

Chapter III

Reviews relating to Statutory Corporations

Punjab State Electricity Board

3A Operational Performance and Maintenance of Guru Gobind Singh Super Thermal Plant, Ropar

Highlights

Guru Gobind Singh Super Thermal Plant, Ropar has installed capacity of 1,260 mega watt (MW) with 6 units of 210 MW each. The units were commissioned during September 1984 to March 1993.

(Paragraph 3A.1)

Actual generation of power was less than the possible generation during all the five years up to 2000-01 thereby resulting in generation loss of 2,197.05 million units valued at Rs. 417.11 crore.

(Paragraph 3A.4.1(ii))

Excess time taken in overhauling of boilers over and above the norms prescribed by Kulkarni Committee appointed by Government of India resulted in generation loss of 246.07 million units valued at Rs.15.59 crore during five years up to 2001-02.

(Paragraph 3A.4.2.1)

Excess consumption of coal by 40.74 lakh metric tonnes over and above the standards laid down by equipment supplier resulted in loss of Rs. 772.68 crore during 1997-2002.

(Paragraph 3A.5.1)

Payment of Rs. 5.32 crore as commission to a private firm for settlement of claims between the Board and Railways was not justified, as both the parties were Government organisations.

(Paragraph 3A. 5.4)

Avoidable payment of Rs. 5.43 crore was made to Punjab Pollution Control Board for operating the Plant without consent and releasing of water into Sirsa Nadi at higher temperature.

(Paragraph 3A. 8)

3A.1 Introduction

Punjab State had three thermal power plants having total installed capacity of 2120* MW. Guru Gobind Singh Super Thermal Plant, Ropar (Plant) has installed capacity of 1260 MW from six generating units (210 MW each). These units were commissioned during September 1984 to March 1993.

3A.2 Organisational set up

The management of the Plant is vested in a General Manager who works under the overall control of Board of Members (Board) through Member (Generation). In day to day working of the Plant, General Manager is assisted by ten Superintending Engineers and one Financial Advisor and Chief Accounts Officer (FA&CAO).

3A.3 Scope of Audit

The execution and generation performance of the Plant, Stages I, II and III were reviewed in the Reports of Comptroller & Auditor General of India for the years ended 31 March 1985, 1991 and 1994 (Commercial) – Government of Punjab, respectively. These reviews have been discussed by the Committee on Public Undertakings (COPU) and recommendations of last two reviews were awaited (February 2002).

The present review conducted during the period from August 2001 to April 2002 covers the operational performance and maintenance of the Plant during 1997-2002.

* i) Guru Gobind Singh Super Thermal Plant, Ropar-1260MW
ii) Guru Nank Dev Thermal Plant, Bathinda-440MW
iii) Guru HarGobind Thermal Plant, Lehra Mohabbat-420MW

3A.4 Operational performance

3A.4.1 Generation

Generation performance of the Plant for the five years up to 2001-02 is tabulated below:

Sl. No.	Particulars	1997-98	1998-99	1999-2000	2000-01	2001-02
1	Generating capacity (MUs)	11,037.6	11,037.6	11,067.8	11,037.6	11,037.6
2	Total available hours in a year	52,560	52,560	52,704	52,560	52,560
3	Net available hours after excluding planned/ forced outages	44,899	42,037	42,621	42,571	46,331
4	Percentage of plant availability factor (3/2)	85.42	79.98	80.87	80.99	88.15
5	Actual running hours	39,764	38,871	41,075	42,129	43,807
6	Possible generation with reference to hours actually operated (MUs)	8,350.39	8,162.83	8,625.73	8,847.08	9,199.47
7	Actual generation (MUs)	7,764.24	7,728.16	8,203.43	8,436.56	8,856.06
8	Shortfall (6-7) (MUs)	586.15	434.67	422.30	410.52	343.41
9	Plant load factor ((7/1x100) (percentage))	70.34	70.02	74.12	76.43	80.24
10	Percentage of targets of auxiliary consumption (MUs)	7.50 (582.32)	7.60 (587.34)	7.70 (631.66)	7.70 (649.62)	8.00 (708.48)
11	Percentage of actual auxiliary consumption (MUs)	7.69 (597.00)	7.77 (600.30)	8.10 (664.70)	8.12 (685.37)	7.96 (705.25)
12	Percentage of excess auxiliary consumption (MUs)(11-10)	0.19 (14.68)	0.17 (12.96)	0.40 (33.04)	0.42 (35.75)	—

Unit wise performance is summarised in *Annexure 11*. Analysis of the above table and the Annexure revealed as under:

(i) Net available hours for generation decreased from 44,899 in 1997-98 to 42,571 in 2000-01 due to increase in planned and forced outages. However, available hours increased to 46,331 in 2001-02.

(ii) Actual generation was less as compared to possible generation during all the five years up to 2001-02. Total shortfall in generation during the five years (1997-2002) worked out to 2,197.05 MUs valued at Rs. 417.11 crore.

(iii) The percentage of plant availability factor of the whole Plant showed downward trend during four years, i.e., from 85.42 in 1997-98 to 80.99 in 2000-01 but increased to 88.15 in 2001-02. However, plant availability was below the norm of 80 per cent recommended (1980) by Rajadhyaksha Committee in respect of Unit I during 1997-98 (72 per cent), 1998-99 (63 per cent) and 2001-02 (77 per cent), Unit II during 1998-99 (77 per cent) and

Shortfall in generation was 2,197.05 MUs valued at Rs. 417.11 crore.

1999-2000 (72 per cent), Unit III during 2000-01 (60 per cent) and Unit IV during 1999-2000 (67 per cent) and 2000-01 (76 per cent).

(iv) A part of energy generated was consumed for auxiliary purposes and was not available for sale. During the last five years ending 31 March 2002, the targets for auxiliary consumption were increased constantly from 7.50 to 8 per cent. In spite of the increased targets for auxiliary consumption of energy, the actual consumption was more than the targets in four years (1997-2001) resulting in excess consumption of 96.43 MUs valued at Rs. 18.66 crore.

