were inferior to grade D. Therefore, actual consumption of coal both at BTPS and MTPS was much in excess of norms. Excess consumption of 13.97 lakh MT coal amounted to Rs. 97.01 crore and Rs. 45.99 crore respectively, as detailed in the Annexure-16. The reasons for excess consumption of coal were not analysed by the Board. The reasons for excess consumption, as analysed in audit, are discussed below:

- As the quality of coal received was not as per norms and grade of coal slipped from D to E & G, the calorific value of coal came down resulting in excess consumption of coal.

Absence of capital maintenance had affected the performance of the plant.

- The condition of plant and equipment of the thermal power stations was not good and even statutory capital maintenance could not be undertaken. This resulted in malfunctioning of the system and excess consumption of coal.

- The percentage of ash in coal was much higher than that stipulated in the DPR which caused damages to the system of CHP and bowl mills leading to excess consumption of coal.

The Board stated (October 2003) that coal companies were being requested and persuaded regularly for supply of proper grade and good quality of coal and this issue was always raised in meetings of the linkage committee. The fact remains that the Board continued to receive poor quality of coal resulting in excess consumption of coal.

Excess consumption of furnace oil

Furnace oil valued at Rs 37.17 crore was consumed in excess of norms.

3.2.10 Injection of furnace oil (FO) is required in the thermal plant for boosting the temperature and heating value. As per norms fixed by CEA for consumption of oil, thermal power plant should consume oil at the rate of 15 ml/kwh. However, the actual consumption of oil during 1998-2003 was much higher than norms, as detailed in Annexure-17. Thus, excess consumption of 11,864.41 KL furnace oil valued at Rs 9.22 crore at BTPS and 32,365.08 KL valued at Rs 27.95 crore at MTPS led to loss to the Board. Reasons for excess consumption of oil as noticed in audit were ruptured furnace casing needing support of more furnace oil to stabilise draught, worn out burner tips, defective oil guns, poor quality of coal, etc.

The Board stated (October 2003) that the Central Electricity Authority revised the norm for consumption of furnace oil at 36 ml/kwh for BTPS and MTPS considering the conditions of their boilers and other accessories. The Board did not furnish any proof of revision. Even the Board officials continued to adopt the norm of 15 ml/kwh for monitoring purposes.

Excess consumption of light diesel oil

Light diesel oil valued at Rs 6.45 crore was consumed in excess of norms.

3.2.11 Light diesel oil (LDO) is used for lighting up of the furnace while furnace oil is used to support burning of coal. LDO is more costly than FO. The consumption of LDO should not exceed 5 per cent of the total oil consumption. The consumption of LDO at BTPS and MTPS during the last five years is detailed in Annexure-18. Consumption of LDO in both thermal power stations was much in excess of the norms. An excess quantity of 19,029.45 KL LDO valued at Rs 6.45 crore was consumed. The Board attributed (October 2003) such higher consumption of LDO to frequent shut downs and lighting up and time taken in synchronisation of the plant. The plea of the Board is not acceptable as this aspect was taken into account while norm was fixed.

The Board further stated (October 2003) that there were frequent power failure at MTPS as there was only 132 KV transmission line available through Samastipur, Barauni. For this the Board itself is responsible, as despite massive investment, the alternate route of MTPS–Biharsharif could not be made operational due to collapse of Ganga crossing tower between Hazipur and Fatuah in May 1993, as discussed in paragraph 3.1.15.

Non-utilisation of oil flow meters

Oil flow meters valued at Rs 23.44 lakh remained unutilised.

3.2.12 Oil flow meters were to be installed both at BTPS and MTPS for an accurate measurement and close monitoring of the fuel oil consumed. Mention was made in the Report of the Comptroller and Auditor General of India for the year ended 31 March 2000 (Commercial)-Government of Bihar about oil flow meter valued at Rs 21.02 lakh not being utilised at BTPS. The Board procured and supplied (August 1999) oil flow meters valued at Rs 2.42 lakh for installation at MTPS which were lying in the stores unaccounted for

want of inspection. Thus the Board's funds of Rs 23.44 lakh (Rs 21.02 lakh + Rs 2.42 lakh) remained locked since April 1998/August 1999.

Physical verification of coal

Shortages of 4.31 lakh MT coal valued at Rs 44.08 crore was found on physical verification.

