

## Chapter II

### Performance Audit relating to Government Companies

#### Rajasthan Rajya Vidyut Utpadan Nigam Limited

##### 2.1 Power Generation Activities

###### Executive summary

Power is an essential requirement for all facets of life and has been recognised as a basic requirement. In Rajasthan, the generation of power is managed by the Rajasthan Rajya Vidyut Utpadan Nigam Limited (RRVUNL), which was incorporated on 19 June 2000 as per the Rajasthan Power Sector Reforms Transfer Scheme 2000 under the administrative control of the Energy Department of the Government of Rajasthan. As on 31 March 2010, RRVUNL had four thermal generation stations and 12 hydro generation stations with installed capacity of 2,930.50 MW and 163.85 MW respectively. The turnover of RRVUNL was ₹ 5,101.12 crore in 2008-2009, which was equal to 29.13 and 2.66 per cent of the State PSUs turnover and State Gross Domestic Product respectively. It employed 3,492 employees as on 31 March 2010.

###### **Capacity Addition and Project Management**

Against the envisaged capacity addition of 3,020 MW to meet the energy generation requirement in the State during 2005-10, the actual addition was 2,519.82 MW. Though 1,525 MW of capacity was planned to be added by RRVUNL during the five years ending March 2010, the actual addition was only 525 MW leaving a deficit of 1,000 MW. The State was not in position to meet the demand as the power generated as well as purchased fell short to the extent of 678.02 MUs to 2,693.10 MUs during 2005-10 due to non-commencement of commercial production by the newly established generation stations/ units as per the scheduled plan.

The nine units taken up for implementation during the review period were not completed within scheduled time. The slippage in time schedule were due to delay in signing of gas supply agreement for Gas based plant, finalisation and approval of drawings, execution of work of main plant by

BHEL, providing input from Balance of Plant contractors/RRVUNL etc. Three units could not be commercially operated even after synchronization due to technical problems which could not be resolved till September 2010. Time overrun varied from 12.5 to 48 months in commercial operation of projects, which led to cost overrun amounting to ₹ 1,133.44 crore.

###### **Contract Management**

During 2005-10, contracts valuing ₹ 5,121.35 crore were executed. RRVUNL failed to recover liquidated damages of ₹ 222.34 crore being the penalty for the delay in commissioning of the projects. RRVUNL also failed to impose penalty for extra cost of dismantling and rework at SSTPS-Unit VI and thus had to bear an extra cost of ₹ 1.95 crore due to modification in approved drawings which could have been avoided.

###### **Operational Performance**

Performance of the existing generation stations depends on efficient use of material, manpower and capacity of the plants so as to generate maximum energy possible without affecting the long term operations of the plants. Audit scrutiny of operational performance revealed the following:

###### **Procurement of fuel**

Short receipt of coal (14.91 per cent) against the total linkage approved by Standard Linkages Committee during the four years upto 2008-09 led to shortfall in achievement of the generation targets by 3,289 MUs in the TPSs valued at ₹ 777.99 crore. In absence of any agreement with the coal companies from May 2002 to August 2009, RRVUNL failed to procure allotted quantity of coal. Similarly, short receipt of gas at DCCPP resulted in shortfall in achievement of the

generation targets by 23.86 MUs valued at ₹ 6.34 crore.

### **Consumption of fuel**

Use of coal having less gross calorific value coupled with Station Heat Rate (SHR) above the Rajasthan Electricity Regulatory Commission (RERC) norms and leakages of steam in the ageing units of power plants caused excess consumption of coal to the tune of 38.34 lakh MT (₹ 892.12 crore) during 2005-10. Similarly, in case of gas based DCCPP, SHR in excess of RERC norms led to excess consumption of 18.03 MMSCM of gas valued at ₹ 16.73 crore.

### **Deployment of Manpower**

RRVUNL had 3,492 employees as on 31 March 2010. The deployment of manpower was not rational as the manpower deployed at gas based and hydro power station was in excess of the norms fixed by CEA whereas the manpower at coal based power stations was inadequate.

### **Plant Load Factor**

The PLF of KSTPS, SSTPS and DCCPP was above the national average of 77.2 per cent but the PLF of RGTPS, was lower (36 per cent than the national average in 2008-09) due to non availability of gas. The estimated shortfall in generation as compared to national average PLF works out to 1,782.93 MUs during 2005-10 resulting in loss of contribution amounting to ₹ 46.36 crore. Decline in PLF of hydro power projects was due to less availability of water.

### **Outages**

The total number of hours lost due to planned outages increased from 7,718 hours in 2005-06 to 8,528 hours in 2009-10. The unit wise analysis of planned outages revealed that total 4,800 hours were lost in excess of annual all India average. The forced outages remained less than the norm of 10 per cent fixed by CEA in all the five years, but it increased by 4.42 to 99.23 per cent during 2006-10 as compared to the year 2005-06.

### **Auxiliary Consumption**

The actual auxiliary consumption at RGTPS was more than the norms fixed by RERC during the period under review resulting in loss of generation of 76.53 MUs valuing ₹ 18.11 crore.

### **Financial Management**

Dependence on borrowed funds increased from ₹ 4,723.23 crore in 2005-06 to ₹ 7,521.25 crore

(59.24 per cent) in 2008-09, which resulted in interest burden of ₹ 360.86 crore. Heavy capital expenditure coupled with interest commitment on loans without adequate returns due to delay in commercial operation of the plants caused significant increase in cost of operations. RRVUNL's own inclination for equity support of 20 per cent of project cost as against 30 per cent prescribed by CERC caused short receipt of equity support from the State Government by ₹ 433 crore.

### **Environmental Issues**

RRVUNL could not get registered its Gas based DCCPP under Clean Development Mechanism and consequently could not earn Certified Emission Reduction. Further, it did not initiate any action for washing of 117.28 lakh MT of high ash content coal (weighted average of ash ranged between 35.85 and 39.01 per cent) before use to meet the MOE&F norm of less than 34 per cent ash. KSTPS and SSTPS neither installed adequate silencing equipments nor installed noise monitoring equipment to record noise levels.

### **Conclusion and Recommendations**

RRVUNL could not keep pace with growing demand of power in the State due to non-commencement of commercial production by the newly established generating stations/ units as per their scheduled plan. The project management was ineffective as there were instances of time and cost overrun in all the projects taken up during 2005-10. Delay in completion also caused significant increase in interest cost during construction period. Operational performance of the plants was adversely affected due to short receipt as well as inferior quality of coal/gas, low heat rate causing excess consumption of coal/gas. Further though plant load factor, plant availability and capacity utilization remained higher than the national average level, there was a declining trend since 2007-08 due to increase in forced outages and auxiliary consumption. Heavy capital expenditure coupled with interest commitment on loans without adequate returns due to delay in commercial operation of the plants caused significant increase in cost of operations. The top management did not take corrective measures to ensure adherence to norms/targets in respect of input efficiency parameters. The review contains seven recommendations which include effective planning and monitoring, ensuring consumption of coal/gas within the prescribed norms, minimise forced outages and auxiliary consumption and ensure compliance to environmental laws, etc.

## Introduction

**2.1.1** Power is an essential requirement for all facets of life and has been recognized as a basic requirement. The availability of reliable and quality power at competitive rates is very crucial to sustain growth of all sectors of the economy. The Electricity Act 2003 provides a framework conducive to development of the Power Sector, promote transparency and competition and protect the interests of the consumers. In compliance with Section 3 of the *ibid* Act, the Government of India (GOI) prepared the National Electricity Policy (NEP) in February 2005 in consultation with the State Governments and Central Electricity Authority (CEA) for development of the Power Sector based on optimal utilisation of resources like coal, gas, nuclear material, hydro and renewable sources of energy. The Policy, *inter alia*, aims at laying guidelines for accelerated development of the Power Sector. It also requires CEA to frame National Electricity Plan once in five years. The Plan would provide short term framework for five years and give a 15 years' perspective.

During 2005-06, electricity requirement in Rajasthan was assessed at 32,052 Million Units (MUs) of which only 31,373.98 MUs were available leaving a shortfall of 678.02 MUs, which works out to 2.12 *per cent* of the total requirement. The total installed power generation capacity in the State of Rajasthan as on 1 April 2005 was 5,248.64 Mega Watt (MW) and effective available capacity was 4,414 MW against the peak demand of 4,786 MW leaving deficit of 372 MW. As on 31 March 2010, the comparative figures of requirement and availability of power were 44,031 and 41,337.90 MUs with deficit of 2,693.10 MUs (6.12 *per cent*) while the installed capacity was 7,768.46 MW and effective available capacity was 6,859 MW. Thus, there was a growth in demand of 11,979 Million Units (MUs) during review period against which only 9,963.92 MUs were additionally available. The capacity addition during the review period was 2,519.82 MW.

In Rajasthan, generation of power is managed by Rajasthan Rajya Vidyut Utpadan Nigam Limited (RRVUNL), which was incorporated on 19 June 2000 under the administrative control of the Energy Department of the Government of Rajasthan as per the Rajasthan Power Sector Reforms Transfer Scheme 2000. The Management of the RRVUNL is vested with Board of Directors comprising Chairman & Managing Director (CMD), one full time functional Director and six non functional Directors appointed by the State Government. The day-to-day operations are carried out by the CMD, who is the Chief Executive of the RRVUNL, with the assistance of Director Finance and Chief Engineer (Planning Procurement Construction & Fuel) at the Head office. The CMD is being assisted by the respective Chief Engineers for construction, operation and maintenance activities at power stations. As on 31 March 2010, the RRVUNL had four thermal generation stations and twelve hydro generation stations with installed capacity of 2,930.50 and 163.85 MW, respectively. Further, two thermal generation stations of 750 MW capacity were under commissioning as on 31 March 2010. The details of the generation stations are given in **Annexure 7**. The turnover of the RRVUNL was

₹ 5,101.12 crore in 2008-2009, which was equal to 29.13 and 2.66 *per cent* of the State PSUs turnover and State Gross Domestic Product during that year, respectively. It employed 3,492 employees as on 31 March 2010.

Two reviews on Fuel Management and one review on Construction of Giral Lignite Power Project Phase-I of the RRVUNL were included in the Reports (Commercial) of the Comptroller and Auditor General of India for the year 2003-04, 2008-09 and 2007-08, Government of Rajasthan respectively. The Reports for the year 2003-04 and 2007-08 were discussed by COPU in June 2007 and July 2010 respectively. The recommendations of COPU are awaited (September 2010). The Report for the year 2008-09 is yet to be discussed by COPU (September 2010).

### Scope and Methodology of Audit

**2.1.2** The present review conducted during January 2010 to May 2010 covers the performance of the RRVUNL for the years 2005-06 to 2009-10. The review mainly deals with Planning, Project Management, Financial Management, Operational Performance, Environmental Issues and Monitoring by Top Management. The audit examination involved scrutiny of records at the Head Office and six\* out of total 18 generating stations. The units were selected for detailed study where the capacity addition has been made or was planned to be made during the period under review. Apart from it, one Hydro Power station based on its higher generating capacity was also selected for detailed study. Thus, coverage in terms of capacity was 1,490 MW (38.76 *per cent*) out of total installed/under commissioning capacity of 3,844.35 MW.

### Audit Objectives

**2.1.3** The objectives of the performance audit were:

#### Planning and Project Management

- To assess whether capacity addition programme taken up/ to be taken up to meet the shortage of power in the State is in line with the National Policy of Power for All by 2012;
- To assess whether a plan of action is in place for optimization of generation from the existing capacity;
- To ascertain whether the contracts were awarded with due regard to economy and in transparent manner;

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\* Kota Super Thermal Power Station (KSTPS), Suratgarh Super Thermal Power Station (SSTPS), Chhabra Thermal Power Project (CTPP), Giral Lignite Thermal Power Project (GLTPP), Dholpur Combined Cycle Power Project (DCCPP) and Mahi Hydro Power House I.

- To ascertain whether the execution of projects were managed economically, effectively and efficiently.

#### **Financial Management**

- To ascertain whether the projections for funding the new projects and upgradation of existing generating units were realistic including identification and optimal utilization for intended purpose;
- To assess whether all claims including energy bills and subsidy claims were properly raised and recovered in an efficient manner; and
- To assess the soundness of financial health of the RRVUNL.

#### **Operational Performance**

- To assess whether the power plants were operated efficiently and preventive maintenance as prescribed was carried out minimising the forced outages;
- To assess whether requirements of each category of fuel worked out realistically, procured economically and utilised efficiently; and
- To assess whether the manpower requirement was realistic and its utilisation optimal.

#### **Environmental Issues**

- To assess whether various types of pollutants (air, water, noise, hazardous waste) in power stations were within the prescribed norms and complied with the statutory requirements.

#### **Monitoring and Evaluation**

- To ascertain whether adequate MIS existed in the entity to monitor and assess the impact and utilize the feedback for preparation of future schemes.

### **Audit Criteria**

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

- National Electricity Plan, norms / guidelines of Central Electricity Authority (CEA) regarding planning and implementation of the projects;
- standard procedures for award of contract with reference to principles of economy, efficiency and effectiveness;

- targets fixed for generation of power ;
- parameters fixed for plant availability, Plant Load Factor (PLF) etc;
- performance of best performers in the regions/all India averages;
- prescribed norms for planned outages; and
- Acts relating to Environmental laws.

### Financial Position and Working Results

**2.1.5** The financial position of the RRVUNL for the four years ending 2008-09 is given below. The accounts for the year 2009-10 are under finalisation by the Company (September 2010).

Particulars	(₹ in crore)			
	2005-06	2006-07	2007-08	2008-09
<b>A. Liabilities</b>				
Paid up Capital	2106.59	2458.59	3116.59	3822.59
Reserve & Surplus (including Capital Grants but excluding Depreciation Reserve)	72.38	157.80	334.68	692.88
Borrowings (Loan Funds)				
Secured	4537.47	1493.83	2826.14	4069.49
Unsecured	185.76	3952.99	3899.84	3451.76
Current Liabilities & Provisions	695.20	917.39	1064.44	1346.07
<b>Total</b>	<b>7597.40</b>	<b>8980.60</b>	<b>11241.69</b>	<b>13382.79</b>
<b>B. Assets</b>				
Gross Block	6016.49	6052.09	7104.87	7189.89
Less: Depreciation	1654.77	1853.77	2068.33	2317.07
Net Fixed Assets	4361.72	4198.32	5036.54	4872.82
Capital works-in-progress	885.95	2450.75	3969.27	5586.93
Investments	0	0.15	0.15	0.15
Current Assets, Loans and Advances	2269.93	2266.49	2182.81	2384.27
Miscellaneous expenditure to the extent of not written off	79.80	64.89	52.92	43.08
Accumulated losses	-	-	-	495.54
<b>Total</b>	<b>7597.40</b>	<b>8980.60</b>	<b>11241.69</b>	<b>13382.79</b>

An analysis of financial position revealed as under:

- The Paid up capital increased from ₹ 2,106.59 crore during 2005-06 to ₹ 3,822.59 crore during 2008-09. The increase of ₹ 1,716 crore was mainly due to equity contribution from State Government for the projects commissioned/under commissioning.
- The borrowings increased by ₹ 2,798.02 crore in 2008-09 as compared to the year 2005-06 to finance various projects and to meet out the day to day requirement.
- The increase of ₹ 650.87 crore in current liabilities during 2005-09 was

mainly due to accounting of actuarial valuation of Gratuity fund & Superannuation fund, deposit and retention money from supplier and interest accrued but not due on term loan.

- Increase of ₹ 1,052.78 crore in Gross Block of fixed assets during 2007-08 was mainly due to capitalisation of Dholpur Combined Cycle Power Project.
- Capital work in progress increased by ₹ 4,700.98 crore mainly on account of Unit- I and Unit-II of GLTPP which were commissioned in February 2007 and December 2008 respectively, but failed to achieve the trial run conditions, hence cost could not be capitalised. Other units viz KSTPS Unit-VII, SSTPS Unit-VI, Chhabra Unit-I & II at commissioning stage also attributed to increase in capital work in progress.
- RRVUNL prepared accounts up to the year 2007-08 on 'No Profit No Loss basis' which were not as per Generally Accepted Accounting Principles (GAAP). RRVUNL, however, has shown losses of ₹ 495.54 crore for the year 2008-09. We noticed that the losses were mainly due to provision of actuarial valuation (₹ 400 crore) and charging of expenditure of ₹ 44 crore on GLTPP Unit-I, which was earlier capitalized.
- RRVUNL's debt equity ratio remained ideal and ranged between 1.57:1 and 1.82:1 during 2005-09 against standard of 2:1.

