CHAPTER - VI

GOVERNMENT COMMERCIAL AND TRADING ACTIVITIES

6.1 Overview of Government Companies and Statutory Corporation

6.1.1 Introduction

As on 31 March 2006, there were five Government companies, one Statutory corporation and one Autonomous Body (all working) under the control of the State Government, the same as on 31 March 2005. The accounts of the Government companies (as defined in Section 617 of Companies Act, 1956) are audited by the Statutory Auditors appointed by the Comptroller and Auditor General of India (CAG) as per the provisions of Section 619 (2) of the Companies Act, 1956. These accounts are also subject to supplementary audit conducted by the CAG as per the provisions of Section 619 (4) of the Companies Act, 1956. The CAG is the sole auditor of Jharkhand State Electricity Board under Rule 14 of the Electricity Supply (Annual Accounts) Rules, 1985 read with Section 172 (a) and 185 (2) (d) of the Electricity Act, 2003 and of the Jharkhand State Electricity Regulatory Commission under Section 104 (2) of the Electricity Act, 2003.

Working Public Sector Undertakings (PSUs)

6.1.2 Investment in working PSUs

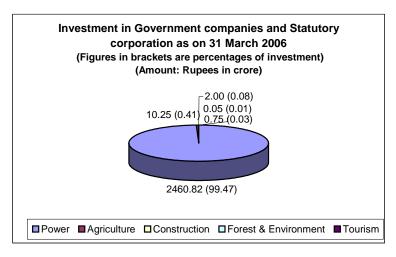
The total investment in six PSUs (five Government companies and one Statutory corporation) at the end of March 2005 and March 2006, respectively was as follows:

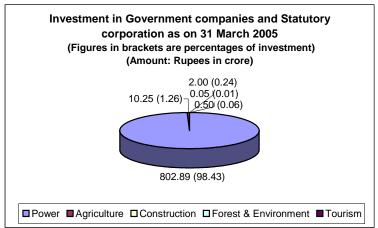
(Rupees in crore)

Year	Number of	Investment in PSUs			
	PSUs	Equity	Share application	Loan	Total
			money		
2004-05	6	7.55	-	808.14	815.69
2005-06	6	7.55	0.25	2466.07	2473.87

6.1.2.1 Sector-wise investment in the working Government companies and Statutory corporation

The investment (equity and long term loan) in various sectors and percentage thereof at the end of March 2005 and March 2006 are indicated in the following pie charts:





6.1.3 Working Government companies

The total investment in five working Government companies at the end of March 2005 and March 2006 was as follows:

(Rupees in crore)

Year	Number of Government	Investment in working companies				
1 cai	companies		Equity Share application money		Total	
2004-05	5	7.55	-	5.25	12.80	
2005-06	5	7.55	0.25	5.25	13.05	

The summarised position of Government investment in these Government companies in the form of equity and loans is detailed in *Appendix-6.1*.

As on 31 March 2005 and 31 March 2006, the total investment in these Government companies comprised 59 *per cent* and 60 *per cent* of the equity capital and 41 *per cent* and 40 *per cent* of loan, respectively.

6.1.4 Working Statutory corporation

The total investment in one working Statutory corporation (Jharkhand State Electricity Board) as at the end of March 2005 and March 2006 was not available due to non-apportionment of assets and liabilities between Bihar

State Electricity Board and Jharkhand State Electricity Board. The long term loans given by the Jharkhand Government during 2004-05 and 2005-06 were, however, Rs 295.76 crore and Rs 321.26 crore respectively. The loans outstanding as on 31 March 2006 stood at Rs 2460.82 crore (State Government – Rs 1058.61 crore, Central Government – Rs 1336.67 crore, Others – Rs 65.54 crore) as against Rs 802.89 crore (State Government – Rs 737.35 crore, Others – Rs 65.54 crore) as on 31 March 2005.

6.1.5 Budgetary outgo, grants/subsidies, guarantees, waiver of dues and conversion of loans into equity

The details regarding budgetary outgo, grants/subsidies, guarantees issued, waiver of dues and conversion of loans into equity by the State Government in respect of working Government companies, Statutory corporation and the Autonomous Body are given in *Appendix-6.1 and 6.3*.

The budgetary outgo in the form of equity capital and loans and grants/subsidies from the State Government to working Government companies, Statutory corporation and the Autonomous Body for 2004-05 and 2005-06 is given below:

(Rupees in crore)

			2	004-05			2005-06					
	Co	Companies		poration		onomous Body	Con	mpanies	Cor	poration		onomous Body
	No.	Amount	No.	Amount	No.	Amount	No.	Amount	No.	Amount	No.	Amount
Equity capital outgo from budget	1	0.25	-	Nil	-	Nil	1	0.25	-	Nil	-	Nil
Loans given from budget	-	Nil	1	295.76	-	Nil	-	Nil	1	321.26	-	Nil
Other grant/subsidy	-	Nil	1	348.39	1	0.95	-	Nil	-	Nil	1	1.10
Total outgo	1	0.25	1	644.15	1	0.95	1	0.25	1	321.26	1	1.10

During 2005-06, the Government did not give any guarantee.

6.1.6 Finalisation of accounts by working PSUs

The accounts of the Government companies for every financial year are required to be finalised within six months of the end of the financial year under sections 166, 210, 230 and 619 of the Companies Act, 1956 read with Section 19 of the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971. They are also required to be laid before the Legislature within nine months of the end of the relevant financial year. In the case of Statutory corporation, the accounts are finalised, audited and presented to the Legislature as per the provisions of Section 185 (2) (d) of Electricity Act, 2003.

As would be seen from *Appendix-6.2*, out of five Government companies, one Statutory corporation and one Autonomous Body, only one company finalised its accounts for the period upto 2004-05, one company finalised its accounts for the period upto 2003-04, one company for the year 2002-03 and one Statutory corporation finalised its accounts for the year 2001-02. The accounts of all the five Government companies were in arrears for periods ranging from one to four years. The accounts of the Statutory corporation and the

Autonomous Body were in arrears for four years and three years respectively as on 30 September 2006.

Though the concerned administrative departments and officials of the State Government were apprised by the Accountant General regarding arrears in finalisation of accounts, no effective measures have been taken by the Government and as a result the net worth of the PSUs could not be assessed.

