

CHAPTER III

3 Review relating to Statutory corporation

GROWTH AND DEVELOPMENT OF TRANSMISSION SYSTEM - WEST BENGAL STATE ELECTRICITY BOARD

Highlights

The growth of the transmission system of West Bengal State Electricity Board (Board) did not keep pace with the increased power availability due to delays in implementation of schemes. During 1999-2004, the Board took up construction of 40 transmission lines and 52 sub-stations of which seven lines and 25 sub-stations remained incomplete. Moreover, construction of 25 lines and 14 sub-stations were not taken up.

(Paragraphs 3.7 & 3.8)

During 1999-2004, the Board incurred expenditure of Rs 527.48 crore, funded through loans of Rs 427.32 crore from the Central and State Governments, external agency, financial institution as well as own fund of Rs 77.68 crore and State Government grant of Rs 10.53 crore. Besides, the Board was yet to receive reimbursement of Rs 11.95 crore from the external agency.

(Paragraphs 3.10 & 3.11)

During 1999-2004, achievement of physical targets was 19 and 29 per cent for lines and sub-stations respectively, while financial expenditure was 58 per cent of outlay. Moreover, due to defective planning the Board failed to synchronise the construction of sub-stations and related transmission lines leading to under/ non-utilisation of transmission lines costing Rs 78.49 crore.

(Paragraphs 3.11 & 3.15)

Under the Japan Bank for International Co-operation (JBIC) assisted project, construction of 18 out of 23 sub-stations and all 24 transmission lines stretched beyond their scheduled completion dates. In respect of Power Finance Corporation Limited (PFC) assisted schemes, the picture was equally bleak with the schemes remaining incomplete beyond target dates. Consequently, the Board lost potential revenue of Rs 226.76 crore as well as incurred additional line losses of Rs 40.29 crore. Besides, there was a loss of Rs 8.90 crore to the State exchequer.

(Paragraphs 3.13.1, 3.14.3, 3.15 & 3.16)

Despite incidence of high transmission and distribution (T&D) losses, the Board failed to take up energy audit so far. Due to T&D losses in excess of norm, the Board resorted to avoidable purchase of 13,626 million units valuing Rs 2,294.37 crore.

(Paragraphs 3.9 & 3.17)

Introduction

3.1 The transmission system is required for evacuation of power from generating stations to bulk load centres. The optimum utilisation of 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.

3.2 West Bengal State Electricity Board (Board) purchases as well as generates power. During 1999-2004, against purchase of 67,033 million units from central sector¹ and other sources², net generation of the Board was 8,213 million units constituting 11 *per cent* of total power available for sale. Thus, the Board largely depended on purchases as compared to generation.

3.3 Power generated and purchased by the Board is evacuated through extra high voltage (EHV) transmission lines at 400, 220, 132 and 66 KV and is stepped down to 400/230 volts to low & medium voltage (L&MV) consumers and 33 KV, 11 KV and 6.6 KV to high voltage (HV) consumers. During 1999-2004, the Board invested Rs 527.48 crore on transmission projects.

Organisational set up

3.4 The transmission wing of the Board functions under the Member (Operation and Transmission), who is assisted by three Chief Engineers, in charge of Transmission, JBIC³ funded West Bengal Transmission Project and Central Planning and Engineering Department (CPED). The transmission wing consists of nine circles, headed by Superintending Engineers, subdivided into three construction and 15 operation and maintenance (O&M) divisions, each headed by a Divisional Engineer. The West Bengal Transmission Project, with four zones headed by Superintending Engineers, is responsible for implementing the JBIC funded transmission project of Rs 631.06 crore.

Scope of Audit

3.5 The review on the working of transmission and distribution (T&D) system of the Board, which appeared in the Report of the Comptroller and Auditor General of India (Commercial) for 1995-96, highlighted deficiencies in the transmission system such as failure to keep pace with the availability of power, slow progress of construction works, mismatch between growth of sub-stations and lines, non-implementation of system improvement schemes etc. These deficiencies still persisted, as discussed in the subsequent paragraphs. The review was not discussed by COPU (September 2004).

3.6 The objective of the present review, conducted between December 2003 and April 2004, was to evaluate the efficiency and effectiveness of the Board in the growth and development of transmission

¹ DVC, NTPC, PGCIL, PTC, NEEPCO

² WBPDC, DPL

³ Japan Bank for International Co-operation

During 1999-2004, the Board purchased and generated 75,246 MU power and invested Rs 527.48 crore on transmission projects.

system in the State during 1999-2004. The present review is the outcome of test check of records at 16⁴ out of 34 unit offices selected on the basis of value of works under execution. The audit findings were reported to Government/ Board in June 2004 and subsequently discussed at the Audit Review Committee for Public Sector Enterprises (ARCPSE) meeting held on 10 August 2004 with the Principal Secretary, Power department representing the Government and the Chairman on behalf of the Board. The review was finalised after considering the views of the Government and the Board.

In the light of audit objectives, results of audit are discussed in the succeeding paragraphs.

Transmission network

The availability of capacity at 132 KV failed to keep pace with the enhanced transmission of power.

3.7 The Board's transmission network as on 31 March 2004 consisted of 88 extra high voltage (EHV) sub-stations, 425 high voltage (HV) sub-stations and 8,308 circuit kilometres (ckms) of extra high voltage lines within and outside the grid.