The details of working results like cost of generation of electricity, revenue realisation, net surplus/ loss and earnings and cost per unit of operation are given below.

(₹ in crore)					
Sl.No	Description	2005-06	2006-07	2007-08	2008-09
<b>1.</b>	<b>Income</b>				
(a)	Generation Revenue	3483.38	3604.16	3875.99	5101.12
(b)	Other income	31.85	13.35	23.39	32.48
(c)	Total Income	<b>3515.23</b>	<b>3617.51</b>	<b>3899.38</b>	<b>5133.60</b>
<b>2.</b>	<b>Generation</b>				
(a)	Total generation (In MUs)*	18901	19041	19543	21175
(b)	Less: Auxiliary consumption (In MUs)	1679.39	1696.79	1872.36	1976.94
(c)	Total generation available for Transmission and Distribution (In MUs)	<b>17221.61</b>	<b>17344.21</b>	<b>17670.64</b>	<b>19198.06</b>
<b>3.</b>	<b>Expenditure</b>				
(a)	Fixed cost				
(i)	Employees cost	62.64	71.30	75.27	214.54
(ii)	Administrative and General expenses	25.44	30.55	61.87	37.85
(iii)	Depreciation	199.65	196.45	205.03	254.86
(iv)	Interest and finance charges	470.85	454.44	379.09	512.07
	<b>Total fixed cost</b>	<b>758.58</b>	<b>752.74</b>	<b>721.26</b>	<b>1019.32</b>
(b)	Variable cost				
(i)	Fuel consumption				
(a)	Coal	2506.67	2626.55	2611.26	3427.45
(b)	Oil	40.39	50.92	66.04	51.11
(c)	Gas	61.49	57.65	297.15	539.00
(d)	Naphta	0	0	0	0
(e)	Other fuel related cost including shortages/ Surplus	89.62	56.08	49.65	86.18
(ii)	Cost of water (hydro/ thermal/ gas/ others)	9.68	10.17	8.65	8.18
(iii)	Lubricants and consumables	1.35	2.02	1.48	2.89
(iv)	Repairs and maintenance	60.80	68.63	83.52	108.74
	<b>Total variable cost</b>	<b>2770.00</b>	<b>2872.02</b>	<b>3117.75</b>	<b>4223.55</b>
<b>C.</b>	<b>Total cost 3(a) + (b)</b>	<b>3528.58</b>	<b>3624.76</b>	<b>3839.01</b>	<b>5242.87</b>
4.	Realisation (₹ per unit)	2.023	2.078	2.193	2.657
5.	Fixed cost (₹ per unit)	0.440	0.434	0.408	0.531
6.	Variable cost (₹ per unit)	1.608	1.656	1.764	2.200
7.	Total cost per unit (5+6) (₹)	2.048	2.090	2.172	2.731
8.	Contribution (4-6) (₹ per unit)	0.415	0.422	0.429	0.457
9.	Profit (+)/Loss(-) (4-7) (₹ per unit)	-0.025	-0.012	0.021	-0.074

We noticed that:

- Generation revenue was higher by ₹ 1,617.74 crore during 2008-09 as compared to 2005-06 due to capacity addition of 330 MW at DCCPP during the year 2007-08 and increase in total generation by 2,274 MUs.

\* Source: Generation data furnished by TPS.



- The variable and fixed cost increased significantly due to increase in employee's cost (provision of VI Pay commission and provision of actuarial valuation of pension), repairs & maintenance and fuel cost. Consequently, the loss per unit of generation of power increased from ₹ 0.025 to ₹ 0.074 during 2005-09.

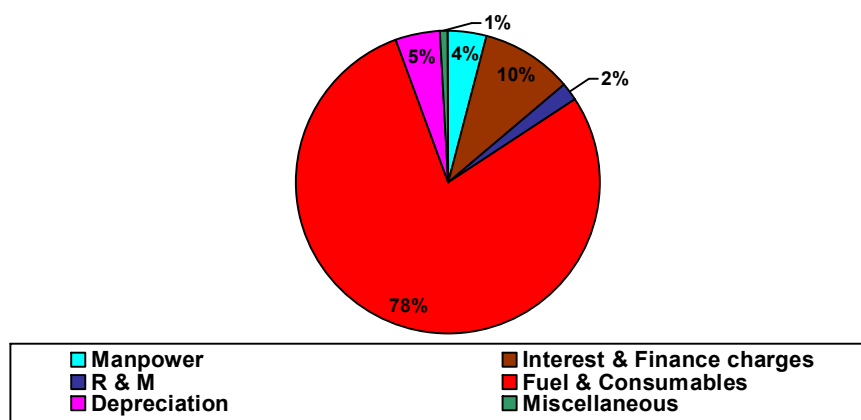
The Government stated (September 2010) that taxes and prior period charges/credits should be considered for deriving out actual profit or loss during the year 2005-06 to 2008-09.

We are of the opinion that prior period adjustments are book adjustments only and therefore have been excluded while arriving at per unit profit/loss.

**Elements of Cost**

**2.1.6** Fuel & consumables and interest & finance charges constitute the major elements of costs. The percentage break-up of costs for 2008-09 is given below in the pie-chart.

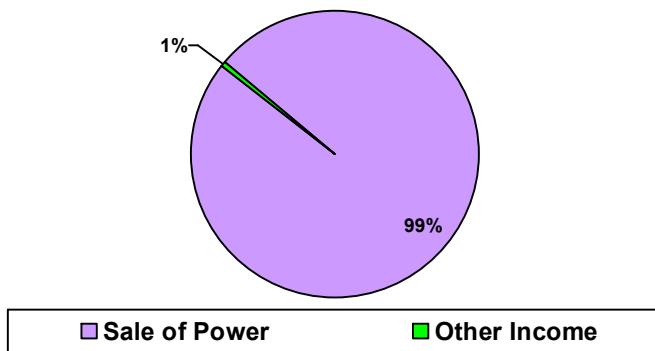
Components of various elements of cost



**Elements of revenue**

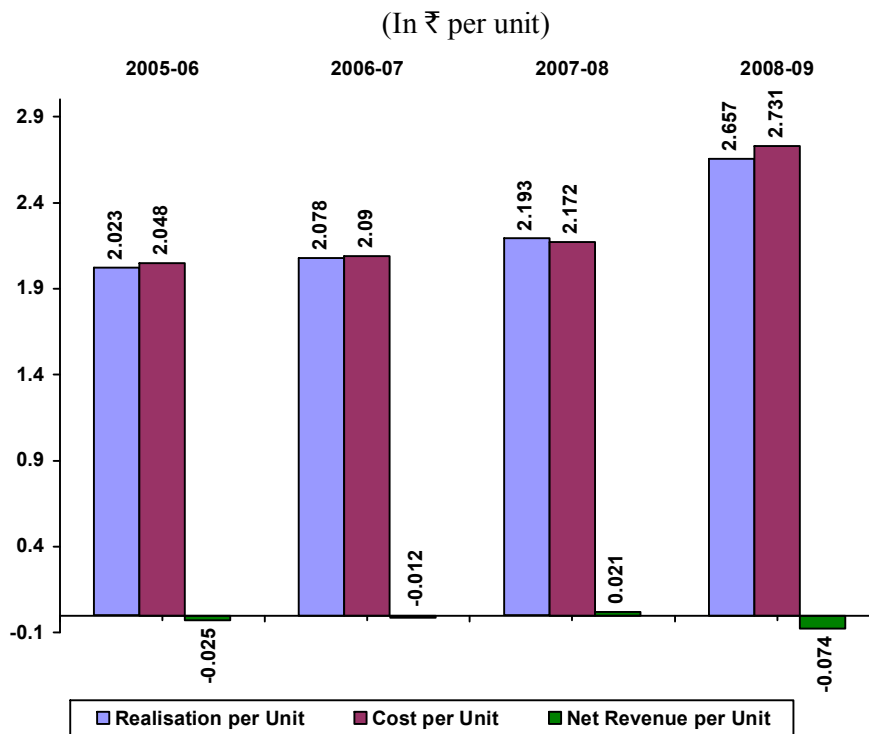
**2.1.7** Revenue from sale of power contributes 99 per cent revenue. The percentage break-up of revenue for 2008-09 is given below in the pie-chart.

Components of various elements of revenue



**Recovery of cost of operations**

**2.1.8** The RRVUNL was not able to recover its cost of generation in all the years of review except 2007-08. During 2005-06, 2006-07 and 2008-09 the net revenue remained negative as given in the graph below:



Had the total revenue earned by RRVUNL been sufficient to cover the cost, an additional amount of ₹ 205.93 crore could have been available for capacity addition/ life extension programmes. The main reasons for high cost of generation were depreciation, excessive shutdown time for repairs and maintenance and low thermal efficiency. The other reasons are increase in administration costs and higher interest and finance charges.

**Audit Findings**

**2.1.9** Audit explained the audit objectives to the RRVUNL during Entry Conference held on 18 February 2010. Audit findings were reported to the RRVUNL and the State Government in June 2010 and subsequently discussed in Exit Conference held on 17 August 2010 where the State Government was represented by the Secretary, Energy Department and the RRVUNL by the Chairman and Managing Director. The performance audit has been finalized after considering/incorporating the replies received from the Government in September 2010. The audit findings are discussed below.

## Operational Performance

**2.1.10** The operational performance of the RRVUNL for the five years ending 2009-10 is given in the **Annexure 8**. The performance of the RRVUNL was evaluated on various operational parameters as discussed in succeeding paragraphs. It was also seen whether the RRVUNL was able to maintain pace in terms of capacity addition with the growing demand for power in the State. These audit findings show that the losses were controllable and there was scope for improvement in performance.

## Planning

**2.1.11** National Electricity Policy aims to provide availability of over 1,000 Units of per capita electricity by 2012, for which it was estimated that need based capacity addition of more than 1,00,000 MW would be required during 2002-2012 in the country. The power availability scenario in the State indicating own generation of the RRVUNL, purchase of power, peak demand and net deficit was as under:

Year	Generation (MW)*	Average demand (MW)	Peak demand (MW)	Percentage of actual generation to average demand	Percentage of actual generation to peak demand
2005-06	2158	4574	5588	47.18	38.62
2006-07	2174	4743	5794	45.84	37.52
2007-08	2489	5242	6374	47.48	39.05
2008-09	2418	5323	6303	45.43	38.36
2009-10	2486	6283	7000	39.57	35.51

The actual generation was only 39.57 to 47.48 per cent of the average demand and 35.51 to 39.05 per cent of the peak demand.

As may be seen from the above, the actual generation was only 39.57 to 47.48 per cent of the average demand and 35.51 to 39.05 per cent of the peak demand.

However, the total supply even after import was not sufficient to meet the peak demand, as shown below:

Year	Peak demand (MW)	Peak demand met (MW)	Sources of meeting peak demand (MW)		Peak deficit (Percentage of peak demand)
			Own*	Import	
2005-06	5588	4822	2820	2002	13.71
2006-07	5794	4946	2630	2316	14.64
2007-08	6374	5564	2902	2662	12.71
2008-09	6303	6101	2785	3316	3.20
2009-10	7000	6859	3093	3766	2.01

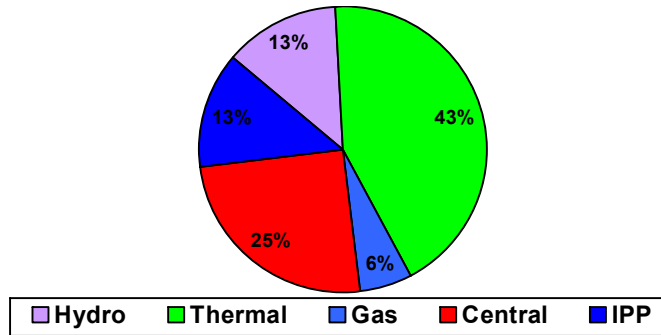
\* Worked out in audit based on the installed capacity and PLF of the respective units in each year.

♦ The figures here may not tally with generation figures mentioned in the table above since it includes generation from other sources in the State based on power purchase agreements with private parties.

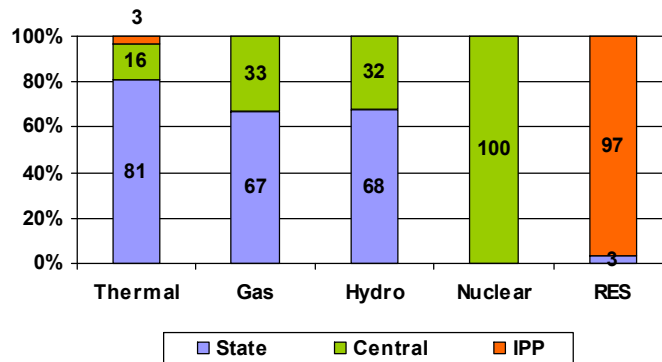
Though the peak deficit decreased to 2.01 per cent in 2009-10 from 13.71 per cent in 2005-06, the peak demand was mainly met by increasing import of power since own generation of the State remained almost static during the review period.

**Capacity Additions**

**2.1.12** The Rajasthan State had total installed capacity of 5,248.64 MW at the beginning of 2005-06 and increased to 7,768.46 MW at the end of 2009-10. The break up of generating capacities, as on 31 March 2010, under thermal, hydro, gas, central, IPP and others is shown in the pie chart below.



Further break up of generating capacities of State, Central and IPP, as on 31 March 2010, under thermal, gas, nuclear, hydro and renewable energy source (RES) is given in the bar chart below:



To meet the energy generation requirement of 44,031 MUs in the State, a capacity addition of about 3,020 MW was required during 2005-06 to 2009-10. As against this, the actual capacity addition at the end of March 2010 was 2,519.82 MW leaving a shortfall of 500.18 MW. The projects categorised as ‘Projects under Construction’ (PUC) and ‘Committed Projects<sup>∞</sup>’ (CP)

<sup>∞</sup> National Electricity Plan defines Committed Projects as Projects for which the formal approval to take up the same has been granted by the CEA.

earmarked for capacity addition during review period according to NEP are detailed below.

**(In MW)**

Sector	Thermal	Hydro	Non-conventional Energy	Total
PUC	1908	13	0	1921
CP	1099	0	0	1099
<b>Total</b>	<b>3007</b>	<b>13</b>	<b>0</b>	<b>3020</b>

The particulars of capacity additions envisaged, actual additions and peak demand vis-à-vis energy supplied during review period are given below.

Sl.No	Description	2005-06	2006-07	2007-08	2008-09	2009-10
1.	Capacity at the beginning of the year (MW)	5248.64	5452.79	5967.88	6242.85	6426.15
2.	Additions Planned for the year as per National Electricity Plan (MW)	0	250	220	0	2550
3.	Additions planned by RRVUNL (MW)	0	125	330	1070	0
4.	Actual Additions (MW)	204.15	515.09	274.97	183.30	1342.31
4 (a).	Actual Additions by RRVUNL (MW)	<b>0</b>	<b>110</b>	<b>220</b>	<b>0</b>	<b>195</b>
5.	Capacity at the end of the year (MW) (1 + 4)	<b>5452.79</b>	<b>5967.88</b>	<b>6242.85</b>	<b>6426.15</b>	<b>7768.46</b>
6.	Shortfall in capacity addition (MW) (3-4)	0	0	55.03	886.70	0
7.	Demand during the year (MUs)	32052	33236	36738	37306	44031
8.	Energy supplied (MUs)					
	a) Energy produced	18390.54	20438.49	21298.30	22110.46	23290.48
	b) Energy Purchased	12983.44	11558.33	14457.24	16420.44	18047.42
9.	<b>Surplus/ Shortfall in demand (MUs) (8-7)</b>	<b>(678.02)</b>	<b>(1239.18)</b>	<b>(982.46)</b>	<b>1224.90</b>	<b>(2693.10)</b>

**The actual capacity addition was only 525 MW against 1,525 MW planned by the RRVUNL leaving shortfall of 1,000 MW.**

It may be observed from the above table that during review period actual capacity addition was only 525 MW against 1,525 MW planned by the RRVUNL leaving shortfall of 1,000 MW against the addition planned. The State, except in the year 2008-09, was not in a position to meet the demand as the power generated as well as power purchased fell short to the extent of 678.02 MUs to 2,693.10 MUs due to non-commencing of commercial production by the newly established generating stations/units as per the scheduled plan.

