

### 3.1 Performance Audit of Power Distribution Utilities in Bihar

#### Executive Summary

##### Introduction

The distribution system of the power sector constitutes the final link between the generation and the consumer. As on 31 March 2011, the Board had distribution network of 1.42 lakh CKMs of lines, 473 Sub-stations and 43491 Distribution transformers of various capacities. The Turnover of the Bihar State Electricity Board (Board) was ₹ 2409.69 crore in 2010-2011, which was equal to 47.14 per cent of State PSUs Turnover and 1.13 per cent of the State GDP. It employed 11651 employees as on 31 March 2011.

##### Distribution network planning

As against the planned addition of 291 Sub-stations and 3062.7 MVA capacity during the review period, only 111 sub-stations and 1912.70 MVA was added to the distribution system. Ineffective circle-wise planning resulted in wider mismatch between the planned transformation capacity and the projected connected load as on 2010-11.

##### Ineffective planning

While planning the construction of 40 PSSs, the planning for construction of its connecting lines was not done simultaneously. As a result, 12 out of 40 PSSs constructed with an expenditure of ₹ 11.53 crore could not be charged and were lying idle for eight months. Further, ineffective planning, had increased the cost of construction of connecting lines by ₹ 4.80 crore from the estimated cost.

##### Implementation of Centrally Sponsored Schemes

##### Rural Electrification

The target of cent per cent village electrification could not be achieved. Out of 28140 targeted villages, infrastructure work of electrification was completed in only 20573 villages upto March 2011. In eight districts of Bihar where the Board

was the executing agency, out of 4714 villages to be electrified, only 1920 villages could be electrified up to October 2011. Against the target of providing access to electricity to 27.62 lakh BPL rural households (RHHs), only 18.18 lakh (65.83 per cent) were electrified (September 2011).

Due to inordinate delay in award of contract the project cost had increased by ₹ 103.69 crore and the objectives of RGGVY could not be achieved.

An amount of ₹ 24.18 crore incurred on installation of 3038 DTRs had proved to be infructuous, as the DTRs failed in guarantee period due to slackness of the Board to stop the unauthorized connections.

##### APDRP

The Board nominated the PGCIL (consultant) to execute the APDRP Scheme without following the process of award for execution of work of underground cabling. Had the Board executed the scheme itself, Board could have saved ₹ 6.24 crore towards supervision charges. Again, the Board lost an opportunity to avail grant of ₹ 2.95 crore due to under-estimation of the project cost. Besides, due to inefficient monitoring and poor co-ordination by the Board, the project suffered cost overrun of ₹ 65.69 crore.

The Board incurred an expenditure of ₹ 69.21 crore on system metering for data analysis in four circles with a view to reduce T&D losses by energy accounting. However, in the absence of follow-up action on analysis of data collected, the Board could not derive the envisaged benefit of the project.

##### Restructured Accelerated Power Development Reforms Programme (R-APDRP)

Out of total fund of ₹ 68.37 crore received during 2009-11, the Board could

utilise ₹ 12.31 crore till March 2011 due to non-synchronisation of the activities of the scheme.

Due to failure of Board to appoint IT implementing agency within stipulated time, the IT enabled system was delayed by nine months. Further, in SCADA/DMS project, the IT consultant was selected after a delay of seven months. The consultant submitted the DPR in April 2011, after a delay of 15 months which was approved by PFC in November 2011. Since there was initial delay in selection and approval of DPR, the possibility of completing the project within stipulated period and conversion of loan into grant is, therefore, remote.

Target for installation of consumer metering had not been achieved in any of the year by the Board. The percentage of meter installed against target ranged from 26.59 per cent to 36.6 per cent only during performance audit period.

#### **Operational efficiency**

Due to drawal of power under Unscheduled Interchange, the Board incurred an extra expenditure of ₹ 254.26 crore on 1211.51 MUs as compared to long term power purchase cost during 2006-11. In addition, the Board could not make payment of UI charges in time which resulted in payment of penal interest of ₹ 20.95 crore on delayed payment during 2008-09 to 2010-11.

Except during 2008-09, the Board could not bring down the T&D losses within the limit prescribed by BERC. The energy lost during the period 2006-11 was 1768.66 MUs. The loss of revenue suffered by Board on this count was ₹ 638.55 crore.

The percentage of failure of DTRs had increased and ranged between 10.40 and 17.46 per cent of the total installed DTRs during the performance audit period. 120 DTRs failed in the guarantee period. Out of these, 112 DTRs were replaced/ repaired after a delay of two days to 237 days. Besides, eight DTRs were still not repaired/ replaced (December 2011) even after a delay of five months to three years.

Due to non-installation of capacitor banks in distribution system, the Board

had lost envisaged energy savings of 20.01 MUs valued at ₹ 6.09 crore.

The percentage of checking of number of consumers by raid team was minor and ranged between 0.08 per cent and 0.24 per cent.

#### **Billing Efficiency**

Energy billed during the performance audit period ranged between 56.36 and 61.95 per cent of the total energy available for sale. Further, the assessed sales constituted 31.11 per cent to 42.04 per cent of the metered sales.

Due to incorrect application of tariff provisions with respect to transformer capacity, the Board suffered a loss of revenue of ₹ 4.84 crore. The Board also suffered a revenue loss of ₹ 2.45 crore due to short assessments and short billing of contract demand with respect to a HTSS consumer.

#### **Revenue collection efficiency**

The dues outstanding at the end of the year ranged between ₹ 5749.43 crore in 2006-07 and ₹ 5700.20 crore in 2010-11. Non-disconnection of supply of defaulting consumers resulted in accumulation of arrears to ₹ 245.98 crore (March 2011).

#### **Financial Position and Working Results**

The Accumulated Losses of the Board had increased by 281.77 per cent from ₹ 1524.71 crore in 2006-07 to ₹ 5820.86 crore in 2010-11. The Board was incurring losses mainly due to the high cost of power purchase, interest and finance charges.

The borrowings of the Board had also increased by 52.29 per cent from ₹ 5577.62 crore in 2006-07 to ₹ 8493.88 crore in 2010-11. Loss per unit had also increased from ₹ 1.12 per unit in 2006-07 to ₹ 1.65 per unit during 2010-2011.

#### **Financial Management**

##### **Filing of Aggregate Revenue Requirement**

Due to delay in the filing of ARR (80 days to 399 days), the Board suffered revenue loss of ₹ 963.85 crore during the period 2006-07 to 2010-11.

**Subsidy Support**

The subsidy support from the State Government ranged between 42.97 per cent and 56.43 per cent. This was a matter of concern as the subsidy might be withdrawn over a period of time in a phased manner so that tariff would cover the average cost of supply to consumers.

**Consumer Satisfaction****Redressal of consumer grievances**

The pending complaints were ranging between 33000 and 52000 during the period 2008-11. The percentage of complaints redressed beyond time to total complaints ranged between 15.74 per cent and 27.46 per cent during this period.

**Energy conservation & energy audit**

The Board did not formulate any energy conservation policy during 2006-11. Further, energy audit could not be conducted as cent per cent system metering was not done.

**Conclusion**

The Board was incurring losses mainly due to the high cost of power purchase, interest and finance charges. The Board did not make correct assessment of power purchase, as a result, the Board incurred extra expenditure on drawal of power through UI. The Board was also dependant on borrowings for implementation of various schemes and other activities. This can be minimized by reducing T&D losses and improving its operational, billing and collection efficiency. The centrally sponsored scheme and State specific scheme launched for strengthening and

upgrading the distribution system should be closely monitored to ensure economy, efficiency and effectiveness. The Board also did not submit ARR in time and cross- subsidization was also beyond the norms.

**Recommendations**

Planning for creation of additional infrastructure should be done on the basis of the past load growth trends, current load and projected load growth in future to make the system equally efficient and to reduce the gap between transformation capacity and connected load in all circles.

Effective contract management and regular monitoring of execution of projects and schemes should be done to avoid delay and cost over run.

The Board should implement effective measures to reduce the T&D losses in phased manner.

Correct application of the Tariff Orders should be ensured in the billing system and the Board should be prompt in realisation and collection of outstanding dues.

The Board should ensure the filing of ARR in time so as to reduce the losses due to delayed implementation of revised tariff.

The Board should ensure the installation of system meters in all the Supply Circles so that the Energy Audit could be started and at the same time the Board should initiate awareness campaign regarding Energy Conservation.

**3.1 Introduction**

**3.1.1** Electricity is an essential requirement for all facets of our life. In fact, it has become a basic human need. It is a critical infrastructure on which the socio-economic development of the country depends. Supply of electricity at reasonable rate to rural India is essential for overall development. Availability of reliable and quality power at competitive rates makes the industry globally competitive and enables it to exploit the tremendous potential of employment generation. Availability of quality supply of electricity is very crucial to sustained growth of this segment.

Recognizing that electricity is one of the key drivers of rapid economic growth and poverty alleviation, the nation has set itself the target of providing access to electricity for all households.

Major responsibility for achieving the key parameters of the above said importance of electricity devolves on the distribution sector. The distribution system in the power sector constitutes the final link between the generation and the consumer. The National Electricity Plan (NEP) proposed reforms in the power distribution sector with focus on system upgradation, control and reduction of Transmission & Distribution (T & D) losses/power thefts and making the sector commercially viable, besides framing financing strategies to generate adequate resources. The NEP further aimed to achieve conservation strategy to optimize utilisation of electricity with focus on Demand Side Management (DSM) and Load Management. To achieve the above objectives, Electricity Boards need to make a financial turnaround and they should be commercially viable.

In this performance audit, it is proposed to analyse how far the Bihar State Electricity Board (Board) planned its distribution operations to achieve the above objectives, its financial turnaround and the problems, if any encountered during the last five year period from 2006-07 to 2010-11.

### **3.1.2 Power sector reforms in Bihar**

As part of the power sector reforms, the Bihar State Electricity Board (Board) was to be unbundled. The Government of Bihar (GoB) decided (August 2011) to form and operate five companies i.e Bihar Rajya Vidyut Company (Holding Company), Bihar Rajya Vidyut Utpadan Company, Bihar Rajya Sancharan Company, Dakshin Bihar Vidyut Apurti Company and Uttar Bihar Vidyut Apurti Company. These companies have not commenced (November 2011) their business.

### **3.1.3 Vital parameters of Electricity Supply in Bihar**

The Board had sold 4,541.68 Million Units ( MUs) of energy during 2006-07 which increased to 6139.14 MU in 2010-11, i.e., an increase of 35.17 *per cent*. As on 31 March 2011, the Board had distribution network of 1.42 lakh Circuit Kilo Meters (CKM) of lines (33/11 KV and LT); 473 Sub-stations and 43,491 Distribution transformers (DTRs) of various categories. The number of consumers were 0.35 crore. The turnover of the Board was ₹ 2,409.69 crore in 2010-11, which was equal to 47.14 *per cent* of the State PSUs turnover and 1.13 *per cent* of State Gross Domestic Product, respectively. The number of employees employed in the Board was 11,651 as on 31 March 2011.

## **3.2 Scope and Methodology of Audit**

The present performance audit conducted during February 2011 to June 2011 covered the functioning of the Board from 2006-07 to 2010-11. The performance audit mainly deals with Network Planning and Execution, Implementation of Central Schemes, Operational Efficiency, Billing and



Collection Efficiency, Financial Management, Consumer Satisfaction, Energy Conservation and Monitoring. The audit examination involved scrutiny of records at the Head Office of Board and five<sup>1</sup> out of 16 Electric Supply Circles (ESCs) including ten divisions, along with two<sup>2</sup> Transformer Repair Workshops (TRWs). The above Units were selected on the basis of annual revenue assessed and billed and annual expenditure incurred on operation and maintenance which represented 65.54 *per cent* of total revenue assessed and billed and 44.88 *per cent* of total expenditure incurred on operation and maintenance.

The methodology adopted to attain the audit objectives with reference to audit criteria consisted of explaining the audit objectives to the Board, scrutiny of records at head office and selected units, interaction with the audited entity personnel, analysis of data with reference to audit criteria, raising of audit queries, discussion of audit findings with the Board and issue of draft performance audit report to the Board for comments.

### 3.2.1 Performance audit of the electricity sector

A performance audit report on tariff, billing and collection of revenue and implementation of APDRP schemes had been included in the Report of the Comptroller and Auditor General of India (Commercial), Government of Bihar for the year ended 31 March 2006. This performance audit is conducted on the functioning of the Board in Bihar.

## 3.3 Audit Objectives

The objectives of the performance audit were to assess whether:

- aims and objectives of National Electricity Policy/Plans were analysed and the Plans were adhered to and distribution reforms were implemented;
- network planning and its execution was adequate and effective;
- the Central schemes such as Restructured Accelerated Power Development & Reforms Programme (R-APDRP) and Rajiv Gandhi Grameen Vidyutikaran Yojna (RGGVY) were implemented efficiently and effectively;
- operational efficiency was achieved in meeting the power demand of the consumers in the State;
- financial management was effective and the subsidy due from Union/ State Government was released in time;
- aggregate revenue requirement (ARR) and tariff revision petition was submitted timely to ensure adequacy of tariff to cover the cost of operations and cross-subsidisation at prescribed level;
- billing and collection of revenue from consumers was efficient;

<sup>1</sup> ESC Patna, PESU (EAST), PESU (WEST), Muzaffarpur, Samastipur.

<sup>2</sup> TRW at Patna and Muzaffarpur.

- effective system was in place to assess consumers satisfaction and redressal of grievances;
- effective energy conservation measures were undertaken; and
- effective monitoring system was in place and the same was being utilised in review of overall working.