The table below indicates the transmission facilities built up *vis-à-vis* power transmitted at the end of five years up to 2003-04 :

Particulars		1999-2000	2000-01	2001-02	2002-03	2003-04
A(i)	Power available for sale (Million units)	13,608	13,831	14,842	14,289	18,676
A(ii)	Power wheeled on behalf of others (Million units)	81	51	855	1,239	61
A(iii)	Total power transmitted (Million units)	13,689	13,882	15,697	15,528	18,737
B	EHT Transmission lines (ckm)					
	400 KV	568	568	568	568	755
	220 KV	1,979	1,979	2,092	2,092	2,305
	132 KV	3,786	3,799	3,799	4,207	4,720
	66 KV	862	863	863	863	528
	Total	7,195	7,209	7,322	7,730	8,308
C	Transformation capacity (MVA)					
	400 KV	1,260	1,260	1,260	1,260	1,260
	220 KV	2,720	2,710	2,710	3,040	4,120
	132 KV	3,098	3,271	3,476	4,020	4,543
	66 KV	310	313	314	297	250
	Total	7,388	7,554	7,760	8,617	10,173
D	Availability of transmission capacity (at 132 KV) per million units of power transmitted (ckm) {B/A}	0.28	0.27	0.24	0.27	0.25
E	Availability of transformation capacity (at 132 KV) per million units of power transmitted (MVA) {C/A}	0.23	0.24	0.22	0.26	0.24

⁴ Transmission Project Headquarter, Transmission Headquarters, Central Planning and Engineering Department, Durgapur, Midnapore, Siliguri Transmission Circle & Chandannagar Transmission Project Circle, Siliguri Transmission (O&M) Division, Burdwan Transmission Construction Division, Kharagpur Transmission (O&M) Division, Tamluk Transmission Construction Division, Calcutta Transmission Construction Division, Burdwan Transmission (O&M) Division, Chinsurah, Siliguri & Midnapur Field Zonal Offices

The Board stated (August 2004) that the transformation and transmission capacity at the 132 KV level covered the transmission of power at voltages above and below this level. Audit observed that the ratio of availability of transmission capacity (at 132 KV) per million units of power transmitted ranged from 0.24 to 0.28 and that of transformation capacity ranged from 0.22 to 0.26 respectively. This indicated that the transmission system did not keep pace with the increase in power transmitted during 1999-2004. The Board conceded (August 2004) that in a few pockets, there were problems in fulfilling demand for power as well as maintaining voltage and frequency. The Board, however, had not segregated the losses on this account.

Transmission schemes including their age-wise analysis

The Board took up construction of 40 lines and 52 sub-stations out of planned 65 lines and 66 sub-stations.

3.8 The Board was to construct 65 lines and 66^δ sub-stations during different plan periods as per the scheme approved by the Planning Commission. Audit observed that during 1999-2004, the Board undertook construction of 40 lines and 52 sub-stations including 10 lines and four sub-stations spilled over from Vth to VIIth Plans. Seven lines and 25 sub-stations remained incomplete as of March 2004 as tabulated below-

Plan period	In progress		Completed		Not taken up		Total	
	Lines	Sub-stations	Lines	Sub-stations	Lines	Sub-stations	Lines	Sub-stations
Vth (1975-80)	1	-	-	-	-	-	1	-
VIth (1980-85)	-	-	2	-	-	-	2	-
VIIth (1985-90)	1	2	6	2	2	-	9	4
IXth (1997-2002)	5	12	25	25	23	14	53	51
Xth (2002-2007)	-	11	-	-	-	-	-	11
Total	7	25	33	27	25	14	65	66

The Board also took up (January 1998) construction of a sub-station at Kolkata Leather Complex and strengthening of Falta- Joka transmission line. The Board was unable (August 2004) to furnish the expenditure incurred on incomplete projects.

Growth of transmission network

3.9 During last five years ending 31 March 2004, the growth of 400, 220 and 132 KV transmission network was 228^υ, 329 and 1,042 ckm respectively. Only seven schemes of 220 KV grid sub-station (GSS) and 15 numbers of 132 KV GSS were completed. The growth of transmission system of the Board during last five years up to 2003-04 is detailed overleaf :

^δ Including two sub-stations viz. 220/ 132 KV sub-station at Asansol and 132/ 33 KV sub-station at Rampurhat which were not included in the scheme.

^υ Taking the figures of 01 April 1999 (400 KV : 527 ckm; 220 KV : 1,976 ckm and 132 KV : 3,678 ckm) as base.

Sl. No.	Particulars	1999-2000	2000-01	2001-02	2002-03	2003-04
1	Installed capacity ⁵ (MW)	1,292.70	1,292.70	282.70	282.70	284.70
2	Transmission lines (ckm)					
	400 KV	568	568	568	568	755
	220 KV	1,979	1,979	2,092	2,092	2,305
	132 KV	3,786	3,799	3,799	4,207	4,720
3	Grid sub-stations (Nos./ capacity in MVA)					
	a) 400 KV	2/ 1,260	2/ 1,260	2/ 1,260	2/ 1,260	2/ 1,260
	b) 220 KV	8/ 3,480	8/ 3,480	8/ 3,480	9/ 3,640	12/ 4,120
	c) 132 KV	42/ 3,589	47/ 3,981	48/ 4,044	49/ 4,107	54/ 4,286

The position of power handled, power supplied and transmission loss incurred by the Board between 1999 and 2004 is given below :

Sl. No.	Particulars	1999-2000	2000-01	2001-02	2002-03	2003-04
		In million units (MU)				
1	Total power handled	13,608	13,831	14,842	14,289	18,676
2	Total power supplied to area board, HT consumers and neighbouring system	9,561	8,587	9,484	9,425	12,900
3	Transmission & distribution (T&D) loss (1-2)	4,047	5,244	5,358	4,864	5776
4	T&D loss in excess of norm of 15.5 per cent	1,938	3,100	3,057	2,649	2,882
5	Avoidable purchase of power (Rupees in crore)	335.27	474.30	504.41	452.98	527.41

Since transmission losses exceeded the norm, the Board resorted to avoidable purchases of 13,626 MU valuing Rs 2,294.37 crore.

The Board had not laid down norms for system losses at various stages of transmission. As against the norm of 15.5 per cent approved by Central Electricity Authority (CEA), transmission and distribution (T&D) loss ranged between 29.74 and 37.91 per cent during last five years ending 31 March 2004. The T&D loss in excess of norms was Rs 3,675.02 crore during the same period. This also resulted in wastage of 13,626 MU power involving avoidable purchase of power valuing Rs 2,294.37 crore, based on average purchase price[≡] for those years.