### Project Management

**2.1.13** Preparation of an accurate and realistic Detailed Project Report (DPR) after considering feasibility study, factors like creation of infrastructure facility, addressing bottlenecks likely to be encountered in various stages of project are critical activities in planning stage of the project. Project management includes timely acquisition of land, effective actions to resolve bottlenecks, obtaining necessary clearances from Ministry of Environment and

Forest (MOEF) and other authorities, rehabilitation of displaced families, proper scheduling of various activities using Programme Evaluation and Review Technique (PERT)/ Critical Path Method (CPM) technique, adequate budget provisions, etc. However, time and cost over runs were noticed in the implementation of the projects during review period as discussed in succeeding paragraphs.

The following table indicates the scheduled and actual dates of completion of the power stations, date of start of transmission, date of commissioning of power stations and the time overrun.

**Time overrun**

Sl. No.	Phase-wise name of the Unit	Details	As per DPR/WO	Actual date	Time overrun (Months)
1.	DCCPP Unit-I	Date of completion of unit	28.02.06	29.03.07	13
		Date of start of transmission	28.02.06	29.03.07	13
		Date of commercial operation/ commissioning of unit	31.12.06	01.03.08	14
	DCCPP Unit-II	Date of completion of unit	30.04.06	16.06.07	13.5
		Date of start of transmission	30.04.06	16.06.07	13.5
		Date of commercial operation/ commissioning of unit	31.12.06	01.03.08	14
	DCCPP (STG)	Date of completion of unit	30.09.06	27.12.07	15
		Date of start of transmission	30.09.06	27.12.07	15
		Date of commercial operation/ commissioning of unit	31.12.06	01.03.08	14
2.	GLTTP Unit-I	Date of completion of unit	31.07.06	28.02.07	7
		Date of start of transmission	31.07.06	28.02.07	7
		Date of commercial operation/ commissioning of unit	31.08.06	Not yet started	48
	GLTTP Unit-II	Date of completion of unit	15.06.08	26.12.08	6
		Date of start of transmission	15.06.08	26.12.08	6
		Date of commercial operation/ commissioning of unit	15.07.08	Not yet started	26
3.	KSTPS Unit-VII	Date of completion of unit	31.03.08	30.05.09	14
		Date of start of transmission	31.03.08	30.05.09	14
		Date of commercial operation/ commissioning of unit	30.06.08	31.12.09	18
4.	CTPP Unit-I	Date of completion of unit	31.08.08	16.04.09	7.5
		Date of start of transmission	31.08.08	16.04.09	7.5
		Date of commercial operation/ commissioning of unit	30.11.08	11.06.10	18
	CTPP Unit-II	Date of completion of unit	31.10.08	04.05.10	18
		Date of start of transmission	31.10.08	04.05.10	18
		Date of commercial operation/ commissioning of unit	31.12.08	Not yet started	21
5.	SSTPS Unit-VI	Date of completion of unit	14.09.08	31.03.09	6.5
		Date of start of transmission	14.09.08	31.03.09	6.5
		Date of commercial operation/ commissioning of unit	14.12.08	30.12.09	12.5

**(Delay in the projects not yet started mentioned above has been worked out up to 30 September 2010)**

It would be seen from above that all the nine units taken up for implementation during review period were not completed within the stipulated time. We noticed that the slippages in time schedule were due to delay in signing of gas supply agreement (GSA), finalization/approval of drawings, execution of work of main Plant by Bharat Heavy Electricals Limited (BHEL), providing input from Balance of Plant (BOP) contractor /RRVUNL etc., which could have been avoided by effective planning and monitoring.

The deficiencies in project management noticed during review are discussed below:

***Dholpur Combined Cycle Power Project (DCCPP)***

***Delay in executing gas supply agreement***

**2.1.14** RRVUNL entered (August 2003) the Head of Agreement (HOA) with GAIL which was valid for a period of one year or till signing of Gas Supply Agreement (GSA), whichever was earlier. However, before finalisation of GSA, RRVUNL placed (June 2004) order for supply and erection of main plant on BHEL and also released (September 2004) advance of ₹ 50.13 crore. The commissioning of main plant was linked with the finalisation of GSA. Consequently, the plant was to be commissioned between 20 and 27 months from the date of signing of GSA. The RRVUNL, however, executed the GSA with Oil & Natural Gas Corporation (ONGC) in October 2005. Delay in executing the GSA led to postponement of commissioning schedule as the same was reckoned from date of execution of GSA with ONGC. The plant was commercially commissioned on 1 March 2008 as against scheduled completion in December 2006. Thus, delay of 14 months due to late execution of GSA resulted in deprival of generation of 2,617.14 MUs<sup>#</sup>.

In reply, the Government stated (September 2010) that GAIL incorporated (December 2003) stringent commercial terms and condition in their draft agreement, on which RRVUNL requested (August 2004) for relaxation in some of them, which were only partly agreed by GAIL in August 2004.

However, the RRVUNL could not make any firm opinion on the draft agreement before expiry of the said agreement and took up the matter for relaxation in terms only in August 2004.

***Giral Lignite Thermal Power Project (GLTPP) Unit-II***

***Delay in commissioning and low PLF***

**2.1.15** The State Government conveyed (April 2005) approval for installation of Unit II of 125 MW at GLTPP under stage II at an estimated cost of ₹ 618 crore. The unit was planned to be commissioned by June 2008. The unit was, however, synchronized in December 2008 with a delay of six months due to delay in approving the drawings of boiler and turbine generator and BOP works by the consultant, erection of boiler and turbine related activity by BHEL and BOP. The imposition of LD on BHEL and BOP contractor is discussed in paragraph 2.1.22.

It was also noticed that after synchronization, the unit could not achieve the trial run condition and therefore commercial operation could not be started till 31 March 2010. This was due to frequent trippings/shut downs. As the sulphur content in lignite is very high *i.e.* around six *per cent* against the normal two

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<sup>#</sup> Net generation (2,243.26 MUs per year at 80 per cent PLF) envisaged in DPR x No. of months delayed

*per cent*, the unit was facing technical trouble attributable to BHEL like cyclone chocking due to accumulation of bed material, tube leakages, back pass chocking, clinker formation *etc.* Similar observations were mentioned in the performance audit on Construction of Giral Lignite Power Project Phase-I of the RRVUNL included in the Report of the Comptroller and Auditor General of India for the year 2007-08 (Commercial), Government of Rajasthan. Thus due to non-commissioning of the unit by BHEL within the stipulated time and low PLF, RRVUNL suffered a loss of generation of 1,028 MUs\* up to March 2010.

The Government stated (September 2010) that continuous efforts are being made to obtain power generation at an optimum capacity with SO<sub>x</sub> (various oxides of Sulphur) level in permissible limit and to achieve COD of unit.

### ***Kota Super Thermal Power Station (KSTPS) Unit-VII***

#### ***Delay in commercial operation***

**2.1.16** As per the DPR, the commercial production from the unit was to be commenced from June 2008. The unit though synchronised with grid in May 2009 but it was put on commercial operation in December 2009 with a delay of 18 months from that envisaged in DPR. The delay was attributed to awarding of work (main plant and BOP), as the unit was planned in January 2005 whereas the letters of intent (LOI) were placed in June 2006 and October 2006 respectively consequent on receipt of financial approval of State Government in April 2006. Besides this, there was delay in completion of civil works by BOP contractor, supplies by BHEL, non availability of inputs from RRVUNL and BOP contractors *etc.* Further even after synchronization, the unit suffered various technical problems such as high shaft vibration in turbine, oil leakages from turbine, defective battery valve *etc.* and therefore the unit could not be operated on trial run and also the commercial operation was got delayed. Consequently, RRVUNL was deprived of generation of 829 MUs<sup>▼</sup> between December 2008 and August 2009 *i.e.* the envisaged completion date as per work order and date of actual commencement of generation. The liquidated damages (LD) recoverable for delay on the part of BHEL and BOP contractor is discussed ahead in paragraph 2.1.22.

The Government accepted (September 2010) the facts that delay in supply of equipment and shortage of design engineer/skilled manpower led to delay in commissioning of the unit.

### ***Chhabra Thermal Power Project (CTPP) Unit-I&II***

#### ***Delay in commercial operation***

**2.1.17** The State Government conveyed (August 2005) approval for installation of 2x250 MW coal based thermal power project at Chhabra at an

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\* Net generation (792.78 MUs per year at 80 *per cent* PLF) envisaged in DPR x No. of months delayed- units generated since synchronisation.

▼ Net generation (1,243.57 MUs per year at 80 *per cent* PLF) envisaged in DPR x No. of months delayed.



estimated cost of ₹ 1,750 crore. As per the work orders awarded (March 2006) for main plant to BHEL, Units I and II were planned to be synchronised by 2 September 2008 and 2 December 2008 respectively. The units were required to be put on commercial operation by December 2008 and February 2009 respectively. We noticed that Unit I though synchronized with the grid on 16 April 2009 but started commercial operation on 11 June 2010 due to various technical faults on the part of BHEL such as drum disturbances, fans failures, low furnace pressure *etc.*

The Unit II could not be synchronised up to March 2010 due to delay in completion of various works by BHEL/BOP contractor relating to main plant *viz.*, delay in drum lifting, erection of turbine, hydraulic test, Oil flushing *etc.* and delay in availability of T.G foundation, construction of main control room, cooling water system. Consequently, RRVUNL was deprived of generation of 3,637.40 MUs<sup>Y</sup> from the envisaged date of commercial operation till March 2010.

The Government stated (September 2010) that due to technical fault in trial run, units could not be commissioned as scheduled.

### ***Suratgarh Super Thermal Power Station (SSTPS) Unit-VI***

#### ***Delay in commissioning due to technical snags***

**2.1.18** The State Government conveyed (December 2005) approval for installation of Unit VI of 250 MW coal based thermal power unit at Suratgarh at an estimated cost of ₹ 750 crore. The work orders for supply of main plant (boiler and turbine generator), erection, testing and commissioning of the unit and BOP activities were awarded to BHEL and Indure Private Limited (BOP contractor) on August 2006 and October 2006 respectively. The unit was to be commissioned by 14 October 2008 as per the work order.

We noticed that the unit was synchronized on 31 March 2009 after a delay of five and half months due to delay in various works by BHEL/BOP contractor. It was also noticed that the unit could not be handed over to RRVUNL till December 2009 as it suffered numerous trippings during its trial run due to technical faults such as high/low drum level, low furnace pressure, low vacuum *etc.* Though the unit was declared commercial operationalised from 31 December 2009 but on 04 January 2010, the unit suffered heavy damage to its low pressure (LP) turbine due to presence of high vibrations in the blades of LP turbine owing to design/ manufacturing defects. Consequently, the declaration of COD was revoked on 6 January 2010 and the unit was commissioned again in August 2010 after repairs by BHEL. Thus due to delay in completion of the project as well as non-rectification of defects by BHEL, RRVUNL suffered loss of generation of 752.57 MUs.

The Government stated (September 2010) that the delay was due to non-availability of equipment and skilled manpower.

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<sup>Y</sup> Net generation envisaged in DPR (3,188.64 MUs per year at 80 *per cent* PLF)/2 x (16/12 + 3,188.64/2x14/12)-units generated (348.40 MUs).

The time overrun varied between 12.5 and 48 months in commercial operation of power projects leading to deprival of 8,864.11 MUs.

Due to delay in commissioning of projects, RRVUNL was deprived of interest rebate of ₹ 4.97 crore.

Thus due to non adherence of time schedule in completion of above projects as discussed in paragraph 2.1.14 to 2.1.18, RRVUNL was deprived of generation of 8,864.11 MUs.

**Deprival of interest rebate due to delay in commissioning of projects**

2.1.19 Apart from State Government equity, RRVUNL arranged the balance funds from Power Finance Corporation (PFC) at interest rates prescribed from time to time for completion of various projects. As per policy of PFC, an interest rebate at the rate of 0.25 per cent is admissible from the date of commissioning of unit. We noticed that due to delay in commissioning of projects as discussed above, RRVUNL could not avail the rebate from the date of commissioning envisaged under project financing scheme and thus was deprived of interest rebate of ₹ 4.97 crore.

The Government stated (September 2010) that there was no ground to avail the rebate on PFC loan in terms of agreed condition of loan due to delay in projects. We are of the opinion that RRVUNL could have availed itself of interest rebate with proper monitoring.

Thus, it would be seen that time overrun varied between 12.5 months and 48 months in the execution of power projects which mainly led to cost overruns as discussed in the succeeding paragraphs.

2.1.20 The estimated cost of the various power stations executed under different phases, actual expenditure, cost escalation and the percentage increase in the cost are tabulated below:

(₹ in crore)

Sl. No.	Phase-wise name of the Unit	Estimated cost as per DPR	Awarded Cost	Actual expenditure as on 31 March 2010	Expenditure over and above estimate (5) = (4 - 2)	Percentage increase as compared to DPR (5)/(2) x 100
	(1)	(2)	(3)	(4)	(5)	(6)
1.	DCCPP	1155	758.78	1090	(-) 65	(-) 5.63
2.	GLTPP Unit-II	618	695.97	759.87	141.87	22.96
3.	KSTPS Unit-VII	690	794.52	897.74	207.74	30.11
4.	SSTPS Unit -VI	750	883.30	1031.12	281.12	37.48
5	CTPP Unit-I & II	1750	1988.78	2317.71	567.71	32.44
	<b>Total</b>	<b>4963</b>	<b>5121.35</b>	<b>6096.44</b>	<b>1133.44</b>	

It would be seen from above that out of five projects implemented during review period, there was cost overrun in four projects ranging from 22.96 to 37.48 per cent of the estimated cost of projects and reasons as analysed in

audit were as under:

- Delay of 6 to 26 months (from the date of administrative/financial sanction) in awarding work orders to BHEL/BOP.
- Additional items of works not envisaged/under estimated in the DPR of the projects.
- Increase in interest during construction by ₹ 390.12 crore due to time over run in respect of KSTPS Unit-VII, SSTPS Unit-VI, Giral Unit-II, and Chhabra Unit-I & II.
- Lack of effective control over the completion of various packages.
- Taxes, levies and price variation payable beyond the estimates.

**Time overrun in execution of projects led to cost overrun by ₹ 1,133.44 crore including interest amounting to ₹ 390.12 crore during construction.**

### **Contract Management**

**2.1.21** Contract management is the process of efficiently managing contracts (including inviting bids and award of works) and execution of works in an effective and economic manner. The works in thermal power projects is generally awarded on turnkey (Composite) basis to a single party involving civil construction, supplies of machines and ancillary works.

During review period various contracts valuing ₹ 5,121.35 crore were executed. These contracts were related to different spheres of activities such as civil works, supply of equipments and other miscellaneous works.

The instances of tardy progress of work leading to time and cost overrun in various projects undertaken during review period are given below.

#### ***Short levy of liquidated damages***

**2.1.22** As the time and scheduled date of completion was the essence of the contracts awarded for main plant and BOP works, the work orders provided that in case the BHEL/BOP contractor fail to complete the work or any part thereof within the specified period, RRVUNL could recover liquidated damages at the rate of half *per cent* or one *per cent* from BHEL or BOP contractor, respectively of the order price for each week or part thereof for which the contract completion had been delayed. The recovery of such amount was limited to five *per cent* and 10 *per cent* of the order prices, in case of BHEL and BOP contractor, respectively.

It was noticed that as per terms of payment stipulated in the work order of BHEL, besides mobilisation advance of 12.5 *per cent*, total work order price to the extent of 85.5 *per cent* was to be paid progressively on monthly pro rata basis. The balance two *per cent* of the work order price was payable on commissioning of the equipment against the bank guarantee for an equal amount. Further in case of BOP contractor, besides advance of 10 *per cent* of

the contract price, 70 per cent was to be released against consignee's receipted challans/despatch documents, 10 per cent on completion/commissioning of all the BOP packages and balance 10 per cent payment was to be released after ascertaining satisfactory performance of material or equipment for a period of 12 months from the date of commissioning of the project.