3.2.13 As per provision of the Stores Manual of the Board, stock taking must be done every year. As per provision of Electricity (Supply) (Annual Accounts) Rules, 1985, the loss on account of shortage should be charged in the year it is detected. But in the Board this was not done and the book stock was not adjusted as per the physical stocktaking for investigation and write off. The annual physical verification was not conducted by the Board in MTPS during the last four years up to 2002-03 for want of surveyor. The last physical verification of the stock of coal was done on 2 November 1998 at MTPS and only 37,371 MT of coal was found. However, as per records of accounts, the book stock was 1,40,538.23 MT. Thus there was shortage of 1,03,167.23 MT coal valued at Rs 10.24 crore on that date.

Similarly, at BTPS the actual coal stock found on the last physical stock taking done on 30 November 2002 was 3,142.37 MT whereas the book stock as per accounts was 3,31,660.19 MT on that date. Thus there was a shortage of 3,28,517.82 MT of coal valued at Rs 33.84 crore on that date.

The Board has neither investigated the matter nor fixed any responsibility for the same.

The Board stated (October 2003) that normal shortage of 4 per cent was allowed and abnormal shortage was never found on stocktaking. Also coal shortage occurred due to presence of stones for which claim was made from the coal companies. The Board's reply is not correct, as there were 8.88 per cent shortage on 2 July 2000 and 6 per cent shortage on 25 December 2000 found on physical verification of coal sock at BTPS. Also, the claim for stones is not reimbursed fully by the coal companies as discussed in succeeding paragraph.

Claims for coal supply from Eastern Coalfields Limited

3.2.14 After introduction of "cash & carry system" (August 1998), coal is purchased from Eastern Coalfields Limited (ECL) by paying advance of Rs 84 lakh every 10 days for each BTPS and MTPS. Periodical reconciliation were to be made to reconcile the account. It was observed that seven meetings were held between February 1999 and July 2002 for reconciliation purpose. Claims on account of grade slippage, short receipt of coal, coal rejects, stones and railway freight on short receipt of coal etc. of Rs 76.04 crore of BTPS (Rs 34.49 crore) and MTPS (Rs 41.55 crore) were under dispute with ECL for the period November 1998 to March 2002 as detailed in Annexure-19.

Test check in audit revealed the following:

- Claim of Rs 5.23 crore of BTPS was not admitted by the ECL as the Board failed to produce the electronic printout of weight from 'in-motion weigh bridge'. The claim of Rs 1.38 crore on railway freight on short receipt of coal was also not accepted for the same reasons. Thus, failure to maintain weigh bridge resulted in loss of Rs 6.61 crore of the Board.

- Against claim of Rs 2.88 crore of BTPS on account of stones, only Rs 40 lakh was accepted. The Board had to forgo claim of Rs 1.44 crore. The balance amount of Rs 1.04 crore was still under dispute.

- Other claims of Rs 26.83 crore could not be settled in meeting between representatives of ECL and BTPS (July 2002) for which no action was taken at Board level and thus the amount was blocked.

Similarly in MTPS, against claim of Rs 44.88 crore, only Rs 1.90 crore was accepted and Rs 1.43 crore was rejected while claims of Rs 41.55 crore were under dispute. Audit observed that claim of Rs 10.95 crore on account of shortages and freight thereon could not be admitted due to failure of the Board to produce electronic printout of weight from 'in-motion weigh bridge' installed at MTPS. This resulted in loss of Rs 10.95 crore of the Board. Further no action was taken at Board's level to settle claim of Rs 30.60 crore for which no reasons were on record.

The Board had foregone its claims of Rs 48.35 crore.

Board stated (October 2003) that in the meeting held during August 2003 between the Board and ECL all claims of the both thermal power stations of the Board of Rs 84.40 crore pertaining to the period November 1998 to March 2002 were finally settled for 16 per cent of the total billed value of Rs 225.33 crore i.e. for Rs 36.05 crore. Thus the Board had to forego its claims of Rs 48.35 crore.

Missing, unconnected and diverted wagons

3.2.15 The thermal power stations receive coal from collieries through rail wagons. Freight thereon is generally paid in advance through credit note cum cheques (CNC).

Board's claim of Rs 41.13 crore for missing coal wagons remained unresolved.