⁵ From April 2001, Bandel & Santaldih Thermal Power Plants (1,010 MW) transferred to WBPDC.

[≡] Re 1.68382 per unit.

The Board had also not analysed reasons for such excess T&D loss. However, audit scrutiny revealed that due to non-completion of 220/132 KV sub-stations along with their associated lines, bulk power was evacuated and transmitted through long distances over 132 KV lines, resulting in higher T&D loss.

Funding of transmission schemes

The Board received Rs 437.85 crore as loans/ grants and utilised own fund of Rs 77.68 crore during 1999-2004.

3.10 The Board was sanctioned (February 1997-May 2002) loans aggregating Rs 820.64 crore by JBIC (Rs 471.09 crore), PFC⁹ (Rs 132.66 crore) and the State Government (Rs 216.89 crore) for construction/ extension of 36 sub-stations and 31 transmission lines. The Board passed on bills aggregating Rs 435.77 crore for payment/ reimbursement to JBIC (Rs 387.42 crore), PFC (Rs 27.74 crore) and the State Government (Rs 20.61 crore). Till March 2004, the Board received Rs 423.82 crore^e, while bills of Rs 11.95 crore awaited reimbursement from JBIC. In addition, the Board received (1997-2003) grant of Rs 10.53 crore for construction of a sub-station at Kolkata Leather Complex and strengthening of Falta-Joka transmission line and loan of Rs 3.50 crore in 1999-2000 from the Government of India for inter-State transmission line. The Board also utilised own fund of Rs 77.68 crore.

Targets and actuals

3.11 The following table indicates financial outlay and actual expenditure, physical targets and actual achievement in the construction of new transmission lines and sub-stations by the Board during the past five years till 2003-04 :

	Particulars	1999-2000	2000-01	2001-02	2002-03	2003-04	Total
		Rupees in crore					
	Financial outlay	125.00	142.01	280.00	220.00	140.00	907.01
	Actual expenditure	64.76 (52)	75.05 (53)	172.34 (62)	152.99 (70)	62.34 (45)	527.48 (58)
	Physical targets and achievements						
A	<i>Transmission lines (in ckm)</i>						
1	Target	89.38	402.25	1,453.70	1,623.20	234.00	3,802.53
2	Achievement	41.00 (46)	13.25 (3)	280.93 (19)	314.67 (19)	80.00 (34)	729.85 (19)
B	<i>Sub-stations (in MVA)</i>						
1	Target	664.10	490.40	4,990.30	4,051.50	3,138.00	13,334.30
2	Achievement	381.00 (57)	218.53 (45)	535.50 (11)	962.50 (24)	1,765.50 (56)	3,863.03 (29)

(Figures in brackets indicate percentage of achievement)

(Source : Information furnished by Chief Engineer, CP & ED)

⁹ Power Finance Corporation Limited

^e JBIC-Rs 375.47 crore, PFC-Rs 27.74 crore & State Government-Rs 20.61 crore

Audit observed that –

While overall physical achievement was only 19 to 29 per cent of targets, the aggregate expenditure was 58 per cent of outlay.

- Though the overall physical achievement in construction of lines and sub-stations was 19 and 29 *per cent* respectively, the aggregate expenditure was 58 *per cent* of outlay, indicating that a substantial part of the work continued to remain incomplete and there were significant cost overruns. The Board stated (August 2004) that whereas the physical targets included only completed works, the works-in-progress were included in actual expenditure.
- During 1999-2000, no targets were fixed for 220 KV and 400 KV lines and substations.
- The achievements were nil in respect of 400 KV lines (2000-02), 220 KV lines (1999-2002), 400 KV sub-stations (2001-03) and 220 KV sub-stations (2001-02).

The Board failed to reconcile the physical and financial achievements with its records and books of accounts.

- The aggregate physical and financial achievements as furnished to Audit did not tally with the position indicated in the Annual Reports for 1999-2003 and financial records of the Board. The Annual Reports indicated achievement of 646.86 ckm and 1,801.60 MVA in lines and sub-stations respectively against CPED's records of 649.85 ckm and 2,097.53 MVA thereby casting doubt on the actual achievement. The Board had no explanation for the difference.
- Similarly, the outlay and expenditure as per budgets/ accounts was Rs 872.41 crore and Rs 1,109.59 crore respectively during 1999-2004 against Rs 907.01 crore and Rs 527.48 crore shown in the records of CPED. The Board observed (August 2004) that reconciliation was not feasible. This indicated that monitoring was lax.

The reasons for poor achievement were delayed implementation of schemes, mismatches in construction of sub-stations and related transmission lines as well as poor monitoring, as discussed in paragraphs 3.12, 3.13, 3.15 & 3.16 *infra*.

Monitoring of on-going works

The Board had no system of reporting the follow-up action on deficiencies pointed out during progress review meetings.

3.12 Member (Operation & Transmission) was to fortnightly review the progress of JBIC funded transmission works, separately for transmission lines and sub-stations, with executing agencies. Moreover, CPED was to monitor both the physical and financial progress of transmission project works, other than JBIC funded projects. Scrutiny revealed that CPED did not maintain physical and financial progress of 274 work orders (value: Rs 187.04 crore) out of 346 work orders (value: Rs 397.40 crore) issued (1998-2004) indicating that a substantial part of ongoing works was not monitored and reviewed by CPED. The Board of the Members (BOM) reviewed the progress of work only once in March 1999.

However, at the direction (March 2004) of Member (Operation & Transmission) review meetings of non-JBIC funded projects are since being held monthly.

Scrutiny of minutes of review meetings revealed that no follow-up action on deficiencies pointed out in different meetings was carried out and placed in subsequent meetings. The synopsis of deficiencies and corrective action taken thereagainst was not also placed before the BOM. The Board agreed (August 2004) to table the reports before Members. Thus, though substantial works were lagging behind schedule, the Board was yet to evolve effective monitoring mechanism.