The position of work order price, delay in weeks (up to the date of synchronisation), penalty to be imposed as per work order clause and penalty actually imposed up to 31 March 2010 is tabulated below:

(₹ in crore)

Sl. No.	Name of unit	Contractor	Work order price	Delay in weeks	Penalty to be imposed	Penalty actually imposed	Short levy of penalty
1.	KSTPS Unit- VII	BHEL	399.00	26	19.95	2.11	17.84
		BOP	266.95	34	26.70	6.43	20.27
2.	DCCPP	BOP	209.53	38	20.95	1.66	19.29
3.	GLTPP Unit - II	BHEL	287.25	24	14.36	12.00	2.36
		BOP	242.50	36	24.25	10.08	14.17
4.	SSTPS Unit - VI	BHEL	443.00	22	22.15	2.80	19.35
		BOP	371.00	28	37.10	5.71	31.39
5.	CTPP Unit -I & II	BHEL	861.00	30 & 18	43.05	8.96	34.09
		BOP	823.00	34	82.30	18.72	63.58
<b>Total</b>							<b>222.34</b>

**Due to non-correlating delay with overall delay in commissioning of the projects, RRVUNL short levied penalty of ₹ 222.34 crore.**

It would be seen from the table above that RRVUNL short levied ₹ 222.34 crore being the penalty for the delay occurred in commissioning of the project. We noticed that RRVUNL levied penalty for the delay actually occurred in case of each component of the project and did not correlate it with the over all delay in the commissioning of the project for which a maximum penalty of five per cent or 10 per cent was prescribed in the work order of BHEL and BOP contractors respectively. We noticed that RRVUNL had only ₹ 22.59 crore in the form of Bank Guarantee (BG) given by BHEL as against the amount of short levy of penalty of ₹ 39.55 crore in respect of KSTPS Unit - VII, GLTPP Unit - II and SSTPS Unit -VI.

The Government stated (September 2010) that the decision was taken to deduct applicable liquidated damages within 6 months after completion of respective projects. It was further stated that sufficient financial hold of BHEL/BOP contractors was available with the RRVUNL by way of BG and retention money.

It was observed that the RRVUNL did not recover differential liquidated damages even after completion of the respective units. Further the financial holds are meant for guaranteed performance of plant and not for recovery of LD.

**Extra expenditure on modification work of Mill Building at SSTPS Unit-VI**

**2.1.23** Development Consultant Private Limited (DCPL) was appointed (May 2006) to provide comprehensive consultancy engineering services for 1x 250 MW coal based SSTPS Unit - VI. The scope of work of DCPL, *inter alia*,

included review and approval of all designs, drawings along with providing technical design and other details for proof checking of steel structures for main power house building. As per the work order, the structural work of Mill building was to be carried out by BOP contractor as per drawings approved by DCPL and its Tube Mills and associated Coal Piping work was to be erected by BHEL.

During erection of Coal Piping, BHEL observed (March 2009) that pipes were fouling with the Bracing and Beam at various levels. It was, therefore, assessed that design and drawings of beams, bracings and columns, were required to be modified and erection work of modified drawings was to be carried out by the BOP contractor. The BOP contractor submitted (July 2009) an estimate of ₹ 1.95 crore including all structural steel supply, fabrication, dismantling and erection of modified beams, bracing and columns. It was noticed that RRVUNL made an adhoc payment of ₹ 60 lakh to the BOP contractor.

We observed that DCPL, while approving the design and drawings of Mill building prepared by the BOP contractor, did not consider the design and drawings prepared by BHEL, which were mismatched. Thus, due to non-performing of duties efficiently by the DCPL, RRVUNL had to bear an extra cost of ₹ 1.95 crore which could have been avoided. Further, RRVUNL had not even invoked the bank guarantee of ₹ 27 lakh till date (July 2010).

The Government stated (September 2010) that modifications were made as they were urgently required for commissioning of the Unit. Further, the matter is under investigation.

## **Operational Performance**

**2.1.24** Operations of RRVUNL is dependent on input efficiency consisting of material and manpower and output efficiency in connection with Plant Load Factor, plant availability, capacity utilization, outages and auxiliary consumption. These aspects have been discussed below.

## **Input Efficiency**

### ***Procedure for procurement of coal***

**2.1.25** CEA fixes power generation targets for thermal power stations (TPS) considering capacity of plant, average plant load factor and past performance. The RRVUNL works out coal requirement on the basis of targets so fixed and past coal consumption trends. The coal requirement so assessed was conveyed to the Standing Linkage Committee (SLC) of the Ministry of Power (MOP), Government of India, which decided the source and quantity of coal supply to TPSs on quarterly basis. However, from 2009-10, the above concept of SLC was discontinued by notification of New Coal Distribution Policy

(October 2007). The RRVUNL now directly enters into a fuel supply agreement with the coal companies.

The position of coal linkages fixed, coal received, generation targets as reported to SLC for procurement of coal and actual generation achieved during the period from 2005-06 to 2008-09 covering all the TPSs of RRVUNL was as under:

Sl. No.	Particulars	2005-06	2006-07	2007-08	2008-09	Total
1.	Coal linkage fixed (Lakh MT)	131.10	136.20	147.45	145.80	560.55
2.	Quantity of coal received (Lakh MT)	114.65	117.65	120.33	124.32	476.95
3.	Percentage of less coal received	12.55	13.62	18.39	14.73	14.91
4.	Generation targets reported to SLC (MUs)	19018	18665	19258	19994	76935
5.	Actual generation achieved from coal based TPS (MUs)	18245	18369	18618	18415	73646
6.	Shortfall in generation targets (MUs)	773	296	640	1579	3289
7.	Percentage of shortfall in generation	4.06	1.59	3.32	7.90	4.28

It would be seen from the above that the total linkage of coal during the four years fixed by the SLC was 560.55 lakh MT. Against this, only 476.95 lakh MT of coal was received, resulting in short receipt of 83.60 lakh MT (14.91 per cent) of coal which led to shortfall in achievement of the generation targets by 3,289 MUs in all the TPSs valued at ₹ 777.99 crore (at the average rate of sales realisation per unit of the RRVUNL during 2005-09). In the absence of any agreement with the coal companies from May 2002 to August 2009, the Management failed to procure allotted quantity of coal.

The Government in its reply (September 2010) stated that the coal requirement was generally calculated on 100 per cent PLF and not as per CEA targets.

### **Fuel supply arrangement**

**2.1.26** Coal is classified into different grades. The price of the coal depends on the grade vis-à-vis calorific value of coal. RRVUNL entered (May 1999) into a Fuel Supply Agreement (FSA) with South Eastern Coalfields Limited (SECL) for supply of coal to its power stations at different places. The FSA was valid for a period of three years i.e. up to May 2002. It was, however, noticed that TPS continued to obtain supply of coal even after May 2002 according to terms and conditions of the said FSA without executing new agreement. New FSA was approved belatedly in August 2009. The main reason for delay was disagreement on various clauses of FSA between the coal companies and RRVUNL. Consensus on such clauses took almost seven years, which was avoidable with timely pursuance and follow up.

The Government stated (September 2010) that the Coal India Limited changed the model draft agreement under Coal Distribution Policy and hence the same was accepted by RRVUNL after acceptance of NTPC/MOP/CEA.

***Import of coal without ascertaining reasonability of prices***

**2.1.27** Government of India insisted (January 2008) for import of six lakh MT coal during 2008-09 and regularly pursued with RRVUNL to import the coal. It was noticed that RRVUNL after a delay of seven months invited (13 August 2008) limited tenders for procurement of six lakh MT imported coal from Public Sector Undertakings (PSU) for its KSTPS and SSTPS. Although the bidders quoted higher rates yet in view of prevailing coal stock position as of 15 September 2008 which had reached at critical stage (coal stock at KSTPS and SSTPS was available for 7 and 2 days only as on date) and SLC also had reduced the allocation, no alternative was left with RRVUNL except to accept the lowest quoted rates. Accordingly, RRVUNL placed orders on Projects and Equipments Corporation Limited (PEC) at ₹ 11,903.63 and ₹ 11,723.55 per MT for supply of three lakh MT coal each at SSTPS and KSTPS respectively. The RRVUNL suspended (December 2008) the contract after supply of 2.17 lakh MT and 2.10 lakh MT respectively at KSTPS and SSTPS due to reduction in international prices of coal.

It was observed that despite instructions of Government of India to finalise the cases for import of coal at the earliest to ensure receipts of coal in time, RRVUNL did not initiate timely action to explore the market for imported coal and placed order only when the stock of coal reached at critical stage. It was also observed that Maharashtra Generation Company at the same time had placed (June 2008) an order for supply of 15 lakh MT imported coal of similar specifications at ₹ 6,800 per MT.

Thus due to delay in initiation of action to procure imported coal, RRVUNL had to incur an extra expenditure of ₹ 175.47 crore\*.

The Government stated (September 2010) that the matter for procurement of imported coal was deferred as the MOC/MOP was being persuaded regularly to allocate the indigenous coal in place of imported coal but due to uncertainties in getting the indigenous linkages, approval for import of coal was accorded in July 2008.

It may be mentioned here that GOI clarified (January 2008) that power utilities would have to suffer generation on account of coal shortages in absence of import against allotted share of coal. Despite this RRVUNL belatedly approached the State Government in May 2008 for approval to import the coal and placed orders at higher prices when the coal stock reached at a critical stage.

***Extra expenditure due to delay in execution of gas supply agreement***

**2.1.28** As stated in paragraph 2.1.14, RRVUNL entered (August 2003) the Head of Agreement (HOA) with GAIL which was valid for a period of one year or till signing of Gas Supply Agreement (GSA), whichever was earlier. GAIL offered (March 2004) maximum affordable price at ₹ 199

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\* KSTPS-₹ 88.49 crore (₹ 4,078 X 2.17 lakh MT), SSTPS-₹ 86.98 crore (₹ 4,142 X 2.10 lakh MT) after reducing the element of freight.

i.e. USD 4.326 per Million Metric British Thermal Unit (MMBTU), at consumer end (i.e. inclusive of transportation cost) on exchange rate of USD equal to ₹ 46 including transportation cost. In case of timely execution of agreement, the offered price was valid for supply up to 31 December 2008. We noticed that RRVUNL could not execute GSA within a period of one year by August 2004 on account of disagreement with some conditions of draft agreement. State Government also expressed (March 2005) displeasure on the lacklustre approach of RRVUNL for failure to execute the GSA prior to placing order on BHEL (in June 2004) for main plant. Subsequently, GSA was executed (31 October 2005) with ONGC on higher price of USD 4.6 per MMBTU plus transportation.

**Delay in execution of GSA with GAIL caused extra expenditure of ₹ 110.12 crore.**

We observed that improper sequence of placing work orders without execution of GSA coupled with delay in executing the GSA with GAIL led to extra expenditure of ₹ 110.12 crore<sup>r</sup> for the gas consumed by the plant during October 2007 to 31 December 2008.

The Government stated (September 2010) that GAIL incorporated stringent commercial terms and condition in their draft agreement, on which RRVUNL requested for relaxation in some of them.

#### ***Procedure for procurement of gas for DCCPP***

**2.1.29** A tripartite agreement was entered (December 2007) among ONGC, GAIL and RRVUNL and accordingly the work of supply and transportation was assigned (January 2008) to GAIL. The delivery point was also changed from Hazira to Dholpur. The quantity of gas fixed, quantity received, generation targets and shortfall is given below:-

Particulars	2007-08	2008-09	2009-10	Total
Quantity of Gas fixed (MMSCM)	46.54	548.00	548.00	1142.54
Quantity of Gas received (MMSCM)	47.56	521.16	547.34	1116.06
Generation targets (MUs)	192.72	2312.64	2312.64	4818.00
Actual generation achieved (MUs)	214.90	2288.78	2424.75	4928.43
Surplus/Shortfall (-) in generation targets (MUs)	22.18	(23.86)	112.11	110.43

We observed that as against the fixed quantity of 548 Million Metric Standard Cubic Metre (MMSCM) gas the quantity received in 2008-09 was 521.16 MMSCM, resulting in short receipt of 26.84 MMSCM of gas (4.89 per cent). This resulted in shortfall in achievement of the prescribed generation targets by 23.86 MUs valued at ₹ 6.34 crore<sup>▲</sup>. Similar observation pertaining to RGTPS was mentioned in the paragraph 2.1.14 of the performance audit on Fuel Management (RRVUNL) included in the Report of the Comptroller and Auditor General of India for the year 2008-09 (Commercial), Government of Rajasthan.

<sup>r</sup> \$ 4.6/MMBTU - \$ 4.326/MMBTU = \$ 0.274/MMBTU x Quantity of gas received during October 2007 to December 2008 x effective exchange rate + transportation charges.

<sup>▲</sup> 23.86 MUs x ₹ 2.657 per unit.



### ***Quality of coal***

**2.1.30** Each thermal station is designed for usage of particular grade of coal. Usage of envisaged grade of coal ensures optimizing generation of power and economizing cost. We observed that the grade of coal received from collieries was not always of the specified grade required by the thermal stations. During review period, RRVUNL received 3.59 lakh MT of inferior quality coal, for which payment was made as per declared/billed grade. This resulted in avoidable payment of ₹ 3.26 crore to the collieries up to March 2010. The claims aggregating to ₹ 98 lakh towards Central Sales Tax (CST), imposed on bills raised according to superior quality of coal, were, however, not reimbursed as these claims were not lodged by the Account Wings of SSTPS and KSTPS during the same financial year. The others claims, though lodged by RRVUNL were outstanding for non-reconciliation of difference in quality of coal (March 2010).

The Government stated (September 2010) that Coal Companies were being persuaded continuously for early settlement of these claims.

Previous FSA (expired in May 2002) provided that the coal supplied by the seller shall generally be free from oversize stones. As per the said FSA, stones above 200 mm shall be segregated by the purchaser and equivalent cost of the same along with 50 *per cent* freight (except surcharge) royalty and taxes were to be borne by the seller. It was, however, observed that RRVUNL belatedly signed (August 2009) new FSA and hence the representative of Coal Companies did not assess/inspect the quantum of stones contained in the coal received at TPS during the period June 2007 to March 2009. Consequently, SSTPS could not lodge claims for 12,387.47 MT stones amounting to ₹ 1.54 crore\*.

The Government stated (September 2010) that it was getting claims for stones after execution of new FSA since April 2009.

### ***Consumption of fuel***

#### ***Excess consumption of coal***

**2.1.31** The consumption of coal depends upon its calorific value. The norms fixed in the project report for various power generation stations for production of one unit of power vis-à-vis maximum and minimum consumption of coal

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\* At the rate of last claim lodged *i.e.* ₹ 1,242.45 per MT x 12,387.47 MT stones.

during the period of five years ending 2009-2010 is depicted in the table below.

(in Kilograms)

Name of the Station	Norms fixed in the project report	Average minimum consumption during the year	Average maximum consumption during the year
<b>KSTPS</b>			
Unit I	0.674	0.652 (2010)	0.904 (2010)
Unit II	0.674	0.652 (2010)	0.998 (2008)
Unit III	0.584	0.601 (2007)	0.794 (2008)
Unit IV	0.584	0.575 (2006)	0.794 (2008)
Unit V	0.714	0.578 (2006)	0.761 (2008)
Unit VI	0.714	0.563 (2007)	0.737 (2008)
Unit VII	0.714	0.653 (2010)	0.683 (2010)
<b>SSTPS</b>			
Unit I	0.595	0.570 (2006)	0.740 (2010)
Unit II	0.595	0.544 (2009)	0.715 (2009)
Unit III	0.595	0.536 (2006)	0.737 (2006)
Unit IV	0.595	0.559 (2006)	0.698 (2010)
Unit V	0.595	0.555 (2006)	0.697 (2009)

(Figures in brackets indicate the year in which the maximum/ minimum consumption was obtained)

**The consumption of coal in excess of norms at KSTPS and SSTPS was 38.34 lakh MT valued at ₹ 892.12 crore.**

From the above it may be seen that in the Unit-III of KSTPS, the consumption remained higher than the norms fixed in the project report in all the years under review. RERC allows TPS-wise norms for consumption of coal on yearly basis while fixing the tariff. The consumption above the norms allowed by RERC in KSTPS and SSTPS resulted in excess consumption of coal to the tune of 38.34 lakh MT valued at ₹ 892.12 crore during the review period as detailed in **Annexure 9**. We observed that out of excess consumption of 38.34 lakh MT of coal, 36.08 lakh MT was on account of usage of low grade coal and 2.26 lakh MT on account of low heat rate.