### **3.4 Audit Criteria**

The audit criteria adopted for assessing the achievement of the audit objectives were:

- National Electricity Policy/Plan, Plans and norms concerning distribution network of the Board and Planning criteria fixed by the Bihar Electricity Regulatory Commission (BERC);
- Standard procedures for award of contract with reference to principles of economy, efficiency and effectiveness;
- Norms prescribed by various agencies with regard to operational activities;
- Norms of technical and non-technical losses;
- Guidelines/ instructions/ directions of BERC;
- Terms and conditions contained in the Central Scheme Documents;
- Comparison with best performers in the regions/all India averages; and
- Provisions of Electricity Act, 2003.

### **3.5 Audit Findings**

Audit explained the objectives of the performance audit to the Board in February 2011. However, an entry conference could not be held due to transfer of the then Pr. Secretary, Energy Department, Government of Bihar and also due to non-synchronization of their time schedule. The Audit findings were reported to the Board and the State Government in October 2011 and discussed in an 'Exit Conference' held on 29 November 2011. The Exit Conference was attended by Member (Finance and revenue) of the Board. The Board replied to audit findings in November 2011. The views expressed by Board have been considered while finalizing the performance audit. The audit findings are discussed in subsequent paragraphs.

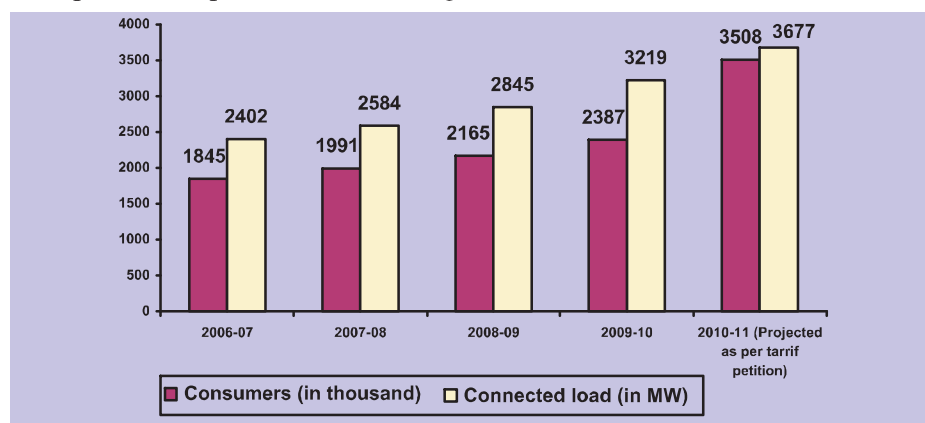
### **3.6 Distribution Network Planning**

The National Electricity Policy was evolved for achievement of the following aims and objectives.

- Access to electricity availability for all household in next five years from 2005.
- Supply of reliable and quality power of specified standards in an efficient manner and reasonable rates.

Planning is an essential element in creation of infrastructural facilities for efficient distribution of electricity so as to cover maximum population in the State. Besides the upkeep of the existing network, additions in distribution network are planned keeping in view the demand/ connected load, anticipated new connections and growth in demand based on Electric Power Survey (EPS). Considering physical parameters, the Board submits capital investment plans to the State Government/BERC. The major components of the outlay include normal development and system improvement besides rural electrification and strengthening of information technology (IT) enabled systems.

**3.6.1** The growth in consumers and their connected load during performance audit period is depicted in the bar diagram below:



The connected load and the transformation capacity to meet the connected load in respect of Board and the estimated growth by 2012 are given in the table below:

(in MVA)

Year	Existing Transformation Capacity	Connected load <sup>3</sup>	Required Transformation Capacity	Gap in Transformation capacity	Ratio of Transformation capacity to connected load
(1)	(2)	(3)	(4)=(3/0.75)	(5)=(4 – 2)	(6)
2006-07	2770.21	3002.50	4003.33	1233.12	0.92:1
2007-08	3113.69	3230.00	4306.66	1192.97	0.96:1
2008-09	3450.19	3556.25	4741.66	1291.47	0.97:1
2009-10	3939.06	4023.75	5365.00	1425.94	0.98:1
2010-11	4457.15	4596.14	6128.19	1671.04	0.97:1

It would be seen from the table above that the ratio of existing transformation capacity to total connected load ranged between 0.92 and 0.98 as against 1.33. This represented a wide gap of 1671.04 MVA of transformation capacity as on 31 March 2011. The gap of transformation capacity led to overloading of the system resulting in frequent tripping and adverse voltage regulation with consequential higher quantum of energy losses. The shortage of adequate capacity for distribution would hamper the objective of providing 'Power for all by 2012' as envisaged in the National Electricity Policy.

<sup>3</sup> The figures of connected load appearing in MVA in Column 3 of Table have been by converting them in MW in Graph.

The Board accepted the facts and said that to avoid frequent tripping and maintain system voltage as per prescribed limit all loads were not connected simultaneously at a given point of time. Further, Board also stated that system capacity augmentation was also being carried out through schemes under State plan.

While the system improvement and rural electrification schemes have been dealt with separately under subsequent paragraphs, the particulars of distribution network planned vis-à-vis achievement there against in the State as a whole is depicted in *Annexure –12 and 13*.

It would be seen from the annexure that:

- Against the planned addition of 291 sub-stations during 2006-07 to 2010-11, only 111 sub-stations were added resulting in a shortfall of 180 substations (61.86 *per cent*). Additions planned for each years during this period were never achieved.
- Existing capacity of sub-stations as on 1 April 2006 was 2544.45 MVA. Additions planned during the year 2007-11 were 3062.70 MVA, against which 1912.70 MVA was added upto the period 2010-11. Thus, there was a shortfall of 1150 MVA (37.55 *per cent*).
- The Board accepted (November 2011) the facts and stated that the targeted capacity was not achieved mainly due to delay in availability of land for PSS right from selection of feasible land to handing over of the same through defined procedures. In addition to the above, water logging for longer period especially in north Bihar, right of way and local public hindrances were the causes which slowed down progress of work.
- The anticipated load growth of supply circles was not considered while formulating the plan which resulted in wide mismatch between the planned transformation capacity and the projected connected load as on 2010-11 as detailed in *Annexure-13*. As a result, in eight circles, planned capacity additions were more than the projected capacity which ranged between three and 87 *per cent*, whereas in seven circles the capacity additions were below the projected capacity which ranged between 47 and five *per cent*.

The Board stated that in circles where planned capacity addition was less than the actual growth, it was due to unexpected commercialization, industrialization, infrastructure development, etc. and in circles where planned additions were more than required load, it was done by considering Government's future program in the field of growth of industrialization, commercialization, tourist and historical importance of that area. In addition, compulsory electrification of rural areas led to above mismatch. The reply was not convincing due to reasons that the planning was not done according to the anticipated growth of load in the areas concerned. The Board, however, should have considered past load growth trend, current load and projected load growth in future while formulating the planning for creation of additional infrastructure.

**Ineffective planning**

**3.6.2** The Board had planned to include 40 Power sub-stations (PSSs) of 400 MVA capacities to be constructed in 2008-09. Distribution network includes two major parts i.e. construction of PSSs and construction of its input (33 KV) line and output feeder (11 KV) line. Both the work should be completed simultaneously to avoid delay in utilization of PSS. An estimate of ₹ 100.60 crore was prepared for both the work, out of which the Government had sanctioned (March 2008) a loan of ₹ 70 crore under State Plan-Additional Central Assistance (ACA) with schedule completion of project in one year by March 2009.

**Due to delay in planning for construction of connecting lines of PSS an expenditure of ₹ 11.53 crore remained idle for eight months which resulted in loss of interest of ₹ one crore**

We observed that the NITs for PSSs construction and its connecting lines were floated in February 2008 and February 2009 respectively. The work order for construction work and its connecting lines were issued in January 2009 and February 2010 respectively. The construction of connecting lines started after a delay of 12 months. As a result, 12 out of 40 PSSs constructed with an expenditure of ₹ 11.53 crore by June 2011, could not be charged for want of its connecting lines and were lying idle for eight months (from November 2010 to June 2011) which resulted in loss of interest of ₹ one crore<sup>4</sup>.

The Board stated that there was no fund provision for construction of 33 & 11 KV lines for these PSSs, therefore, NIT was floated for construction of 40 PSS only. The reply was not correct as construction of PSS without its connecting line had no use. The Board should have planned for construction of PSS and its connecting lines only for that numbers of PSSs which were feasible with the available funds.

**Delay of 12 months in planning resulted in increased cost of construction of connecting lines by ₹ 4.80 crore from the initial estimated cost**

We also observed that the initial estimated cost of ₹ 30.60 crore for construction of connecting line of PSSs (33KV line 400KM and 11KV line 800 KM) exceeded by ₹ 11.47 crore<sup>5</sup>. This increase was due to inclusion of new items (₹ 6.67 crore) and increase in the cost of material (₹ 4.80 crore). Thus, a delay of 12 months in planning had also resulted in increased cost of construction of connecting lines by ₹ 4.80 crore from the initial estimated cost.

Land for construction of PSSs was to be made available by the Board to the executing agencies. The Board, however, awarded the work without ensuring the availability of land. As a result, 19 out of 40 plots of lands were handed over to the agency after a delay ranging between eight to 17 months. Further, land for seven PSSs could not be acquired even after a lapse of 28 months. Resultantly, the work of 16 PSS could not be started till June 2011.

The Board replied that at the time of Letter of Award( LoA), very few lands for construction of PSS were identified. Further, acquisition of land was multi procedural work which delayed the project. The Board should have ensured

<sup>4</sup> calculated at the rate of 13 per cent payable by the Board.

<sup>5</sup> Extension of bay and allied work of ₹ 6.67 crore and increase in cost of materials of ₹ 4.80 crore.



the availability of land before issuing LoA to avoid delay in execution of work.

The construction of Sanhaula PSS at Bhagalpur, under RE State Plan-ACA, was awarded (January 2009) to an agency with scheduled construction period of 18 months. After lapse of 16 months, the Board noticed that there was no need to construct a PSS at that site as one PSS already existed there. Subsequently, the Board decided to construct a PSS of the same capacity at another area i.e. Sangrampur, Munger. This indicated the lack of planning, which Board however, had justified that as per clause of 2.1 of tender document, the site of erection could be changed.

As a result of the shortcomings mentioned above in planning, only six out of 40 PSSs had been charged till November 2011.

### Implementation of Centrally Sponsored Schemes

#### 3.7 Rural Electrification

The National Electricity Policy states that the key objective of development of the power sector is to supply electricity to all areas including rural areas for which the Government of India (GoI) and the State Governments would endeavour jointly.

Accordingly, the GoI launched (April 2005) ‘Rajiv Gandhi Grameen Vidyutikaran Yojna (RGGVY)’ with the goal of electrifying all un-electrified villages and providing access to electricity (free of charge to consumers coming under Below Poverty Line (BPL) category) to all households in the next five years. For implementation of the programme, GoI was to provide 90 *per cent* of the expenditure as grant and the balance 10 *per cent* as loan through Rural Electrification Corporation (Nodal Agency). The other Rural Electrification (RE) schemes viz., ‘Accelerated Electrification’ of one lakh villages and one crore households and ‘Minimum Needs Programme’ were merged into RGGVY. The features of the erstwhile ‘Kutir Jyoti Programme’ were also suitably integrated into this scheme.

In addition, the GOI notified the Rural Electrification Policy in August 2006. The policy *inter-alia* aims at providing access to electricity for all households by 2009 and Minimum lifeline consumption of one unit per household per day by the year 2012.

For implementation of RGGVY in Bihar, out of total 38 districts, Government allocated (June 2006) 24 districts to Power Grid Corporation of India Limited (PGCIL), six districts to National Hydro-Electric Power Corporation (NHPC) and remaining eight districts to Board for electrification of villages.

As on 31 March 2006, out of 39015 villages in the State (as per 2001 Census), 20610<sup>6</sup> villages were electrified (52.83 *per cent*). The year-wise target vis-à-

<sup>6</sup> Electrified as per old definition.

vis achievement of electrification under RGGVY scheme during the performance audit period is tabulated below:

(in numbers)					
Year	Electrified in the beginning of the year	Targeted for electrification during the year	Electrified <sup>7</sup> during the year	Total Electrified in the end of the year	Percentage of achievement against target during the year
2006-07	1611	8000	8404	10015	105.05
2007-08	10015	5000	3347	13362	66.94
2008-09	13362	6549	3098	16460	47.30
2009-10	16460	3988	2584	19044	64.79
2010-11	19044	4603	3140	22184	68.22

Out of 28140 targeted villages, 20,573 villages were electrified during 2006-07 to 2010 - 11. The yearly target of village electrification could not be achieved except in 2006-07. There was a shortfall of electrification of 7567 villages during 2007-11. Further, out of 4714 villages to be electrified in eight districts by the Board, only 1920 villages (40.73 *per cent*) could be electrified up to September 2011.

The Board stated that target could not be achieved due to right of way problems, flood and other local problems.

We further observed that:

- Against the target of providing access to electricity to the total 27,62,076 Below poverty line (BPL) Rural house holds (RHHs) in Bihar, only 18,18,161 BPL RHHs (65.83 *per cent*) were electrified (September 2011). Further, against the target of providing access to electricity to the total 6,02,564 BPL RHHs being done by Board, only 1,47,432 BPL RHHs (24.47 *per cent*) were electrified (September 2011).

The Board stated that shortfall in achievement was due to non-completion of infrastructure in villages. The progress of BPL service connection was linked with the progress of completion of infrastructure work of villages.

- As per Rural Electrification Plan (REP) of GoI (notified in August 2008), the State Government was required to notify the REP within six months i.e. by February 2009. The State REP has, however, not been notified by the State Government till November 2011.
- As per RGGVY guidelines, establishment of franchisee was mandatory for controlling theft of electricity. We observed that although electrification work in 22184 villages was completed by March 2011, franchisee was established only in 1625 villages (November 2011).