6.1.7 Financial position and working results of working PSUs

The summarised financial results of working PSUs (Government companies and Statutory corporation) as per their latest finalised accounts are given in *Appendix-6.2*. According to the latest finalised accounts, two working Government companies earned aggregate profit of Rs 1.97 crore, one working Government company incurred loss of Rs 0.17 crore and the Statutory corporation incurred loss of Rs 49.45 crore.

6.1.8 Jharkhand State Electricity Regulatory Commission

Jharkhand State Electricity Regulatory Commission (Commission) has been constituted by the Government of Jharkhand under Section 82 of the Electricity Act, 2003 (earlier under section 17 of the Electricity Regulatory Commission Act, 1998, since repealed). The Commission became operational with effect from 24 April 2003. The Commission issued five regulations during the year 2005-06.

6.1.9 Response to Inspection Reports and Draft Paras

Audit observations noticed during audit and not settled on the spot are communicated to the heads of the respective PSUs and concerned departments of the State Government through Inspection Reports. The heads of PSUs are required to furnish replies to the Inspection Reports through the respective heads of departments within a period of six weeks. A review of the Inspection Reports issued up to March 2006 pertaining to the Jharkhand State Electricity Board disclosed that 774 paragraphs relating to 760 Inspection Reports remained outstanding at the end of March 2006 (*Appendix-6.4*).

Similarly, draft paragraphs and reviews on the working of PSUs are forwarded to the Principal Secretary/Secretary of the Administrative department concerned demi-officially seeking confirmation of facts and figures and their comments thereon within a period of six weeks. It was, however, observed that against 5 draft paragraphs and one draft review forwarded to various departments during May 2006 to October 2006, replies of four draft paragraphs from the Government, one draft paragraph and one review from the Government/Board are awaited (October 2006).

It is recommended that the Government may ensure that: (a) procedure exists for action against the officials who fail to send replies to inspection reports/draft paragraphs/reviews and ATNs to recommendations of COPU, as per the prescribed time schedule; (b) action to recover loss/outstanding advances/over payments is taken within the prescribed period and (c) the system of responding to the audit observations is strengthened.

Performance Review relating to Statutory corporation

6.2 PROCUREMENT, MAINTENANCE, REPAIR AND PERFORMANCE OF TRANSFORMERS IN JHARKHAND STATE ELECTRICITY BOARD

Highlights

Mismatch of capacity of Power Sub Station with distribution transformation capacity and distribution capacity with connected load resulted in overloading of transformers causing T&D losses of over 200 per cent of the norms fixed by the Central Electricity Authority. The Board lost Rs 3,798.08 crore of potential revenue due to excessive T&D losses.

[Paragraphs 6.2.7.2 & 6.2.7.3]

Failure to fix norms for retrieval of aluminium wire and transformer oil resulted in loss of Rs 55 lakh to the Board.

[Paragraphs 6.2.9.1 & 6.2.9.2]

High failure rate of distribution transformers resulted in avoidable procurement of transformers worth Rs 12.77 crore.

[Paragraph 6.2.9.5]

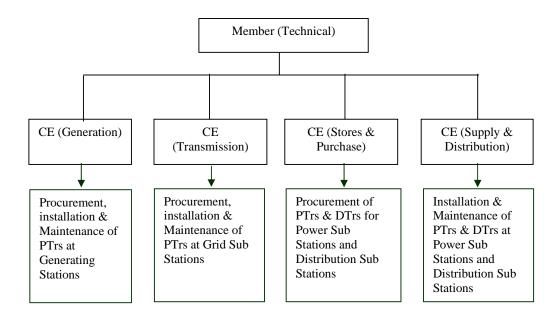
No census of distribution transformers was done by the Board resulting in non-availability of details for 4,633 distribution transformers valued at Rs 5.22 crore, at the Stores.

[Paragraph 6.2.11.1]

6.2.1 Introduction

Transformer is a static equipment used for stepping up and stepping down voltage in transmission and distribution of electricity. Power is usually generated at a very low voltage (11 KV to 15.75 KV) and then stepped up (132 KV, 220 KV and 400 KV) through power transformer for bulk transmission to the load centres. At the receiving sub-station, voltage is stepped down (220 KV/132 KV/66 KV/33 KV) by using step down transformers and further stepped down (6.6 KV/11 KV/33 KV) for supplying power to the various consumers. The transformers used at the generating station and in the high voltage sub-stations (known as transmission system) are called power transformers (PTr), while the transformers used in distribution system are called distribution transformers (DTr). Power is distributed to the consumers through transmission and distribution lines at voltage ranging from 132 KV to 440/220 volts.

The organisational set up of Jharkhand State Electricity Board (JSEB) relating to procurement, maintenance, repair and performance of transformers is as under:



6.2.2 Scope of audit

The Performance of Jharkhand State Electricity Board with regard to the procurement, maintenance, repair and performance of transformers for the period from 2001-02 to 2005-06 was conducted during May to September 2006. Records at the Board's Headquarters, all the three Transformer Repairing Workshops (TRWs), six (out of 13) Supply Circles including Meter and Relay Testing (MRT) Divisions and Central Stores selected on the basis of the volume of work undertaken, were reviewed in Audit.

6.2.3 Audit objectives

Performance review of procurement, maintenance, repair and performance of transformers by JSEB was carried out to assess whether:

- ➤ the grid power transformation capacity was commensurate with the sub power transformation capacity, distribution power capacity and technical losses, outages and voltage fluctuations were kept to the minimum and revenue realisation was maximised;
- ➤ the transformation capacity was commensurate with the connected load;
- > the Board had prepared plans for procurement, maintenance and repair of transformers in consonance with its Policy;
- ➤ there existed an appropriate procedure for the procurement of transformers to minimise delay, ensure quality and to avoid extra/excess expenditure in procurement;
- ransformers failed within or beyond the guarantee period were got repaired quickly taking the benefit of the guarantee provided; and

[®] Deoghar, Dhanbad and Ranchi

^{*} Dhanbad, Deoghar, Hazaribagh, Jamshedpur, Loyabad and Ranchi.