The Board while admitting the facts stated (July 2002) that decrease in available hours was due to planned and forced outages as the units were getting older and excess auxiliary consumption was stated to be due to running of equipment for more hours for blending of imported coal with Indian coal.

The reply was not tenable as regular maintenance of the Plant was being done and blending of coal was done only from September 1999 to October 2000 and for this, the targets for auxiliary consumption were also increased from 7.60 to 7.70 per cent of the total generated energy.

3A.4.2 Plant outages

The table below indicates total hours available, actual hours operated and outages during five years up to 2001-02:

Sl. No.	Particulars	1997-98	1998-99	1999-2000	2000-01	2001-02
1	Total available hours	52,560	52,560	52,704	52,560	52,560
2	Actual hours operated	39,764	38,871	41,075	42,129	43,807
3	Shutdown (Hours)					
(a)	Reserve	5,135	3,166	1,546	442	2,524
(b)	Planned	4,122	6,275	5,870	5,325	4,990
(c)	Forced	3,539	4,248	4,213	4,664	1,240
4	Percentage of					
(a)	Reserve shutdown to available hours	9.77	6.02	2.93	0.84	4.80
(b)	Planned shutdown to available hours	7.84	11.94	11.14	10.13	9.49
(c)	Forced shutdown to available hours	6.73	8.08	7.99	8.87	2.36
	Total	24.34	26.04	22.06	19.84	16.65

It would be seen from above table that the percentage of shutdown to available hours ranged from 16.65 to 26.04 during the last five years ending March 2002. These are discussed in detail in subsequent paragraphs.

3A.4.2.1 Planned outages

Overhauling of boilers

The Kulkarni Committee appointed by Government of India for suggesting measures to reduce time for maintenance of thermal plants so as to increase the availability of Thermal Power Stations had recommended (April 1975) that regular overhauling of boiler should be done in 28 days and of the unit in

Excess time taken in overhauling of boiler resulted in generation loss of 246.07 MUs valued at Rs. 15.59 crore.

45 days. It was noticed in audit that in respect of four overhaulings of boiler got done during 1998-2002, the actual time taken ranged from 49 to 68 days. Thus, even after allowing maximum period of 45 days for overhauling of a unit, the excess time taken worked out to 65 days resulting in generation loss of 246.07 MUs valued at Rs.15.59 crore.

The Board stated (July 2002) that since Kulkarni Committee Report had not been adopted by the Board, it was not applicable to this power plant. The plea was not tenable because the recommendations of expert committee appointed by Government of India could not be ignored by the Board.

3A.4.2.2 Forced outages

3A.4.2.2.1 The percentages of forced outages to available hours of the whole plant showed upward trend during four years, i.e., 6.73 in 1997-98 to 8.87 in 2000-01 but decreased to 2.36 in 2001-02. However, the forced outages were in excess of 10 *per cent* of the available hours, as prescribed by Central Electricity Authority, in respect of Unit-I during 1997-98 and 1999-2000, Unit-II during 1998-99 and 2000-01 and Unit III & IV during the year 2000-01 as tabulated below:

Sl. No.		1997-98	1998-99	1999-2000	2000-01				Total
	Units	I	II	I	II	III	IV		
1.	Available hours	8,760	8,760	8,784	8,760	8,760	8,760	52,584	
2.	Permitted outages (10 percent of available hours)	876	876	878	876	876	876	5,258	
3.	Actual forced outages (hours)	1,484	1,670	1,159	917	969	997	7,196	
4.	Excess forced outages (3-2)	608	794	281	41	93	121	1,938	
5.	Generation loss (in MUs)	92.10	128.22	51.22	6.86	11.71	19.21	309.32	
6.	Generation loss (Rs. in lakh)	399.79	641.74	273.38	59.79	102.02	167.34	1,644.06	

Excess forced outages resulted in generation loss of 309.32 MUs valued at Rs. 16.44 crore.

As a result of excess forced outages (1,938 hours), short generation was of 309.32 MUs valued at Rs. 16.44 crore during 1997-01. The Board in its reply (July 2002) admitted the audit findings and stated that forced outages for Plant as a whole were within the norm of 10 *per cent*. The reply was not tenable because each of the six units in the Plant was an independent generating unit and the norm of 10 *per cent* should have been achieved separately in respect of each unit.

3A.4.2.2.2 A few cases of forced outages are discussed in the following paragraphs:

(a) Improper repair of generator rotor at plant site

As per clause 6 of a work order placed on Bharat Heavy Electricals Limited (BHEL) in November 1999 for carrying out inspection/overhaul of Rotor No. 544 of Unit-IV, BHEL was to provide guarantee of 30 days after repair and commissioning of the unit for any loss due to bad workmanship. On

being put to use on 26 January 2000 after overhauling the Rotor, high vibrations were observed in generator bearing and the turbine was stopped. After restart on 29 January 2000, high vibrations were again observed and BHEL declared imbalancing in the Rotor. The Rotor was replaced on 7 February 2000 with spare Rotor No. 523. BHEL experts re-opened the imbalanced Rotor at the plant site and declared (April 2000) that the Rotor was in satisfactory condition and could be used on any machine.

Unit-IV again tripped on 24 August 2000 due to Rotor earth fault. Rotor No.523 was replaced with Rotor No. 544 (repaired earlier). However, high vibrations appeared again on generator bearings. The BHEL experts were again allowed to balance the Rotor at site. Finally, machine was rolled on 27 September 2000 but it again failed. Ultimately, the Rotor No.544 was taken out of the machine and sent (5 October 2000) to BHEL works at Haridwar for balancing at a cost of Rs. 19.70 lakh. The machine was successfully synchronized on 15 November 2000.

Allowing the repair of the Rotor at plant site without any balancing facility, was not justified thereby resulting in generation loss of 80.21 MUs valued at Rs. 6.99 crore due to forced shutdown of the unit from 24 August 2000 to 28 September 2000 (after excluding planned outages from 29 September to 15 November 2000). The Board stated (July 2002) that it did not claim loss from BHEL on the plea that BHEL seldom committed such negligences. The plea was not acceptable because BHEL was required to compensate the Board for loss as per terms of work order.