Execution of schemes

3.13 In order to enhance reliability of transmission system, reduce transmission loss and voltage fluctuation etc., JBIC sanctioned Rs 471.09 crore (Rs 353.09 crore in February 1997 and Rs 118 crore in May 2002) for construction of 23 new sub-stations along with extension of eight existing sub-stations and their associated 24 lines. The project was to be completed by March 2001 but was extended (March 2000) to September 2004. While five sub-stations with associated lines were taken up with loans from PFC, a sub-station and a transmission line was constructed out of Government grant as well as Board's fund.

Despite delays of one month to 49 months in construction of 18 sub-stations and 23 lines, the Board had not recovered damages of Rs 17.70 crore.

3.13.1 The JBIC assisted schemes were divided in four lots, with lots I and II consisting of 23 transmission lines and lots III and IV consisting of 31 sub-stations. The Board invited (December 1997) tenders under international competitive bidding (ICB) for erection of transmission lines and construction of sub-stations and local competitive bidding (LCB) for other related works viz., land development, construction of boundary wall etc. The contracts for all lots were awarded (February 1999/ March 2000) on turnkey basis to RPG Transmission Limited (Lot I – Rs 58.98 crore), KEC International Limited (Lot II – Rs 48.83 crore), consortia led by Bharat Heavy Electricals Limited⁶ (Lot III – Rs 182.46 crore) and Crompton Greaves Limited⁷ (Lot IV – Rs 163.90 crore). Construction of a transmission line⁸ was awarded (February/ March 1998) under LCB to Sunsteel Industries Private Limited and Eastern Construction Company.

The progress of works is given at **Annexure – 25**. It would be seen from the annexure that:-

- Out of 23 sub-stations, only five⁸ were commissioned within target dates, 13⁹ sub-stations after delays of one to 15 months and five sub stations were yet to be completed even after time overrun of 9 to 13 months. Similarly, all lines were completed after delays of two to

⁶ Other members – Crompton Greaves Limited (CGL) & Asea Brown Boveri Limited (ABB)

⁷ Other members – Bharat Heavy Electricals Limited (BHEL) & Asea Brown Boveri Limited (ABB)

⁸ Siliguri-New Jalpaiguri 132 KV double circuit line

⁹ Raina, Rampurhat, Mankar, Pingla and Basirhat

⁹ Siliguri, Krihnnanagar, Midnapore, Tarakeswar, Chanditala, Lakshmikantapur, Samsi, Domjur, Rishra, Khanyan, New Jalpaiguri, Uluberia and Bongaon

49 months. The delays were mainly attributable to delay in acquisition of materials/ equipments, non-deployment of adequate manpower, failure to arrange way leave in time etc. As all these factors are controllable, these delays could have been avoided by proper planning and monitoring of activities.

- Despite delays by the suppliers/ contractors in supply/ completion of work, the Board did not impose liquidated damages of Rs 17.70 crore since it failed to assess the extent of delays in supply and consequential delay in execution.
- Due to non-completion of five sub-stations, Rs 78.91 crore remained blocked for nine to 13 months for which the Board was liable to pay interest of Rs 20.84 crore without benefit accruing to it.

In addition, due to delayed commissioning of eight¹⁰ 132 KV sub-stations, the Board sustained loss of potential revenue of Rs 216.33 crore and electricity duty of Rs 8.87 crore to the exchequer. Moreover, delays in commissioning of 132 KV transmission lines had led to additional line losses of 7.5 MU valuing Rs 1.91 crore, arising from transmission of power at a lower voltage of 33 KV.

Failure to avail discount

The Board's failure to quantify some items of work resulted in loss of discount/ rebate of Rs 68.51 lakh.

3.13.2 The Board awarded (February 1999) the two contracts to KEC International Limited (KEC) and to RPG Transmission Limited (RPG) at prices of Rs 14.15 crore and Rs 13.41 crore respectively. These prices were after discount of 19 *per cent* on all items quoted by KEC and a lump sum rebate of Rs 1.45 crore (9.75 *per cent*) on the price quoted by RPG.

While awarding these contracts, the Board excluded certain items of civil works, since it had not quantified them despite obtaining their unit rates in the tender. During execution, these items were quantified after detailed survey and the Board issued (December 2001/ June 2002) two variation orders on RPG (Rs 4.29 crore) and KEC (Rs 2.08 crore). Ultimately, the Board received discount of 7.18 *per cent* only from KEC, while RPG offered no discount. Although the Board was aware of the need for these works, it failed to include these items while evaluating the bids resulting in loss of Rs 68.51 lakh.

The Members of the Board directed (May 2002) that detailed facts must be submitted on the deviations in these contracts and reasons for not putting up the proposals at the appropriate time. The facts and reasons had not been submitted (August 2004). The Board stated (August 2004) that these deviations would not recur.

Procurement in advance of requirement

3.13.3 Between May 2001 and August 2002, the Board received seven transformers (160 MVA capacity each) at Rs 13.79 crore for installation at

¹⁰ Siliguri, Krishnagar, Chanditala, Uluberia, Samsi, Tarakeswar, Khanyan, Bongaon

five¹¹ sub-stations due to be commissioned between March and November 2002. Due to delays of eight to 17 months in commissioning these substations, the transformers remained idle for 247 to 804 days leading to blocking of fund of Rs 13.79 crore for that period and avoidable interest liability of Rs 2.05 crore to JBIC.

The Board stated (August 2004) that to overcome this problem the material advance component was presently reduced from 90 to 70 *per cent*.

Time and cost overrun

3.14 Although the Board incurred an expenditure of Rs 16.75 crore, it failed to complete four sub-stations and one transmission line due to lack of planning and non-synchronisation of related activities after a lapse of one year to 12 years. In addition, the Board had completed three sub-stations after a delay of 11 to 60 months and cost overrun of Rs 8.50 crore.