➤ the Board had devised and put in place a well rounded maintenance policy/schedule and the transformers installed at various substations were being maintained accordingly or as per the manufacturers' specification to ensure trouble free service and long life.

6.2.4 Audit criteria

The following audit criteria were adopted:

- ➤ Electricity Policy of the State Government,
- > JSEB's procedures for procurement, storage and accounting of transformers,
- > Terms and conditions of purchase orders,
- ➤ Norms fixed by the Ministry of Power for the life of transformers, terms and conditions of transformer repair agreements; and
- Norms fixed by Central Electricity Authority regarding Transmission & Distribution losses.

6.2.5 Audit Methodology

The following mix of the methodologies was adopted:

- ➤ Analysis of the data/information on transformer related records at Head Office and O & M divisions.
- > Scrutiny of records of procurements made,
- Verification of the maintenance programme, cause-wise reasons of failure, time taken to repair the failed transformers so as to put them to use in system; and
- Examination of recommendation files, Tender specification files, order files, execution files, loss/extra expenditure on procurement.

Audit findings

The audit findings were reported to the Government/Management on 27 October 2006 and discussed at the meeting of the Audit Review Committee for Public Sector Enterprises (ARCPSE) held on 17 November 2006, where Government was represented by the Secretary, Energy Department and the management was represented by the Chairman, JSEB. The review was finalised after considering the views of the Government/Management.

The audit findings are discussed in succeeding paragraphs.

6.2.6 Planning

6.2.6.1 Absence of Electricity Policy and Corporate Planning

Power demand projections based on the estimated growth of load in various categories of consumers and plans for expansion of electrification in rural and urban areas are required to be made every year. Plans are also made to improve the availability, quality and reliability of power supply and to ensure commercial viability of the power utility.

The growth in demand of power from 2001 to 2006 was about 550 MU per annum. There was, thus, a need for commensurate augmentation of the transformation capacity in the electricity networks. No planning for the required augmentation of the transformation capacity was, however, made by the Board.

6.2.6.2 Absence of Annual procurement plan

For procurement of transformers, the Board was required to prepare an annual plan taking into account:

- ➤ the Annual Development Programme specifying the targets relating to rural electrification, electrification of other new areas etc.;
- ➤ the anticipated annual growth in the connected load in the existing electrified areas; and
- > the expected annual damage rate of transformers.

Though the Board had to achieve the target for electrification of 8,823 villages over a period of five years upto 2005-06 and to provide for an additional requirement of power of about 550 MU per annum, it failed to prepare any annual procurement plan during 2001-06.

6.2.7 Performance

6.2.7.1 Targets and Achievements

The Board fixed year wise targets for electrification of 8,823 villages over a period of five years upto 2005-06 under Rural Electrification Scheme. The details relating to targets and achievement during 2001-02 to 2005-06 were as follows:

Year	Target	Achievement	Shortfall	Per cent
2001-02	1,381	537	844	61
2002-03	2,000	771	1,229	61
2003-04	2,000	1,225	775	39
2004-05	2,000	1,113	887	44
2005-06	1,442	702	740	51
Total	8,823	4,348	4,475	51

The Board had electrified only 4,348 villages during 2001-02 to 2005-06. Remaining 4,475 villages were not electrified as of March 2006. The reasons for non achievement of the targets were found to be diversion of 1,130 transformers from rural electrification work to other works, non receipt of 454 transformers against pending purchases orders and short purchases of 2,891 transformers.

6.2.7.2 Capacity mismatch

The year-wise details of connected load of the entire Board were not maintained properly. Adequate grid power transformation capacity is needed for evacuation of power from generating stations. Sub-power transformation capacity is the middle chain for feeding distribution transformers to meet power load of the consumers. The table below indicates the year wise details of Sub Power Transformation capacity, Distribution Transformation capacity and the connected load of the six Supply circles, as arrived at by Audit, during the five years ended 31 March 2006.

Sl. No.	Particulars	2001-02	2002-03	2003-04	2004-05	2005-06			
1.	Sub Power Transformation capacity (33/11 KV)								
	MVA	963	997	1,034	1,096	1,195			
	MW	819	847	879	932	1,016			
2.	Distribution Transformation cap	pacity							
	MVA	915	969	1,051	1,154	1,272			
	MW	778	824	893	981	1,081			
3.	Total connected load								
	MVA	935	1,090	1,206	1,408	1,581			
	MW	795	927	1,025	1,197	1,344			
4.	(a) Connected load in excess of	17	103	132	216	263			
	distribution transformation								
	capacity (MW)								
	(b) Percentage of excess	2	13	15	22	24			
	connected load to distribution								
	transformation capacity								
5.	Sub power Transformation	1.03	0.91	0.86	0.78	0.76			
	capacity per MVA of connected								
	load (Sl.No.1÷Sl.No.3)								
6.	Distribution transformation	0.98	0.89	0.87	0.82	0.80			
	capacity per MW of connected								
	load (Sl. No. 2 ÷ Sl. No.3)								

It would be seen from the above table that:

Augmentation in the transformation capacity did not keep pace with increase in load Against an increase of 69* per cent in the connected load, the sub power and distribution transformation capacity increased by only 24 and 39 per cent respectively. The transformation capacity declined by 26 per cent over the period against the connected load. The Board did not have any norms relating to the ratio between transformation capacity and the connected load. In the absence of the norms, deviations and their impact

^{* 1,581} MVA – 935 MVA = 646 MVA; 646 ÷ 935 = 69 per cent

on the transformers due to increase in the connected load could not be ascertained.

As on 31 March 2006, the Sub Power Transformation capacity was 1,195 MVA and distribution transformation capacity was 1,272 MVA against the connected load of 1,581 MVA. The sub power Transformation capacity per MVA of connected load ranged between 0.76 MVA and 1.03 MVA during 2001-02 to 2005-06 against the desired capacity of one^{\$}. It rather declined during 2001-02 to 2005-06. This mismatch in sub power transformation capacity and connected load resulted in overloading of the power transformers contributing to failure of transformers and increase in transmission and distribution losses.

Thus the Board failed to maintain a balance in growth of sub power transformation capacity and distribution transformation capacity *vis-à-vis* the connected load in respect of test checked Supply circles. This could result in increased outages, voltage fluctuations and also damage to transformers.