(b) Replacement of slip rings of rotor

As per BHEL's Operation and Maintenance Manual for turbo-generator, the outside diameter of slip rings could be grinded as and when necessary till the diameter reached up to 440 mm. No further grinding was recommended. Before capital overhauling of Unit II (from 1 December 1996 to 18 January 1997), the outside diameter of slip rings was measured on 28 November 1996 and found less than the recommended minimum limit of 440 mm. The worn-out slip rings were not replaced during capital overhauling without recording any reasons. Later on, the slip rings were replaced by taking shutdown of 10 days from 30 August 1997 to 9 September 1997 for 248.82 hours resulting in loss of generation of 36.73 MUs valued at Rs. 1.59 crore.

The Board stated (July 2002) that slip rings were replaced during back down* due to low system demand. The reply was not tenable because as per data of outages made available by the Plant, there was no back down due to low system demand during the said period and the unit was exclusively on shut down for replacement of slip rings.

(c) Repair of water escape channel

Cracks were observed in April 1996 in the outfall structure of the water escape

*Back down-closure of the unit.

channel of the Plant. Detailed checking in May 1997 revealed that bed of channel at outfall had sunk (settled) by about 4 cms. Some displacement, tilt and opening of joints of the walls were also noticed. For taking remedial measures, it was suggested (April 1998) by the Chief Engineer/ Thermal Design to carry out grouting of cracks/gaps with water proof compound, providing of wall support to the grouted joints and provision of 200 mm thick RCC seats at bottom. The proposed remedial measures were not taken. The Plant authorities inspected (July 2000) the outfall structure of the channel and found that wall of outfall structure had settled by about 60 cms, besides displacement and tilt. Extensive damage was attributed to non-maintenance of outfall structure. The Plant was closed from 13 to 16 October 2000 and the repairs were carried out at a cost of Rs. 10.08 lakh. Grouting work was done in November 2000 at a cost of Rs. 4.42 lakh. Closure of Plant from 13 to 16 October 2000 resulted into loss of generation of 52.42 MUs valued at Rs. 4.57 crore. The loss could have been minimised if the repair work was done during 26 to 28 August 1997 when the Plant (four units from 26 to 28 August and one unit for 26 and 27 August 1997) was closed due to low system demand.

The Board stated (July 2002) that the escape channel could not be repaired in the running conditions of the Plant and closure of the unit was required. Repair could also not be carried out during closure of 5 units from 26 to 28 August 1997 as remedial measures had not been finalised by that date. The reply was not tenable as the repairs to the water outfall were carried out after closure of the Plant at a belated stage in October 2000 and the plant authorities failed to identify remedial measures immediately after damage was noticed in April 1996.

3A.5 Cost of generation

The cost of generation per KWH for the five years 1997-2002 is given in *Annexure 12*. It would be seen from the Annexure that generation cost increased from 180.98 paise per unit in 1997-98 to 187.73 paise per unit in 2001-02. The Board attributed (July 2002) the increase in cost of generation per unit mainly to increase in rates of coal. However, it was observed in audit that the increase in cost per unit was not only due to increase in rates of coal but owing to some other avoidable factors also which have been discussed in the succeeding paragraphs:

3A.5.1 Excess coal consumption

According to the supplier of the main plant and equipment, heat rate required to generate one unit of power is 1,985 K*Cal /KWH with boiler efficiency at 88.21 *per cent*. Consumption of coal as per standard adopted for actual generation, coal actually consumed vis-à-vis excess consumption of coal are given in *Annexure 13*. It would be seen from the Annexure that during five years up to 2001-02, there was excess consumption of coal of 40.74 lakh metric tonnes valued at Rs. 772.68 crore when compared with standards given

* K.Cal- Kilo calorie

Coal valued at Rs. 772.68 crore was consumed in excess of standard norms.

by supplier of plant and equipment by giving allowance for low calorific value of coal received at the Plant. Excess consumption had a rising trend as it increased from 16.26 per cent in 1997-98 to 17.02 per cent in 2001-02 when compared with standard norms.

The Board stated (July 2002) that excess consumption of coal was due to poor quality of coal containing excessive ash contents having low calorific value. The reply was not tenable because excess consumption had been worked out after taking into account the actual calorific value of coal received at the Plant.

3A.5.2 Excess consumption of oil

The table given below indicates oil consumption at the Plant when compared with target fixed by the Board during five years up to 2001-02:

Sl. No.	Particulars	1997-98	1998-99	1999-2000	2000-01	2001-02
1	Consumption target (ml/KWH)	4.00	2.00	1.22	1.50	1.90
2	Actual consumption (ml/KWH)	1.62	1.22	2.02	1.95	1.37
3	Excess consumption (ml/KWH)	--	--	0.80	0.45	--
4	Gross generation (MUs)	7,764.24	7,728.16	8,203.43	8,436.56	8,856.06
5	Total excess consumption (Kls) (3 x 4)	--	--	6,563	3,796	--
6	Rate of oil per Kl (Rs.)	--	--	7,538.83	9,607.13	--
7	Value of excess consumption (Rs. in lakh)	--	--	494.77	364.69	--

Due to non-achievement of targets, oil valuing Rs. 8.59 crore was consumed excess in two years.

It would be seen from the above table that no standard norms were fixed for the consumption of oil. However, the yearly consumption targets were fixed which varied between 1.22 and 4 ml per KWH. Similarly, the actual consumption of the oil was also fluctuating ranging from 1.22 to 2.02 ml per KWH. Due to non-achievement of the targets of oil consumption during 1999-2000 and 2000-01, oil valuing Rs. 8.59 crore was consumed in excess.

The Board replied (July 2002) that excess consumption of oil was due to poor quality of coal leading to breakdown of coal mills. Resultantly, availability of crushed coal became inadequate, thereby requiring additional oil support to maintain healthy flame in the boiler. The reply was not tenable as the excess oil consumption was only during 1999-2000 and 2000-01 when the Plant was fed with superior quality imported coal from September 1999 to October 2000.