The Government stated (September 2010) that there was marginal increase in specific coal consumption due to ageing effect, quality of coal, backing down etc. which were not under control of RRVUNL.

### **Excess consumption of Gas**

**2.1.32** The Company projected 0.2053 SCM of gas for generation of one unit of electricity at DCCPP in the DPR. Audit analysis revealed that during March 2008 to March 2010 the DCCPP consumed 0.2287 SCM gas on an average for generation of one unit. The value of excess consumption of gas worked out in Audit amounted to ₹ 96.05 crore as detailed below:

Year	Generation (MUs)	Gas to be consumed as per DPR (in MMSCM)	Actual consumption (MMSCM)	Excess consumption (MMSCM)	Average Rate ₹/SCM	Amount of Excess consumption (₹ in crore)
2007-08	214.90	44.12	47.56	3.44	7.86	2.71
2008-09	2288.78	469.88	521.16	51.28	8.91	45.68
2009-10	2424.75	497.80	547.34	49.54	9.62	47.66
<b>Total</b>	<b>4928.43</b>	<b>1011.80</b>	<b>1116.06</b>	<b>104.26</b>		<b>96.05</b>

The excess consumption of gas due to higher SHR than the norms was valued at ₹ 16.73 crore.

Further analysis of excess consumption of gas revealed that the Station Heat Rate (SHR) was in excess of the norms fixed by RERC/projected in DPR and ranged between 1,966 and 2,282 k.cal/kwh of electricity on monthly basis during the period under review against norms of 1,950 k.cal /kwh fixed by RERC for the plant. This resulted in excess consumption of 18.03 MMSCM gas valued at ₹ 16.73 crore.

The Government in its reply stated (September 2010) that during 2008-09 the weighted average Net Calorific Value of gas was 8,499 k.cal/scm as against projected 9,000 k.cal/scm. The low calorific value along with deviation from design values of weather conditions resulted into higher consumption of gas. It further stated that being combined cycle the gas turbines were operated on open cycle mode as well as closed cycle mode and RERC after allowing for some reasonable open cycle mode of operation fixed 1,950 k.cal/kwh on yearly average basis. It may be mentioned here that RERC had relaxed the norms (1,850 k.cal/kwh) for closed cycle mode. However, RRVUNL could not even adhere to the relaxed norms on average monthly basis.

### Manpower Management

**2.1.33** Consequent upon the unbundling of erstwhile Rajasthan State Electricity Board (June 2000), RRVUNL came into existence (June 2000). State Government decided that the staff strength available in the power stations on the date would be taken as their respective sanctioned strengths. The CEA in its report recommended (April 2007) 1.15 person per MW of the installed capacity in case of thermal power plants less than 500 MW. In case of Gas and Hydro, manpower would be 0.36 and 1.53 person per MW respectively.

Actual manpower in RRVUNL was less than the sanctioned strength and the norms of CEA during the years 2005-06 to 2009-10. An analysis of category-wise deployment of manpower *i.e.* Thermal, Gas and Hydro as shown in **Annexure 10** revealed that the manpower deployed at Gas based power plants and at hydro power station was in excess of the norms fixed by CEA whereas the manpower at thermal based stations was inadequate. RRVUNL, however, did not initiate any action to rationalise the available manpower as per CEA norms. Due to shortage of manpower at thermal stations, the supervision/monitoring work has been affected, which resulted in delay in initiation of various proposals, processing tenders, persuasion with the consultants/contractors, verification/payment of the bills of contractors and also attributed to delay in commissioning of the Projects.

The Government stated (September 2010) that the manpower norms had been kept at the best suitable ratio based on working conditions and level of modernisation of the plant.

## Output Efficiency

### Shortfall in generation

**2.1.34** The targets for generation of power for each year are fixed by the RRVUNL and approved by the CEA. It was observed in Audit that the RRVUNL was able to generate a total of 99,280 MUs of power during 2005-06 to 2009-2010 against a target of 98,449 MUs fixed as shown in the following table:

Year	Target (MUs)	Actual (MUs)	Shortfall (-) Excess(+) (MUs)
2005-06	18289	18901	612
2006-07	18258	19041	783
2007-08	18905	19543	638
2008-09	21186	21175	(-)11
2009-10	21811	20620	(-)1191
<b>Total</b>	<b>98449</b>	<b>99280</b>	<b>831</b>

It would be observed from the above table that though the cumulative targets for the five year ending 2009-10 has been achieved by RRVUNL, but the targets in respect for the year 2008-09 and 2009-10 could not be achieved primarily due to increase in forced outages and decrease in plant availability compared to the previous years under review.

The year-wise details of energy to be generated as per design, actual generation, PLF as per design and actual PLF in respect of the power Projects commissioned up to March 2010 are given in **Annexure 11**.

The details in the Annexure indicate that:

- The actual generation and actual PLF achieved were below the energy to be generated and PLF as per design during the five years upto 2009-2010.
- As against the total designed generation of 1,12,868 MUs of energy during the five years ended 2009-2010 the actual generation was 99,280 MUs leading to the shortfall of 13,588 MUs, production of which was technically feasible.
- As the PLF had been designed considering the availability of inputs the loss of generation (total 13,588 MUs) during the period 2005-2006 to 2009-2010 indicated that resources and capacity were not being utilised to the optimum level due to design deficiencies, frequent breakdown of units and delay in timely rectification of defects as discussed subsequently.

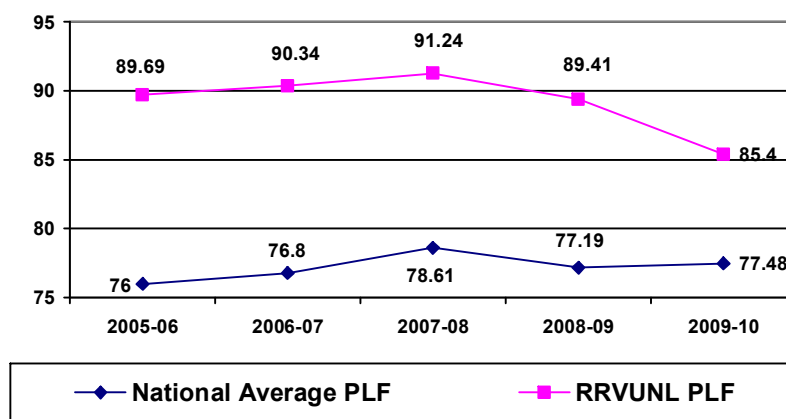
The Government stated (September 2010) that shortfall in generation at SSTPS during 2008-10 was mainly due to deferment of capital overhauling of turbine of unit I and II and failure of generator transformers of Unit II. It further stated that mandatory repairs and maintenance were not considered in the design PLF pointed out by audit.

However, while computing the design PLF due weightage of mandatory repairs and maintenance had been considered.

### **Plant Load Factor (PLF)**

**2.1.35** Plant load factor (PLF) refers to the ratio of the actual generation to the maximum possible generation at installed capacity. According to norms fixed by Central Electricity Regulatory Commission (CERC), the PLF for thermal power generating stations should be 80 *per cent*, against which the national average was 77.22 *per cent*. It was noticed that PLF in respect of KSTPS and SSTPS was more than the norms fixed by CERC as well as national average. PLF at DCCPP was less than 80 *per cent* during 2008-09 due to less availability of gas as discussed in paragraph 2.1.29.

The line graph depicting the national average PLF and PLF of RRVUNL for the five years ending 31 March 2010 is given below.



We observed that the main reasons for declining trend in PLF since 2007-08 onwards was less availability of plant and increase in forced outages as discussed in succeeding paragraphs. Further, decline in PLF was also due to less availability of gas at RGTPS and less availability of water at Hydro Power Stations.

We observed that actual PLF in case of RGTPS ranged between 36 and 45 *per cent* during 2005-10 which was below than the national average PLF. The estimated shortfall in generation as compared to national average PLF works out to 1,782.93 MUs during 2005-10 resulting in loss of contribution amounting to ₹ 46.36 crore.

The details of average realisation vis-à-vis average cost per unit, PLF achieved, average realisation at national average PLF, PLF at which average

cost would be recovered and the difference of PLF in *per cent* are given below:

S. No.	Description	2005-06	2006-07	2007-08	2008-09
1.	Average realisation (₹ per unit)	2.023	2.078	2.193	2.657
2.	Average cost (₹ per unit)	2.048	2.090	2.172	2.731
3.	Actual PLF ( <i>per cent</i> )	89.69	90.34	91.24	89.41
4.	Average realisation at National PLF (₹ per unit)	1.742	1.776	1.856	2.295
5.	PLF at which average cost stands recovered ( <i>per cent</i> ) (2/1 x 3)	90.80	90.86	90.37	91.90
6.	Difference ( <i>per cent</i> ) (5-3)	1.11	0.52	(0.87)	2.49

It could be seen from the table above that overall PLF of RRVUNL was higher than the national average PLF. However, during 2005-06, 2006-07 and 2008-09, there was shortfall in achievement of PLF to realise the average cost of generation.

The details of maximum possible generation at installed capacity, actual generation and corresponding Plant Load Factor achieved in respect of each generating unit for the five years up to 2009-2010 are given in **Annexure 11**.

### ***Plant availability***

**2.1.36** Plant availability means the ratio of actual hours operated to maximum possible hours available during certain period. As against the CERC norm of 80 *per cent* plant availability during 2004-09, the average plant availability of power stations of RRVUNL was 90.26 *per cent* during the five years up to 2009-10.

The details of total hours available, hours operated, planned outages, forced outages and overall plant availability in respect of RRVUNL as a whole are shown below:

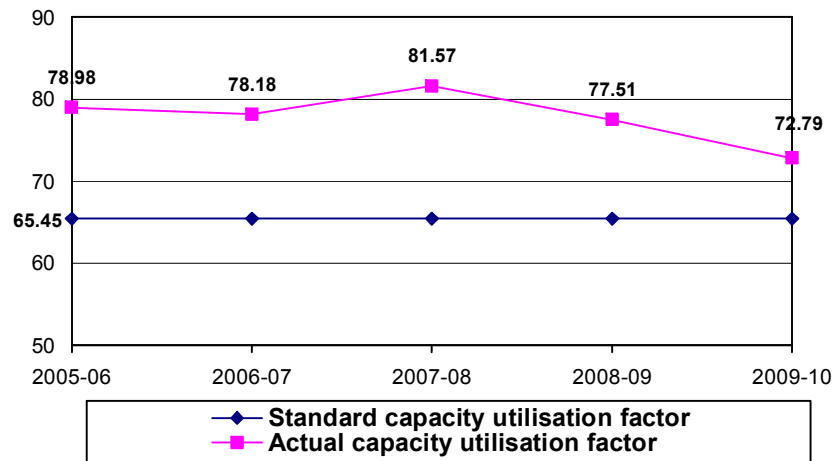
S. No.	Particulars	2005-06	2006-07	2007-08	2008-09	2009-10
1.	Total hours available	122640	122640	124872	148920	151110
2.	Operated hours	108001	106134	111632	129099	128793
3.	Planned outages (in hours)	7718	8234	6013	6443	8528
4.	Percentage of planned outages	6.30	6.72	4.81	4.33	5.64
5.	Forced outages (in hours)	6921	8272	7227	13378	13789
6.	Percentage of forced outages	5.64	6.74	5.79	8.98	9.13
7.	Plant availability ( <i>per cent</i> )	88.06	86.54	89.40	86.69	85.23

It could be seen from the table above that the plant availability has decreased from 89.40 *per cent* in 2007-08 to 85.23 *per cent* in 2009-10 due to increase in forced outages as discussed in paragraph 2.1.38

The Government stated (September 2010) that decrease in availability during 2009-10 was attributable to capital overhauling of turbine modules and acid cleaning of the boiler *etc.*

### Capacity utilisation

**2.1.37** Capacity utilisation means the ratio of actual generation to possible generation during actual hours of operation. Based on national average PLF of 77.22 per cent and average plant availability at 84.76 per cent, the standard capacity utilisation factor works out to be 65.45 per cent. It was noticed that as against this, RRVUNL achieved average capacity utilisation of 77.78 per cent of the installed capacity during the review period. The audit analysis revealed that though the average capacity utilisation of RRVUNL was more than national average but from 2007-08 onwards it was on declining trend. The line-graph depicting the capacity utilisation is given below:



We noticed that reasons for declining trend of capacity utilisation were attributable to low plant availability due to increase in forced outages and low PLF in case of SSTPS and RGTPS during 2008-09 and 2009-10 as compared to the year 2007-08.

### Outages

**2.1.38** Outages refer to the period for which the plant remained closed for attending planned/ forced maintenance. We observed following deficiencies in planned and forced outages:

- The total number of hours lost due to planned outages increased from 7718 hours in 2005-06 to 8528 hours in 2009-10. The actual average planned outages were more than annual all India average of 552 hours (23 days) during 2006-07. Further, the unit wise analysis revealed that total 4800 hours were lost in excess of annual all India average of planned outages. This has resulted in loss of generation of 965.43 MUs.
- The forced outages in power stations increased from 6,921 hours in 2005-06 to 13,789 hours in 2009-10 *i.e.* from 5.64 to 9.13 per cent of the total available hours in the respective years due to delay in annual maintenance ranged between one to five months and old age plants of KSTPS (Unit-I to IV). Though the forced outages remained less than

the norm of 10 *per cent* fixed by CEA in all the five years ending 31 March 2010, but forced outages increased by 4.42 to 99.23 *per cent* during the year 2006-07 to 2009-10 as compared to the year 2005-06. Adherence to the 2005-06 forced outages would have entailed availability of plant for additional 14,982 hours during the year 2006-07 to 2009-10 with consequent generation of 2,454.61 MUs during these years.

### ***Auxiliary consumption of power***

**The auxiliary consumption of power in excess of the norms at RGTPS resulted in loss of 76.53 MUs valuing ₹ 18.11 crore.**

**2.1.39** Energy consumed by power stations themselves for running their equipments and common services is called auxiliary consumption. We observed that the actual auxiliary consumption was within the norms allowed by RERC except in case of RGTPS. In case of RGTPS, RERC allowed (October 2004) five *per cent* of the power generated to be used as auxiliary consumption. However, the actual auxiliary consumption of RGTPS increased from 7.15 *per cent* in 2005-06 to 13.32 *per cent* in 2007-08 and subsequently decreased to 7.88 *per cent* in 2009-10. The excess auxiliary consumption resulted in loss of 76.53 MUs valuing ₹ 18.11 crore\* which could not be dispatched to the grid.

The Government in its reply (September 2010) stated that the auxiliary consumption of RGTPS was higher than prescribed because the gas supplied was sufficient to run one gas turbine on full rated capacity and thus the other turbine is bound to run on half capacity, but the need of auxiliary equipment is almost same for running the plant in case of part or full load.

### ***Operation and maintenance***

**2.1.40** The operation and maintenance (O&M) cost includes expenditure on the employees, repair & maintenance including stores and consumables, consumption of capital spares not part of capital cost, security expenses, administrative expenses *etc.* of the generating stations besides corporate expenses apportioned to each generating stations *etc.* but exclude the expenditure on fuel.

CERC in its Regulation of 2009 allowed O&M norm for 2009-10 as ₹ 18.20 lakh per MW in respect of plants up to 250 MW. We noticed that the O&M expenditure of the RRVUNL remained in the range of ₹ 5.79 lakh to ₹ 12.46 lakh per MW during 2005-09 and was well within norms.