Construction of 220 KV sub-station at Dharma, Midnapore

3.14.1 The Board was supplying power to Midnapore from the 132/33 KV Hijlee sub-station 20 km away. To improve power supply, the Board issued (May 1993) work order for construction of 220/132/33 KV sub-station (383 MVA) at Dharma, Midnapore at an estimated cost of Rs 19.81 crore to be completed by March 1997.

The Board incurred cost overrun of Rs 4.76 crore due to delays in commencing and executing the work.

After taking up work in January 1996, the Board decided (February 1997) to execute work on only the 132/33 KV (31.5 MVA x 2) section (estimated cost Rs 12.49 crore) of the proposed sub-station with its own fund, due to fund constraint. The first transformer was commissioned in February 1998 and the second in September 1999.

After lapse of three years, the work of 220 KV portion comprising two transformers (320 MVA) was awarded (March 2000) to Crompton Greaves Limited (CGL) at Rs 14.41 crore. The first transformer was commissioned in November 2002 and the second on 27 February 2003 against scheduled date of March 2002. However, due to persistent oil leakage, the second transformer was switched off on 01 March 2003 and re-commissioned only in July 2004. Till March 2004, the Board incurred expenditure of Rs 12.08 crore. The delay was attributable to delays in supply of materials, submission of drawings and failure by the contractor to mobilise additional manpower and resources. The Board attributed (August 2004) the delay in repair to non-availability of shutdown in view of law and order, examinations, boro cultivation, VIP visit, election, World Cup etc.

Due to inordinate delays in taking up and completing the work, the Board incurred cost overrun of Rs 4.76 crore.

¹¹ Lakshmikantapur, Midnapore (Dharma), Domjur, Rishra and New Jalpaiguri

Construction of 220/132 KV sub – station at Rishra

3.14.2 The Board simultaneously took up (May 1989) construction of a 220/132 KV sub-station (320 MVA) at Rishra at an estimated cost of Rs 8.18 crore as well as augmentation (150 MVA) of existing 132 KV sub-station at Rs 1.68 crore. The augmentation was completed in April 1996 at Rs 1.52 crore, while the work on the 220 KV sub-station was kept in abeyance, after incurring Rs 40.03 lakh, due to fund constraint.

Inadequate planning by the Board and delays by contractor led to cost overrun of Rs 8.23 crore.

After lapse of 11 years, the sub-station was included in JBIC project and work was awarded (March 2000) to Asea Brown Boveri Limited (ABB) at Rs 16.01 crore with scheduled date of completion by July 2002. The sub-station was, actually, completed in December 2003 after an inordinate delay of 17 months. Consequently, the Board had sustained cost overrun of Rs 8.23 crore.

The Board attributed (August 2004) the delay to ABB's inability to supply material and equipment on time as well as need to relocate distribution lines passing through the sub-station land. This indicated that although the works were taken up simultaneously, the Board had not planned the shifting of overhead/ underground lines at the appropriate time.

Construction of sub-stations and lines with PFC assistance

The Board failed to reap anticipated benefit of Rs 6.79 crore due to slow progress of work.

3.14.3 Between September 1997 and September 2001, the Board took up construction of four sub-stations and associated lines with loans from PFC. The progress of work was negligible and against aggregate estimated cost of Rs 111.22 crore, actual expenditure was only Rs 5.55 crore up to March 2004. The works, scheduled to be completed between November 2002 and March 2003 as specified in the loan agreements, were still in progress, as discussed below :

- For the Krishnagar sub-station and Satgachia – Krishnagar line to evacuate power from Bakreshwar and Farakka Thermal Power Stations, the Board spent Rs 2.73 crore and completed the control room building and part of PCC/ RCC foundation work. The Board had not taken any action for construction of the Satgachia-Krishnagar transmission line (March 2004), leading to time overrun of 15 months due to delay in acquisition of land and placement of order.
- For the Coochbehar sub-station, the Board issued (July 2003) two orders, eight months after target date of completion (November 2002) on Crompton Greaves Limited, Chennai, for supply of equipment (Rs 4.96 crore) and for erection and commissioning (Rs 1.87 crore) by March 2005. While materials valuing Rs 1.22 crore were supplied during December 2003 and January 2004, the Board had not taken action to construct sub-station due to delay in acquisition of land, leading to time overrun of 16 months.
- At Subhasgram sub-station, against the scheduled date of completion by March 2003, the Board had acquired 19.77 acres land at

Rs 77.11 lakh only in September 2002 and floated (February 2004) tender for land filling and construction of boundary wall of the sub-station. In respect of transmission line only route survey had been completed so far (September 2004).

Due to time overrun for all sub-stations, the Board failed to reap anticipated benefit of Rs 6.79 crore by reducing line losses and generating additional revenue.

At the ARCPSE meeting, the Board mentioned (August 2004) that poor quality of land and continuous local disturbances hampered these works.

Construction of 220 KV Jeerat - Rishra line

3.14.4 The Board issued (January 1992) work order on BTCD^o for construction of Jeerat-Rishra line at an estimated cost of Rs 8.51 crore by December 1993. The Board revised (October 1993) the estimate by more than 100 *per cent* to Rs 17.16 crore two months prior to the target date. After lapse of about one and a half years, the Board placed (March 1995) orders for supply of materials and erection of transmission line on Electrical Manufacturing Company Limited (EMC) at Rs 3.72 crore and Rs 3.76 crore respectively by March 1998.

Although the route involved crossing the river Ganges, the Board floated (September 1998) tender for bored pile foundation for Ganges crossing and placed (October 1999) letter of intent on Rajnath Construction & Engineering (P) Limited (RCEL) for the work at Rs 2.42 crore. The work was completed in July 2003 for Rs 2.40 crore.