3A.5.3 Extra expenditure on coal handling

Open tenders for appointment of coal handling agents for Ropar and Bathinda thermal plants were opened in November 1996. Four offers were received. The first and second lowest offers of 30 paise per MT and 38 paise per MT were rejected on the ground of inadequate infrastructure at coal fields. Besides, the rate of 30 paise per MT was also considered very low with which no effective service would be provided by the first lowest firm. Accordingly, the work was allotted (May 1997) to the third lowest firm for three years with effect from 1 March 1997 at the rate of 55 paise per MT.

Ignoring the rate of the lowest firm lacked justification because scrutiny in

audit revealed that the first lowest firm was at par with the third lowest in respect of infrastructure at various coal fields, i.e., Ramgarh, Ranchi, Dhori, Kathara, north Karanpura and Piparwar area. The second reason to ignore the lowest firm that it would not provide proper services with such low rate, was also not tenable as the firm fulfilled the criteria of minimum handling of 30 lakh MT of coal per year as per terms of the tender.

Extra commission of Rs. 38.94 lakh was paid on coal handling.

The work allotment was extended for further three years up to 28 February 2003 on same terms and conditions. Thus, allotment of coal handling work at higher rate was not justified and resulted in extra payment of commission of Rs. 38.94 lakh on 260.07 lakh MT of coal handled during March 1997 to March 2002.

The Board stated (July 2002) that the first lowest firm was neither technically sound nor held good business ethics and was in the habit of quoting low rates. The reply was not tenable as the lowest firm had produced proof of satisfactory performance from Government organisations for which it had worked. The plea of the Board that the agreement was further extended for 3 years without inviting fresh tenders because the performance of the firm was satisfactory was not acceptable as non-invitation of fresh tenders had deprived the Board of the benefit of competitive rates.

3A.5.4 Avoidable payment of commission

On the basis of proposal received from Narain Consultancy, Baroda (owned by an ex-Railways employee), the Board appointed them (January 1997) as agents for settlement of claims with the Railways. The commission to be paid varied from 5 to 35 *per cent* depending upon the nature of claims got settled. The work initially allotted for a period of one year ending February 1998 was extended up to June 1999. Finally, the contract was extended for 3 years from July 1999 in respect of Ropar Plant. An amount of Rs. 5.32 crore had been paid up to 31 March 2002 to the firm as commission on the claims of Rs 44.31 crore got settled.

Appointment of an agent and payment of commission of Rs. 5.32 crore for settlement of claims with Railways was not justified.

The Board stated (July 2002) that the agent being an ex-Railways employee had wide knowledge of Railways rules and regulations. The reply was not tenable as appointment of consultancy firm for settlement of claims with Railways involving heavy payment to an ex-Railways employee lacked justification because both the parties were Government agencies and claims should have been settled mutually by the parties. In case of dispute, higher authorities in Government could be involved for settling the claims. Moreover, the firm had no legal sanctity to work as claim settlement agent as evident from the firm's letter dated 25 May 2001 vide which it had advised the Board not to mention its name in the correspondence with the Railways. Thus, appointment of consultants for settlement of claims with the Railways leading to payment of commission of Rs. 5.32 crore was not justified.

3A.5.5 Repair of H.T. motors

The Plant authorities had been placing work orders for repair of H.T. Motors of BHEL, Kirloskar and Jyoti make on HSB & Sons, Mohali for the last ten years on single quotation basis on the contention that the firm was authorised repairer of the motors, *ibid*. It had been observed in audit that the firm was

only an accredited re-winders and repairers of HT motors supplied by the above companies and did not fall under the category of authorised dealer or agent of the above companies. During scrutiny of six work orders, it was found that the plant authorities got the work done for Rs. 48.60 lakh in four cases during 2000 without inviting tenders. In other two cases, discussed below, the plant authorities made substantial saving of 67.53 and 78.12 *per cent* with reference to rates of Mohali firm when the work was got done after inviting tenders. Thus, placing of work orders on the above firm without inviting tenders was not in order and deprived the Board of competitive rates thereby resulting in financial loss.

(a) A 250 KW, 6.6 KV motor of conveyor 16-A damaged (January 2001) was jointly inspected by representative of the Mohali firm and Plant engineers. The firm quoted (February 2001) Rs. 3.48 lakh for the repair of above motor. However, instead of getting the motor repaired from the above firm, it was decided to invite limited tender enquiry for the damaged motor and the same firm quoted Rs. 1.64 lakh for the repair of the motor for which it had earlier quoted Rs. 3.48 lakh. The damaged motor was got repaired from another firm at Mohali (lowest firm) at a cost of Rs. 1.13 lakh.

(b) A 1300 KW 6.6 KV BHEL make Motor of ID Fan of Unit-2 was damaged on 19 October 1999 and got repaired (April 2000) from Mohali firm at a cost of Rs. 9.55 lakh. However, the same capacity motor of ID Fan 3A damaged in November 2000 having slightly more scope of work was got repaired (July 2001) by inviting open tenders from another firm at a cost of Rs. 2.09 lakh. Thus, repair of HT Motor without inviting tenders in 1999 had put the Board to a loss of Rs. 7.46 lakh.

3A.5.6 Claims pending recovery

Claims on various counts for Rs.450.70 crore (short receipt of coal: Rs.44.43 crore, penalty on overloading: Rs.38.24 crore*, difference in grading of coal: Rs. 362.70 crore*, ungraded coal: Rs.2.08 crore* and freight thereon: Rs.3.25 crore*) relating to the period from 1996-2002 were pending settlement with Coal India Limited (CIL). Following points were noticed in audit:

(a) Out of the pending claims of Rs. 44.43 crore pertaining to short receipt of coal, the claims of Rs 2.68 crore for the period from November 1999 to March 2000 were finally rejected (June 2002) because the same were lodged after completion of reconciliation of the said period.

(b) The Government of India appointed (May 1995) a single member umpire for settlement of disputes relating to claims of Rs.406.27 crore (quality of coal: Rs.368.03 crore, penalty levied by Railways on overloading: Rs. 38.24 crore).