## **Financial Management**

**2.1.41** Efficient fund management is the need of the hour in any organisation. This also serves as a tool for decision making, for optimum utilisation of available resources and borrowings at favourable terms at appropriate time.

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\* 76.53 MUs x 2.023 per unit to 3.00 per unit *i.e.* RRVUNL's average selling price during the year 2005-06 to 2009-10.



The power sector companies should, therefore, streamline their systems and procedures to ensure that:

- funds in idle inventory are not invested,
- outstanding advances are adjusted/recovered promptly,
- funds are not borrowed in advance of actual need, and
- swapping high cost debt with low cost debt is availed expeditiously.

The main sources of funds were realisations from sale of power, loans from State Government/Banks/Financial Institutions (FI), *etc.* These funds were mainly utilised to meet payment of power purchase bills, debt servicing, employee and administrative costs, and system improvement works of capital and revenue nature.

In absence of availability of financial statements for 2009-10, the details of cash in flow and out flow of RRVUNL for the four years 2005-06 to 2008-09 are given below:

(₹ in crore)

S.No.	Particulars	2005-06	2006-07	2007-08	2008-09
<b>Cash Inflow</b>					
1.	Net Profit/(Loss)	0	0	0	(495.54)
2.	Add: adjustments	202.11	199.00	214.56	287.37
3.	Operating activities	177.10	179.50	529.49	292.92
4.	Investing activities	0	200.33	0	1.65
5.	Financing activities	418.19	1161.02	2167.19	2307.55
	<b>Total</b>	<b>797.40</b>	<b>1739.85</b>	<b>2911.24</b>	<b>2393.95</b>
<b>Cash Outflow</b>					
6.	Operating activities	219.70	144.61	23.24	300.48
7.	Investing activities	560.76	1600.55	2673.90	1737.35
8.	Financing activities	0	0	53.15	448.07
	<b>Total</b>	<b>780.46</b>	<b>1745.16</b>	<b>2750.29</b>	<b>2485.90</b>
	<b>Net increase/decrease in cash and cash equivalent</b>	<b>16.94</b>	<b>(5.31)</b>	<b>160.95</b>	<b>(91.95)</b>

It could be observed from the above table that cash and cash equivalent increased during 2005-06 and 2007-08 whereas it decreased in 2006-07 and 2008-09. The cash inflow was mainly through increased borrowings for utilisation in project implementation. We observed that dependence on borrowed funds increased during review period as borrowings increased from ₹ 4,723.23 crore in 2005-06 to ₹ 7,521.25 crore (59.24 per cent) as at the end of 2008-09. This entailed interest burden of ₹ 360.86 crore during review period ultimately increasing the operating cost of RRVUNL. Heavy capital expenditure coupled with interest commitment on loans without adequate returns due to delay in commercial operation of the plants caused significant increase in cost of operations. Therefore, there is an urgent need to optimise internal resource generation by enhancing the PLF of RGTPS and GLTPP.

The audit findings on financial management are given below.

**Equity contribution for the projects**

2.1.42 CERC specified debt-equity ratio of 70:30 as the funding mix for the capital cost of a project. The position of equity to be contributed by the State Government on various projects and equity actually received is given in the table below:-

(₹ in crore)

Sl No	Name of project	Project cost	Equity contribution to be received as per CERC norms	Equity received	Short receipt of equity
1.	GLTPP Unit –II	618	185	185	0
2.	DCCPP	1155	347	347	0
3.	KSTPS Unit-VII	880	264	176	88
4.	SSTPS Unit-VI	1117	335	225	110
5.	CTPP Unit-I & II	2350	705	470	235
	<b>Total</b>				<b>433</b>

It was observed in audit that in KSTPS Unit VII, SSTPS Unit VI and CTPP Unit I and II, RRVUNL approached the State Government for release of equity support of 20 per cent on the plea that financial institutions were ready to grant term loan up to 80 per cent though the State Government provided equity support of 30 per cent of the estimated cost in earlier projects. Due to this the support of equity was lesser by ₹ 433 crore and the same was met out by borrowing from financial institutes. Thus, RRVUNL would have to bear additional interest liability due to short receipt of equity.

The Government in its reply (September 2010) stated that the debt equity ratio of 70:30 of the funding mix of the capital cost of the project was for the purpose of determination of tariff only. It further stated that the available limited resources were utilised optimally for maximum development works in the best interest of economy/State.

However, RRVUNL itself approached the State Government for equity support of 20 per cent only despite that the Government extended equity equivalent to 30 per cent in earlier projects. Consequently, the generation cost was also increased.

Further, the initial estimated project cost of ₹ 618 crore for GLTPP Unit-II was revised (May 2008) to ₹ 750 crore against which an expenditure of ₹ 759.87 crore was incurred on the project. RRVUNL, however, while sending the proposal for approval of revised cost to the State Government, specifically mentioned that PFC was sanctioning loan on the basis of debt equity ratio of 80:20, hence the State Government equity already sanctioned was sufficient to meet out the requirement. We observed that non inclusion of items worth ₹ 60 crore in preparation of DPR led to depriving Government equity of ₹ 18 crore as well as extra interest burden on term loan.

**Non inclusion of items worth ₹ 60 crore in preparation of DPR of GLTPP Unit II led to depriving Government equity of ₹ 18 crore.**

The Government stated (September 2010) that the original project report did not have adequate provisions for initial spares of main equipment and for spares bulldozers and the same could be known only after facing the

operational problems. We are of the opinion that initial spares were essentially required and could have been included in estimation at DPR stage.

***Excess expenditure due to payment of VAT instead of CST***

**2.1.43** RRVUNL procured gas for DCCPP from ONGC. As the sale of gas was made between two different States (Gujarat and Rajasthan) as such concessional Central Sales Tax (CST) at the rate of three *per cent* was payable against providing of 'C' form. It was noticed that ONGC charged VAT at the rate of 12.5 *per cent* in its invoices for the period April 2007 to December 2007 treating delivery point of gas at Hazira (Gujarat). RRVUNL, initially paid CST at the rate of three *per cent* only, however, on the demand of ONGC, released (October 2007) the balance tax amount to avoid interest at the rate of two *per cent* above PLR as demanded by ONGC. Thereafter payment on account of VAT at the rate of 12.5 *per cent* on purchase of gas from ONGC was made up to December 2007. However, on continuous persuasion from the RRVUNL, ONGC subsequently agreed (June 2008) with RRVUNL and asked to make available 'C' form and undertaking to bear interest penalty *etc.*, if any, before submission of revised return *i.e.* before 30 June 2008. We observed that RRVUNL could not furnish the 'C' form and undertaking till 30 June 2008. In view of the above, RRVUNL may not get the refund of excess tax paid from April 2007 to December 2007 amounting to ₹ 7.98 crore.

The Government in its reply (September 2010) stated that ONGC assured that on receipt of refund from Gujarat VAT authorities/Sales Tax Department, the same would be refunded to RRVUNL.

***Deprivation of discount***

**2.1.44** RRVUNL placed (November 2005) purchase orders on MMTC and PEC for supply of 3.0 and 1.0 lakh MT imported coal at SSTPS and KSTPS respectively. It was noticed that a discount of ₹ 45 and ₹ 50 per MT was admissible for timely payment.

RRVUNL deducted the admissible discount but the payments were not released within the stipulated time. Due to delay in releasing the payment, RRVUNL had to refund ₹ 1.64 crore (MMTC-₹ 1.23 crore and PEC-₹ 0.41 crore) and thus could not avail the admissible discount.

The Government stated (September 2010) that payment to these firms were prolonged deliberately to save equivalent amount of interest and accordingly it saved interest more than the discount.

However, the RRVUNL faced liquidity crunch all the time and that the payments were made subsequently out of short term loan only.

## **Tariff Fixation**

**2.1.45** RRVUNL is required to file an application for approval of Generation Tariff for each year 120 days before the commencement of the respective year or such other date as may be directed by the RERC. The RERC accepts the application filed by RRVUNL with such modifications/conditions as may be deemed just and appropriate. After considering all suggestions and objections from public and other stakeholders, RERC issues an order containing targets for controllable items and the generation tariffs for the year.

The RERC sets performance targets for each year of the Control Period for the items or parameters that are deemed to be “controllable” and which include:

- a. Station heat rate;
- b. Plant availability;
- c. Auxiliary energy consumption;
- d. Secondary fuel oil consumption;
- e. Operation and maintenance expenses;
- f. Plant load factor;
- g. Financing cost which includes cost of debt (interest), cost of equity (return); and
- h. Depreciation.

Scrutiny of tariff petitions filed by RRVUNL from 2005-06 to 2009-10 revealed that there was a delay in filing petition before RERC ranging from 13 to 88 days except in 2006-07 and 2008-09. The overall per unit cost of generation of RRVUNL was higher by ₹ 0.098 and ₹ 0.620 than that allowed by RERC in its tariff order in 2007-08 and 2008-09 respectively. The excess per unit cost in respect of its various power plants ranged between ₹ 1.764 Mini Micro Hydro (MMH) to ₹ 0.189 (SSTPS) in 2007-08 and ₹ 14.905 (MMH) to ₹ 0.644 (KSTPS) in 2008-09. The high cost of generation was mainly due to increase in cost of different items of fixed and variable cost such as O&M expenses, finance cost, depreciation at different plants and increase in extraordinary and prior period items. The excess cost of ₹ 0.098 per unit in 2007-08 over the allowed tariff was charged by RRVUNL in the energy bills raised on Power Distribution Companies (DISCOMS) while in 2008-09 it billed only ₹ 0.396 per unit additionally beyond the allowed tariff. Therefore, due to non-achievement of tariff performance targets by RRVUNL, DISCOMS had to bear extra cost of generation of ₹ 941.80 crore.

The Government in its reply stated (September 2010) that non achievement of tariff performances as per norms prescribed by RERC was attributed to several reasons like grid parameters, deferment of capital overhauling/planned maintenance and compelling running of units on partial load. It further stated

that the bills to DISCOMs were raised as per tariff order and increase in variable cost was due to increase in fuel price which was adjusted as per fuel price adjustment formula of RERC and as such no amount over and above tariff order was charged from DISCOMs.

However, the RRVUNL filed trueing up petition with RERC to approve the expenditure incurred over and above allowed in tariff order due to non-achievement of performance targets fixed by RERC due to inefficiencies in operation like station heat rate, plant availability, excess consumption of fuel *etc.*

## Environment Issues

**2.1.46** In order to minimize the adverse impact on the environment, the GOI had enacted various Acts and statutes. At the State level, State Pollution Control Board (SPCB) is the regulating agency to ensure compliance with the provisions of these Acts and statutes. MOEF, GOI and Central Pollution Control Board (CPCB) are also vested with powers under various statutes. RRVUNL has an environmental wing at the KSTPS & SSTPS.

Audit scrutiny relating to compliance with the provisions of various Acts in this regard revealed the following:

### ***Carbon Credits and Clean Development Mechanism***

#### ***Non registration of plant under Clean Development Mechanism***

**2.1.47** To save the earth from green house gases (GHG), a number of countries including India signed (December 1997) the “Kyoto Protocol” (Protocol). Article 3 of the Protocol targeted reduction of emission of GHG by five *per cent* in the developed countries. United Nations Framework Convention on Climate Change (UNFCCC) had set the standard level of Carbon emission allowed for a particular industry or activity. The extent to which an entity is emitting less Carbon (as per standard fixed by UNFCCC), its gets credited for the same. If the developed countries were unable to reduce their own carbon emissions, they could book the savings of GHG in developing countries in their account by paying some money to the concerned country. The booking of such savings of GHG is called purchase of Certified Emission Reduction (CER), commonly called Carbon Credits. This whole system is named as Clean Development Mechanism (CDM).

For sale of CER, registration of the Power Plant is required as CDM project with UNFCCC. The Power Plants that commenced operation on or after 1 January 2000 were eligible for registration by submitting the request with Designated National Authority (DNA) *i.e.* MOEF. We, however, observed that RRVUNL has not taken prompt action for getting registered its 330 MW Gas based power plant *i.e.* DCCPP. Though the project report of DCCPP was prepared and the work order for erection of plant was awarded in June 2004, however, RRVUNL belatedly appointed (March 2008) consultant for

registration of the plant under CDM *i.e.* after commissioning of the project. However, the DNA dropped the request on the ground that CDM consideration was not taken into account while conceiving the project

The Government stated (September 2010) that RRVUNL could not include CDM consideration as the project was already conceived in August 2003 *i.e.* before the protocol came into force in February 2005.

However, the physical work of DCCPP was started only after October 2005. We are of the opinion that RRVUNL could have approached the State Government for inclusion of CDM consideration (before October 2005) in its DPR.

### ***Use of high ash content coal***

**2.1.48** As per MOEF notification (July 2003) coal based power stations located 1,000 KM away from the coal mine or located in urban, sensitive or critically polluted areas were required to use coal having less than 34 *per cent* ash on an annual weighted average basis. We observed that SSTPS is more than 1,000 KM away from SECL Korba coal fields and KSTPS is located at Kota, an urban area. During review period, KSTPS and SSTPS received 117.28 lakh MT of coal, in which the weighted average of ash ranged between 35.85 and 39.01 *per cent*. The ash content could have been brought down by washing the coal through washeries and beneficiation to meet the laid down norms. However, RRVUNL did not initiate any action in this regard.

The Government stated (September 2010) that at present RRVUNL arranges washing of entire raw coal grade “F” allotted to its TPSs to meet the MOEF requirement.

## **Noise Pollution**

**2.1.49** Noise Pollution (Regulation and Control) Rules, 2000 aims to regulate and control noise producing and generating sources with the objective of maintaining ambient air quality. To achieve the above, noise emission from equipment need to be controlled at source for which adequate silencing equipment should be provided at various noise sources and a green belt should be developed around the plant area to diffuse noise dispersion. The TPSs are required to record sound levels in all the areas stipulated in the rules referred to above.

We observed that KSTPS and SSTPS neither installed adequate silencing equipments nor installed noise monitoring equipment and did not record noise levels at all, which resulted in violation of statutory provisions in this regard.

The Government in its reply (September 2010) stated that measures like installation of low noise machines, silencers, mufflers, noise refuge, noise absorbent padding and green belt development were taken to restrict sound levels. However, we are of the opinion that RRVUNL did not install noise

monitoring equipment to record noise level.

### Monitoring by top management

### MIS data and monitoring of service parameters

**2.1.50** RRVUNL plays an important role in the State economy. For such a giant organisation to succeed in operating economically, efficiently and effectively, there should be documented management system of operations, service standards and targets. Further there has to be a Management Information System (MIS) to report on achievement of targets and norms. The achievement need to be reviewed to address deficiencies and also to set targets for subsequent years. The targets should generally be such that the achievement of which would make an organisation self-reliant. RRVUNL has system of MIS where by the generation details are being sent to the Head office on daily basis and the operational performance on monthly basis. The generation targets are set by the management and achievement measured against them. In case of non-achievement of targets, necessary corrective actions are taken for their achievement. However, we observed that non-adherence to norms/targets in respect of input efficiency parameters was not monitored by top management. Though information relating to thermal efficiency, auxiliary consumption *etc.* were received in monthly reports, no action was taken to control these factors. The Board of Directors (BOD) also did not discuss the operational performance on regular basis. We observed that BOD, while approving the annual financial and operational performance, did not recommend corrective measures to be taken on operational underperformance.