Even after lapse of six years, the Board failed to complete the construction of the line on account of delayed finalisation of survey and tower schedule, delayed approval and supply of drawing/ bill of materials as well as failure to arrange way leave. Moreover, delayed finalisation of survey and soil testing compelled the Board to defer tender for Ganges crossing. The Board stated (August 2004) that the financial condition of EMC was precarious and it had been referred to BIFR leading to slow progress of work. Consequently, Rs 9.91 crore incurred so far (March 2004) was locked up without any benefit accruing to the Board, despite time overrun of 123 months.

Construction of 66/ 11 KV sub-stations at Nagrakata and Hasimara

3.14.5 To cater to the rising demand of power at Nagrakata in Jalpaiguri district, the Board decided (1989) to construct a 66/11 KV sub-station (estimated cost : Rs 1.07 crore) by March 1992 at Nagrakata to be funded from RIDF¹²-VI/VII scheme. Though requisite land was acquired in April 1989, the Board did not take steps for construction of the sub-station for reasons not on record. After eleven years, the Board decided (August 2000) to

^o Burdwan Transmission Construction Division

¹² Rural Infrastructure Development Fund, contribution to which is received by the National Bank of Agriculture and Rural Development from scheduled commercial banks against their shortfall in priority sector/ agricultural lending during the preceding year.

construct the sub-station from own funds by March 2003, at a revised estimate of Rs 1.29 crore. The Board failed to construct the sub-station within the due date. While the construction of boundary wall had been completed (December 2002), other works were in progress. An expenditure of Rs 37.40 lakh had been incurred (September 2003). The Board stated (August 2004) that the contractor had abandoned the work and the contractor's financiers had taken the matter to Court.

Similarly, the Board issued (July 1993) a work order on STCD^ε for construction of a 66/11 KV sub-station at Hasimara, Jalpaiguri at an estimated cost of Rs 1.93 crore to be completed within March 1996. After identification of land, the Board prepared drawings in August 1996, submitted acquisition proposal in November 1996 that matured in February 1998. STCD acquired the land in March 1998. Ultimately, the sub-station (12.6 MVA) was commissioned in April 2001 at an expenditure of Rs 3.13 crore.

Thus, delay in execution of these works resulted in cost overrun of Rs 1.42 crore (Nagrakata : Rs 0.22 crore; Hasimara : Rs 1.20 crore) and time overrun of 12 years (Nagrakata) and five years (Hasimara).

Mismatch in construction of sub-stations and transmission lines

Mismatch in construction of lines and sub-stations not only led to under/non-utilisation of lines constructed at a cost of Rs 78.49 crore but also resulted in higher line losses.

3.15 Grid sub-stations (GSS) and transmission lines are to be constructed simultaneously to achieve the anticipated benefit. But, the Board failed to plan and integrate the construction of lines and sub-stations leading to mismatches in their completion, time and cost overrun in completion of related schemes etc. Twenty six such instances of mismatch noticed in audit are given in **Annexure - 26**. These delays not only deprived the Board of the intended benefits but also adversely affected the quality of power supplied, besides leading to under/ non-utilisation of transmission lines constructed at a cost of Rs 78.49 crore. Deficiencies noticed in audit are detailed below.

Construction of 220 KV Kolaghat – New Haldia transmission line

3.15.1 Mention was made in paragraph 3.6(ii) of Audit Report (Commercial) 1995-96 that the Board took up (April 1987) erection of a 220 KV line from Kolaghat to the proposed 220/132/33 KV sub-station at New Haldia. The line was completed only in June 2001 at a cost of Rs 12.35 crore. In absence of the terminating sub-station (220 KV) at New Haldia, the line was charged at 132 KV. Although the Board issued work order for the sub-station in August 1991, it failed to take up the work due to fund constraints as stated by management (August 2004).

The Board sustained higher line losses of 7.03 MU valuing Rs 1.95 crore due to failure to complete sub-station at New Haldia.

Subsequently, BHEL was entrusted (March 2000) with construction of the sub-station on turnkey basis at an estimated cost of Rs 22.98 crore, to be completed by July 2002 but this was yet to be commissioned. The expenditure up to March 2004 was Rs 17.76 crore. The reasons for delay were non-acquisition of materials, non-deployment of erection equipment, inadequate workforce and suspension of work.

^ε Siliguri Transmission Construction Division

Due to non-completion of the sub-station, the Board transmitted 40 MVA power at 132 KV through Kolaghat – Haldia line (220 KV) (route length : 56.1 Kms) entailing higher transmission loss of 7.03 MU valuing Rs 1.95 crore.

Jeerat – Saintala – Kasba – Lakshmikantapur 220 KV line

3.15.2 The Board issued work order (Rs 17.96 crore) in July 1992 to KTCD[∞] for execution of the Jeerat - Saintala- Kasba - Lakshmikantapur 220 KV double circuit line. After lapse of more than two years, KTCD issued (October 1994) order (value: Rs 4.28 crore) for supply of materials, survey, erection etc., to be completed within October 1997. The contractor commenced route survey in December 1994. After delay of more than one year, the contractor started (January 1996) foundation of towers and completed the work on Jeerat – Saintala – Kasba section in October 1998. Since the proposed Lakshmikantapur sub-station, scheduled to be completed in July 2002, was completed only in December 2003, the remaining section i.e. Kasba-Lakshmikantapur was completed and energised only in December 2003 at a total cost of Rs 25.73 crore for the line. The delay of 80 months was mainly attributable to need for frequent change of route profile, failure to arrange way leave, construction of school building enroute, non-supply of store materials etc.

Thus, lack of co-ordination in the construction of line and sub-station resulted in time overrun of nearly seven years and cost overrun of Rs 7.77 crore.

Kolaghat – Durgapur 400 KV line

3.15.3 Mention was made in paragraph 4B.1.6 of the Report of the Comptroller and Auditor General of India (Commercial) for the year 1995-96 on the slow construction of the 400 KV transmission line between Kolaghat and Durgapur due to delayed finalisation of route alignment by the Board. It also pointed out theft of conductors and line materials valuing Rs 1.75 crore on the erected section of the line. Consequently, revitalisation work, awarded in November 1993, was completed in August 1999 against scheduled date in July 1997.