6.2.7.3 Excessive transmission and distribution losses

T&D losses were far in excess of the CEA Norms Transmission loss is the loss of energy due to resistance in the conductor while transmitting energy from one place to another. Similarly, distribution loss is accounted for as the difference between the energy sent out from the Power Sub Station and energy billed to the consumers in the distribution network. Transformation loss is the loss of energy due to copper and iron loss of transformer which is used to step up and step down the voltage in transmission and distribution network and accounted for in T & D losses.

Central Electricity Authority (CEA) has fixed the norms of transmission and distribution (T & D) losses at 15.5 per cent (8.5 per cent transmission and subtransmission losses and 7 per cent distribution losses). Against this, the reported losses in the Board's system during the five years ended March 2006 were as under:

Year	Т&	D loss (Norms)	Excess over norms		
	Per cent	Million units	Per cent	Million units	
2001-2002	15.5	674.04	33.46	1,455.06	
2002-2003	15.5	733.17	35.03	1,656.97	
2003-2004	15.5	796.46	36.44	1,872.46	
2004-2005	15.5	911.03	35.80	2,104.17	
2005-2006	15.5	1,005,40	31.81	2.063.35	

Jharkhand State Electricity Regulatory Commission (JSERC), Ranchi in its tariff order (December 2003) had directed the Board to monitor the T&D loss reduction programme. It would be seen from the above table that T&D losses of the Board had increased from 674.04 MU in 2001-02 to 1,005.40 MU in 2005-06. The Board could not achieve the norms fixed by CEA. Thus, due to T&D losses in excess of the norm, the Board lost potential revenue of Rs 3.798.08* crore.

[§] As followed by Madhya Pradesh State Electricity Board.

^{* 9,152.01} MU x Rs 4.15 per unit (average sale rate 2001-02) = Rs 3,798.08 crore.

6.2.7.4 Mismatch between power transformation capacity and distribution capacity (33/11 KV power substation)

High T&D loss due to mismatching of capacity with connected load The 33/11KV PSS has a major role in power distribution system. To reduce line loss, all the 33/11 KV feeders are required to be optimally loaded. If a 33 KV feeder is working on 50 *per cent* of its rated load, the technical line loss will be 4 *per cent* whereas on a load of 100 to 120 *per cent*, the technical line loss will be 20 *per cent*. Besides, optimum tolerance capacity of a transformer is 80 *per cent* of its rated capacity in order to prevent transformer from burning/ developing defects.

The table below indicates the circle wise transformation and distribution capacity during 2001-02 to 2005-06:

Sl.	Name of the supply circle	Average power transformation capacity	Average distribution capacity	Average distribution capacity as a percentage of power transformation capacity	Average in per	
110.	supply circle	(in MVA)	(in MVA)	(col. iv/col. iii)	Net	Gross
(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)
1.	Dhanbad	140	143	102	26.50	42.00
2.	Deoghar	75	101	135	40.45	55.95
3.	Hazaribagh	178	232	130	28.66	44.16
4.	Jamshedpur	231	369	160	24.27	39.77
5.	Loyabad	159	169	106	32.88	48.38
6.	Ranchi	274	286	104	26.48	41.98

Note: Net line loss = Gross line loss minus permissible transmission and distribution loss (i.e. 15.5 per cent).

It would be seen from the above table that the distribution transformation capacity of the circles was more than 100 *per cent* of the power transformation capacity (33/11 KV) in all the years from 2001-02 to 2005-06 and the average percentage of distribution capacity to power transformation capacity ranged from 102 (Dhanbad) to 160 *per cent* (Jamshedpur) during these years. The average line loss was between 40 and 56 *per cent* which was 24.27 and 40.45 *per cent* respectively higher than the norms fixed by Central Electricity Authority (CEA). As a result the Board lost potential revenue of Rs 1,917.51 crore towards excessive T&D losses during the period.

6.2.7.5 Augmentation of power sub station capacity and distribution capacity

The details of the connected load, augmentation of PTr and DTr capacity as on 31 March 2006 were as follows:

Sl. No.	Name of circle	Period As on 31 March	Power transfor- mation capacity	Distribution capacity	Connected load	DTr. Capacity required to match load (col.6x100/80)	PTr capacity required to match DTr. Capacity (col.7x2-col.4)
			MVA	MVA	MVA	MVA	MVA
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1.	Dhanbad	2005-06	160	161	194	243 (151)	326 (204)
2.	Deoghar	Do	92	128	134	168 (131)	244 (265)
3.	Hazaribagh	Do	202	237	278	348 (147)	494 (245)
4.	Jamshedpur	Do	239	288	389	486 (169)	733 (307)
5.	Loyabad	Do	178	151	172	215 (142)	252 (142)
6.	Ranchi	Do	324	307	414	518 (169)	712 (220)

(Figures in bracket represent percentage)

Supply circles required augmentation of PSS capacity and distribution capacity It can be seen from the table that the connected load on the distribution transformers in each circle ranged from 105 (Deoghar) to 135 *per cent* (Jamshedpur and Ranchi) of the existing capacity of the distribution transformers and augmentation required for distribution capacity was between 169 (Jamshedpur) and 131 *per cent* (Deoghar) of the existing capacity. Similarly augmentation of PTr capacity required ranged from 142 (Loyabad) to 307 *per cent* (Jamshedpur) of the existing capacity during 2005-06. To contain line losses (distribution loss) to four *per cent*, the Board has to augment its power station transformation capacity and distribution capacity as shown in the table above (Col. 7 & 8).

The mismatch in power sub station capacity, distribution capacity and connected load resulted in overloading of distribution transformers as well as power sub-station transformers which contributed to higher failure rate of the transformers, fluctuations in voltages, outages and excess line losses.