The umpire issued (November 1999) guidelines for working out claim for quality of coal and in case of penalty on overloading, it was decided that the same may be shared on 50:50 basis by coal companies and the Board. As per the award, the parties were required to submit their claim to the umpire in

* Period is up to March 2001.

writing in terms of the above said guidelines. The revised claims had not been lodged by the Board so far (June 2002). The Board stated (July 2002) that both the parties (Punjab State Electricity Board & CIL) had agreed to have a relook at the issue. The fact, however, remained that the Board was not able to recover its huge claims.

3A.5.7 Non-levy of penalty

The Board placed (August 1999) a purchase order on Mineral and Metal Trading Corporation Limited for supply of imported coal for Thermal Plant, Ropar. As per clause 14(d) of contract agreement, in case of an increase of sulphur contents beyond 0.60 *per cent*, a penalty of Rs. 10 per MT of coal was required to be levied for every increase of 0.1 *per cent* based on load port analysis. Test report of coal of Nord Energy Vessel containing 1,41,677.56 MT of coal revealed sulphur content at 0.74 *per cent* which was 0.14 *per cent* in excess of the required limit of 0.60 *per cent*. The Board had not levied a penalty of Rs. 14.17 lakh on 1,41,677.56 MT of coal. The Board stated (July 2002) that the recovery would be effected from final payment of the firm. It was, however, seen from the record that final payment was made in January 2001 without effecting the recovery.

3A.5.8 Non-sharing of maintenance charges of railway track

The Board entered (April 1993) into an agreement with Gujarat Ambuja Cement Limited (GACL), Bombay for leasing land measuring 354 kanals and 8 marlas adjoining thermal plant for manufacture of cement with fly ash utilisation. As per terms of agreement, the infrastructure facilities were to be provided by the Board to GACL which included allocation of land for construction of plant building, allowing a tee off track with existing railway line and supply of fly ash free of cost. The Board allowed the use of its railway track of 8.31 kms. from Ropar Railway Station. However, the agreement was silent about the sharing of annual maintenance expenditure to be incurred on the track.

The Board incurred an expenditure of Rs.1.32 crore on maintenance of this railway track during 1995-2002. In the absence of any clause in the agreement, no recovery of maintenance expenses could be made from GACL. This resulted in loss of Rs. 33.64 lakh calculated on proportionate basis on 1,55,338 wagons handled by GACL (out of total 7,65,395 wagons handled).

The Board stated (July 2002) that the railway track from Ropar to the Plant site was an infrastructure facility provided to GACL and as such sharing of its maintenance charges was not stressed. The reply was not tenable as infrastructure facilities were meant for providing basic structural facilities for starting a project only and not for meeting recurring expense in the shape of maintenance of such facilities. Thus, maintenance expenditure which was recurring revenue expenditure was required to be recovered from GACL.

3A.5.9 Avoidable expenditure on boiler tubes

According to boiler design parameters, the temperature of super heater (SH)/ re-heater (RH) tubes is to be maintained at 540°C. The frequent boiler tube leakages taking place in Unit I & II were got examined from BHEL in

September 1997 and January 1999. BHEL pointed out that these were due to overheating of tubes at temperature from 600°C to 640°C. BHEL report dated July 2000 further stated that the tubes had failed due to long term overheating.

In spite of findings of BHEL, the Board did not take any remedial measure to control the excessive boiler temperature to avoid damage to the SH/RH tubes. Overheating of boiler tubes in excess of designed parameters (i.e. beyond 540°C) caused damage to the boiler tubes and the Board had to incur (March 2001) avoidable expenditure of Rs. 0.73 crore on the replacement of SH/ RH tubes.

The Board while admitting the facts stated (July 2002) that it started taking all necessary measures to control the temperature by water spray inside the boiler but failure of boiler tubes could not be avoided due to corrosion, ageing and fatigue. The reply was not tenable as the BHEL reports over the years clearly stated that the tubes were damaged due to long term overheating.

3A.6 Procurement of material

3A.6.1 Extra expenditure on purchase of heating baskets

Open tenders for the purchase of nine types of cold end and hot end heating baskets for air pre-heaters (APH) invited in April 2000 were opened on 23 June 2000. Five firms submitted rates. Rates of Sharda Engineers, Surat ranging between Rs. 7,889 and Rs. 19,487 per basket for eight types of heating baskets were the lowest. The merit position of BHEL which had quoted rates between Rs. 10,158 and Rs. 23,141 per basket was fourth and fifth for different items. However, Project Purchase Committee rejected offer of Surat firm on technical grounds and decided (November 2000) to place order on BHEL. A purchase order amounting to Rs.48.48 lakh (including Rs. 39.80 lakh for these eight items) was placed in November 2000 on BHEL. Rejection of the lowest offer of Sharda Engineers, Surat was not justified because the Board had purchased baskets valued at Rs. 1.70 crore from this firm between July 1997 and January 2000 and the same were giving satisfactory performance. Rejection of the lowest offer resulted in extra expenditure of Rs. 11.30 lakh.

In reply, the Board stated (July 2002) that the suppliers other than BHEL were not making supplies exactly matching to BHEL specifications and huge weight difference was observed in the baskets supplied by them. The reply was not tenable as baskets supplied by the firm were as per specification framed by the Board after taking measurement of APH baskets supplied by BHEL. Moreover, Deputy Chief Engineer (Purchase) of the Plant certified satisfactory performance of the baskets supplied by Sharda Engineers, Surat.

3A.7 Inventory management

In order to have effective control over inventory holdings, the Plant had not evolved any system to identify fast moving, slow moving and non-moving stores. The table given below indicates inventory holdings of spares and consumables (other than fuel) for five years up to 2001-02:

(Rs. in crore)

Year	Opening stock	Receipts	Issues	Closing stock	Closing stock equivalent to months' consumption
1997-98	24.55	18.38	17.65	25.28	17.18
1998-99	25.28	32.73	32.36	25.65	4.43*
1999-2000	25.65	26.10	18.11	33.64	10.64*
2000-01	33.64	33.88	23.85	43.67	7.60*
2001-02	43.67	32.16	28.99	46.84	7.56
* Monthly consumption calculated after excluding value of insurance spares, i.e., Rs. 13.71 crore, Rs. 17.57 crore and Rs. 28.55 crore, respectively.					