Non-completion of three sub-stations led to additional line loss of 31.23 MU valuing Rs 7.93 crore.

Consequently, the line became operational only in August 1999 against the original schedule of June 1988, after expenditure of Rs 41.46 crore with time overrun of 134 months and cost overrun of Rs 18.19 crore. Meanwhile, to match the line with a sub-station, the Board decided (1993) to construct a 400 KV sub-station at Durgapur from Board's own fund. Audit observed that the work had not been completed so far (August 2004). Due to non completion of sub-station till August 2004, this 400 KV line is being utilised for evacuation of power at 220 KV from Kolaghat to Howrah, Arambag and Domjur sub-stations leading to additional line loss of 31.23 MU valuing Rs 7.93 crore even after expenditure of Rs 41.46 crore.

[∞] Kolkata Transmission Construction Division

Arambag – Midnapore 220 KV and Arambag – Raina 132 KV lines

3.15.4 The Central Electricity Authority (CEA) cleared (April 1995) the Board's proposal for a 220 KV double circuit transmission line from Arambag to Midnapore (cost : Rs 19.64 crore), to be completed in 1997-98. The Board placed (February 1996) two orders for supply of equipment and materials and for survey and erection of Arambag – Midnapore 220 KV double circuit transmission line (71 Km) on Sun Steel Industries Private Limited (SSIP) for Rs 5.19 crore before deciding (February 1997) to take up the 220 KV sub-station at Midnapore. While the line was scheduled to be completed in June 1997, the sub-station was due only in March 2002. Consequently, the above line was completed in June 1998 at Rs 8.95 crore and charged at 132 KV to supply power to Midnapore 132 KV sub-station till November 2002, when the Midnapore 220 KV sub-station was commissioned.

Similarly, the Board decided to construct a 132 KV double circuit transmission line (30 km) from Arambag to Raina (Rs 5.58 crore), by 1996-97. Prior to taking up (February 1997) the 132 KV sub-station at Raina, the Board placed (February 1996) two orders for supply of materials and for erection of line on SSIP at Rs 2.29 crore by December 1998, while the Raina sub-station was due only in November 2002. Though this line was completed in January 2000 at a cost of Rs 5.27 crore, it remained unutilised due to non-completion of sub-station at Raina, construction of which was completed in October 2002 and the line was operated at 132 KV from November 2002.

Thus, due to mismatch in planning and failure to take up lines and related sub-stations in tandem, the Board had to suffer additional line loss of 10.68 MU (value : Rs 2.03 crore) for the period from July 1998 to October 2002.

Alipurduar – Cooch Behar 132 KV line

3.15.5 The Board issued (November 1993) work order on STCD^U for erection of 132 KV single circuit Alipurduar – Cooch Behar transmission line at an estimated cost of Rs 2.18 crore within March 1997. After five and a half years, an order for supply of towers and tower accessories was placed (May 1999) by STCD on Sun Steel Industries (P) Limited (SSIP) at Rs 67.38 lakh and another order for route survey, erection and commissioning of the line was issued (July 1999) on Eastern Construction at Rs 78.63 lakh. Erection of line was almost complete in September 2003 at a cost of Rs 2.75 crore. However, due to failure on the part of the Board to arrange requisite conductors, the erection and stringing of end points at Alipurduar and Coochbehar was incomplete. The Board, however, erected (May 2003) temporary connections and supplied power at 66 KV.

Thus, despite expenditure of Rs 2.75 crore, the Board failed to derive any benefit.

^U Siliguri Transmission Construction Division

Operation and maintenance of sub-stations and lines

3.16 In the course of operation of sub-stations and lines, the supply-demand profile within the constituent sub-systems is identified and system improvement schemes are undertaken to reduce line losses and ensure reliability of power by improving voltage profile. These schemes are for augmentation of existing transformer capacity, installation of additional transformers, laying of additional lines and installation of capacitor banks. The Board either delayed or failed to take up the schemes, as discussed below :

System improvement in Asansol and Jhargram regions

3.16.1 To improve the T&D network, cater to growing load demand at Asansol and its suburbs and also to improve the quality of power supplied, the Board approved (May 1999) a system improvement scheme for strengthening of existing power transmission and distribution network ranging from 11 to 220 KV in Asansol and its adjoining areas with loans from PFC (cost : Rs 78.36 crore). The entire scheme was expected to yield an anticipated annual benefit of Rs 12.13 crore from April 2004, by way of reduction in line loss, supply of additional power etc.

Despite interest outgo of Rs 1.45 crore, the Board was yet to enjoy anticipated benefit.

PFC sanctioned (July 2000) Rs 54.80 crore of which Rs 24.31 crore was for construction of 220/132/33 KV sub-station at Kanyapur, Asansol along with associated transmission lines by March 2004. Till August 2004, only 33 *per cent* of work (value : Rs 5.89 crore) had been completed due to delayed placement of orders as well as slow progress of construction work by the contractors. Erection order had not yet been placed (March 2004). Till March 2004, the Board drew Rs 18.86 crore from PFC and paid interest of Rs 1.45 crore. Thus, the Board was yet to receive the anticipated benefit.

3.16.2 The Jhargram area in West Midnapore was being fed from Hijlee 132/33 KV sub-station (12.45 MVA) through two 33 KV feeders, having route length of 50 kms, which also fed another five¹³ 33/ 11 KV power sub-stations enroute.

Delay in taking up sub-station at Jhargram, led to loss of Rs 27.42 crore to the Board.

Prior to April 2000, the Jhargram sub-station catered 24 bulk consumers and 12,140 low and medium voltage consumers with connected load in excess of capacity of the sub-station. Consequently, during peak hours, voltage in this area was 70-75 *per cent* of normal voltage with frequent interruptions in power supply. Moreover, catering to aggregate load of these six sub-stations (51.2 MVA) across this long distance, had an adverse impact on the voltage profile of all six sub-stations.