6.2.8 Procurement of transformers

6.2.8.1 Distribution Transformers

For distribution network, distribution transformers and power transformers of up to 5 MVA are procured by the Chief Engineer (Stores & Purchase) wing. Records relating to the number of transformers procured by the CE during 2001-06 were not made available to audit. Audit scrutiny of the payment files of Deputy Director of Accounts (DDA) (Headquarter), and DDA (Rural Electrification) JSEB, however, revealed that 91 purchase orders were issued for procurement of 10,881 transformers out of which only 9,907 transformers worth Rs 78.89 crore were delivered and remaining 974 transformers (from 12 suppliers) were not received till 31 March 2006. It was noticed during audit that the transformers were not procured as per the purchase order and time schedule was not adhered to as per the conditions of purchase order. Due to non adherence to the time schedule and non receipt of transformers, intended benefit to the Board was not achieved. Besides, rural electrification programme also suffered adversely.

6.2.8.2 Avoidable payment due to failure to place extension order

The Board invited (November 2001) tenders for procurement of 50 Copper wound power transformers of 5 MVA capacity. Purchase orders were placed (February 2002) on three suppliers* for the supply of 30 power transformers (10 power transformers from each supplier) at the landed cost of Rs 9,92,509 per unit. The reasons for not placing the orders for the remaining 20 transformers on these suppliers were not available on record.

Avoidable payment of Rs 16 lakh due to non placement of extension order The Board again invited (July 2002) tenders for the supply of 40 power transformers of 5 MVA capacity and placed orders for 30 transformers at Rs 10,44,408 per unit. The Board again issued a purchase order {No. 24

^{*} Synergy Equipments Ltd., East India Udyog (EIU) and Marisons Ltd.

(S&P)} to East India Udyog for supply of 10 transformers in May 2003 at a landed cost of Rs 9,92,509 per unit.

Had the Board placed an extension order against the first call (February 2002), instead of a fresh call for procurement of 40 transformers in July 2002, it could have saved Rs 16[#] lakh.

6.2.8.3 Delay in delivery

Power transformers are used in generating stations for transformation of energy from low voltage to high voltage for transmission of energy over long distances. Transformers are again utilised in grid system for stepping down the high voltage for further dissemination of energy to sub-stations. The Board placed (January 2004, June 2004 & September 2005) three purchase orders for procurement of nine transformers of various capacities for total value of Rs 11.94 crore on urgent basis. It was noticed during audit that delay in delivery of four transformers ranged from one to four months against the normal delivery period of eight months from the date of issue of order.

6.2.9 Repair of transformers

The Board undertakes repair of defective transformers at its Transformer Repair Workshops (TRWs) at Ranchi, Deoghar and Dhanbad*. During 2001-06, against the receipt of 5,309 distribution transformers, TRWs had repaired 5,184 distribution transformers. It was noticed during audit that the TRWs did not maintain important records like History Cards. In the absence of History card of transformer, Audit could not verify the dates of receipt of transformers at TRW, time taken for repair and dates of despatch to circles.

6.2.9.1 Loss due to shortage of retrieved coils

While repairing the transformers, the old aluminium coils were retrieved and new coils were drawn from Stores. During 2001-06, the details relating to aluminium coil drawn and retrieved are as under:

Transformer Repair	Alum. Wire drawn	Retrieved	Percentage
Workshop*	(in M	Γ)	
Ranchi	102.396	60.527	59
Deoghar	74.481	60.402	81

Loss of revenue of Rs 16 lakh due to short retrieval of coils It can be seen from above table that the percentage of aluminium wire retrieved at TRW Ranchi was less than that at TRW Deoghar. Considering the level of efficiency of retrieval at TRW Deoghar as a benchmark, the loss incurred by the Board on account of short retrieval at TRW Ranchi worked out to Rs 16 lakh[@].

^{*}Rs 10,44,408 – 9,92,509 = Rs 51,899 X 30 Nos. = Rs 15,56,970

^{*} TRW Dhanbad was set up only in July 2005.

[®] 22.413 MT x Rs 72,086 per MT

The Board stated (November 2006) that it is very difficult to arrive at a percentage for retrieved aluminium in case of burnt transformers. It further stated that the quantity of retrieved coil at TRW Deoghar is slightly higher than that of TRW Ranchi because the aluminium strips are retrieved as scrap at TRW Deoghar. The reply is not specific and is not tenable as the Board had not fixed any norm for the scrap also.

6.2.9.2 Short recovery of transformer oil

The details of transformer oil (new and reclaimed) issued for filling of repaired transformers and transformer oil retrieved during 2001-06 in respect of two TRWs are as under:

Transformer	Oil issued for	Oil r	Shortage	
Repair Workshop♥	filling (in KL)	As per norm (70 per cent)	Actual (recovery in	(in KL)
	,	\ 1 /	percentage)	222
TRW Ranchi	570	399	176 (31)	223
TRW Deoghar	395	277	97 (25)	180
Total	965	676	273	403

Loss of revenue of Rs 39 lakh due to short recovery of Transformer oil The Board has not fixed any norm for recovery of oil. As per the norms fixed by Uttar Pradesh Power Corporation Ltd. (UPPCL), recovery of transformer oil from defective transformers should not be less than 70 *per cent* of the oil tank capacity. It was, however, noticed during audit that the recovery percentage relating to two TRWs ranged between 25 and 31 *per cent*. The short recovery of transformer oil worked out to 403 KL, valuing Rs 39^{\$} lakh.

The Board stated (November 2006) that the retrieved oil, which is not fit for further reclamation is generally used in circuit breakers and not used by TRWs. The reply is not tenable as there is no system of proper accounting of the retrieved oil.

6.2.9.3 Missing copper coil

It was noticed during audit that the Board had issued (September 2005) a sale order for disposal of 10 MT scrap copper coil valuing Rs 15 lakh, from the store of TRW Deoghar. The Project Manager (Technical Services), who controls all TRWs, reported (October 2005) that the copper coil valuing Rs 12 lakh (7.85 MT) was missing from TRW Deoghar and sought (October 2005) permission of the Board for lodging complaint with the police. There is nothing on record to show that the permission sought was granted and matter investigated.

6.2.9.4 Non repair of defective transformers

Nine power transformers of various capacities of upto 100 MVA were lying at the grid sub stations without being repaired. The details are as given below:

TRW Dhanbad was set up only in July 2005.