### Conclusion

- **RRVUNL could not keep pace with growing demand of power in the State due to non-commencement of commercial production by the newly establish generating stations/ units as per their scheduled plan.**
- **The management of projects under commission was ineffective as there were instances of time and cost overrun in all the projects taken up during 2005-10. Delay in completion also caused significant increase in interest cost during construction period.**
- **Operational performance of the plants was also affected due to short receipt as well as inferior quality of coal/gas, low thermal efficiency and low heat rate caused excess consumption of coal/gas.**

- **Plant load factor, plant availability and capacity utilisation showed declining trend since 2007-08.**
- **The unit-wise deployment of manpower was not in accordance with the prescribed CEA norms.**
- **The top management did not take corrective measures to enhance the operational performance of the plants.**
- **Statutes relating to ash content of coal and noise pollution were not adhered to.**

### **Recommendations**

**The RRVUNL needs to:**

- **evolve effective planning for capacity addition to keep pace with growing demand to overcome the shortage of power;**
- **evolve effective monitoring mechanism to establish new power generating stations/units as per the scheduled plan;**
- **take effective steps to ensure the consumption of coal/gas within the prescribed norms.**
- **ensure adequate plant load factor, plants availability and capacity utilisation by minimising outages and auxiliary consumption;**
- **rationalise its manpower allocation to ensure optimum utilisation;**
- **enhance the use of beneficiated coal in case of high ash content coal and ensure effective compliance relating to environmental laws; and**
- **ensure adherence to norms/ targets in respect of input efficiency parameters.**



## Rajasthan State Mines & Minerals Limited

### 2.2 Performance Audit of Mining and Marketing of Rock Phosphate and Limestone

#### Executive summary

*Rajasthan State Mines & Minerals Limited incorporated as Government Company in December 1974 is involved in mining and marketing of Rock Phosphate, Gypsum, Limestone, Lignite and other minerals . The Company has four mineral based Strategic Business Units and Profit Centre (SBU&PC) at Udaipur, Bikaner, Jodhpur and Jaipur engaged in mining and marketing of Rock Phosphate, Gypsum, Limestone and Lignite respectively. The Company is mining 87 per cent of the total Rock Phosphate production in the country and fulfils 19 per cent of total demand of Rock Phosphate and balance 81 per cent demand is fulfilled by imported Rock Phosphate. Rock Phosphate and Limestone had contributed almost 59 and 12 per cent respectively of the total revenue earned by the Company during 2004-09.*

#### **Planning and statutory compliance**

*The Company's planning was not adequate as it failed to prepare long term plan and the mining schemes were also faulty. The company did not comply with the statutory requirements viz; obtaining environment clearance, preparation of mine plan, operating mines under minor mineral category despite being covered under major*

*mineral, delay in reclamation of excavated mine area. The Company had to close down its mining operations at eight mines since May 2004 due to non compliance of the statutory requirements. Resultantly, the Company incurred idle expenditure of ₹ 62.46 crore on these closed mines towards land tax and dead rent. Non converting the Limestone mines under major mineral resulted in avoidable payment of premium charges amounting to ₹ 66.49 lakh on transferring the same in its name.*

#### **Production of minerals**

*The production performance of the Company was at variance with both Mine Plan (MP) and Annual Plan (AP). The quantity of ore (Rock Phosphate) excavated during 2004-09 ranged between 85 and 110 per cent whereas the quantity of over burden removed ranged between 86 and 123 per cent of quantity projected in the AP. The excavation targets fixed for contractors for SMS grade Limestone were not commensurate with the MP/AP projections. The Limestone produced by the Company at Gotan was 12.68 per cent of the total production despite the fact that it had 43.58 per cent of total lease area.*

The Company could not utilise the heavy earth moving machines (HEMMs) optimally in excavation of mineral due to high number of breakdowns which resulted in loss of production of 4.17 lakh MT during 2004-09. Despite having sufficient quantity of low grade ore, the crusher plant was not utilised optimally. Consequently, the Industrial Beneficiation Plant (IBP) could not be utilised to its installed capacity. The crushing and screening plant at SBU&PC-Limestone also remained idle. As a result, the Company was deprived of revenue of ₹ 23.16 crore.

#### **Contract Management**

The contract management of the Company was deficient in award of contracts and their execution. The Company ignoring the defects noticed during inspection/trial run of the excavator accepted the supply. The Company awarded repair and maintenance contract without obtaining competitive bids. The Company did not include any penal provision in the contract awarded for determining load limits in wagons due to which the Company failed to recover penalty from the transporters for overloading and got involved in unnecessary litigation resulting in payment of ₹ 6.84 crore as penalty charges to Railways.

#### **Marketing/sales Management**

There was no documented sales policy at SBU&PC Rock Phosphate and Limestone. Due to non-review of sale price in comparison to effective increase in cost led to loss of revenue of ₹ 60.23 crore. The losses of the SBU&PC-Limestone (Gotan) were exceptionally high in 2007-08. The Company also failed to recover ₹ 46.27 crore towards Mineral Right Cess

imposed retrospectively by the State Government from the consumers.

#### **Financial Management**

The SBU&PC- Limestone in violation of the guidelines kept the funds with the unit without any use. The Company did not utilise the corpus fund and adopted other methods for financial assurance.

#### **Manpower Management**

The Company did not have any structured manpower policy. The manpower deployed at SBU&PC-Limestone was excess whereas SBU&PC- Rock phosphate was facing shortage of manpower.

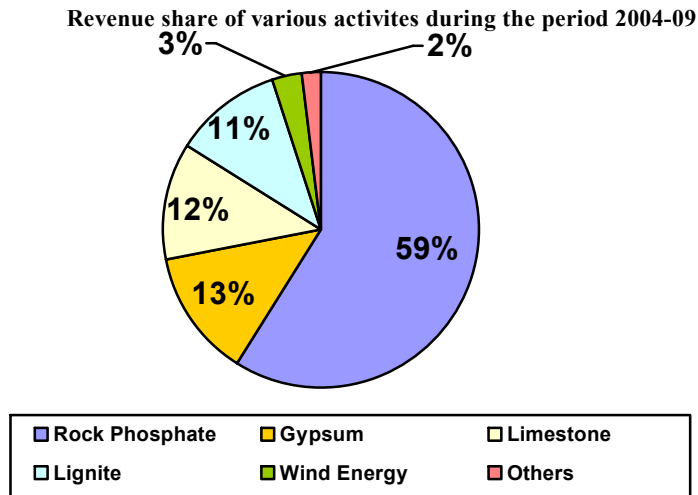
#### **Conclusion and Recommendation**

The Company's planning was inadequate and the mining schemes were also faulty. The Company also did not comply with the statutory requirements. The production performance of the Company, utilisation of HEMMs and IBP was not satisfactory. There was no documented sales policy. The review contains nine recommendations which includes preparation of broad strategic corporate plan, compliance of statutory requirements and optimal utilisation of HEMMs/IBP and best practices for contract management.

## Introduction

**2.2.1** Rajasthan State Mines & Minerals Limited (Company) incorporated as Government Company in December, 1974 is involved in mining of Rock Phosphate, Gypsum, Limestone, Lignite and other minerals in the State. The main objective of the Company is to procure, purchase, take on lease or otherwise acquire and deal with any mines, mining rights and concessions, prospecting and development rights at any place and to acquire by purchase or otherwise land containing mineral of all descriptions and any interest therein and to explore, work exercise, develop and turn to account the same.

The Company has four mineral based Strategic Business Units and Profit Centres (SBU&PC) at Udaipur, Bikaner, Jodhpur and Jaipur engaged in mining and marketing of Rock Phosphate, Gypsum, Limestone and Lignite respectively. Revenue share of various activities of the Company is depicted in the pie-chart given below:



The Company is mining 87 *per cent* of the total Rock Phosphate production in the country and fulfils 19 *per cent* of total demand of Rock Phosphate and balance 81 *per cent* demand is fulfilled by imported Rock Phosphate. Rock Phosphate had contributed almost 59 *per cent* of the total revenue earned by the Company during 2004-09. The importance of SBU&PC Rock Phosphate can be realised from the fact that out of the total reserves of 527.23 lakh MT of Rock Phosphate in the country as on 1 April 2005 as per Indian Bureau of Mines (IBM), the Company has reserves of 229.59 lakh MT, however, the Company estimated 239.06 lakh MT reserve of Rock Phosphate as on 31 March 2009. The Company had five mines as on March, 2009 of which only one operational mine at Jhamarkotra alone contains reserves of 223.98 lakh MT and the remaining four mines containing reserves of 15.08 lakh MT were not in operation since May 2004.

The Company is also engaged in mining of Limestone of Steel Melting Soap (SMS) grade and chemical grade. SBU&PC (Limestone) was having four mines of Limestone and four mines of Fluorspar containing reserves of 597 and 5.98 lakh MT respectively as on 1 April 2009. The SMS grade Limestone mined at Jaisalmer (Sanu Mines) is used as a flux by steel plants in the melting process. The chemical grade Limestone mined at Jodhpur (Gotan and Basni mines) is used by cement industries and lime kilns. Limestone had contributed almost 12 *per cent* of the total revenue earned by the Company during 2004-09.

The revenue share of other activities *i.e.* Gypsum and Lignite in the revenue earned by the Company during 2004-09 was 13 and 11 *per cent* respectively.

The financial performance for last five years ending March 2009 in respect of SBU&PC - Rock Phosphate and Limestone was given in **Annexure 12**.

From the Annexure it was observed that:

- The profit of the SBU&PC Rock Phosphate had increased from ₹ 118.83 crore in 2004-05 to ₹ 138.71 crore in 2007-08 and decreased to ₹ 79.09 crore in 2008-09. The profit in 2008-09 had declined due to increased liability of land tax (₹ 154.08 crore), increase in wages and salaries, imposition of cess (₹ 46.27 crore) with retrospective effect *etc.*
- The SBU&PC-Limestone incurred loss of ₹ 1.31 crore in 2007-08 from a profit of ₹ 7.13 crore in 2004-05 and again earned a profit of ₹ 6.17 crore in 2008-09. The main reason for declining profit was decrease in sales volume, increase in cost of excavation and levy of land tax (₹ 14.41 crore in 2007-08) by the State Government.
- Gotan unit of SBU&PC (Limestone) incurred losses in all the five years mainly due to heavy expenditure on land tax on 3,022.33 hectare of land whereas the mining operations were carried out on 991 hectare of land.

The management of the Company is vested in a Board of Directors consisting of nine directors including a Chairman and a Managing Director (MD). The MD is the chief executive of the Company who is assisted by four Group General Managers (one for each SBU&PC). The Group General Managers are assisted by General Managers, Deputy General Managers and Senior Managers/Managers.

### Scope of Audit

**2.2.2** A comprehensive review on the working of Rajasthan State Mines & Minerals Limited appeared in the Audit Report (Commercial) for the year ended 31 March 2001 in which Rock Phosphate activity was also covered. The review had been discussed by the Committee on Public Undertakings (COPU) on 14 July, 2005, the recommendation on the same are still awaited. Similarly two

separate performance reviews on the performance of SBU&PC Gypsum and SBU&PC Lignite appeared in the Audit Report (Commercial) for the year ended 31 March 2006 and 31 March 2007 respectively were discussed in May 2008 and September 2009 recommendations on which are still awaited. The present review exclusively focuses on the performance of all the 13 mines of SBU&PC Rock Phosphate and Limestone covering the period 2004-05 to 2008-09.

### **Audit Objectives**

**2.2.3** Performance audit of mining and marketing of Rock Phosphate and Limestone by the Company was carried out to evaluate and assess that:

- the mining activities have been carried out as per the mandate and mining policy of Government of Rajasthan (GOR)/Government of India (GOI);
- production of minerals has been done keeping in view the market demand, capacity utilisation and in cost effective manner;
- the Company was able to market the mineral effectively keeping in view the demand and competition with imported mineral in the country;
- the contracts for mining and transportation of mineral were awarded in an economic and efficient manner;
- funds were arranged in an economical manner and utilised properly to achieve maximum return; and
- there was an effective and efficient internal control and monitoring mechanism.

### **Audit criteria**

**2.2.4** The following audit criteria were adopted:

- rules and regulations prescribed in the Mines Act 1957, Mines and Minerals (Development and Regulations) Act 1957, Mineral Concession Rules 1960, Environment (Protection) Act, 1986 and Forest (Conservation) Act 1980, Rajasthan Minor Mineral Concession Rules 1986;
- orders issued by Directorate of Mines and Geology(DMG), GOR and Director General of Mines & Safety (DGMS), Government of India (GOI);

- directions/guidelines of the Board of the Company;
- terms and conditions of the contracts executed by the Company with contractors and sales agents; and
- Sale policy of the Company and sales records.

## **Methodology**

**2.2.5** The following methodology for scrutiny of records was adopted:

- Scrutiny of Board Agenda and Minutes;
- Review of mineral rules and regulations;
- Checking correctness of assessment of demand of minerals excavated;
- Adherence to mining activity with reference to mining plan and actual mining;
- Ascertaining capacity utilisation of departmental plant & machinery;
- Comparing contractual mining vis a vis departmental mining;
- Efficacy of contracts for excavation and transportation;
- Review of sale pricing policy and marketing policy; and
- Internal check/ internal control system, manpower and fund management system.

## **Audit findings**

**2.2.6** Audit explained the audit objectives and methodology for the performance audit during Entry Conference held on 27 January 2010, which was attended by the Managing Director (MD), Financial Advisor (FA) and Group General Managers (GGMs) of the Company. Subsequently, the audit findings were discussed (17 August 2010) in the Exit Conference where the State Government was represented by the Principal Secretary, Mines and Petroleum Department and the Company by the Managing Director and GGMs. The performance audit has been finalised after considering/incorporating the replies received from the Government in November 2010.

## Planning and Statutory Compliance

### *Regulatory framework of mineral*

2.2.7 Rule 9 of Mineral Conservation & Development Rules (MCDR) 1988 provides that no person shall commence mining operations in any area except in accordance with a mining plan duly approved as per Section 5 of Mines and Minerals (Development and Regulations) Act, 1957. Further any modification in approved mining plan, during the operation of mining lease also required approval under Rule 10 of MCDR-1988. The lease holder of every mine is also required to review the mining plan and submit a scheme of mining for the next five years of the lease for approval. For the scientific and systematic development of mineral deposits, the mining has to be carried out in accordance with the envisaged proposals in the approved mining plan as per Rule 22A of the Mineral Concession Rules 1960.

The status of the mines/mine leases under SBU&PC- Rock Phosphate and Limestone were as under:

Sl. No.	Mineral and Name of mine	Area in hectare	Mineable reserves as on 01 April 2009 (in lakh MT)	Status of mine
<b>Rock Phosphate</b>				
1	Jhamarkotra	1370.369	223.98	Operative
2	Badagaon	215.600	0.35	Non-operative
3	Kanpur	379.490	7.99	Non-operative
4	Kharbaria ka Guda	105.590	0.64	Non-operative
5	Dakan Kotra	159.770	6.10	Non-operative
<b>Limestone</b>				
6	Sanu-I	1000.000	213.00	Operative
7	Sanu -II	998.400	230.20	Operative
8	Gotan-I	938.230	56.80	Operative
9	Basani	2084.100	97.00	Operative
<b>Fluorspar</b>				
10	Tavidar	600.000	2.94	Non-operative
11	Karara	150.000	1.55	Non-operative
12	Lakhawas-I	225.000	0.93	Non-operative
13	Lakhawas-II	100.000	0.56	Non-operative

It could be seen from the above table that out of 13 mines, eight mines were inoperative in absence of environment clearance. The shortcomings noticed in planning and statutory compliance are discussed in succeeding paragraphs.

### *Compliance of statutory provisions*

2.2.8 The Company was responsible for compliance of the provisions of mining laws. The long-term mine plan for Jhamarkotra, based on the Definitive Feasibility Report (DFR), was approved by Indian Bureau of Mines in 1989. The

DFR conceived the project life of 20 years from 1 April 1987 as base date. In view of liberalised import policy and demand of Rock Phosphate, the Company awarded (March 1996) work order jointly to SNC Lavlin, Canada and Engineers India Limited (EIL), New Delhi for a further updation study of reserves to ascertain the longevity of mine. The DFR prepared by SNC and EIL envisaged the project life of 15 years from zero date 1 April 1998. The report of SNC and EIL was, however, not submitted to IBM for its approval although it was



***Mining at Jhamarkotra***

mandatory as per MCDR, 1988. Since the validity of long-term mine plan was at expiry stage in 2007, the Company belatedly awarded (October 2005) work order to prepare long-term mining plan and mining scheme for years 2008-13 in favour of MECON Limited at a cost of ₹ 37.85 lakh with scheduled completion date of March 2006. It was, however, noticed that the long term mine plan and mining scheme prepared by MECON Limited was not as per the requirements of the Company and therefore the Company itself prepared a mining scheme and submitted the same to IBM, which was approved in September 2008.

Thus, the Company failed to comply with the statutory provision of getting the revised long term mine plan approved from IBM.