Periodical reconciliation is required to be done between Railways and thermal power stations to settle the account with Railways. It was noticed that meeting between Railways and the Board was held in March 2000 to reconcile the claim of BTPS (up to October 1999) and MTPS (up to April 1999) but the mode of valuation of grade and quantity of coal could not be decided and the claim of the Board of Rs 41.13 crore in respect of BTPS (Rs 27.30 crore) and MTPS (Rs 13.83 crore) on account of missing wagons of coal remained unresolved (August 2003).

Board's claim of Rs 59 lakh was rejected by Railways being time barred.

Further, claim of MTPS on account of missing wagons of Rs 59 lakh was rejected by the Railways, as it was not claimed within the time limit prescribed by the Railway.

The Board stated (October 2003) that several reconciliation meetings were held with Railways to settle the claims. But the fact remains that no fruitful results came out so far and Board's funds remained locked.

Under-utilisation of wagon tipplers

3.2.16 There are two wagon tipplers installed at MTPS for unloading coal received in coal rakes. However, tipplers were operated intermittently due to mechanical defects. One tippler was out of order since February 1996. Though spares valued at Rs 17.08 lakh were procured (February 1998) from Mining & Allied Machinery Corporation Limited for its repairs and maintenance, the equipment could not be re-commissioned so far due to failure on the part of the management to engage an executing agency (August 2003).

The condition of the other wagon tippler of MTPS was also not satisfactory and was tipping much below its normal capacity. It was noticed that shortfall in actual tipping against norm ranged between 78 and 89 per cent during 1999-2003. As one wagon tippler was out of order and the other was working below its capacity, the Board had to engage contractor's labourers at a cost of Rs 26.65 lakh during 1999-2002.

Similarly in BTPS the wagon tippler was not working at its full capacity. On test check, it was noticed that shortfall in tipping against norm ranged between 76 and 80 per cent during 1998-2003. It was further observed that there was practice of engagement of departmental labour for unloading of coal. During audit it was seen that unloading of coal was done on 10 days (average) in a month and the service of departmental labour for 20 days were utilised in other work in coal handling plants. This practice was stopped (December 1998) and contractor's labourers were engaged at a cost of Rs 22.40 lakh between December 1998 and March 2003.

The Board stated (October 2003) that they could not depend fully on wagon tipplers and engaged manual coal unloaders to avoid demurrage. The Board's reply is not tenable because demurrage charges of Rs 1.01 crore (MTPS – Rs 0.87 crore and BTPS – Rs 0.14 crore) were paid during the period 1998-2003 in spite of engagement of manual coal unloaders as they did not work in night shift.

Poor performance of in- motion railway weighbridges

In-motion weighbridges were not functioning.

3.2.17 A 100 MT in-motion railway weighbridge was installed (October 1996) at BTPS railway siding for weighing coal rakes at a cost of Rs 8.52 lakh. The

equipment functioned intermittently. In-motion weighbridge was under complete break down since January 2002.

Similarly, an in-motion weighbridge was installed at MTPS at a cost of Rs 16.29 lakh in February 1996, although order was placed as early as in February 1984. But it could be certified by the Weights and Measurement Department of the Government of Bihar only in October 2000. However, weighbridge did not function satisfactorily and went out of order frequently. In the absence of log book, its performance could not be ascertained. Besides, another 100 MT in-motion railway weighbridge procured (February 1999) at a cost of Rs 8.20 lakh at MTPS was lying in store since July 1999. This machine was installed and stamped by the Weight and Measurement Department of the Government of Bihar (March 2003). But this could not be calibrated by placing wagons on running position by the supplier so far (October 2003). As a result the Board could not produce electronic printouts of weight of coal received in support of its claims of short receipt to the coal companies/Railways.

Transportation of coal

Avoidable payment of siding charges

BTPS has its own siding but paid Rs 2.07 crore as siding charges to Railways.

3.2.18 Siding charge is payable in case customer uses Railway's siding. It was seen that BTPS had its own siding and had not used Railway's siding but paid Rs 2.07 crore to Railway as siding charges for the period 1998-2003. MTPS has also its own siding but no such payment was being made there.

The Board stated (October 2003) that in case of BTPS it was not avoidable as per the siding agreement. Neither the Board nor BTPS management made available the siding agreement to audit for scrutiny to verify the Board's contention. However, even if it is provided in the agreement, the Board should have taken up the matter *de novo* with the Railways, as Railways' rule would apply uniformly to all. Incidentally, both BTPS and MTPS fall under the same zone of Eastern Central Railway.

Bowl mills

3.2.19 Milling of coal takes place in the bowl type structure where with the help of bowl assembly the coal is pulverized. This structure is known as bowl mill.