^{\$ 403} KL x Rs 9.80 per litre (sale value)

Sl. No.	Capacity	Name of GSS	Remarks	
1.	100 MVA	Chandil	Commissioned in 1975. Failed in September 2005.	
2.	50 MVA	Hatia	Commissioned in 1999. Failed in January 2005 due to high surge voltage due to heavy rain accompanied by lightning.	
3.	12.5 MVA	Hatia	The unit was brought from Sikidri for repair.	
4.	20 MVA	Sikidri	Lying since 1992.	
5.	20 MVA	Sikidri	Lying since 2003.	
6.	9.4 MVA	Sikidri	Lying since 2002.	
7.	12.5 MVA	Jamtara	Lying since 1997.	
8.	7.5 MVA	Deoghar	Lying since 1983.	
9.	10 MVA	Dalbhumgarh	Commissioned in November 1962 and kept as defective since October 1996.	

Out of these nine transformers, five transformers were lying at the grid substations for more than ten years. Audit noticed that one 132/25 KV power transformer of 13.35 MVA* was lying idle at GSS Chandil (II) for more than 15 years. The Board did not carry out any survey to find out whether the transformers are repairable or to be auctioned so that these could be disposed of to prevent further diminution in their value.

6.2.9.5 High failure rate of distribution transformers

The table below shows the number of transformers installed/replaced during 2002-06[@]:

Year	Number of distribution transformers installed	Distribution transformers issued for replacement	Percentage of failure	Number of distribution transformers failed in excess of the norm of seven <i>per cent</i>
2002-03	14,545	1,252	9	234
2003-04	15,508	2,495	16	1,409
2004-05	16,911	1,590	9	406
2005-06	18,439	1,423	8	132
Total	•	•		2,181

It can be seen from the table above that the percentage of breakdown of distribution transformers in the State was higher than that of Assam (7 to 10 *per cent*), Bihar (8 to 9 *per cent*), Himachal Pradesh (5 to 7 *per cent*) and Maharastra (10.3 to 15.1 *per cent*).

Failure rate of distribution transformers was very high The excess failure of transformers over seven *per cent* norm of Himachal Pradesh State Electricity Board worked out to 6,760 transformers costing Rs 39.57* crore. The annual failure rate of distribution transformers ranged between 8 and 16 *per cent* of the total number of distribution transformers installed during 2002-03 to 2005-06. The main reasons for failure of transformers were overloading, mismatched capacities between PSS and Distribution Sub Stations and improper maintenance of transformers as discussed in para 6.2.10.1.

^{*} serial no. 2343 and make 1982

[®] Figures for 2001-02 not available.

^{*} average cost of distribution transformers at the then prevailing rate i.e., Rs 58,536 per transformer x 6,760 Nos. = Rs 39.57 crore.

The Board did not carry out any analysis of the excessive failure, as of September 2006 for taking corrective action. Due to high failure rate of transformers during 2002-06, the Board had lost an opportunity to save Rs 12.77° crore. Besides, high failure rate of transformers was indicative of poor maintenance of the transformers.

6.2.10 Maintenance

6.2.10.1 Periodical maintenance of transformer

Periodical maintenance of transformers was not done Transmission and Commissioning (T&C) Division of Transmission Circle and MRT Division of supply circle were vested with the responsibility of maintenance of power transformers at Grid Sub Station and PSS respectively. For distribution transformers, the maintenance work was assigned to the concerned Junior Engineer. To ensure trouble free service of the transformers it is necessary that periodical maintenance is planned, conducted and recorded as per the schedule prescribed.

Audit scrutiny revealed the following:

- ➤ The Board had not prescribed any maintenance schedule for distribution transformers.
- ➤ Neither the divisions nor the sub-divisions prepared any detailed maintenance programme to ensure maintenance of all distribution transformers over a cycle.
- ➤ There was no system of feedback of maintenance performed by the divisions to the circle/Head Office for monitoring and control.
- > Records relating to maintenance of transformers were not prepared.
- ➤ The Board had not prescribed any schedule for inspection of distribution transformers at the division level to ensure effective and regular maintenance.

Non-maintenance of transformers contributed to high failure rate of transformers.

6.2.10.2 Delay in Commissioning

As per the terms and conditions of the purchase order, performance of the power transformer is guaranteed for a period of 12 months from the date of its commissioning or 18 months from the date of its receipt, whichever is earlier. It was noticed during audit that one new 132/33 KVA power transformer of 20 MVA received (January 2005) at GSS, Dalbhumgarh was commissioned only in June 2006 due to delay in construction of transformer bay. Non synchronisation of civil works with delivery schedule of the power transformer resulted in avoidable delay of 16 months in commissioning of the transformer besides loss of performance guarantee.

[^] average cost of distribution transformers at the then prevailing rate i.e., Rs 58,536 per transformer x 2,181 Nos. of failed transformers = Rs 12.77 crore.

Repaired and new transformers were kept in the yard without commissioning In yet another case one power transformer of 150 MVA commissioned at Ramchandarpur GSS in 1998 had failed in April 2000. The failed transformer was sent (May 2004) to BHEL for repair at a cost of Rs 90 lakh. The repaired transformer was received at the GSS in May 2005 but is yet (October 2006) to be commissioned. The guarantee period of the repaired transformer expired in May 2006.

6.2.11 Inventory Management

6.2.11.1 Census of Transformers

Non- conducting of census of transformers

During 2002-03 to 2005-06, new and repaired distribution transformers (11,645) were issued to the field units for augmentation and replacement. The table below indicates the number of distribution transformers issued to field offices for replacement and augmentation during 2002-03 to 2005-06.

(Capacity in MVA)

Details	2002-03		2003-04		2004-05		2005-06		Total	
	Number	Capacity	Number	Capacity	Number	Capacity	Number	Capacity	Number	Capacity
New and repaired DTs	2,243	216	3,458	360	2,993	308	2,951	310	11,645	1,194
issued to field offices										
(A)										
Actual augmentation (B)	991	79	963	102	1,403	164	1,528	215	4,885	560
DTs used as	1,252	137	2,495	258	1,590	144	1,423	95	6,760	634
replacement in the place										
of defective/condemned										
DTs (Balancing figure)										
$(\mathbf{C}) = (\mathbf{A}) - (\mathbf{B})$										
DTs received from field	375	35	601	63	496	50	655	66	2,127	214
offices as defective /										
condemned (D)										
Short receipt	877	102	1,894	195	1,094	94	768	29	4,633	420
$(\mathbf{E}) = (\mathbf{C}) - (\mathbf{D})$										

Details of 4,633 distribution transformers valuing Rs 5.22 crore were not available at stores It would be seen from the table above that the number of distribution transformers issued to the field did not tally with that of distribution transformers on line and at Stores. No census of the transformers procured and issued was ever undertaken by the Board. Against 6,760 distribution transformers issued to the field units for replacement of defective transformers, the stores accounted for only 2,127 distribution transformers. The details of the balance 4,633 distribution transformers valued at Rs 5.22 crore[#] were not available at the central stores.