<sup>7</sup> All achievement of electrification pertains to infrastructure developed by the PGCIL, NHPC and Board.

The Board received funds under RGGVY for rural electrification. The position of the funds available vis-à-vis utilised during the three years ending 31 March 2011 is depicted in the table below.

(₹ in crore)					
Year	Opening Balance	Funds received during the year	Total funds available	Funds Utilised	Unspent funds at the end of the year
2008-09	0	287.68	287.68	0	287.68
2009-10	287.68	52.35	340.03	91.86	248.17
2010-11	248.17	234.20	482.37	162.67	319.70
<b>Total</b>		<b>574.23</b>		<b>254.53</b>	

During the period 2008-11, out of ₹ 574.23 crore received, the Board could utilize only ₹ 254.53 crore (44.3 per cent) till March 2011, which indicated the laxity on the part of the Board in implementation of scheme.

The Board stated that scheme was delayed due to process of land acquisition, finalization of BPL list by Government and other uncontrollable factors.

*Other irregularities noticed in implementation of RGGVY are discussed below:*

### 3.7.1 Non-adjustment of interest income against cost of projects

Non-adjustment of interest accrued on RGGVY fund against cost of work resulted in submission of higher cost estimate by ₹ four crore to REC

As per tripartite agreement executed in July 2006 amongst REC, Government and the Board, the fund was to be directly released to the Board on behalf of the Government to meet the expenditure to be incurred for implementation of projects under RGGVY. The funds received under the scheme were to be kept in a separate account and was to be utilized for earmarked purpose only. Thus, interest accrued on RGGVY fund should have been credited to Government account or adjusted against cost of work executed under the scheme.

Out of total funds received, ₹ 253.19 crore was kept in fixed deposits on which interest of ₹ four crore was received up to February 2011.

The Board submitted (February 2011) revised cost estimate of ₹ 1131.67 crore to REC/Government for all eight projects executed under RGGVY, without adjustment of interest received on RGGVY funds. This resulted in higher cost estimate by ₹ four crore. Further, till September 2011, total interest received on funds kept in fixed deposit was ₹ 7.01 crore.

The Board stated that final settlement may be done after closure of the project as per terms of the agreement. The reply was not acceptable as the interest received on funds should have been adjusted in revised cost estimate.

### 3.7.2 Time and cost overrun

Due to abnormal procedural delays in getting sanction of DPRs and award of work the project cost increased by ₹ 103.69 crore

The Board floated NIT on the estimated cost included in the DPR in October/December 2006. After finalization of tender, the Board sent the same to REC for approval (October 2007) the cost (₹ 748.40 crore) of lowest tender. The validity of all the lowest bidders' offer was upto June 2008. But before approval of the L1 tenderer, Ministry of Power (MoP) communicated

(February 2008) cost norms<sup>8</sup> for village electrification for revision of DPR. Finally, based on cost norms fixed, the revised DPR was sanctioned by REC in March 2008. The cost of award of work of ₹ 748.40 crore for eight districts was finally approved by REC in August, 2008 after the expiry of validity of offer of all the lowest bidders. Consequently, fresh bid was invited (September 2008) and the lowest rate received was ₹ 852.09 crore, which was higher by ₹103.69 crore than the previous lowest bids as detailed in *Annexure-14*. Finally, letters of award were issued (May 2009) for rural electrification work.

Consequent to abnormal procedural delays in getting sanction of DPRs and award of work, the project cost had substantially increased by ₹ 103.69 crore. Besides, the objectives of RGGVY of electrification of all villages and providing all rural households with access to electricity by 2009 was not achieved.

The Board stated that the delay was mainly due to revision of cost norms by MoP, GoI. The reply did not address the issue of delay by the Board which took 18 months in finalisation of tender delaying the start of the project.

### 3.7.3 Infertuous expenditure due to burnt/ failed transformer of 16 KVA & 25 KVA installed under RGGVY- ₹ 24.18 crore.

Under RGGVY Scheme, distribution transformer (DTRs) of 16 KVA, 25 KVA and 40 KVA were installed by the executing agencies (PGCIL/NHPC). The Board was to ensure the safety of the infrastructure created.

We observed that there were 34,727 DTRs of 16 KVA, 25 KVA and 40 KVA capacity installed by the executing agencies as on April 2011, out of which 3,038 DTRs had been burnt/failed either immediately after commissioning or within one year from the date of handing over of villages by PGCIL/NHPC to the Board. The Board requested PGCIL to replace the burnt/failed DTRs which were in warranty period. PGCIL, however, refused to replace/repair them on the plea that these DTRs were burnt/failed due to over loading and bypassing of protection as per inspection carried out by them for burnt DTRs. The Board also did not take preventive measures to stop the unauthorized connections which caused overloading and bypassing of protection.

The total expenditure of ₹ 24.18 crore<sup>9</sup> incurred on installation of 3038 DTRs thus proved to be infertuous, as neither the PGCIL replaced them nor did the Board get these failed DTRs repaired. This defeated the very purpose of the scheme to provide electricity to BPL consumers.

The Board stated that above DTRs failed due to internal defects and many of these DTRs had minor defects which would be got repaired at marginal cost. The reply of the Board contradicts with the reasons qualified by the PGCIL for

The total expenditure of ₹ 24.18 crore incurred on installation of DTRs became infertuous, as neither the PGCIL replaced them, nor did the Board get repaired these failed DTRs

<sup>8</sup> ₹ 13 lakh for un-electrified village and ₹ four lakh for intensive electrification of already electrified village in normal terrain.

<sup>9</sup> 16 KVA = 1860 x ₹ 66000 per transformer = ₹ 122760000  
25 KVA = 1151 x ₹ 101000 per transformer = ₹ 116251000  
40 KVA = 27 x ₹ 103800 per transformer = ₹ 2802600  
Total= ₹ 241813600

its failure. However, the DTRs failed due to internal defects should have been replaced immediately as these were under warranty period.

### 3.7.4 Excess payment to contractor- ₹ 2.27 crore

The work of electrification of villages under RGGVY in eight districts of Bihar was awarded (May 2009) on turnkey basis. As per clause 10<sup>10</sup> of Tender Document, the price would remain firm for all equipments and materials except cost of transformers, cables and conductors for which price adjustment was allowed. Price variation/adjustment was to be calculated on the formula and prices provided in the IEEMA<sup>11</sup> circular published in every month. Further, as per the tender terms, the liability of the Board would be limited to the price prevailing as on the scheduled date or actual date of dispatch of goods whichever was lower.

Due to payment without considering the price variation clause, the Board paid an excess amount of ₹ 2.27 crore

We observed that in four districts<sup>12</sup>, payment for power transformers and distribution transformers was made on firm basis without considering the price variation clause. Scrutiny of IEEMA circulars pertaining to the period of delivery revealed that the price of the transformer had reduced considerably and the Board without considering the price variation clause, paid an excess amount of ₹ 2.27 crore till March 2011.

The Board stated that calculation of price variation was under process, which would be done at the time of final payment.

## 3.8 Implementation of APDRP Schemes

GoI had launched (June 2003) the Accelerated Power Development Reforms Programme (APDRP) to leverage the reforms in power sector through State Governments. This scheme was focused on upgradation of sub- transmission and distribution in densely electrified zones in the urban and industrial areas and improvement in commercial viability of SEBs of the State.

Under the scheme, 16 projects valuing ₹ 854.01 crore in 12 Circles were sanctioned by MoP. As per the modified scheme, 25 per cent of the sanctioned project cost was as grant from GoI and remaining 75 per cent was to be managed by loan from financial institution. The GoI and PFC released ₹651.73 crore as against the total sanctioned original cost of project of ₹ 854.01 crore which was revised (December 2006) to ₹ 1066.58 crore. The revised cost was sanctioned by MoP, GoI with the condition that enhanced amount of the scheme would not be released by the GoI. The scheme was short closed (March 2009) except few works which were being undertaken by loan provided by GoB.

State Government had provided a loan of ₹ 188.40 crore to the Board till March 2011 and ₹ 226.45 crore was still required to complete the project (November 2011)

<sup>10</sup> General Condition and General Technical requirements volume –I.

<sup>11</sup> Indian Electrical Equipments Manufacturers' Association.

<sup>12</sup> Khagaria, Katihar, Samastipur and Shekhpura.



### 3.8.1 Implementation of APDRP Phase –II scheme.

As per GoI guidelines (June 2003), SEBs were to implement the projects on turnkey basis through pre-qualified contractors selected through competitive bidding to ensure quality and expeditious implementation of the work.

A detailed project report (DPR) was prepared (September 2004) for underground cables distribution system with an estimated cost of ₹ 35.07 crore to be executed under APDRP phase-II in the significant areas of Patna.

The Board executed (February 2006) an agreement with PGCIL for above mentioned work with a scheduled completion period of 18 months. As per agreement, total cost of the project was ₹ 39.28 crore including 12 *per cent* consultancy charges. PGCIL prepared revised DPR for the project with an estimated cost of ₹ 67.94 crore (173 *per cent* above the original cost) and invited tender (September 2006) for execution of the project. Finally, the PGCIL awarded (January 2007) the work to the contractor at a cost of ₹ 89.17 crore (158 *per cent* of the revised estimate and 227 *per cent* of the original cost) without associating the Board. As per PGCIL's agreement with the contractor, the work was to be completed within 12 months from the date of issue of work order.

We observed that:

- The Board nominated (February 2006) PGCIL to execute the APDRP schemes without following the process of award for the execution of the scheme as mentioned in GoI circular (April 2005). PGCIL, however, executed the work by awarding the work to sub-contractor. Had the Board executed the above scheme itself it could have saved ₹ 6.24 crore payable to PGCIL by way of supervision charges<sup>13</sup>. Till March 2011, the Board had already incurred an extra expenditure of ₹ 4.65 crore<sup>14</sup> due to entrusting the entire work to PGCIL. The Board had also lost the benefit of competitive rates.

The Board stated that due to shortage of staff and officers, it was not possible to complete the project in a time bound manner. Therefore the Board got the APDRP scheme executed through PGCIL.

- The funds for APDRP were provided by the MoP, GoI, through a combination of grant and loan and ratio of the project cost was 1:1. We observed that estimated cost of the project did not include cost towards Entry Tax, supervision charges and cost of street lighting etc. As a result, as against ₹ 46.88 crore<sup>15</sup>, estimate of ₹ 35.07 crore was prepared. The DPR was sanctioned (April 2005) by GoI and matching grant of ₹ 8.77 crore (25 *per cent* of the project cost) was released. Had the DPR been prepared considering all essential items, the Board could have availed grant of ₹ 11.72 crore<sup>16</sup>. Thus, due to under- estimation of

<sup>13</sup> Seven *per cent* of ₹ 89.17 crore.

<sup>14</sup> (₹ 71.03 crore x 07/107).

<sup>15</sup> (Project cost = ₹ 35.07 crore + Cost of street lighting + Entry tax + supervision charges).

<sup>16</sup> 25 *per cent* of the ₹ 46.88 crore .

the project cost, the Board had received less matching grant of ₹ 2.95 crore from GoI.

The Board had accepted the observation and stated that the above project was being executed for the first time in Bihar and the Board was not having experience for the same. The Board also stated that the DPR was prepared by the PGCIL in consultation with the Board without considering the advance technology.

- The Board, while executing the agreement with PGCIL, did not incorporate a suitable clause to adjust the liquidated damages recovered from the contractors by the PGCIL in case of time over-run to safeguard its financial interest. As the project had already been delayed by 30 months the Board lost the opportunity to recover the liquidated damages deducted by the PGCIL from their contractors to the tune of ₹ 4.46 crore (five *per cent* of ₹ 89.16 crore) in the absence of LD clause in the agreement with the PGCIL.

The Board apprised that the issue of adjustment of LDs had been raised with the PGCIL and their reply was awaited. However, the PGCIL, as per agreement, was not liable to return the LD recovered from the contractors.

- GoI had sanctioned (December 2006) the revised project cost of ₹ 100.76 crore with the instructions that the expenditure in excess of the original estimated cost of ₹ 35.07 crore would be arranged by the Board on its own. We observed that the Board could not co-ordinate and monitor the work done by the PGCIL which led to cost overrun of ₹ 65.69 crore.

The Board stated that the cost overrun was mainly due to increase in the cost and inclusion of the new items such as RMUs and Street light arrangements. The reply was not acceptable as the Board did not participate in the bidding process and preparation of revised DPRs, etc. as a result the work was awarded at ₹ 89.17 crore which was 158 *per cent* of the revised cost.

### 3.8.2 System Metering in four circles under APDRP

The Board placed (August 2006 & October 2007) orders on M/s Secure Meters Ltd (Contractor) for supply, installation and commissioning of system meters for PSSs and DTRs and its associated equipments at four electricity supply Circles<sup>17</sup> on turnkey basis. This had also included collection of data from Feeders and Distribution transformer meters and preparation of reports for energy accounting with detailed analysis under APDRP Scheme. The objective of system metering was to take remedial measures for reduction of T&D loss/AT&C loss, overall system study, system planning & operational planning and management.

**Due to lack of proper coordination and poor monitoring, the Board could not restrict the actual cost to the original cost which led to cost overrun of ₹ 65.69 crore**

<sup>17</sup> PESU (E) PESU (W), Patna and Muzaffarpur

The Contractor, against the ordered quantity of 12091 meters, had supplied 11844 meters and commissioned 11593 meters only with an expenditure of ₹ 63.63 crore.