There are 12 bowl mills in MTPS, six in each unit. Out of 12 bowl mills, two have been closed, two are kept as standby and four mills are in operation in each unit.

Similarly, there are two sections of bowl mills at BTPS (2 X 110 MW) having 10 bowls mills, five in each unit. Out of these two mills are kept as reserve.

Performance of spares parts used in bowl mills

3.2.20 Scrutiny of records of the thermal power stations revealed that consumption of critical spare parts during the period under review was much higher due to presence of high quantity of stones and other foreign materials in coal received. During scrutiny of records the following were observed:-

Use of sub standard spares

Worm shaft, gear with key, nut and lock

MTPS procured spares of substandard quality of Rs 48.59 lakh.

3.2.21 In BTPS, the worm shaft, gear with key, nut and lock were procured from BHEL while in MTPS these spares were procured from Allenberry Works, Kolkata. During audit it was found that against consumption of three sets in BTPS, 15 sets were consumed in MTPS during the same period. It was further noticed that though five sets of spares procured at a cost of Rs 30.37 lakh from Allenberry failed prematurely, further purchase order for three sets at a cost of Rs 18.22 lakh was placed on the firm. The officials of MTPS had also admitted that the performance of spares procured from the firm was not satisfactory.

The Board stated (October 2003) the spares were procured from the supplier as an import substitution. The cost of BHEL's imported item was rupees eight lakh as compared to the Allenberry's Rs 4.96 lakh. The Board's reply is not acceptable as the Board should have procured one or two items first instead of eight to assess their performance.

Procurement of defective spares at BTPS

BTPS procured defective spares of Rs 48.63 lakh which were lying in store.

3.2.22 Two sets of worm shafts, gear with key, nuts and lock received in BTPS stores in September 1994 and November 1997 against purchase order of December 1993 at a cost of Rs 40.73 lakh were lying in stores (May 2003) due to non-matching of the description of the case and material. Similarly, one set of worm shaft, worm gear with key lock and nuts valued at Rs 7.90 lakh was procured from Bharat Heavy Electricals Limited in July 2001. However, this could not be accounted for as the descriptions on case and material were not matching. The matter was taken up with the supplier in July 2001 but nothing could be done so far. No further action was taken by the Board and Rs 48.63 lakh was blocked.

The Board stated (October 2003) that regarding one set of spares received in July 2001 BHEL assured that these spares were interchangeable and there will be no problem in fitting. The fact remains the spares were still lying in the stores unopened and if so the two sets of spares received against previous order should have been used and there was no need to place further order.

Unnecessary procurement of bearing housings

Spares of Rs 16.72 lakh procured much in advance were lying unutilised.

3.2.23 BTPS placed (September 1998) order on BHEL for procurement of spares for bowl mills namely thrust bearing housing, radial bearing housing, coal compartment assembly, etc. at a cost of Rs 16.72 lakh. These spares were received in August 1999 and payment was made. However, it was noticed that these spares were lying unutilised in stores (May 2003). Management of BTPS stated that these spares would be used when capital maintenance work of unit six would be taken up. As the capital maintenance of unit six was not contemplated in near future, procurement of these spares much in advance was not prudent which resulted in locking of fund of Rs 16.72 lakh.

The Board stated (October 2003) that the spares were procured in advance as the lead time was long and that the same would be used in capital maintenance of the unit. The reply is not tenable as the lead time for these spares is six to nine months and the spares were lying for the last four years.

Procurement of spares for closed units of BTPS

3.2.24 Unit numbers four and five were under shutdown since April 1996 and March 1995 respectively. The units could not be restarted unless electrostatic precipitators were installed as per undertaking of the Board given to State Pollution Control Board. Despite this the management procured spare parts for the bowl mills of these units as detailed below:

The Board accepted spares of Rs 26.52 lakh after delivery dates though units were closed.