The closing stock of stores in terms of months' consumption at the end of years, *ibid*, varied between 4.43 and 17.18 months' consumption.

3A.7.1 Shortages/ excesses in coal stock

As per the Commercial Accounting System (Fuel Manual) of Punjab State Electricity Board-1985, stock at the year end would be physically verified and value of difference added to or reduced from the cost of coal consumed as the case may be. Plant authorities conducted physical verification (PV) of coal stock 17 times during the last 5 years ending 2001-02 and found shortages of 2,90,500.21 MTs (in 9 PVs) and excesses of 2,67,774.69 MTs (in 8 PVs) valued at Rs. 54.63 crore and Rs. 50.36 crore, respectively.

It was noticed in audit that on eight occasions, when the variations in stock were more than 5 per cent, the Plant management did not bring these to the notice of the Board, as per requirement of Manual, *ibid*.

In August 2000, the Board constituted a Committee for conducting an enquiry relating to the shortages of coal stock. The Committee in its report of March 2001 observed that consumption of coal was being booked on experience/ assessment basis, which was being adjusted on the basis of physical verification carried out from time to time and also pointed out certain deficiencies in weighing of coal.

The Board while considering the report of the Committee on shortage of coal decided (April 2001) that the chargesheets may be issued to all concerned officers responsible for the shortages. However, the Board had issued chargesheets to two officers so far (March 2002), including one officer already retired (31 March 2000). The outcome of chargesheets was awaited (March 2002). The Board stated (July 2002) that physical verification of coal was being got done from technical audit wing of the Board and as well as by the Plant officers. However, the reply was silent about action taken on the recommendations given by the Committee, *ibid*.

3A.8 Environment management

The Punjab Pollution Control Board (PPCB) had given consent for operation of Plant up to April 1992. The Board deposited Rs.0.60 lakh for seeking permission from PPCB for 1992-1994. The consent was, however, not granted by PPCB. Thereafter, the Board did not deposit the fee up to May 1999 with PPCB for seeking its consent. However, in June 1999, the Board deposited Rs. 14 lakh for seeking consent for 15 years with retrospective effect from 1994.

The consent had not been renewed so far due to inadequate arrangement for disposal of fly ash, complaints regarding air pollution, water logging in the vicinity of ash disposal dykes, releasing of water at higher temperature than the prescribed limit, inadequate height of stacks of diesel generating sets and improper working of dust extract system/suppression system. A meeting was held in November 2001 between Plant authorities and Chairman, PPCB. During the meeting, Plant authorities stated that a purchase order for fly ash handling system had been placed in September 2001 on a Calcutta based firm and construction of cooling tower to contain the temperature of water released into Sirsa Nadi had been proposed and efforts were being made to remove other irregularities. Further developments were awaited (April 2002).

As the Plant had been releasing water at a temperature higher than the prescribed limit since January 1992, the PPCB was charging water cess at the rate of 2.25 paise per kilo litre instead of 1.50 paise per kilo litre. This resulted in avoidable payment of Rs.4.06 crore to the PPCB from January 1992 to March 2002. In addition, the PPCB was charging water cess at a rate of 9.5 paise per kilo litre instead of 5 paise per kilo litre on the water used for making ash slurry because of running the Plant without consent of the PPCB. This resulted in further extra payment of Rs.1.37 crore. Thus, running of the Plant without consent of PPCB coupled with release of used water at higher temperature resulted in avoidable payment of Rs. 5.43 crore for the above period. The Board stated (July 2002) that a writ petition against charging of penal rates had been filed in April 2002 in Punjab and Haryana High Court.

Avoidable payment of Rs. 5.43 crore was made due to operation of plant without consent of PPCB and release of used water from the Plant at higher temperature.

3A.9 Security hazard to Plant

Unauthorised three hundred and sixty Jhuggies housing about 880 persons had been raised by the labourers, employed by contractors, inside the Plant premises. According to report of Technical Audit submitted in April 1997 to the Board, these Jhuggi dwellers consumed free electricity and coal through unfair means and loss on this account could not be ascertained. Further, these Jhuggi dwellers were used to avoid cross checking of labour engaged by various contractors. A Committee was appointed (August 2000) to ensure that all Jhuggies in the Plant area were removed by 7 November 2000 in co-ordination with the District Administration. However, the records shown to audit indicated that the Committee did not make any efforts in this direction.

The Board stated (July 2002) that the labourers were settled inside the Plant since 1984 to attend any emergency or breakdown at odd hours for smooth

operation of the Plant. These settlers did not use free coal/electricity as no such case had been pointed out. It further stated that the Committee constituted for this purpose could not make any headway as alternative site for settlement of these Jhuggies, very near to the Plant, was not available so as to ensure odd time availability of labourers.

Presence of jhuggies inside the plant was a security hazard for the plant.

The reply was not tenable as Chief Security Officer had intimated (November 2001) the General Manager of the Plant that these labourers were using electricity and coal through unfair means and their activities could not be kept under check because no security staff was sanctioned for this purpose. He further stated that the stay of labourers inside the Plant was a security hazard as some of them could be of great help to anti-national elements in organising covert activities. He recommended that these labourers should be moved to any other place outside the Plant, as there was plenty of area available outside the Plant. Further developments were awaited (July 2002).

Conclusion

Actual power generation in the Plant was less than the possible generation of power. Consumption of coal at the Plant was in excess of the standards laid down by the equipment supplier. The Plant had not been given consent by Punjab Pollution Control Board due to inadequate arrangement for disposal of fly ash, water logging in the vicinity of ash disposal dykes and releasing of used water at higher temperature than prescribed limit.

The Board should take effective steps for reducing the power generation loss by improving overall efficiency and for bringing the coal consumption within the norms. The Board should also take urgent steps for complying with the requirements of Punjab Pollution Control Board to make the Plant environment friendly.