The data collection work on meters installed on DTRs was ordered by Board only for two years from the date of commissioning and taking over by the Board. Accordingly contractor had to collect the data in respect of 10200 meters. The contractor, however, collected data only from 9830 meters. The expenditure incurred by the Board towards data collection and its analysis was ₹ 5.58 crore

We observed that:

**Board could not derive the desired benefit even after expending ₹ 69.21 crore on installation of System Meters**

- One of the main objectives of system metering was to reduce T & D losses. There was no improvement in the T&D losses despite installation of DTR meters. In these four supply circles where the project was implemented, T&D losses were ranging between 41.91 *per cent* and 47.43 *per cent* during the period 2008-09 to 2009-10.
- The supplier had submitted the data analysis report to the Board which could benefit the Board as the unhealthy DTRs ranged between 23 *per cent* and 28 *per cent*. Under-loaded DTRs ranged between seven *per cent* and 32 *per cent* and overloaded DTRs ranged between 23 *per cent* and 28 *per cent* during January 2009 to February 2010. Thus, the Board could not derive the desired benefits even after incurring expenditure of ₹ 69.21 crore.
- Data collection and its analysis were stopped by the contractor in September 2010. Since then no data was collected by the Board, which affected energy accounting adversely.

The Board accepted the audit observation and stated that data collection and analysis required adequate staffs and officers which was the major constraint in achieving the final goal which could not be done even after outsourcing the work of data collection and its analysis on turnkey basis.

### 3.9 Restructured Accelerated Power Development Reforms Programme

Government of India (GoI) had approved the Accelerated Power Development Reforms Programme (APDRP) to leverage the reforms in power sector through the State Governments. This scheme was implemented by the power sector companies through the State Government to upgrade the sub-transmission and distribution system including energy accounting and metering, for which financial support was provided by GoI.

In order to carry forward the reforms process, the GoI had launched the Restructured APDRP (R-APDRP) in July 2008 as a Central Sector Scheme for XI Plan. Projects under R-APDRP scheme were to be taken up in two parts - Part A and B. Part A was dedicated to establishment of IT enabled system for achieving reliable and verifiable base-line data system in all towns besides

installation of SCADA<sup>18</sup>/Distribution Management System. For this, 100 per cent loan was to be provided. The loan was convertible into grant on completion and verification of the system by third party independent evaluating agencies. Part B of the scheme deals with strengthening of regular sub-transmission and distribution systems and up-gradation of projects.

It was proposed to cover urban areas - towns and cities with a population of more than 30,000 (10,000 in case of special category states). In addition, in certain high-load density rural areas with significant loads, works of separation of agricultural feeders from domestic and industrial ones and High Voltage Distribution System (11KV) were also required to be taken up. Further, in respect of towns/areas for which projects were sanctioned in X Plan, R-APDRP was to be considered for XI Plan only after completion or short closure of the projects sanctioned earlier.

The Ministry of Power, GoI, sanctioned (December 2009) projects covering 71 towns of Bihar under Part A at an outlay of ₹ 253.68 crore which included a loan of ₹ 194.58 crore to be disbursed through Power Finance Corporation (PFC) and the balance ₹ 59.10 crore was to be funded by the Board/GoB. PFC released ₹ 58.37 crore and GoB ₹ 10 crore in March 2010 and March 2011 respectively.

### 3.9.1 Financial Performance

The details of the funds released by GoI (through PFC), utilisation and balances in respect of Board are given below;

(₹ in crore)

Year	Opening balance	Funds released by GoI	Funds released by GoB	Funds utilised	Balance	Percentage of funds utilized to funds available
2009-10	0	58.37	-	0	58.37	Nil
2010-11	58.37	0	10.00	12.31	56.06	18

We observed that out of total funds of ₹ 68.37 crore received under the scheme during the period 2009-11, only ₹ 12.31 crore could be utilized till March 2011 due to non-synchronization of the activities of scheme.

### Establishment of IT enabled system

**3.9.2** Part – A of the R -APDRP scheme was dedicated to establishment of IT enabled system and SCADA/ Distribution Management System (DMS).

As per the timeliness decided by the GoI, the Board was to appoint IT implementing agency (ITIA) within three months from the date of sanction of part A of the project i.e. by March 2010 which was, however, executed with M/s Spanco for ₹ 159.89 crore in January 2011, after a delay of nine months.

<sup>18</sup> Supervisory Control and Data Acquisition generally refers to industrial control systems and computer systems that monitor and control industrial, infrastructure or facility-based processes.

The scheduled completion of the projects was May 2012 i.e. 18 months from the date of letter of intent (LOI).

The Board stated that the delay in appointment of ITIA was mainly due to stay order given by the PFC for opening of the price bid.

For implementation of SCADA/DMS project, model request for proposal and DPR template were made available by PFC to the Board in December 2009. The Board invited (August 2010) request for proposal for selection of SCADA/DMS consultant after a lapse of seven months. DPR of the project was submitted to PFC in April 2011, after a lapse of 15 months which was approved in November 2011.

The Board stated that the project was delayed due to procedural delays constrained by the PFC/MoP controls and R-APDRP guidelines.

The loan amount of ₹ 194.58 crore sanctioned by GoI would not be converted to grant unless the Board complete the projects in all the identified towns by December 2012, as per the terms of the agreement governing sanction of loan. Since there was initial delay in selection of consultants, the possibility of completing the projects within the stipulated period and conversion of loan into grant is, therefore, remote.

### **3.9.3 Strengthening of sub-transmission and distribution system**

Part B of the scheme deals with strengthening of regular sub-transmission & distribution systems and also upgradation of the distribution system. The focus of the scheme was on reduction of Aggregate Technical & Commercial (AT & C) losses on sustainable basis and to strengthen the distribution. Funds to the extent of 25 *per cent* of the cost were to be provided as loan by GoI and the balance 75 *per cent* was to be arranged by the Board from the Financial Institutions/Power Finance Corporation. Up to 50 *per cent* of the loan along with its interest was convertible into grant on completion of the project within the stipulated time, maintaining it for five years and on achieving the target of 15 *per cent* set for AT&C losses.

For implementation of part B project under R-APDRP, the DPR template was made available by PFC to the Board in October 2009. However, the Board submitted the DPRs of the projects to PFC in April 2011 after a lapse of 18 months which was approved in November 2011.

### **3.9.4 Consumer metering**

Attainment of 100 *per cent* metering was one of the objectives of the R-APDRP scheme. Accordingly, the work of metering of un-metered consumers and replacement of defective meters was to be undertaken. The progress of the work of consumers' metering by the Board was very slow. The metering work was undertaken (2008-09) in 12 circles instead of 16 circles under APDRP. Out of 12 circles, work in eight circles was undertaken by PGCIL and in remaining four circles by the Board. The achievement of metering of all consumers (of various categories) in the State is indicated in



the **Annexure-15**. Target for installation of consumer metering had not been achieved in any of the year by the Board, the percentage of actual meter installed against target ranged between 26.59 *per cent* and 36.6 *per cent* only during performance audit period. The shortfall in achievement in metering was due to delay in procurement of meter.

The Board replied that the process of replacement of defective and electro-magnetic meters with electronic meters was going on and no new connections were being given without electronic meters. The reply of the Board did not address any time frame set for *per cent* metering considering 10.24 lakh unmetered consumers and 1.28 lakh consumers with defective meters.

### 3.10 Operational efficiency

The operational performance of the Board is judged on the basis of availability of adequate power for distribution, adequacy and reliability of distribution network, minimizing line losses, detection of theft of electricity, etc. These aspects are discussed below.

#### 3.10.1 Purchase of Power

The demand for energy in the State had been increasing. The power requirement of the State is determined by the Board on the basis of the past maximum demands and the availability of power from central sector. The Board prepares the projections and submits it to the BERC for approval. Requirement of power was almost met through purchase (generation being insignificant).

The details of demand of power assessed for the State based on the report of 17 Electric Power Survey (EPS), purchase of power approved by Bihar Electricity Regulatory commission (BERC) and actual power purchased during the period 2006-07 to 2010-11 were as under:

(In million units)

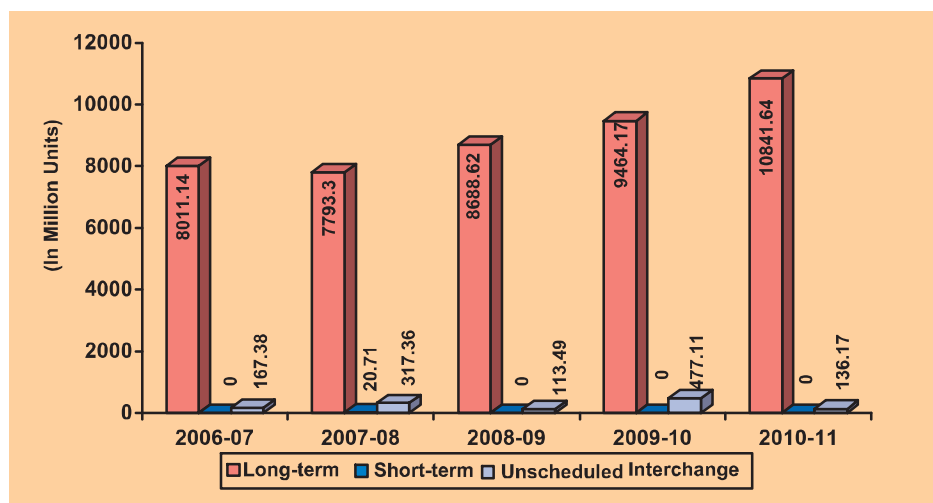
Year	Demand assessed in 17 EPS	Purchases assessed by Board and approved by BERC	Actual Power purchased	Power Deficit	Excess/ Shortfall in purchase against approved
(1)	(2)	(3)	(4)	(5) = (2 – 4)	(6) = (3 – 4)
2006-07	9629.00	7188.00	8178.52	1450.48	(+) 990.52
2007-08	11134.00	8080.00 <sup>19</sup>	8131.37	3002.63	(+) 51.37
2008-09	12874.00	8790.00	8802.11	4071.89	(+) 12.11
2009-10	14886.00	9247.00 <sup>19</sup>	9941.28	4944.72	(+) 694.28
2010-11	17213.00	10170.00	10977.81	6235.19	(+) 807.81

Though the BERC had been approving quantities of power projected by the Board, the actual power procured by the Board against the demand assessed in EPS was always lower during the performance audit period. The Board

<sup>19</sup> Tariff for the year not approved by the BERC.

submitted power purchase requirement in ARR after considering scheduled power cuts but the State was facing power deficit during 2006-11 even the actual power purchased was always higher than those approved by BERC. The excess power purchased than those approved by BERC during the performance audit period was 2556.09 MUs.

For the above purchases, the Board entered into long term power purchase agreements with various agencies viz., Central PSUs, IPPs, etc. besides Unscheduled Interchange (UI) drawal on need basis. The break-up of the total power purchased (as mentioned in previous table) into these categories was as follows.



Due to drawal of power under UI, the Board incurred an extra expenditure of ₹ 254.26 crore as compared to long term power purchases cost

The Board purchased 20.71 MU of power only in 2007-08 through short term power purchase arrangements. Long term power purchase was the main source of power which ranged between 95.20 per cent (2009-10) and 98.74 per cent (2010-11). The source-wise purchase of power during the performance audit period is given in the *Annexure-16*. The Board drew power in excess than the scheduled allocation in all the years which ranged between 1.26 per cent and 4.80 per cent of the total power purchased during 2006-07 to 2010-11. Average annual rates of UI Charges ranged between ₹ 3.43/unit and ₹ 5.17/unit. Thus, the Board incurred an extra expenditure of ₹ 254.26 crore on drawal of power through UI of 1211.51 MU as compared to long-term power purchases cost during the 2006-07 to 2010-11.

### Other observations related to Power Purchase

#### 3.10.2 Avoidable payment of penal interest on delayed payment of UI charge- ₹ 20.95 crore

Non-payment of UI charges in time resulted in payment of penal interest of ₹ 20.95 crore

The Board purchased power mainly from quota allocated by Union Government through central sector power generating units. The Board also drew power over the scheduled allocation through Unscheduled Interchange (UI). Power drawn through UI was billed by Eastern Region Power Committee (ERPC) on weekly basis with a condition that the payment should be made within 10 days from the billed date failing which penal interest at the

rate of 0.04 per cent on the outstanding amount would be payable for each day of default.

We observed that during 2008-09 to 2010-11, the Board had drawn excess power than the scheduled allocation. The Board could not make payment of UI charges in time which resulted in payment of penal interest of ₹ 20.95 crore<sup>20</sup> during 2008-09 to 2010-11.

The Board stated that due to low availability of power during November to May and to meet the demand of power there was no option left but to go for overdrawing from UI.

### 3.10.3 Avoidable excess expenditure on purchase of power – ₹ 5.65 crores

During 2007-08 (October and November), the Board purchased 20.71 MU of Energy as short term arrangement from NTPC Vidyut Vyapar Nigam (NVVN) (supplied from NTPC Kayamkulam, Kerala) at the rate of 789.61 paise/KWH on emergency basis during festival period without inviting any tender for the purchase.

Purchase of power from NVVN instead of drawing cheaper power from UI resulted in avoidable payment of ₹ 5.65 crore

We observed that the required power could have been met through UI which was cheaper (average rate being 517 paisa/unit during 2007-08) than the power purchased (at the rate of 789.61 paise/KWH) from NVVN. This resulted in avoidable payment of ₹ 5.65 crore<sup>21</sup>.

The Board stated that availability of power remained very low during the month of October and November. Due to less power in grid system and very low frequency, UI rates went very high. The Board also stated that dependency to draw power under UI was not a concrete surety to get power during emergency requirement.

The reply was not correct as Board did not analyze the effect of purchase of power through short term as compared to purchases through UI which led to avoidable payment.