The Government of India, Ministry of Power had prescribed (March 1994) the life of power and distribution transformers as 35 years and 25 years respectively. The maintenance of 'History Card' containing full particulars for each transformer such as the name of the supplier, capacity, voltage ratio, date of issue, date of installation, date of energisation, date of failure, date of expiry of guarantee period, normal life of transformer, date of repair and subsequent commissioning etc., was required for monitoring performance and ascertaining the remaining working life. Audit scrutiny revealed the following shortcomings:

^{*} The details of transformers issued for augmentation and replacement in 2001-02 was not available.

^{# 4,633} x Rs 11,263 (average selling price of auctioned distribution transformer of up to 100 KVA)

- ➤ History cards and Asset Registers were not maintained for distribution transformers and power transformers. As a result, the procurement dates and the periods for which the transformers were in service were not ascertainable. No age-wise analysis of transformers was carried out.
- Registers for transformer-wise load distribution and periodical maintenance were not maintained at PSS and GSS.
- ➤ The transformers failed for various reasons. The Board had not analysed the reasons for failure of transformers, like manufacturing defects, inadequate protection, lack of maintenance and adverse system/environmental conditions, for taking corrective action.

As a result, it could not be ascertained in audit whether the transformers had served their normal life. The age-wise incidence of failure could also not be worked out. It could also not be ascertained whether the transformers had failed within the guarantee period.

6.2.11.2 Scrapping and disposal of transformers

The Board invited (November 2004) tenders for auction sale of three irreparable/burnt transformers. The highest bid of Kusum Steels was accepted and delivery order issued. It was, however, noticed at the time of delivery that one 60 MVA transformer was missing. It was noticed during audit that instead of investigating the issue, the Board delivered another 60 MVA transformer which had not been condemned.

Audit further noticed that the Board had disposed of another eight transformers (upto 5 MVA) instead of six transformers as per the tender specifications. In the absence of records, Audit could not verify whether the two transformers disposed of in excess were serviceable or not.

Audit noticed that one power transformer of 20 MVA was received in 1987 at Deoghar GSS. But only the main tank of the transformer was lying at the Stores at present.

6.2.11.3 Distribution transformer

The Board invited (November 2004) tenders for disposal of 820 distribution transformers of capacities upto 200 KVA. Out of these 808 transformers were disposed of. Information regarding remaining 12 transformers was not made available to audit.

Audit scrutiny revealed that before the condemned transformers were proposed to be auctioned, no survey report was prepared taking into account factors like, examination of history card of the transformers, location of transformers, reasons for condemnation, physical and technical examination of all components, reserve price fixed in the past for similar transformers and the actual price fetched, if any, and the reserve price for present auction.

6.2.12 Internal Control Mechanism

Internal control is a management tool used to provide reasonable assurance that management's objectives are achieved in an economical, efficient and orderly manner. It was noticed during audit that the internal control system of the Board was deficient as discussed below:

- ➤ The Board had compiled its accounts only upto 2001-02 which are yet to be certified. Accumulation of arrears of accounts from 2002-03 to 2005-06 is fraught with the risk of fraud, if any, remaining undetected.
- ➤ The Board did not prepare any manual relating to procurement and accounting of stores, Operation and Maintenance of transformers, accounts manual and internal audit manual. The Board did not devise any standard procedure for periodical receipt of indents from field offices, placement of purchase orders, fixing time frame for repairing transformers and returning them to circles and for declaring the defective transformers as condemned.
- Basic records such as census of transformers, transformer history cards, serial number of transformers sent for repair to TRW, logbook of transformers in Power Sub Station (PSS) and Distribution Sub Station (DSS) and registers relating to trippings, voltage fluctuations, outages etc., were not being maintained either in the field units or at the Headquarters. The report relating to the number and capacity of distribution transformers installed in the field units were not available at the Headquarters.
- ➤ Procurement of transformers was made on *adhoc* basis without any requisition obtained from the field units and circle wise details of transformers received was not available at the Headquarters.
- ➤ Norms for ratio of Generating Capacity to Transmission Capacity, Transmission Capacity to Distribution Capacity and Distribution Capacity to Connected Load were not fixed. No guidelines were laid down for repairs, maintenance and performance of transformers or for disposal of scrap transformers, contaminated transformer oil and retrieval of aluminium and copper coils from reparable transformers.

6.2.13 Conclusion

Performance of the Board with regard to procurement, maintenance and repair of transformers was found to be deficient due to non standardisation of procedures, non fixation of norms and absence of controls. The Board had not prepared any annual plan for procurement of transformers. No census of transformers procured, issued and commissioned was ever undertaken by the Board. Periodical maintenance of power and distribution transformers was not carried out resulting in high failure rate of distribution transformers. The Transformer Repair Workshops did not fix any norms for retrieval of materials from the repaired transformers. The Board did not standardise procedure to conduct auction in a systematic manner resulting in arbitrary auction of transformers and also in transformers lying idle at GSS yards. Due to non

fixation of norms/ratio for transformation capacity among generation, transmission and distribution and action thereon the T&D loss was high. Monitoring and evaluation mechanisms and internal controls were not in place.

6.2.14 Recommendations

The Board needs to:

- > prepare annual plans for procurement of transformers to keep pace with the increasing load.
- > conduct census of transformers to monitor commissioning, physical existence and devolution to central stores.
- > prescribe a maintenance schedule for transformers and carry out periodical maintenance as per the prescribed schedule.
- Fix norms for retrieval of materials from failed transformers.
- prepare guidelines for auction of transformers ensuring timely disposal of unserviceable transformers so as to realise maximum value.
- > evolve a monitoring and evaluation mechanism.
- > strengthen internal controls system.