The above matters were reported to the Government in May 2002; reply had not been received (July 2002).

3B Power Sector Reforms- Signing of Memorandum of Understanding and implementation thereof

3B.1 Introduction

The issue of power sector reforms by the States was discussed in the conference of Chief Ministers/Power Ministers held in March 2001, wherein a consensus was reached to depoliticise the power sector reforms and to speed up their implementation. As a follow up thereto, a Memorandum of Understanding (MOU) was signed (30 March 2001) between the Government of Punjab (GOP) and the Government of India (GOI), as a measure of joint commitment to undertake the reforms in a time bound manner and the support which the GOI would extend to GOP. The MOU was valid for a period of 5 years and subject to review annually.

3B.2 Commitments by Government of Punjab

The commitments made by the GOP for speeding up the power sector reforms were as under:

- (i) An effective programme for identifying and eliminating power thefts in next two years with a view to achieve break even point in current operations by March 2003 and positive returns thereafter. For this purpose, energy audit would be undertaken at all level to reduce system losses and bring them to the level of 18 *per cent* by 2003. To achieve this, steps envisaged were to:
- (a) provide energy meters on grid and generating stations by 30 September 2001;
 - (b) provide electronic meters on all 11 KV distribution feeders by March 2001 but in no case later than September 2001;
 - (c) provide meters to all consumers by 31 December 2001 but in no case later than 30 June 2002;
 - (d) replace electromagnetic meters with electronic meters in respect of all consumers other than HT consumers and consumers having load above 100 KW;
 - (e) complete remote monitoring of energy consumption of consumers having load above 100 KW (already under implementation) by December 2001;
 - (f) undertake computerised billing for effective energy audit at all major towns/consumption centres by 31 March 2002;
 - (g) develop an effective distribution management information system.

- (ii) Establishing a functional State Electricity Regulatory Commission (SERC) and sending recommendation to the GOI for omission of Section 43(2) of the Electricity (Supply) Act, 1948 in respect of the State of Punjab by 30 June 2001.
- (iii) Ensuring filing of tariff petitions by 30 August 2001 and to implement tariff orders issued by SERC fully unless stayed or set aside by court orders.
- (iv) Ensuring timely payment of subsidies required in pursuance of GOP's orders on the tariff determined by the SERC.
- (v) Implementing an effective programme of demand side management through energy efficient bulbs, tube lights, agricultural pump sets, etc.
- (vi) Maintaining grid discipline, comply with Indian Electricity Grid Code and availability based tariff when it comes into force and carry out the directions of Regional Load Despatch Centre.
- (vii) Securitise outstanding dues of Central Public Sector Undertakings (CPSUs) as per scheme approved by GOI. After the securitisation, GOP would ensure that outstanding of CPSUs did not cross the limit of 2 months billing.

3B.3 Support from Government of India

The support to be extended by GOI for implementation of power sector reforms in Punjab was as under:

- (i) Providing financial support through Accelerated Power Development Programme (APDP) for:
 - (a) life extension works based on Residual Life Assessment (RLA) studies of Guru Nanak Dev Thermal Plant (GNDTP), Bathinda Units and for renovation and modernisation (R&M) of Hydro Units at Shanan Power House and Upper Bari Doab Canal Power Houses.
 - (b) upgradation of sub-transmission and distribution including metering in three identified circles.
- (ii) Assisting in arranging funds through Power Finance Corporation (PFC) and other institutions for undertaking augmentation, upgradation and improvement of critical transmission lines in Punjab.
- (iii) Providing of funds by PFC on concessional terms for metering all consumers in a time bound manner and computerised billing.
- (iv) Taking note of the need for structural adjustment and financing for successful completion of reforms, Ministry of Power (MOP) would fully assist Punjab in raising funds for this purpose from financial institutions and other sources.
- (v) Assisting in arranging funds for exploiting its hydro-potential.

(vi) Helping in arranging funds for execution of Guru Hargobind Thermal Plant Stage-II (500 MW) Project.

(vii) Allocating additional power from new Central sector generation stations subject to the capability of Punjab to fully pay for the power purchased from such generating stations and signing Power Purchase Agreement (PPA) with concerned CPSU for purchase of power.

(viii) Providing of funds by PFC for:

- (a) investment needs in relaxation of normal conditionalities relating to exposure limit, rate of return and debt service credit ratio;
- (b) studies for reforms and restructuring through grants and interest free loans; and
- (c) R&M of generating stations, sub-transmission and distribution which would include an element of grant and lending at concessional rates to the extent feasible.

3B.4 Implementation of reforms programme

3B.4.1 Status of implementation by Government of Punjab

Areas in which there had been delay in implementation of the reforms programme by GOP with reference to the commitments made in MOU are indicated below:

Planned reduction in system losses was much less than the commitment in MOU.

(i) Against the committed reduction of system losses from 26.51 *per cent* in 2000-01 to 18 *per cent* by March 2003, the Board had planned to reduce losses to 24.50 *per cent* only by March 2003 and to 20 *per cent* by March 2007.

(ii) Electronic meters on all 11 KV feeders were to be installed by 30 September 2001. It was observed that out of 5,266 number 11 KV feeders, meters were installed on approximately 2,000 feeders only (38 *per cent*) up to 31 August 2002.

(iii) Installation of energy meters (1,826 number) on all grid sub-stations was to be completed by 30 September 2001. However, no decision to procure the meters had been taken so far (July 2002).

No scheme was framed for metering of agricultural consumers.

(iv) The meters to all the consumers were required to be provided by 31 December 2001 and in no case later than 30 June 2002. However, no scheme was framed by the Board to provide meters to 7.94 lakh unmetered agricultural consumers on the plea of physical and financial constraints.

(v) Electromagnetic meters were to be replaced with electronic meters in respect of 44.12 lakh consumers (other than HT consumers and those having load above 100 KW as these had already electronic meters) within 5 years (March 2006). However, the Board was able to replace only 3.76 lakh (8.52 *per cent*) meters up to March 2002.