## 3.11 Sub-transmission & Distribution Losses

The distribution system is an important and essential link between the power generation source and the ultimate consumer of electricity. For efficient functioning of the system, it must be ensured that there are minimum losses in sub-transmission and distribution of power. While energy is carried from the generation source to the consumer, some energy is lost in the network. The losses at 33KV stage are termed as sub-transmission losses while those at 11 KV and below are termed as distribution losses. These are based on the difference between energy received (paid for) by the Board and energy billed to consumers. The percentage of losses to available power indicates the

<sup>20</sup> 2008-09= ₹9.66 crore, 2009-10= ₹10.68 crore and in 2010-11= ₹0.61 crore.

<sup>21</sup> 20710000 units x (₹ 7.8961- ₹ 5.17 (Average rate of UI charges during the period)) = ₹ 56457531.

effectiveness of distribution system. The losses occur mainly on two counts, *i.e.*, technical and commercial.

Technical losses occur due to inherent character of equipment used for transmitting and distributing power and resistance in conductors through which the energy is carried from one place to another. On the other hand, commercial losses occur due to theft of energy, defective meters and drawal of unmetered supply etc.

The table below indicates the energy losses of the Board for the last five years upto 2010-11.

(In Million Units)						
S.No.	Particulars	2006-07	2007-08	2008-09	2009-10	2010-11
1.	Net power available for sale	7914.92	7961.30	8584.69	9836.58	10882.86
2.	Energy sold	4541.68	4851.56	5324.64	6067.22	6139.14
3.	Energy losses (1 – 2)	3373.24	3109.74	3260.05	3769.36	4743.72
4.	Percentage of energy losses ( <i>per cent</i> ) {(3 / 1) x 100}	42.62	39.06	38.00	38.32	43.59
5.	Percentage of losses allowed by BERC ( <i>per cent</i> )	41.40	38.00	38.00	35.00	32.00
6.	Excess losses (in MUs)	96.46	84.44	0.00	326.56	1261.20
7.	Average realisation rate per unit <sup>22</sup> (in ₹)	2.75	2.96	3.11	3.03	3.87
8.	Value of excess losses (₹ in crore) (6 x 7)	26.53	24.99	0.00	98.95	488.08

Although percentage of energy losses had decreased from 42.62 in 2006-07 to 38.00 in 2008-09, the position deteriorated subsequently and it increased sharply to 43.59 *per cent* in 2010-11. Except during 2008-09, the Board could not bring down the T&D losses within the limit prescribed by BERC. The energy lost during the period 2006-11 was 1768.66 MUs. The loss of revenue suffered by Board on this count was ₹ 638.55 crore. Reduction in losses was the most significant step towards making the Board financially self-sustaining. The importance of reducing losses can be gauged from the fact that one *per cent* decrease in losses could add ₹ 42.12<sup>23</sup> crore to the income of the Board annually. The main reasons for such high energy losses were non installation of capacitor banks in PSS/DSS, low power factor, heavy quantum of unmetered consumers, theft of electricity etc.

### 3.11.1 Performance of Distribution Transformers

Neither Board nor BERC had fixed any norms for failure of the DTRs. The total numbers of actual DTRs failed and the expenditure incurred on their repairs are depicted in the table below:

<sup>22</sup> As adopted by the Board.

<sup>23</sup> One *per cent* of 10882.86 MU=108.83 MU  
Average rate of realization in 2010-11= ₹ 3.87/unit  
Loss = 108.83 MU x ₹ 3.87/Unit = ₹ 42.12 Crore.

Sl.No.	Particulars	2006-07	2007-08	2008-09	2009-10	2010-11
1.	Existing DTRs at the close of the year (in Number)	35821	37276	39228	41249	43491
2.	DTR Failures (in Number)	3727	4050	4696	6022	7597
3.	Percentage of failures	10.40	10.86	11.97	14.60	17.46
4.	Expenditure on repair of failed DTRs (₹ in crore)	5.52	5.87	8.50	11.62	17.58

There was continuous increase in the numbers of DTRs failed over the years. The percentage of failure of DTRs had also increased year after year which ranged between 10.40 and 17.46 *per cent* of the total installed DTRs. Failure of DTRs could be minimised by preventive maintenance and avoiding overloading of the same. We further observed that no analysis of the failure of DTRs was done by the Board. The technical report prepared for failure of DTRs by the Board was not based on the genuine facts as in almost all the reports the prime cause of the failure of the DTRs mentioned was 'Internal Defects'. The reasons for failure of the DTRs, however, included overloading, shortage of transformers oil, non-installation of lightning arrestor, non-maintenance of DTR etc.

The Board accepted the audit observation and stated that strict instructions had been passed to field officers to follow operation & maintenance manual to restrict the rising rate of DTRs' failure as comparable to other State utilities.

### 3.11.2 Delay in repair of Distribution Transformers

The Board undertakes repairs of damaged transformers through its Transformer Repair Workshop (TRWs) where required material is supplied by the Board and labour work has been outsourced to different agencies. No time limit for return of repaired transformers was fixed by the Board for the TRWs. Scrutiny of records of two TRWs (Patna and Muzaffarpur) revealed that the time taken for repairing of the failed DTRs ranged from one month to more than four years during 2006-07 to 2010-11. Further, as per the general terms and conditions of purchase order, the suppliers were required to guarantee the performance of DTRs for two years from the date of supply or 18 months from the date of installation whichever was earlier. The Board did not fix any time schedule for replacement/repair of the DTRs failed during guarantee period. However, we observed that during the performance audit period, 120 DTRs failed in the guarantee period. Out of these, while 112 DTRs were replaced/ repaired after a period of two days to 237 days, eight DTRs were awaiting repair/ replacement (December 2011), even after a lapse of five months to three years. However, no action was taken by the Board to avoid the delays in repairing the DTRs which had an adverse impact on the operations of the Board.

The Board replied that due to non-availability of matching material required for repairing of the transformers, some times delay occurred. The reply was not acceptable as the range of delay was as long as four years. Further, the Board also stated that the transformers failed under guarantee period were



successfully replaced by the respective suppliers which were not factually correct as there was delay of upto 237 days in replacement of transformers and some transformers were yet to be replaced even after a lapse of three years.

### 3.11.3 Capacitor Banks

Capacitor banks improve the power factor by regulating the current flow and voltage regulation. In the event of voltage falling below normal, the situation can be set right by providing sufficient capacity of capacitor banks to the system as it improves the voltage profile and reduces dissipation of energy to a great extent thereby saving loss of energy. The capacitor bank saves energy to the extents of 0.04959 MU per MVAR (Mega Volt Ampere Reactive Power) of its capacity.

**Due of non installation of capacitor banks in the distribution system, the Board lost envisaged energy savings of 20.01 MU valued at ₹ 6.09 crore**

We observed that no annual planning was done by the Board. Although, the Board decided during 2006-07 to install 2600 capacitors (600 number of 200 KVAR and 2000 number of 100 KVAR) with targeted addition of 320 MVAR in LT side of all DTRs of divisional town and 22 capacitor with targeted addition of 83.56 MVAR in eight PSS in Patna, but no targeted energy savings was envisaged by the Board. The scheduled completion of the targeted installation of capacitor banks was March 2009. We further observed that despite funds of ₹ four crore made available (2007-08) by the State Government, the Board did not install any capacitor banks in Distribution systems during the performance audit period. The Board, thus, had lost envisaged energy savings of 20.01 MU<sup>24</sup> valued at ₹ 6.09 crore.

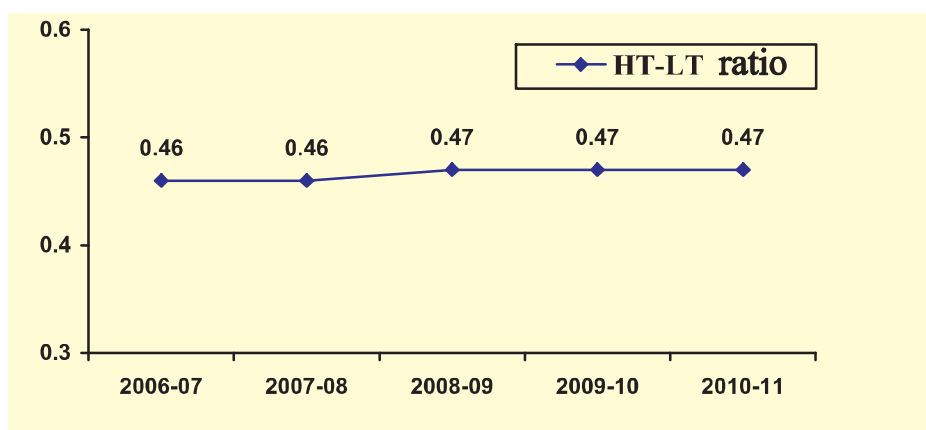
### 3.11.4 Commercial losses

The majority of commercial losses relate to consumer metering, billing and pilferage of energy. While the metering and billing aspects have been covered under implementation of R-APDRP scheme the billing efficiency and the other observations relating to commercial losses are discussed below.

### 3.11.5 Implementation of LT less system

High voltage distribution system is an effective method for reduction of technical losses, prevention of theft, improved voltage profile and better consumer service. The GOI had also stressed (February 2001) the need to adopt LT less system of distribution through replacement of existing LT lines by HT lines to reduce the distribution losses. The HT-LT ratio over the performance audit period is depicted in the graph below:

<sup>24</sup> 403.56 MVAR x 0.04959 MU per MVAR = 20.01 MU X ₹ 3.03/unit (rate adopted for the year 2009-10).



It may be seen that the ratio of HT:LT lines remained almost constant throughout the performance audit period. As against 66364 CKM of HT line, the LT line was 142466 CKM as on March 2011.

The Board accepted the observation and stated that several Grids and their linking line along with linking networks construction were in progress through various schemes. After their completion the HT/LT ratio would gradually improve.

### 3.11.6 Performance of Raid Team

In order to minimise the cases of pilferage/loss of energy and to save the Board from financial losses on this account, Section 163 of Electricity Act, 2003, provides that the licensee may enter into the premise of a consumer for inspection and testing the apparatus. A Special Task Force (STF) team of Board headed by the Officer of the rank of Electrical Superintending Engineer at its headquarters was entrusted with the work of conducting raids or checking the premises of the consumers with the assistance of AE and other departmental officer of the Electric Supply Division concerned. Executive engineers of the concerned divisions were supposed to prepare work plan to conduct raids by identifying such consumers/areas where large scale theft was suspected. The Board constituted (November 2007) STF for controlling of theft of power and un-authorised use of energy. Due to lack of coordination between the vigilance wing and the concerned divisions, raids did not yield the desired results. Following is the position of raids conducted during performance audit period.

Sl. No.	Year	Total number of consumers as on 31 March	No. of consumers checked	Assessed amount (₹ in lakh)	Realised amount (₹ in lakh)	Unrealised amount (₹ in lakh)	Percentage of checking to total nos. of consumer
1	2007-08	1991190	1599	247.00	241.11	5.89	0.08
2	2008-09	2164604	2019	1848.51	869.11	979.40	0.09
3	2009-10	2386866	2893	828.76	593.10	235.66	0.12
4	2010-11	3508475	8565	1520.64	409.07	1111.57	0.24
<b>Total</b>				<b>4444.91</b>	<b>2112.39</b>	<b>2332.52</b>	

We observed that the percentage of checking of number of consumers was minor and ranged between 0.08 *per cent* and 0.24 *per cent*. This showed that there was need to conduct more raids to significantly reduce theft of energy. Further, against the assessed amount of ₹ 44.45 crore, the Board could collect ₹ 21.12 crore indicating a short realisation of ₹ 23.33 crore. The very objective of preventing theft i.e. to cover the financial loss, thus, could not be achieved.

The Board replied that there were only four teams for conducting raids and one team could raid only two consumers in a working day. The Board did not mention about pending realisation of ₹ 23.32 crore.

### 3.11.7 Inordinate delay by the Board in effecting new service connection resulted in loss of Revenue ₹ 10.78 crore

Section 43(1) of the Electricity Act, 2003, read with Para 15 of Bihar Electricity Standards of Performance of Distribution Licensee, 2007 and clause 4.80 of Bihar Electricity Supply Code, 2007 both issued by BERC stipulated that the Board shall provide High Tension (HT) service connection to a consumer within 145 days of receipt of application whenever such service connection involves extension and improvement to the Board's site facilities. There were two elements in the tariff for H.T. consumers. One was energy charge recoverable on quantity of energy consumed at prescribed rate and another was demand charge recoverable on the contract demand at fixed rate (₹ 700/KVA/month) irrespective of the quantity of energy consumed.

**Inordinate delay of 330 days over the stipulated period in effecting new connection resulted in loss of revenue of ₹ 10.78 crore**

We observed (January 2011) that M/s Gangotri Iron and Steel Co. Bihta, applied for a new 33 KV under category HTSS Service connection with contract demand of 14000 KVA (12000 KVA for Furnace and 2000 KVA for rolling mill) for their proposed unit. The application was registered on 19 September 2007 and the supply of electricity was affected on 10 January 2009, thereby taking an overall time of 475 days from the date of receipt of application as against 145 days stipulated as above. Thus, there was delay of 330 days over and above the stipulated period which resulted in loss of revenue of ₹ 10.78<sup>25</sup> crore as demand charges could not be charged.

The Board stated that delay was due to non-completion of all formalities by the consumer related with effecting new service connection. The Board also stated that the consumer submitted new application for clubbing of load of rolling mill along with load of furnace. The reply was not acceptable as the consumer had deposited the required amount for construction of service lines without delay. Further, the Board delayed the preparation of feasibility report, estimate, process of obtaining technical sanction and construction of 33 KV service lines by more than ten months over and above the time prescribed by the BERC which caused the delayed process of effective new service connection and loss of revenue.