- Purchase Order was placed in June 1994 by BTPS on ACC Bebcock Limited, Kolkata for three sets of grinding rings at a cost of Rs 24 lakh plus taxes. As per terms of the order, delivery of material was to be made within four to five months. Audit noticed that one set was received in January 1995 and consumed. After closure of the units, the Board did not take any action to cancel the order. As such balance two sets valued at Rs 18.80 lakh were manufactured and handed over by the firm to the Board's transporter in July 1998 and lying there for want of road permit to be issued by the BTPS. BTPS had already paid advance of Rs 3.20 lakh as per term of the agreement and incurred liability of Rs 15.60 lakh there against.
- Similarly, the Board had placed a purchase order on Simplex Casting Limited, Kolkata in June 1994 for supply of one set of grinding roll at a cost of Rs 6.58 lakh plus taxes. As per terms of the order, the material was to be delivered within six to eight months. The Board did not take any action to cancel the order after closure of the units. As such, the grinding

roll was received in April 1997 at a cost of Rs 7.72 lakh and lying unutilised in stores.

The Board placed order for spares after closure of units and incurred liability of Rs 56.12 lakh.

- The Board placed order in May 1997 on ABB ABL Limited at a cost of Rs 98 lakh for supply of 28 items to be used as spares in coal handling plant of BTPS unit numbers four and five and paid advance of Rs 8.22 lakh. As per terms of purchase order, the material was to be supplied within 10 to 12 months from the date of purchase order. The firm supplied six items valued at Rs 18.71 lakh during 1997-98. These spares could not be taken in stores for want of inspection and lying unaccounted for (August 2003). Further, 13 items of spares valued at Rs 37.41 lakh were despatched by the suppliers in July 1998 but lying in the transporter's godown for want of road permit. As the unit numbers four and five were already under shutdown since April 1996, there was no justification for placing the above purchase orders on the firm and incur the liability of Rs 47.90 lakh as well as paying advance of Rs 8.22 lakh.

The Board stated (October 2003) that the purchase orders for these spares were placed when the units were in operation. But audit observation was that the management should have cancelled the orders when the units went under closure as the scheduled period of delivery as per orders had already expired.

Ash handling and coal rejects system

Excess presence of unburnt coal in ash

The Board sustained loss of Rs 2.85 crore for higher percentage of unburnt coal in ash.

3.2.25 Neither the Detailed Project Reports of the thermal plants nor CEA visualised presence of unburnt coal in ash. However, audit observed that unburnt coal was present in fly ash and bottom ash, which ranged between 5.2 and 7.2 per cent and between 18 and 26.6 per cent respectively at MTPS. Due to passing out of unburnt coal in ash, 20,356.55 MT coal valued at Rs 2.85 crore was lost in ash. The Board had not analysed the reason. However, the reasons for such wastage as analysed in audit, were poor quality of coal, poor functioning of bowl mills, defective oil guns etc. The Board stated (October2003) that presence of high quantity of unburnt coal in ash was due to improper combustion in the furnace of the boiler, which was in a deteriorated condition. This would be controlled after undertaking capital/routine maintenance of the plant.

At BTPS the unburnt coal in fly ash and bottom ash ranged between 3.7 and 5.7 per cent and between 16.5 and 17.5 per cent respectively. The amount of loss on this account could not be calculated as the separate figures of ash arisings were not made available to audit.

Avoidable loss due to coal rejects

3.2.26 Coal rejects arise in coal mills when the coal supplied by the crushers above 20 mm size cannot be pulverized by the mills and come out through exit holes provided in the mills. The coal rejects so coming out of the mills consist of both stones and carbon.

The Board neither claimed Rs 15.23 crore for coal rejects from the coal companies nor sold the stock.

It was observed during audit that against coal rejects equivalent to Rs 20.44 crore received from the coal companies at MTPS (1998-99 to 2002-03) and BTPS (2000-01 to 2002-03), claim of Rs 5.21 crore only was lodged by the Board and Rs 15.23 crore remained unclaimed. The Board used to sell the coal rejects to brick kiln owners and other parties upto 1996 but during the last five years under review no attempt had been made to dispose of the stock of coal rejects.

The Board, in its reply, confirmed (October 2003) that the claim of Rs 5.21 crore on coal company pertained to stones only. But reply was silent on the issue of disposal of coal rejects.

Conclusion

Due to malfunctioning of coal handling plants and bowl mills, poor quality of coal received, non-settlement of claims with the coal companies and Railway, excess consumption of coal due to inefficient working of equipment and machinery, non-adherence to schedule of capital maintenance of the plant, the Board had to suffer loss of Rs 278.30 crore.

The Board should take up the matter at proper forum to improve the quality of coal and recover the claims in time. It should also adhere to the schedule of capital maintenance in order to achieve the optimum generation level.

The matter was reported to the Government (June 2003), their reply had not been received (October 2003).