(vi) Remote monitoring of energy consumption of consumers having loads above 100 KW was to be completed by December 2001. The Board stated (April 2002) that pilot project was in hand and further work would be taken up on availability of funds.

(vii) GOP was to send recommendations to the GOI for omission of Section 43(2) of Electricity (Supply) Act, 1948 in respect of Punjab by 30 June 2001. However, recommendation had not been sent (July 2002).

(viii) GOP had to ensure filing of tariff petitions before the SERC by 30 August 2001. The Board filed the petition on 4 April 2002, i.e., after a delay of 7 months. The Board had been supplying free electricity to the agricultural consumers since February 1997. As per decision (March 2001) taken in Chief Ministers/Power Ministers' conference, tariff of 50 paise per unit was to be recovered from agricultural consumers, but the Board did not file the petition in respect of these consumers. Delay of seven months in filing the petition with consequential delay in implementing the tariff deprived the Board from earning additional revenue of Rs. 161.40 crore from agricultural consumers.

(ix) In order to implement the MOU, *ibid*, the State Government directed (May 2001) the Board to sign MOU with it and submit a Reform Operational and Financial Action Plan (ROFAP). However, neither MOU nor ROFAP had been finalised (May 2002). Resultantly, the financing of Guru Hargobind Thermal Plant (Stage-II), Lehra Mohabbat (500 MW) and Shahpurkandi (168 MW) projects were getting delayed because PFC could provide funds only after approval of ROFAP by State Government.

3B.4.2 Status of support from Government of India

The status of support extended by GOI, as against its commitments in the MOU, was as under:

(i) GOI approved (March 2001) the scheme for renovation and modernisation of hydel units at Shan Power House at a cost of Rs. 11.98 crore and released (March 2001) Central assistance of Rs. 6 crore. The balance amount was to be arranged from PFC by way of loan. Up to 9 September 2002, an expenditure of Rs. 10.82 crore had been incurred and the work was expected to be completed by March 2003.

(ii) Against the twelve schemes (cost: Rs. 267.71 crore) for upgradation of sub-transmission and distribution system including metering in the three identified circles, GOI approved only seven schemes (cost: Rs. 63.42 crore) and released (March 2001) Central assistance of Rs. 31.72 crore. Against balance five schemes (Rs. 204.29 crore), GOI approved (May 2002) schemes for Rs. 158.23 crore. The number of approved schemes could not be identified as the amount sanctioned did not tally with the amount demanded. The Board had sought for (June 2002) clarification from GOI for the same. However, no amount had been released so far (August 2002).

3B.4.3 Status of implementation of the schemes by the Board

A review of the schemes submitted by the Board and their implementation revealed the following deficiencies/irregularities:

Delay in filing the petition for implementing minimum tariff on agricultural consumers deprived the Board from earning additional revenue of Rs. 161.40 crore.

(i) According to MOU, the Board was to identify three circles for carrying out upgradation of sub-transmission and distribution including metering under the APDP. The objective of identifying the circles was to develop the circles as 'Centres of Excellence' so as to serve as models for remaining distribution circles. The Board identified Patiala, Khanna and Mohali circles for the purpose. A review of 7 schemes submitted in this regard revealed the following:

(a) According to schemes for replacement of meters in two identified circles (Patiala and Khanna), the requirement of funds was Rs. 6.32 crore. The Board, however, included the requirement of four other circles (Sangrur, Ropar, Ludhiana City and Ludhiana sub-urban) thereby inflating the cost to Rs.22.47 crore. Resultantly, the Board obtained Rs. 8.07 crore in excess of requirement from the GOI in the form of grant/loan. This was tantamount to diversion of funds and liable to attract penal interest at 10 *per cent* per annum under APDP.

(b) Instead of framing schemes for upgrading sub-transmission and distribution system, as per intended programme, two schemes (cost: Rs.15.95 crore) were framed to replace the damaged transformers in four circles (Patiala, Khanna, Ludhiana City and Ludhiana sub-urban). Audit scrutiny revealed that the requirement of identified circles of Patiala and Khanna was Rs. 11.14 crore. Accordingly, Board got excess release of Rs. 2.40 crore in respect of two unidentified circles from GOI.

Evidently, inclusion of unidentified circles in the schemes coupled with framing of schemes for replacement of damaged transformers, not covered under MOU, resulted in non-creation of model circles (June 2002).

(ii) Under the APDP, the Board was to get 50 *per cent* funds (loan and grant at 25 *per cent* each from GOI) after the schemes were approved by the GOI and the Board was required to get the loan sanctioned from Rural Electrification Corporation (REC)/ PFC simultaneously with release of Central assistance. However, despite receipt (May 2001) of Central assistance of Rs. 18.50 crore (Rs. 12.50 crore for Mohali circle and Rs. 6 crore for Shanan Hydel Project), the Board failed to arrange matching funds from REC/PFC (July 2002). Consequently, the implementation of schemes was affected adversely.

(iii) The assistance from APDP during 10th Plan is dependent upon the success achieved in the ongoing programmes in identified circles. As the achievement was not significant, the Board was likely to lag behind in getting Central funds.

Incidentally, it is added that no funds had been received so far (June 2002) in spite of provision of Rs. 53.36 crore in the Central budget for 2001-02.

(iv) The Board had neither maintained the separate accounts of funds under APDP nor the material received thereagainst was kept separately. The progress reports were being prepared on the basis of expenditure, which was not correct.

3B.4.4 Monitoring of implementation

The Steering Committee was required to be formed to monitor the progress on MOU on quarterly basis. The Committee was constituted in August 2001 and only two meetings were held up to April 2002 instead of four meetings required from the date of execution of MOU.

Conclusion

There had been delay in implementation of the reform programme by Punjab Government with reference to the commitments made in MOU. Though required, the Board neither signed MOU with State Government nor submitted a Reform Operational and Financial Action Plan resulting in delay in getting funds from Power Finance Corporation for implementation of certain projects. Thus, the process of speeding up the power sector reforms could not achieve required momentum. Government needs to take effective steps to speed up the implementation of the reforms as per MOU.

The above matters were reported to the Board/Government in July 2002; replies had not been received (August 2002).