<sup>25</sup>

14000 KVA X ₹ 700 Per month X 11 Month (330 days) = ₹ 10.78 Crore.

### 3.12 Billing efficiency

As per the procedure prescribed in the Bihar Electricity Supply Code 2007, the Board was required to take the reading of energy consumption of each consumer at the end of the notified billing cycle. After meter readings, the Board issued bills to the consumers for consumption of energy. Sale of energy consists of two parts viz., metered and assessed units. The assessed units referred to the units billed to un-metered consumers and cases where the meter reading was not available due to meter defects, door lock etc. The BERC did not stipulate the percentage of assessed sales of the metered sales. Billings of all the consumers were being done at the division level. Domestic consumers (rural & BPL), non domestic consumers up to 5KW (rural) and agricultural consumers (urban & rural) were being billed on bi-monthly basis, while other consumers were being billed on monthly basis.

The efficiency in billing of energy lies in distribution/sale of maximum energy by the Board to its consumers and realisation of revenue in time.

(Figures in MUs)

S. No.	Particulars	2006-07	2007-08	2008-09	2009-10	2010-11
1.	Energy available for sale	7914.92	7961.30	8584.69	9836.58	10882.86
2.	Free Supply	-	4.76	6.11	5.86	5.36
3.	Energy billed	4541.68	4846.80	5318.53	6061.36	6133.78
4.	Energy Billed as percentage of Energy available for sale	57.38	60.88	61.95	61.62	56.36
5.	Free Supply as percentage of Energy available for sale	-	0.06	0.07	0.06	0.05
6.	Total Energy Sold (2+3) or (7+8)	4541.68	4851.56	5324.64	6067.22	6139.14
7.	Assessed Sale	1344.18	1365.83	1548.21	1478.44	1456.74
8.	Metered Sale	3197.50	3485.73	3776.43	4588.78	4682.40
9.	Assessed sales as percentage of metered sales	42.04	39.18	40.99	32.22	31.11

The energy billed during performance audit period ranged between 56.36 and 61.95 *per cent* of the total energy available for sale while free supply was very negligible. Less billing of the total energy available for sale was mainly due to high T&D losses (37.98 to 43.59 *per cent*) during performance audit period. Further, assessed sales constituted between 42.04 *per cent* and 31.11 *per cent* of the total sales during performance audit period.

The Board stated that private agencies had been deployed to ensure 100 *per cent* meter reading and its billing. Large scale manpower had been recruited for improving billing and revenue collection efficiency.

#### 3.12.1 Revenue collection efficiency

As revenue from sale of energy is the main source of income of the Board, its prompt collection assumes great significance. The salient features of the collection mechanism being followed by the Board were as follows:

- Consumers can make payments of the energy charges by cash, cheques or by demand draft.

- Energy charges billed for HT services are collected at collection counters located at every division office.
- In respect of LT services, electricity bills are generally collected by the revenue cashiers (RC) except in some areas where collection work is entrusted to private collection agencies.
- HT consumers are required to pay current charges within a grace period of 10 days after the due date (i.e.15 days from the date of the issue of bills), failing which the consumers are liable for payment of additional charges of 1.5 *per cent* per month or part thereof on the amount of the bill for the period of the delay.

The table below indicates the balance outstanding at the beginning of the year, revenue assessed during the year, revenue collected and the balance outstanding at the end of the year during the last five years ending 2010-11.

(₹ in crore)

S.No.	Particulars	2006-07	2007-08	2008-09	2009-10	2010-11
1	Balance outstanding at the beginning of the year	5929.25	5749.43	5871.08	5531.59	5608.80
2	Revenue assessed/billed during the year	1329.23	1525.33	1753.19	2025.63 <sup>26</sup>	2510.04
3	Total amount due for realisation (1+2)	7258.48	7274.76	7624.27	7557.22	8118.84
4	Amount realised during the year	1375.83	1394.04	2082.90	1933.95	2418.64
5	Amount written off during the year	133.22	9.64	9.78	14.47	NIL
6	Balance outstanding at the end of the year	5749.43	5871.08	5531.59	5608.80	5700.20
7	Percentage of amount realised to total dues (4/3)	18.95	19.16	27.32	25.59	29.79
8	Arrears in terms of no. of months assessment {Sl.no. 6/Sl.no. 2/12 months)	51.90	46.19	37.86	33.23	27.25

We observed that the balance outstanding of ₹ 5749.43 crore as on 31 March 2007 decreased to ₹ 5700.20 crore as on 31 March 2011. This decrease was due to ₹ 167.10 crore written off during the performance audit period. This indicates that the realisation of dues was unsatisfactory.

The Board stated that the assessment of revenue billed, amount realised and the percentage of total amount realised to total dues has increased in 2010-11 as compared to 2009-10. Also, effective steps like persuasion, issue of notices, disconnection of lines of erring consumers vis a vis filing of certificate, etc had been taken to improve revenue realisation.

<sup>26</sup>

Including ₹ 77.45 crore as prior period adjustment.



***Instances of inefficient revenue billing and collection in various forms are illustrated below:***

### **3.12.2 Non-charging of shunt capacitor charge.**

As per Tariff Order 2006-07 issued by BERC, every LTIS (Low Tension Industrial Service) consumers having contract demand of more than five HP (three HP as per Tariff Order 2008-09 onwards) should have installed shunt capacitor of appropriate capacity failing which a shunt capacitor charge would be charged at the rate of five *per cent* of the billed amount. In ESD Muzaffarpur (Urban), 165 LTIS consumers having aggregate connected load of 2247 HP (all being more than five HP) were getting supply without installation of shunt capacitors of appropriate rating and were not charged the shunt capacitor charge for the period from November 2006 to March 2011. This led to a revenue loss of ₹ 0.26 crore.

The Board stated that the divisions had started charging the shunt capacitor charge from May 2011. However, the Board did not realise the revenue loss of ₹ 0.26 crore pertaining to the period prior to May 2011.

### **3.12.3 Incorrect application of tariff**

**Due to incorrect application of tariff, the Board lost revenue of ₹ 4.84 crore**

As per terms and conditions of HT tariff Clause 6 of Tariff order (November 2006), if a consumer was using transformer having a capacity of more than 150 *per cent* of the contract demand, its contract demand should be increased to 2/3<sup>rd</sup> of the transformer capacity and billed accordingly. A test check of the records for the period April 2006 to March 2011 of four<sup>27</sup> Electric Supply Circles (ESC) revealed that five consumers were using transformers of a capacity of more than 150 *per cent* of their contract demand. But the Board neither increased their contract demand nor billed as per tariff applicable. This resulted in loss of revenue of ₹ 4.84 crore.

The Board stated that two consumers had been charged, case of one consumer was sub-judice and one railway consumer (Divisional Accounts Officer) was allowed to have a stand by transformer. The reply was not acceptable as only railway traction service consumers were allowed to have a stand by transformer as per terms and conditions of HT consumers tariff order. The position of one consumer had not been furnished.

### **3.12.4 Non-Billing**

As per Tariff Order 2008-09, consumers having induction furnace shall be categorized under HTSS category. Further, HTSS consumers were allowed to have a separate rolling mill under the same category. In ESC, Patna an HTSS consumer was found (January 2009) using an Oxygen Plant of load 277 KVA apart from induction furnace and rolling mill for which a separate connection under HTS-I category should have been taken. But no additional agreement (under HTS-I) was made for this load. This resulted in loss of minimum monthly charge (energy charge and demand charge) of ₹ 80.34 lakh for the

<sup>27</sup> ESC Muzaffarpur, ESC Samastipur, ESC Patna and PESU(W).

period February 2009 to April 2011. The connected load was disconnected on 30 April 2011.

The Board stated that the consumer was provisionally allowed to include the load of oxygen plant along with the load of induction furnace and rolling mill. The matter was pending with BERC and after final decision, the matter would be finalised.

### 3.12.5 Loss of revenue due to short assessment and short billing of contract demand - ₹ 2.45 crore

As per Clause 7.4 of Tariff Order, 2008-09, for new connection under HTSS category, the contract demand shall be based on total capacity of the induction furnace and equipment (auxiliary load) as per manufacturer's technical specifications. Consumers having rolling/re-rolling mill in the same premises will have to take additional contract demand for the rolling/re-rolling mill over and above the contract demand required for induction furnace. Further, the billing demand shall be the maximum demand recorded during the month or the contract demand, whichever is higher.

**Short determination of contract demand and short billing of demand charges resulted in a loss of ₹ 2.45 crore**

We observed (January 2011) that load of the electrical installation with effect from January 2009 in the premises of a new HTSS consumer viz. M/s. Gangotri Iron & Steel Company was inspected by the team of the Board in January 2009. As per the Load Inspection Report, the load of the Induction Furnace including load of rolling mill was found to be 15946 KVA<sup>28</sup>. However, as against load of 15946 KVA, ESC, Patna billed the demand charges on the load of 14500 KVA only which resulted in short assessment of contract demand and short billing of demand charges by 1446 KVA. As a result, the Board suffered loss of ₹ 2.45 crore up to April 2011. The connected load had been disconnected on 30 April 2011 (as detailed in *Annexure-17*).

The Board stated that as per technical specification of the induction furnace, the auxiliary load of 1725 KVA was included in the load of the induction furnace and the same was not considered separately for determination of contract demand and billing. The reply was not acceptable as the auxiliary load was not a part of the load of induction furnace. Further, in respect of some other consumers of the same ESC, auxiliary load was considered separately for determination of contract demand and billing.

### 3.12.6 Inordinate delay in serving Energy Bills

In ESC Chapra, a new un-metered electric connection was given (August 2004) to A E, Ganga Project, Sub-division-03 with Contract Demand of 200 KVA. Since there was abnormal delay of more than five and half years in the preparation and submission of Service Connection Report (collected by the

<sup>28</sup> (i) Load of Induction Furnace (2x15MT as per manufacturer's specification)=12221 KVA.  
(ii) Auxiliary Load of equipments=1725 KVA  
Total load of Induction furnace (i+ii)=13946  
Total Load of rolling mill applied by the consumer = 2000 KVA  
Total load which should have been sanctioned (A+B)=15946 KVA.

Circle Office in March 2010), no energy bills were raised on the consumer till March 2010.

Due to non installation of the electric meter in the consumer premises, the first energy bill for the period August 2004 to February 2010 was billed on the Minimum Monthly Guaranteed (MMG) consumption basis and sent by registered post to the consumer's address. The bill was, however, returned by the postal authorities as the consumer was not traceable.

**Inordinate delay in the serving of monthly energy bills resulted in unrealised revenue of ₹ 1.53 crore and loss of interest of ₹ 0.63 crore**

Thus, inordinate delay in the preparation and submission of the Service Connection Report, a careless approach in serving of monthly bills, unavailability of the consumer and failure to disconnect their electricity line resulted in an un-realized revenue of ₹ 1.53 crore.

The Board accepted the facts and intimated that the consumer had been located and ₹ 5.04 lakh was paid by the consumer in April 2011. The fact remained that the Board had suffered an unrealizable loss of interest of ₹ 0.63 crore and arrears of bills were pending realisation.

### **3.12.7 Wrong categorisation of Consumers**

As per Part-A, Clause 2.3 of the tariff order (w.e.f. 01/11/2006), NDS-III category applies only to places of worship and burial/crematorium grounds. Other urban non-domestic consumers with load upto 60 KW come under NDS-II. A test check of records of ESD, Muzaffarpur (Urban) revealed that 20 consumers (mainly hospitals and telecom companies) were wrongly classified as NDS-III instead of NDS-II which led to a revenue loss of ₹ 26.07 lakh (April 2007 to March 2011).

The Board stated that all the consumers have been charged accordingly as per audit advice.

### **3.12.8 Loss due to delay in conversion into HT category**

As per part B of the tariff order (November 2006), consumers having load of 75 KVA and above should be classified under HTS. A test check of records of six<sup>29</sup> ESDs revealed that 13 NDS-II consumers were detected using load in excess of 67.5 KW (i.e.75 KVA). However, their loads were not regularized from NDS-II to HTS-I within one month. Due to non conversion of load in specified category, the Board suffered a revenue loss of ₹ 1.98 crore (April 2006 to March 2011).

The Board accepted the facts and stated that few consumers had been converted into HTS-1 and the process of conversion in case of other consumers was in progress.

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<sup>29</sup> ESD Kankarbagh, ESD Muzaffarpur(U), ESD Danapur, ESD Bankipur, ESD Dakbungalow, ESD Banka and NC Divison, Patna.

**Non-disconnection of supply of defaulting consumers resulted in accumulation of arrears of ₹ 245.98 crore**

### 3.12.9 Non-disconnection of supply of consumers with huge arrears

As per Bihar Electricity Supply Code, 2002 and 2005, in case the electricity dues were not deposited by the consumer within due date indicated in the bill, the supply would be disconnected temporarily. We observed that, in seven ESD<sup>30</sup> and one ESC (Muzaffarpur) of the Board, 3514 consumers had arrears of more than ₹ one lakh each, did not make payment of electricity dues for eight to 30 months but their supplies were not disconnected in violation of the above provisions. Non-disconnection of supply of these defaulting consumers resulted in accumulation of arrears of ₹ 245.98 crore (March 2011).

The Board while accepting the facts replied that the consumers having dues above ₹ one lakh were being disconnected regularly under all divisions. However, the Board has not taken any steps to realise the arrears of energy bills so far (November 2011).

### 3.12.10 Failure to finalise Permanent Disconnection cases

In five ESDs<sup>31</sup>, 1556 consumers had arrears of more than ₹ one lakh each did not deposit their dues for 10 to 36 months. The supplies of these consumers were disconnected temporarily and billing was stopped. The Board neither disconnected the supply permanently nor finalized the accounts of these consumers. This resulted in non-realisation of arrears amounting to ₹ 52.86 crore (March 2011).