To improve the situation, the Board decided (December 2002) to install 132/33 KV sub-station at Jhargram at an estimated cost of Rs 26.96 crore with a double circuit transmission line from Midnapore 220/132/33 KV sub-station to Jhargram under RIDF-IX scheme. But even after expiry of two years, the

¹³ Manikpara, Boira, Midnapore, Salboni & Binpur

Board failed to acquire land (March 2004) due to dispute regarding cost of land with the District Land Acquisition Collector.

During 2002-03 and 2003-04, the interruption in power supply in Jhargram area was 29,126 hours and 34,068 hours respectively resulting in loss of potential revenue of Rs 94.76 lakh and electricity duty of Rs 3.02 lakh to the exchequer. In addition, there were line losses of 2.87 MU and drop in voltage of 10.515 KV valued at Rs 26.47 crore during the last five years up to 2003-04 which occurred due to transmission of 10 MW power through a 33 KV trunk line from a distance of 50 Kms. Installation of a 132/33 KV sub-station at Jhargram could have aided in avoiding these losses by transmitting power over long distances at higher voltage as well as improving voltage profile.

Delays in augmentation of traction power

3.16.3 To cater to the increased need for traction power, South-Eastern Railways (SER) requested (April 2001) the Board to replace the existing 2 X 12.5 MVA traction transformers at Howrah grid sub-station with 2 X 20 MVA traction transformers and paid (September 2001) Rs 2.88 crore to the Board as service connection charges. The Board was to procure and install these transformers within a year to realise additional standing charges of Rs 3.27 lakh per month towards the cost of transformers.

The Board invited (September 2002) tenders for purchase of transformers a year after receipt of service connection charges and placed purchase order in August 2003 after another 11 months. Consequently, the Board failed to complete augmentation (March 2004). As a result, the Board was deprived of additional revenue of Rs 58.86 lakh towards standing charges from October 2002 to March 2004, besides delay in improving the traction system at Howrah.

While accepting the facts, the Board stated (February 2004) that standing charges as well as Annual Minimum Guaranteed Revenue (AMGR) would be effective only on augmentation. The contention is not tenable as the Board should have procured the transformers within the specified time period of seven months from the date of receipt of cost of augmentation and accordingly, claimed both standing charge and AMGR from the 13th month i.e. from October 2002.

3.16.4 The Board received (April 1992-March 1998) service connection charges of Rs 3.47 crore from SER and issued (April 1993) order for supply of traction power at Balichak station to SER by laying of 22 Km single circuit LILO[®] from Bishnupur – Hizli 132 KV double circuit line (cost : Rs 2.87 crore) to be completed by March 1996. Subsequently, the Board took two years to decide whether the line would be taken by LILO or a separate line bay would be constructed at the proposed 220/132/33 KV sub-station at Midnapore (route length–26 Km) and opted for the latter, reasons for which were not on record. Ultimately, the line was commissioned (June 1999) at Rs 5.38 crore with cost overrun of Rs 2.51 crore and time overrun of 38 months. Had the Board finalised the source of power supply at inception, it

[®] Loop in loop out

could have avoided an extra expenditure of Rs 2.51 crore, besides earning potential revenue of Rs 1.60 crore towards standing charges from April 1996 to May 1999.

3.16.5 Similarly, the Board received (June 2000) service connection charges of Rs 1.55 crore from Eastern Railways (ER) and issued (August 2000) work order for drawal of a 132 KV single circuit line from Barasat 132 KV sub-station to a proposed 132/25 KV sub-station of railways at Barasat (cost : Rs 1.55 crore) with scheduled completion by March 2002. The Board failed to complete the work till March 2004 due to delay of 15 months in placement (November 2001) of order for erection of equipment, cable laying etc. from the date of issue of work order. Orders for sub-station structure for 132 KV line bay and for first phase of 132 KV single circuit line were placed (January 2002/ February 2002), only two months and one month respectively prior to scheduled date of completion. Expenditure of Rs 41.58 lakh had been incurred till September 2003. Consequently, the Board failed to realise standing charges of Rs 49.99 lakh from ER during 24 months.

Transmission and distribution losses and energy audit

3.17 Mention was made in paragraphs 3B.6 and 3.2.32 of Audit Reports (Commercial) for the years ended March 2002 and 2003 respectively about scheduled completion of 100 *per cent* metering to all EHV and HV sub-stations up to 11 KV feeders by September 2001 and undertaking of energy audit by December 2001 to reduce system losses. Audit observed (March 2004) that as against target of September 2002, the Board completed 100 *per cent* metering in July 2004, at a cost of Rs 45.68 crore. Consequently, the Board was able to assess the quantum of transmission loss from July 2004 only. However, the Board was yet to take any action against the erring contractor, *viz.* Secure Meters Limited (March 2004).

3.17.1 While determining the tariff, the West Bengal Electricity Regulatory Commission (WBERC) permitted recovery of T&D losses at 30, 27.5, 25 and 22.5 *per cent* during 2000-01 to 2003-04 respectively. However, actual T&D losses was 37.9, 36.1, 34 and 30.9 *per cent* in these years leading to aggregate unrecovered T&D loss of Rs 1,440.58 crore.

Conclusion

The Board failed to implement transmission schemes within schedule leading to abnormal time and cost overrun besides foregoing potential revenue and incurring additional system losses. The monitoring mechanism fell short of requirement. Different system improvement schemes were yet to reach fruition, while energy audit was not taken up so far. The transmission and transformation capacity was unable to keep pace with the growth in demand of power. The Board needs to avoid spill over of the schemes and locking up of fund by proper planning; ensure completion of transmission schemes as per their schedule; avoid mismatch in construction of lines and sub-stations; strengthen monitoring and follow-up mechanism; and ensure reduction of transmission and distribution losses by introducing energy audit.

Delay in initiating energy audit led to unrecovered transmission and distribution losses of Rs 1,440.58 crore.