The audit findings were reported to the Government (October 2006); reply had not been received so far (October 2006).

6.3 Transaction Audit Observations

Important audit findings emerging out of test check of transactions of the State Government company / corporation are included in this Chapter.

Government Company

Jharkhand Hill Area Lift Irrigation Corporation Limited

6.3.1 Infructuous Expenditure due to excess staff

Pay and allowances of surplus staff resulted in wasteful expenditure of Rs 3.63 crore.

Jharkhand Hill Area Lift Irrigation Corporation (Company) was incorporated (March 2002) with the objective of implementing lift irrigation schemes and other small irrigation schemes in the State. As per the policy of the Government of Jharkhand, the Company had to engage all those employees of the erstwhile Bihar Hill Area Lift Irrigation Corporation (BHALCO) who had opted for the Company within a stipulated date (March 2003), on deputation basis. Accordingly, the Company engaged 302 employees of the erstwhile BHALCO.

Audit scrutiny revealed (January 2006) that the Company had 152 employees on its rolls since March 2003 which, according to the company were surplus. Audit noticed that the Board had informed (26 September 2005) the Government about the extra annual expenditure of Rs 1.21 crore towards salary and allowances of 152 surplus employees being borne by the Company. Consequently, the Company had incurred an unproductive expenditure of Rs 3.63 crore during 2003-06.

The management stated (January 2006) that the matter was being examined by the Government. The reply is not tenable as the Company took up this matter with the Government only in September 2005 when it had already incurred infructuous expenditure of Rs 3.63 crore. Besides, the Company has incurred an annual recurring liability of Rs 1.21 crore.

The matter was reported to the Government/Management (May 2006); their replies had not been received (June 2006).

Statutory Corporation

Jharkhand State Electricity Board

6.3.2 Delay in collection rendered the dues irrecoverable

The Board suffered loss of Rs 8.03 crore as the dues became time barred/unrecoverable.

As per the provisions of Limitation Act, 1963, in case of consumers whose lines have been disconnected due to non payment of energy dues, Certificate Cases are required to be filed promptly to realise the dues. If the certificate

case is not filed within three years of the payment date the dues become time barred. In such cases, the rules provide that the concerned officer would be liable for disciplinary action, held responsible for dues becoming time barred and the amount of time barred dues could be realised from the erring officer.

Test check of records of 15 Electric Supply Divisions of Jharkhand State Electricity Board (Board) revealed that due to huge outstanding dues against Low Tension Industrial Service (LTIS), Domestic and Commercial consumers, the lines were disconnected (up to March 2003) but the dues were neither realised nor was legal action taken within the limitation period of three years to realise the arrears amounting to Rs 8.03 crore. The details are as under:

Sl. No.	Name of the Unit	No. of Consumers	Amount (Rupees in lakh)	Period upto
1.	Electric Supply Division, Garhwa	86	14.08	3/2002
2.	Electric Supply Division, Ranchi (Rural)	26	43.89	3/2002
3.	Electric Supply Division, Gumla	47	7.02	3/2002
4.	Electric Supply Division, Jharia	280	222.56	3/2002
5.	Electric Supply Division, Sahebganj	54	74.66	11/2001
6.	Electric Supply Division, Saraikela	81	22.74	8/2002
7.	Electric Supply Division, Deoghar	619	146.19	3/2003
8.	Electric Supply Division, Nirsa	173	33.58	2/2002
9.	Electric Supply Division, Tenughat	32	8.62	12/2001
10.	Electric Supply Division, Ghatshila	20	10.53	8/2002
11.	Electric Supply Division, Chakradharpur	53	18.96	3/2003
12.	Electric Supply Division, Adityapur	540	124.96	12/2002
13.	Electric Supply Division, Govindpur, Dhanbad	35	13.53	9/2001
14.	Electric Supply Division, Godda	140	43.10	1/2001
15.	Electric Supply Division, Simdega	19	18.15	3/2003
	Total	2,205	802.57	

It was noticed during audit that not filing certificate cases within the limitation period of three years resulted in loss of Rs 8.03 crore to the Board.

The matter was reported to the Government/Board (June 2006); their reply has not been received so far (July 2006).

6.3.3 Loss of revenue due to incorrect billing

Incorrect billing resulted in loss of Rs 1.20 crore to the Board.

As per the extant instructions the due date for payment of bills on account of energy consumed and other charges by the consumer is specified in the monthly bill issued. If the consumer fails to pay the bill within the due date, Jharkhand State Electricity Board (Board) is at liberty to take action under the law.

According to the Delegation of Financial Powers if any arrear amount is due from a consumer for the supply of electricity, the Chairman, in consultation with the Finance wing, can allow the consumer to pay the arrear in instalments.

Test check of records of Hazaribagh Electric Supply Circle revealed (December 2005) that a High Tension Special Service (HTSS) consumer, Akshaya Technology Private Limited was given (2 September 2001) an electricity connection at a contract demand of 2850 KVA which was reduced (w.e.f. June 2003) to 1530 KVA as per the directions of the General Manager cum Chief Engineer, Electric Supply Area, Hazaribagh (May 2003). It was further noticed that the Consumer had outstanding dues of Rs 4.31 crore as on 31 January 2004. The Chairman allowed (January 2004) the consumer to pay the arrears in sixty equal monthly instalments along with the current energy bills but, instead of intimating outstanding dues of Rs 4.31 crore, the Electrical Superintending Engineer (ESE), Electric Supply Circle (ESC), Hazaribagh signed an agreement with the consumer for payment of Rs 3.11 crore only on the basis of reduced connected load of 1530 KVA. Thus, due to incorrect billing the Board sustained a loss of Rs 1.20 crore.

The Board stated (August 2006) that the load of the consumer was reduced to 1530 KVA from 2850 KVA w.e.f. June 2003 and accordingly the energy bill of the consumer was amended from June 2003 to February 2004. The reply is not tenable as the reduction in contract demand was not permissible before expiration of three years from the date of supply of energy to the consumer as per the terms and conditions of agreement reached between the consumer and the Board.

The matter was reported to the Government (June 2006); their reply had not been received (October 2006).

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