The Board accepted the facts and replied that action for realisation of dues vis-à-vis permanent disconnection of consumers who were not making the payment of admitted dues was being taken.

## 3.13 Financial position and working results

One of the major aims and objectives of the National Electricity Policy of 2005 was to ensure financial turnaround and commercial viability of the electricity sector. The financial position of the Board for the past five years ending 2010-11 was as given below:

<sup>30</sup> ESD Muzaffarpur (Urban), ESD Muzaffarpur(East), ESD Bihta, ESD Danapur, ESD Fatuha, ESD Bankipur and ESD NC, Patna.

<sup>31</sup> ESD Muzaffarpur(Urban), ESD Muzaffarpur (East), ESD Bihta, ESD Fatuha and ESD Bankipur.

(₹ in crore)					
Particulars	2006-07	2007-08	2008-09	2009-10	2010-11 (provisional)
<b>A. Liabilities</b>					
Paid up Capital	Nil	Nil	Nil	Nil	Nil
Reserves & Surplus (including Capital Grants but excluding Depreciation Reserve)	Nil	Nil	Nil	Nil	Nil
Borrowings (Loan Funds)					
Loans from Government	5577.62	5764.95	6151.01	6493.65	8493.88
Capital liabilities	3829.17	4423.27	5616.64	6763.89	8223.35
Current Liabilities & Provisions	2812.26	3049.34	3302.59	3738.72	3832.13
<b>Total</b>	<b>12219.05</b>	<b>13237.56</b>	<b>15070.24</b>	<b>16996.26</b>	<b>20549.36</b>
<b>B. Assets</b>					
Gross Block	2242.42	2418.34	2556.51	2864.80	3856.07
Less: Depreciation	1630.81	1684.44	1740.85	1800.57	1883.35
Net Fixed Assets	611.61	733.89	815.66	1064.23	1972.72
Capital works-in-progress	833.97	808.73	934.09	881.20	1282.04
Investments	415.02	503.94	899.78	829.57	1471.48
Subsidy receivable from State Government	4315.65	4315.65	4315.65	4315.65	4315.65
Current Assets, Loans and Advances	4454.48	4702.33	4927.47	5316.13	5626.61
Assets not in use	3.61	3.61	3.61	3.61	Nil
Regulatory Assets	60.00	60.00	60.00	60.00	60.00
Accumulated losses	1524.71	2109.41	3113.98	4525.87	5820.86
<b>Total</b>	<b>12219.05</b>	<b>13237.56</b>	<b>15070.24</b>	<b>16996.26</b>	<b>20549.36</b>
<b>Debt : Equity</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>
<b>Net Worth</b>	<b>(-) 1524.71</b>	<b>(-) 2109.41</b>	<b>(-) 3113.98</b>	<b>(-) 4525.87</b>	<b>(-) 5820.86</b>

The following observations are made:

- The accumulated losses of the Board had increased by 281.77 *per cent* from ₹ 1524.71 crore in 2006-07 to ₹ 5820.86 crore in 2010-11.
- The borrowings (loan from Government) increased from ₹ 5577.62 crore in 2006-07 to ₹ 8493.88 crore in 2010-11. As there was negative growth in net worth, the Board was facing cash deficit and dependent mainly on borrowings to implement the various schemes and other activities. The subsidy receivables of ₹ 4315.65 crore pertained to the period prior to the year 2006-07 (accumulated) was not released by the State Government even after expiry of more than five years.

### 3.13.1 Working results

The table summarizes the working results of the Board for the past five years period from 2006-07 to 2010-11.



(₹ in crore)						
Sl.No.	Description	2006-07	2007-08	2008-09	2009-10	2010-11 (provisional)
<b>1.</b>	<b>Income</b>					
(i)	Revenue from Sale of Power	1275.94	1464.22	1675.56	1861.52	2409.69
(ii)	Revenue subsidy & grants	720	720	720	840	1080.00
(ii)	Other income	116.32	124.04	89.74	94.37	118.85
	<b>Total Income</b>	<b>2112.26</b>	<b>2308.26</b>	<b>2485.30</b>	<b>2795.89</b>	<b>3608.54</b>
<b>2.</b>	<b>Distribution (In MUs)</b>					
(i)	Total power purchased and generated	8215.77	8264.12	8904.25	10205.99	11198.25
(ii)	Less: Transmission losses and auxiliary consumption	300.85	302.82	319.56	369.41	315.39
(iii)	Net Power available for Sale	7914.92	7961.30	8584.69	9836.58	10882.86
(iv)	Less: Sub-transmission & distribution losses	3373.24	3109.74	3260.05	3769.36	4743.72
	<b>Net power sold</b>	<b>4541.68</b>	<b>4851.56</b>	<b>5324.64</b>	<b>6067.22</b>	<b>6139.14</b>
<b>3.</b>	<b>Expenditure on Distribution of Electricity</b>					
<b>(a)</b>	<b>Fixed cost</b>					
(i)	Employees cost	459.73	471.31	537.00	479.92	488.82
(ii)	Administrative and General expenses	18.95	23.98	30.04	30.06	34.74
(iii)	Depreciation	36.49	38.73	42.31	46.38	72.01
(iv)	Interest and finance charges	597.07	608.29	631.22	672.16	747.02
(v)	Other Expenses					
	<b>Total fixed cost</b>	<b>1112.24</b>	<b>1142.31</b>	<b>1240.57</b>	<b>1228.52</b>	<b>1342.59</b>
<b>(b)</b>	<b>Variable cost</b>					
(i)	Purchase of Power <sup>32</sup>	1493.90	1626.77	1920.85	2529.46	3236.93
(ii)	Electricity Duty					
(iii)	Transmission/ Wheeling Charges					
(iv)	Repairs & Maintenance	15.73	19.97	26.55	39.30	43.54
	<b>Total variable cost</b>	<b>1509.63</b>	<b>1646.74</b>	<b>1947.40</b>	<b>2568.76</b>	<b>3280.47</b>
<b>(c)</b>	<b>Total cost 3(a) + (b)</b>	<b>2621.87</b>	<b>2789.05</b>	<b>3187.97</b>	<b>3797.28</b>	<b>4623.06</b>
4.	Realisation (₹ per unit) (including revenue subsidy)	4.65	4.76	4.67	4.61	5.88
5.	Fixed cost (₹ per unit)	2.45	2.35	2.33	2.02	2.19
6.	Variable cost (₹ per unit)	3.32	3.39	3.66	4.23	5.34
7.	Total cost per unit (in ₹) (5+6)	5.77	5.74	5.99	6.25	7.53
8.	Contribution (4-6) (₹ per unit)	1.33	1.37	1.01	0.38	0.54
9	Profit (+)/Loss(-) per unit (in ₹) (4-7)	(-)1.12	(-)0.98	(-)1.32	(-)1.64	(-)1.65

It may be seen from the above, that the realisation per unit had increased from ₹ 4.65 to ₹ 5.88 during performance audit period (26.45 per cent) and at the same time the cost per unit had also increased from ₹ 5.77 to ₹ 7.53 (30.50 per cent).

32

Total power purchased includes net power generated at BTPS.

The contribution per unit had decreased by 59.40 *per cent* during the period 2006-2011.

There was a revenue gap of ₹ 509.61 crore in 2006-07 (including revenue subsidies & grants), which had increased to ₹ 1014.52 crore in 2010-11. The higher cost of sale of energy was mainly due to increase in cost of purchase of power and interest and finance charges as compared to its revenue from the sale of power. The Board was also required to take remedial measures to reduce T&D losses and to increase its operational efficiency, so as to reduce the loss per unit.

### 3.14 Financial Management

The financial viability of the Board was generally influenced by the various factors such as

- Filing of Aggregate Revenue Requirement (ARR) and revision of tariff.
- Adequacy of tariff to cover the cost of operation;
- Timely release of promised subsidy by the Government; and
- Cross subsidization policy of the Government and its implementation by the Board.

Each of these factors has been discussed in the following paragraphs.

#### 3.14.1 Filing of ARR

The tariff structure of the Board was subject to revision approved by the BERC after the objections, if any, received against ARR petition filed by them within the stipulated date. The Board was required to file the ARR for each year at least 136 days before the commencement of the respective financial year i.e. by 15 November of each year for the next financial year. The BERC approves the application filed by the Board with such modifications/conditions as may be deemed just and appropriate and after considering all suggestions and objections from public and other stakeholders. The table below indicates the position of filing of ARR for the period 2006-07 to 2010-11.

Year	Due date of filing	Actual date of filing	Delay in days	Date of approval	Effective date
2006-07	15/11/2005	04/08/2006	262	29/11/2006	01/11/2006
2007-08	15/11/2006	18/12/2007	399	Not Approved	-
2008-09	15/11/2007	14/02/2008	91	26/08/2008	01/09/2008
2009-10	15/11/2008	09/10/2009	329	Not Approved	-
2010-11	15/11/2009	03/02/2010	80	06/12/2010	01/12/2010

**Delay in filing of ARR resulted in the Board suffering an aggregate loss of ₹ 963.85 crore**

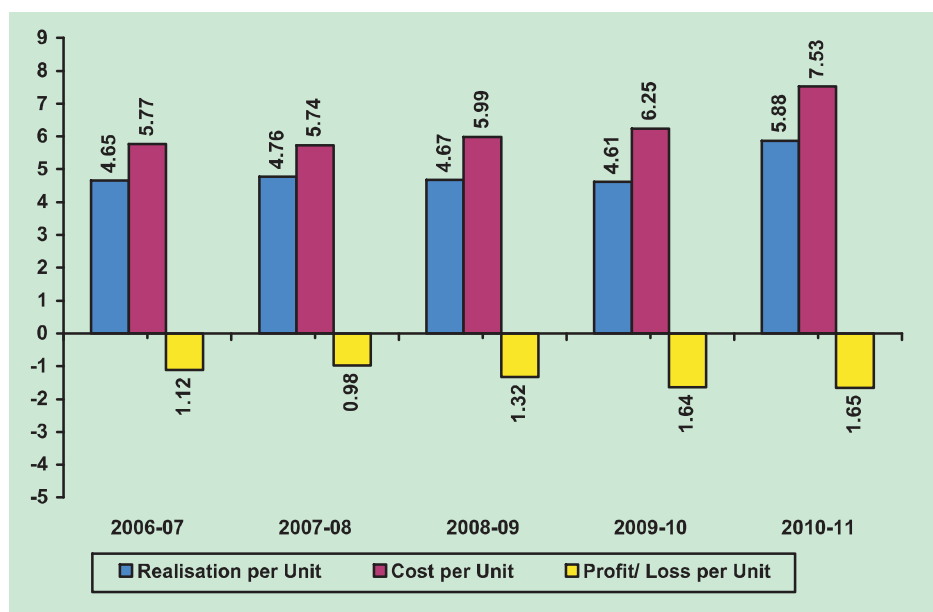
It was observed that there were delays in the filing of ARR each year ranging from 80 to 399 days leading to disallowance of ARR in 2007-08 and 2009-10. The filing of tariff was affected mainly due to inordinate delay in compilation of requisite information and rejections of filed tariff petition by BERC in the absence of submission of complete information. Belated filing of ARR also

caused delay by five to eight months in approval of the tariff revision which resulted in loss of an aggregate revenue of ₹ 963.85 crore<sup>33</sup> to the Board during the period 2006-07 to 2010-11.

The Board stated that delay in filing of tariff petition was mainly due to lack of institutional arrangement and expertise. A professional consultant had been appointed and true-up petitions for financial years 2006-09, review petition for 2010-11 and ARR for FY 2012-13 have been prepared. The Board had filed a claim in true-up petition of a realisable revenue of more than ₹ 8000 crore for the period under reference.

### 3.14.2 Recovery of cost of operation

Cost of operation and income generated per unit of power sold during the last five years ending 31 March 2011 are given below:-



It may be seen from the above depiction that the Board was not able to recover its cost of operations as the realisation per unit was always below the cost per unit which led to increase in loss per unit from ₹ 1.12 to ₹ 1.65 during 2006-07 to 2010-11.

Detailed analysis revealed that the tariff was lower than breakeven levels (in percentage terms) of revenue from sale of power at the present level of operations and efficiency for the last five years ending 31 March 2011 as shown in the table below:

<sup>33</sup> ₹ 107.79 crore in 2006-07, ₹ 114.15 crore in 2007-08, ₹ 13.95 crore in 2008-09, ₹ 694.91 crore in 2009-10 and ₹ 33.05 crore in 2010-11.

(₹ in crore)

Year	Sales (excluding subsidy)	Variable costs	Fixed costs	Contribution	Deficit in recovery of fixed costs	Deficit as percentage of sales
(1)	(2)	(3)	(4)	(5) = (2) – (3)	(6) = (4) – (5)	(7) = {(6)/ (2)} X 100
2006-07	1275.94	1509.63	1112.24	(233.69)	1345.93	105.49
2007-08	1464.22	1646.74	1142.31	(182.52)	1324.83	90.48
2008-09	1675.56	1947.40	1240.57	(271.84)	1512.41	90.26
2009-10	1861.52	2568.76	1228.52	(707.24)	1935.76	103.99
2010-11	2409.69	3280.47	1342.59	(870.78)	2213.37	91.85

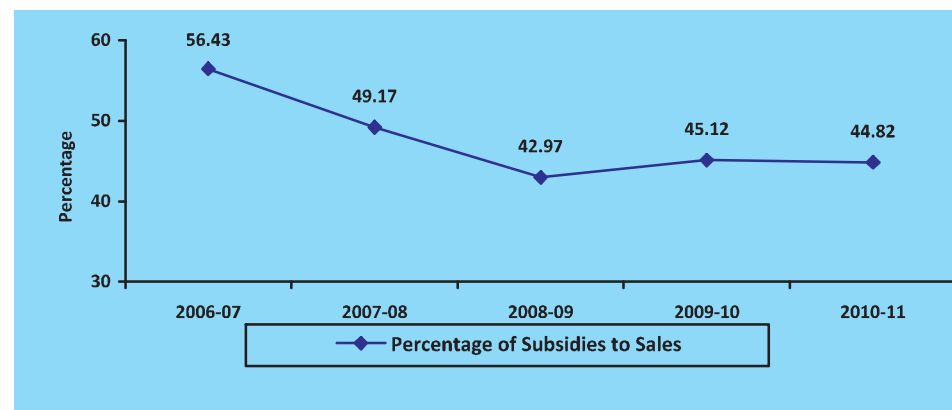
It could be seen from above table that contribution was always negative and increased from ₹ 233.69 crore to ₹ 870.78 crore (272.62 per cent) during 2006-11 which resulted into non-recovery of cost of sales of power. Against 88.86 per cent increase in sales during 2006-11, the corresponding increase in variable cost and fixed cost was 117.30 per cent and 20.71 per cent respectively. Steep rise in variable cost was attributable to rise in cost of power purchase. Non-revision of tariff and non-receipt of subsidy in terms of tariff from State Government were the major reasons for non-recovery of variable cost.

The cost could have been recovered by improving operational efficiency, viz., reduction in /control of AT & C losses, conversion of LT lines to HT lines, metering of unmetered connections/ defective meters, improving billing and collection efficiency, etc., which have been discussed separately in this performance audit. Further, reduction of cross subsidisation among various categories of consumers might also help in improving the position as discussed in subsequent paragraphs.

### 3.14.3 Subsidy support

As per Section 65 of the Electricity Act, 2003, the Government was required to pay, in advance, the subsidy element to the Board so that their operation was not adversely affected.

The graph below indicates revenue subsidy support from State Government (against concessional tariff) as a percentage of sales<sup>34</sup> for the last five years ending 31 March 2011.



<sup>34</sup> The figures here is excluding revenue subsidy from State Government for concessional tariff.

The subsidy support from the Government in terms of percentage of sales had been decreasing during the period 2006-07 to 2010-11 except in 2009-10. The percentage of revenue subsidy ranged between 42.97 and 56.43 which was a matter of concerns as the subsidy might be withdrawn over a period of time in a phased manner so that tariff would cover average cost of supply to consumers. Further, the details of subsidy during the last five years ending March 2011 are given below:-

(₹ in crore)					
Particulars	2006-07	2007-08	2008-09	2009-10	2010-11 (provisional)
Opening balance	4315.65	4430.52	4583.80	4662.5	4732.58
Add: Due from State Government during the year	834.87	873.28	798.7	910.08	1080
Less: Received during the year	720	720	720	840	1080
Closing balance	4430.52	4583.80	4662.5	4732.58	4732.58

During the period 2006-07 to 2010-11, against the subsidy claims of ₹ 4,496.93 crore, the State Government had released subsidy of ₹ 4,080 crore. There was shortfall of ₹ 416.93 crore of subsidy released and also subsidy of ₹ 4,315.65 crores pertained to the period prior to 2006-07 was pending realisation. As a result, to finance its operation, the Board had to resort to borrowings from Government which had increased from ₹ 5,577.62 crore (2006-07) to ₹ 8,493.88 crore (2010-11).

#### 3.14.4 Cross Subsidization policy of the Government and its implementation

Section 61 of the Electricity Act, 2003, stipulates that the tariff should progressively reflect the average cost of supply (ACOS) of electricity and also reduce cross subsidy in a phased manner. National Tariff Policy also envisaged that the tariff of all categories of consumers should range within plus or minus 20 per cent of the ACOS by the year 2010-11. The position in this regard over the performance audit period as per approved tariff is indicated in *Annexure-18*.

It may be seen from the *Annexure-18* that the target envisaged in the National Tariff Policy was not achieved, as the percentage of cross subsidy were in the range of 12.22 to 91.17 over the performance audit period, while agricultural category remained highly subsidised between 73.26 per cent and 91.17 per cent of ACOS. Railway traction was the least subsidised between 20.69 per cent and 32.10 per cent of ACOS. Cross subsidy of interstate sale of power was 12.22 per cent in 2008-09.

### 3.15 Consumer Satisfaction

One of the key elements of the Power Sector Reforms was to protect the interest of the consumers and to ensure better quality of service to them. The consumers often face problems relating to supply of power such as non-availability of the distribution system for the release of new connections or



extension of connected load, frequent tripping on lines and/ or transformers and improper metering and billing.

The Board was required to introduce consumer friendly actions like introduction of computerized billing, online bill payment, establishment of customer care centres, etc. to enhance satisfaction of consumers and reduce the advent of grievances among them. The billing issues have already been discussed in preceding paragraphs. The redressal of grievances is discussed below.

### 3.15.1 Redressal of Grievances

The BERC specified the mode and time frame for redressal of grievance in Consumer Grievance Redressal Forum and Electricity Ombudsman Regulations 2006 in pursuance of the Electricity Act 2003. The Commission had also prescribed the Standards of Performance for the Board in which the time limit for rendering services to the consumers and compensation payable for not adhering to the same were provided. The nature of services contained in the Standards *inter-alia* include line breakdowns, Distribution Transformer failures, period of load shedding/ scheduled outages, voltage variations, meter complaints, installation of new meters/ connections or shifting thereof, etc. Two separate wings viz. (i) Public Grievance (PG) cell and (ii) Consumer Grievance Redressal Forum (CGRF) were constituted for redressal of consumer grievances.

To enable the compilation of complaints for assessing the performance on this account, separate registers were maintained by the Board. The above provisions were applicable to the Board since April 2007 (date of notification). However, the BERC granted one year exemption from compliance of above provisions to the Board. The overall position as regard receipt of complaints and their clearances is depicted in the table below.

(number in lakh)				
S.No.	Particulars	2008-09	2009-10	2010-11 <sup>35</sup>
1.	Total complaints received	3.14	3.35	3.05
2.	Complaints redressed within time	2.59	2.43	2.57
3.	Complaints redressed beyond time	0.20	0.40	0.15
4.	Pending complaints	0.35	0.52	0.33
5.	Percentage of complaints redressed beyond time to total complaints	17.52	27.46	15.74

Though there was improvement in complaint redressal during 2010-11 (84.26 *per cent* complaint were redressed within time), the Board should adhere to prescribed time schedule in this regard.

The BERC also directed (April 2007) the Board to submit quarterly/ annual information on Standards of Performance.

<sup>35</sup> Excluding Electric Supply Circles Darbhanga, Muzaffarpur, Munger, Patna and Saharsa.

We observed:

- During 2009-10, 11 out of 16 circles could not achieve their targeted performance level (95 *per cent*) fixed by BERC with respect to replacement of failed transformers.
- During 2010-11, nine out of 11 circles could not achieve their targeted performance level (99 *per cent*) fixed by BERC with respect to correction of billing mistakes.
- During 2010-11, out of 9712 complaints (in 11 circles) regarding new connections where extension of distribution mains was required, only 925 complaints (9.52 *per cent*) were redressed within stipulated time.

### **3.16 Energy Conservation**

Recognising the fact that efficient use of energy and its conservation is the least-cost option to mitigate the gap between demand and supply, the GOI enacted the Energy Conservation Act, 2001. The conservation of energy being a multi-faceted activity, the Act provides both promotional and regulatory roles on the part of various organizations. The promotional role includes awareness campaigns, education and training, demonstration projects, R & D and feasibility studies. The regulatory role includes framing rules for mandatory audits for large energy consumers, devising norms of energy consumption for various sectors, implementation of standards and provision of fiscal and financial incentives.

We observed that despite direction issued vide Tariff Order 2006-07 by BERC regarding measures to be implemented for energy conservation, the Board did not formulate any energy conservation policy during 2006-07 to 2010-11. The Board did not initiate any of the promotional measure such as financial incentives for energy conservation measure, energy conservation awards, incentive for encouraging reduction of T & D loss, popularising the use of non conventional energy sources such as solar water heater etc. The Board also did not initiate any awareness campaigns for energy conservation of demand side.

Further, as per Energy Conservation Act, 2001, there was mandatory provision for implementation of energy conservation Building codes for new commercial building having connected load of 500 KW or more. However, the Board did not implement the energy conservation Building codes.

### **3.17 Energy accounting and Audit**

A concept of comprehensive energy audit was put in place with the objective of identifying the areas of energy losses and take steps to reduce the same through system improvements besides accurately accounting for the units purchased/ sold and losses at each level. The main objectives of energy audit are as follows:

- Better and more accurate monitoring of the consumption of electricity by consumers;
- Elimination of wastages;

**Due to non-installation of meters in the distribution system, the Board failed to commence Energy Audit**

- Reduction of downtime of equipment;
- Massive savings in operational costs and increase in revenue, etc.

Scrutiny of records revealed that the Board could not install system meters completely in the distribution side (11 KV feeder as well as in DTRs). As against 16 Circle, System metering was installed in 12 Circle only. As against total number of 43491 DTRs, meters were installed in 16035 DTRs. Thus, due to non-installation of meters in the distribution system, the Board failed to commence Energy Audit during 2006-07 to 2010-11.

Further, the Board had only prepared monthly energy Accounting Report which was based on the meter reading available and energy supplied from Grid Sub-station (220/132KV) to Power Sub-station (33KV) for calculation of transmission losses. No energy accounting reports were prepared for accounting of energy supplied at 11KV or LT side for calculation of distribution losses.

### 3.18 Monitoring by Top Management

The Board plays an important role in the State economy. For such a giant organization to succeed in operating economically, efficiently and effectively, there has to be a Management Information System (MIS) for monitoring by top management. The Board had developed (March 2010) a comprehensive MIS system comprising all the substantial areas of Generation, Transmission and Distribution system

It was noticed that there was no effective MIS during the period 2006-07 to 2009-10. Following observations were made:

- As discussed earlier, the Board could not collect and compile the required information for preparation of ARR in time, leading to delay in submission of ARR to BERC. The delay in filling of ARR ranged from 80 to 399 days during the performance audit period. As a result, the Board suffered revenue loss of ₹ 963.85 crore during the performance audit period.
- No target for failure of transformers was set by the Board during the performance audit period. The maintenance schedule for transformer, basic records such as census of transformers, history card were not being maintained. In absence of proper monitoring system, the damage rate of transformer increased continuously from 10.4 *per cent* to 17.46 *per cent* during period 2006-07 to 2010-11.
- The Board could not reduce AT & C losses and T&D losses which increased to 42.79 and 43.59 *per cent* respectively during 2010-11 from 37.54 and 38.32 *per cent* respectively during 2009-10.
- The Board realized only 18.95 *per cent* to 25.86 *per cent* of total outstanding revenue during performance audit period which indicated poor monitoring system on revenue realization.

- The Board did not fix any target for conducting raids for STF. The percentage of raid ranged between 0.08 and 0.24 against total consumers during the performance audit period.

### Conclusion

Planning for creation of additional infrastructure was deficient as it was done without considering the area wise future load growth which resulted in mismatch between transformation capacity and connected load.

Board's performance in rural electrification was very poor as it could electrify only 41 *per cent* of the targeted villages for electrification during the review period. It could spend only 44 *per cent* of the funds allotted and kept ₹ 320 crore unspent. Due to poor contract management, lack of monitoring and inefficient execution of projects, the projects were delayed and suffered cost over run and the Board could not derive the desired benefit of the schemes.

Performance of the Board in consumer metering was not encouraging as the target of consumer metering was not achieved in any of the years. Out of total consumers of 35 lakh, 10.24 lakh consumers were un-metered while 1.28 lakh consumers were with defective meters. Board failed to make the correct assessment of power purchase. Due to drawal of power under UI, the Board incurred an extra expenditure. The operations carried out by the Board were not efficient as the Board failed to reduce T&D losses. There were continuous increase in DTR failure rate and delay in providing new connections. Due to lack of co-ordination between STF & concerned divisions raids did not yield desired result.

Board did not submit ARR in time and cross subsidization was beyond the norms. Billing of the energy consumed was not efficient and as a result, the Board suffered revenue loss due to short/non billing, incorrect application of tariff, wrong categorization of consumers, etc. Revenue collection was also poor as there were ₹ 5,700 crore outstanding for collection.

Board failed to redress the grievances of the consumers within stipulated time schedule especially in case of replacement of burnt transformer and providing new connections. As the system metering was not done in all the supply circles, the energy accounting with respect to 11 KV feeders and DTRs could not be started despite installation of system meters on feeders and DTRs. No significant action was taken towards awareness of energy conservation.

### Recommendations

- Planning for creation of additional infrastructure should be done on the basis of the past load growth trends, current load and projected load growth in future to make the system equally efficient and to reduce the gap between transformation capacity and connected load in all circles. The Board may accelerate the

process of rural electrification by spending the funds made available for the purpose.

- Effective contract management and regular monitoring of execution of projects and schemes should be done to avoid delay and cost over run. The Board may endeavour to achieve maximum of consumer metering.
- The Board should implement effective measures to reduce the T&D losses in phased manner.
- Correct application of the Tariff Orders should be ensured in the billing system and the Board should be prompt in realisation and collection of outstanding dues.
- The Board should ensure the filing of ARR in time so as to reduce losses due to delayed implementation of new rates.
- The Board should ensure the installation of system meters in all the Supply Circles so that the Energy Audit could be started and at the same time the Board should initiate awareness campaign regarding Energy Conservation.