The Government stated (November 2010) that long term mine plan (LTMP) submitted by MECON was not considered suitable for submission to IBM. The Company had taken permission under Rule 11(ii) of MCDR, 1988 and subsequently obtained permission from IBM for late submission of scheme of mining. The reply is silent about non-submission of LTMP prepared in 1998.

### ***Delay in land acquisition***

**2.2.9** The State Government granted (April 1988) lease for 1370.369 hectare at Jhamarkotra to mine out Rock Phosphate mineral in favour of the Company. The mining activities were being carried on 398.445 hectare land and 53.92 hectare was covered under roads and green belt. We noticed that the State Government had issued 'No Objection Certificate' in respect of land measuring 1,185.76 hectare including land outside lease area between January 2008 and April 2008. The Company, however, could not take the physical possession of the land due to



unauthorised encroachment. It was further noticed that the State Government awarded (June 2004) the Company a private land measuring 56 hectare having sufficient mineable reserves with condition to pay compensation of ₹ 1.44 crore to the landowners of Sameta village. The landowners approached court against the



*Encroachment at Sameta*

award as the compensation decided by the State Government was not acceptable to them. The Court revised (2007) the compensation amount and directed the Company to pay ₹ 1.53 crore. The Company paid ₹ 54.19 lakh to 42 landowners between February 2007 and November 2008 who consented for compensation and deposited the balance amount with the court. It was further noticed that despite payment of compensation amount, the Company could not take possession of the land.

We noticed that the Company had to deviate from approved mining scheme of 2003-08 and could not expand its mining operations as it was not possible to carry out blasting due to close vicinity of village Sameta. It was observed that the Company failed to take up the matter at appropriate stage in the light of exploration activity to be undertaken in the interest of state and future requirement of Rock Phosphate resources even after the Court verdict in its favour.

The Government while accepting the facts stated (November 2010) that despite consistent follow up with the administration, the issue has not been settled yet. However, the fact remains that the matter was not taken up at appropriate stage to get the land vacated and State administration appears to be non-responsive.

### ***Compliance of environmental laws***

**2.2.10** The Government of India, Ministry of Environment and Forests (MOEF) issued (January 1994) Environment Impact Assessment (EIA) Notification 1994 which provides that mining projects of major mineral with more than five hectare lease area for commencing production or increasing their production and/or lease area on or after issue of notification were required to obtain environmental

clearance from MOEF. It also provided for submission of a half-yearly report to the Impact Assessment Agency to monitor effectively the implementation of the recommendations and conditions subject to which the environmental clearance was accorded.

**The Company incurred unfruitful expenditure of ₹ 62.46 crore due to non-commencement of mining operations even after obtaining environmental clearance.**

We noticed that the Company ignored the above notifications and did not obtain environment clearance from MOEF despite increase in production after issue of notification. Both the SBU&PCs continued mining operations in its eight mines\* (four Rock Phosphate and four fluorspar mines) up to May 2004. The mining operations were forced to close in May 2004 on the directions of State Government. The Company, thereafter, applied (between March 2005 and March 2006) for environmental clearances which were accorded by MOEF for six mines, except Badagaon and Kharbariya Ka Guda, between March 2007 and August 2007. It was also noticed that despite obtaining environmental clearances, the mining operations could not be started up to March 2010 due to delay in finalisation of contract, habitation in mining area *etc.* The Company, however, paid statutory levies for all eight mines such as dead rent, land tax (imposed by GOR with effect from April 2006) *etc.* during the period 2004-09 when mining operations were put on hold.

Thus, in contravention of environmental laws, the Company continued mining operations for a period of 10 year. Further there was delay in submitting the applications for environmental clearances coupled with failure to commence mining operations after obtaining necessary clearance. This resulted in unfruitful expenditure of ₹ 62.46 crore for the period 2004-09 on account of land tax and dead rent *etc.*

The Government while accepting (November 2010) the fact of deviation from scheme of mining approved by IBM, stated that the Company has filed revision petition under section 51 of Rajasthan Finance Act 2006 (Land Tax). The reply does not address the issue as the revision petition filed by the Company relates to applicability of rate of land tax.

### ***Avoidable payment of premium charges***

**2.2.11** As per Government of India notification (September 1961), limestone used in kilns as building material was to be treated as minor mineral and for all other cases, it was deemed to be major mineral. Further Rule 15 (1AA) of Rajasthan Minor Mineral Concessions Rules (RMMCR) 1986 provides that the mining lease could be transferred from one name to another on payment of premium charges.

The SBU&PC (Limestone) was quarrying the limestone from two mines (Gotan-I and Basni) not only for limekiln purpose but also for other purpose *i.e.* Cement

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\* Rock Phosphate- Kanpur, Dakan Kotra, Badagaon, Kharbariya Ka Guda, Fluorspar - Karara, Lakhawas-I, Tavidar and Lakhawas-II

Grade. 16.43 lakh MT limestone was excavated during last five years, of which 8.96 lakh MT (54.53 per cent) was supplied to the cement industries

The premium charges for transfer of mining leases to another name were not applicable if the mine lease pertains to major mineral. Despite knowing position of rules and the fact that the major share of limestone production was being supplied to the cement industries (which falls under major mineral category), the Company, while getting these mines transferred in its name, did not approach to the State Government to convert these mines under major mineral. As a result, the Company paid (February 2006) avoidable premium charges of ₹ 66.49 lakh to Mines Department, Government of Rajasthan for transferring these mines of erstwhile Rajasthan State Mineral Development Corporation Limited (RSMDC) in its name as the mines were governed under minor minerals.

It was also noticed that the Company was paying royalty to the State Government at the rate prescribed for major mineral for the limestone supplied to cement industries. Further, the SBU&PC (Limestone) was quarrying limestone in the form of major mineral without having an approved mine plan which is prerequisite before carrying out mining operations as per the statutory provisions of MCDR 1988.

The Government stated (November 2010) that the State Government has permitted the minor mineral leaseholders to supply limestone to cement plants provided the royalty is paid as applicable to cement grade limestone. It further stated, that the Company after amalgamation with e-RSMDC requested DMG to transfer the leases in the name of RSMML but State Government did not accede to the request and as per decision taken by them, the leases were transferred after payment of the stamp duty and hence the premium charges were also made applicable as provided under Minor Mineral Concession Rules. The reply is not acceptable as the Company was quarrying limestone under major mineral and no premium charges are applicable for transferring the leases governed under major mineral. Further, the State Government was having no authority to allow quarrying of major mineral under RMMCR 1986.

### ***Non-surrendering of forest land***

**2.2.12** GOR notified (September 1988) 1,060.86 hectares area (out of total area of 1,075 hectares of four fluorspar mines) as reserved forest area under section 29 of Rajasthan Forest Act, 1953. We noticed that SBU&PC (Limestone) did not initiate any action up to January 1999 and thereafter applied for diversification of 203.93 hectares of area for deforestation and to be used for mining operations. The State Government accorded its approval for diversification of 10.5 hectare of land. It was further noticed that the Company did not have any future plan for diversification of balance 856.93 hectare area. Though no mining operations could be undertaken on the reserved forest land, the SBU&PC (Limestone) did not initiate proceedings to surrender these mines even after 22 years. As a result

the Company would continue to pay avoidable land tax and dead rent of ₹ 23.04 lakh per annum from 2004 onwards.

The Government stated (November 2010) that the Company did not apply for diversification after issue of notification, to avoid any immediate financial burden as it was not working in the forest area. It further stated that the diversification has not taken place despite making an application and the amount demanded by the forest department is very high, Company has now decided to surrender the forest area and have submitted application for the same. The reply is not acceptable as the decision to surrender the forest area was taken after being pointed out by audit. Further our observation is on non-surrender of 856.93 hectare of reserved forest land for which Company had no diversification plan for last 22 years.

### ***Delay in obtaining leases***

**2.2.13** The Company had submitted (2003-08) applications to DMG for obtaining four limestone mines containing 3,310 lakh MT of recoverable reserves at Jaisalmer and four Rock Phosphate mines at Jhamarkotra. All the applications for limestone were pending due to the failure of SBU&PC (Limestone) to comply with the prescribed requirements like non submission of revenue map, jamabandi, financial assurance, Progressive Mine Closure Plan and no dues certificates from DMG.

The Management stated (October 2010) that the applications for Limestone are still pending with DMG because of the reason that the area is reserved by the Government and unless this area is freed, leases can not be granted. The reply is not acceptable because the leases could not be granted due to delay by the Company to comply with the prescribed requirements and these areas were declared "reserve" by the Government later on in May 2008.

## **Production of Minerals**

**2.2.14** The Company before carrying out excavation of mineral obtains environment clearance, prepare mine plans/schemes and get it approved from IBM. Based on the approved mine scheme, the Company also prepares annual plan of mining keeping in view the environmental clearance and market demand. The Company was to ensure that the mining activity was in accordance with the approved mining plan.

The Company excavates Rock Phosphate departmentally as well as on contractual basis whereas Limestone is excavated on contractual basis only. The Company has approved mine plan (MP) and mining schemes for Rock Phosphate and SMS grade Limestone. Mining leases at Gotan mines did not require mine plan as the mineral excavated from these mine falls under minor mineral. The mine plan for major minerals *inter-alia* gives the cross-section wise and reduced-level wise

details for excavation of ore and overburden (OB) for each year. The Company also prepares an annual plan (AP) each year, specifying the grade wise quantities of ore and OB to be excavated. The grade wise quantities of ore excavated and the OB removed as per MP/AP (targets) and the actual excavation during the period under review are indicated in **Annexure -13**.

It was observed that:

- The actual excavation was at variance with both MP as well as AP. The quantity of ore (Rock Phosphate) excavated during the period under review ranged between 85 and 110 *per cent* whereas the quantity of OB removed ranged between 86 and 123 *per cent* of quantity projected in the AP. The grade-wise excavation of high grade ore varied between 89 (2008-09) and 115 (2004-05 & 2007-08) *per cent* and 82 (2008-09) and 113 (2005-06) *per cent* in respect of Low grade of AP projections.
- AP did not conform to the approved MP *i.e.* AP only gave grade-wise quantities to be excavated and did not specify cross section-wise and level-wise excavation to be carried out in respect of Limestone mines. Further no detailed AP was prepared for Rock Phosphate mine for the year 2007-08 and 2008-09. As a result, scientific extraction of the ore could not be vouchsafed. Comparison of actual excavated quantity with the available reserves also could not be done for the same reason.
- Mining scheme prepared for the years 2008-13 in respect of Rock Phosphate did not mention cross section wise excavation of over burden and further the deviation for mining scheme for the period 2003-08 was not mentioned cross section wise in respect of ore and overburden.
- The excavation targets fixed for contractors for SMS grade Limestone were not commensurate with the MP/AP projections. Further the AP fixed targets were also more than the environment clearance projection. Thus the Company also violated environment clearance conditions.
- The production at Gotan was not commensurate with the size of mine lease held by the Company. The Company's production at Gotan was 12.68 *per cent* of the total production as against 43.58 *per cent* of total lease area allotted by DMG. Further, with reference to total increase of 16.28 lakh MT production at Gotan during 2006-09, the share of the Company's production was only 2.46 lakh MT.

**SBU&PC  
(Limestone)  
excavated mineral  
more than the  
quantity mentioned  
in environment  
clearance  
projections.**

The Government stated (November 2010) that the Company generally adhered to the approved scheme of mining but the variations took place on account of specific requirements of ore, based on the demand and also restrictive nature in certain areas, due to water logging and other considerations. The reply is not acceptable as the Company was to prepare scheme of mining, mentioning the cross section wise excavation of mineral and the APs should have been based on

approved mining scheme and deviations should be approved by the competent authority.

***Under utilisation of machinery and non-maintenance of proper records***

**2.2.15** The SBU&PC (Rock Phosphate) had Heavy Earth Moving Machines (HEMMs) like drill, shovel, dumper and dozer *etc.*, generally used in open cast mining for removal of overburden and production of mineral. These equipments were required to work in a combination to achieve maximum productivity and to reduce the idleness. The Company had adopted Central Mine Planning and Design Institute Limited (CMPDIL) standards for assessment of performance and utilisation of HEMM's. Availability percentage of the equipment was worked out considering idle hours plus working hours to shift hours and utilisation capacity was based on working hours to shift hours. The CMPDIL's norms of availability, utilisation and the actual performance of HEMMs achieved by the SBU&PC (Rock Phosphate) during the period 2004-05 to 2008-09 are given in **Annexure 14**.

It would be seen from the annexure that:

- The Company follows proper maintenance schedule despite that the breakdowns in all the three HEMMs except dozers were on higher side as against the prescribed norms. The SBU&PC (Rock Phosphate), however, did not analyse the reasons for high number of breakdowns. Further, it did not maintain the details of expenditure incurred on repair and maintenance (R&M) of individual machines.
- The SBU&PC (Rock Phosphate) was not able to utilise the available machinery as per the norms of CMPDIL. The capacity of drills and shovels always remained underutilised and continuous decline in the utilisation capacity eventually resulted in under performance of dumpers.
- The idleness in operation of shovels and dumpers was exceptionally high ranging between 23 and 37 *per cent* and 21 to 35 *per cent* as against the CMPDIL specified norms of 19 and 17 *per cent* respectively.
- The operational efficiency of HEMMs remained on lower side as against the prescribed norms which resulted in loss of production of 4.17 lakh MT during 2004-09.
- The SBU&PC (Rock Phosphate) did not maintain log books of individual HEMM to have a check on the time consumed on account of accident, maintenance, idle time, waiting time for manpower, tyre change, electrical/electronic breakdowns, refueling & lubrication or any other breakdowns. In absence of which, the Company could not ensure 85 *per cent* availability of the equipment as warranted by the supplier of the machine. Consequently, it could not invoke the penalty clause to avail

**Low operational efficiency of HEMMs than the prescribed norms resulted in loss of production of 4.17 lakh MT.**

compensation for every *per cent* decrease in availability at the rate of 0.5 *per cent* of the total ex-works value of the equipment.

- It was observed that four dumpers and three shovels had already completed scheduled hours prescribed for the equipments by the manufacturer.

The Government stated (November 2010) that non-availability of spares, absenteeism and restriction in the working areas on account of presence of water on the lower levels etc. have also contributed to lower availability and lower utilization. The reply is not convincing as the Company did not maintain proper records to analyze the reasons for breakdown.

### ***Industrial Beneficiation Plant***

**2.2.16** Industrial Beneficiation Plant (IBP) was commissioned in 1982 with a view to process the low grade ore (LGO) of Rock phosphate having 15-18 *per cent* P<sub>2</sub>O<sub>5</sub> to high grade ore (HGO) containing 31.54 *per cent* P<sub>2</sub>O<sub>5</sub>\*.

For beneficiation of LGO into high grade concentrate, the Company enhanced (2002-03) the capacity of IBP with designed capacity *i.e.* to give an output of 3.51 lakh MT 34 *per cent* P<sub>2</sub>O<sub>5</sub> grade Rock Phosphate from an input of 9.00 lakh MT of 16.57 *per cent* P<sub>2</sub>O<sub>5</sub> grade Rock Phosphate (39 *per cent* of the input). The production performance of the IBP during the period 2004-09 is given in **Annexure-15**.

A review of production process of IBP revealed that the material before input into main plant is crushed in three stages at the LGO crusher plant (primary, secondary and tertiary crusher) in which the Run of Mine (ROM) is converted from 1000 mm size to less than 25 mm size. The performance of LGO crusher plant was as follows:

Year	Primary crusher			Secondary crusher			Tertiary crusher		
	Crushing in MT	Hours operated	Average Crushing rate MT/hr	Crushing in MT	Hours operated	Average Crushing rate MT/hr	Crushing in MT	Hours operated	Average Crushing rate MT/hr
2004-05	671609	3358	200	644536	2838	227	678028	3799	178
2005-06	869654	4421	197	861684	4070	212	880740	4161	212
2006-07	798631	4244	188	756410	3826	198	832375	4145	201
2007-08	780704	4018	194	760485	3809	200	775040	3974	195
2008-09	726045	3986	182	722244	3636	199	761517	4093	186

\* Phosphorus pentoxide

The availability of the low grade ore during the year was as follows:

*(Quantity in MT)*

Year	Opening Stock	Production	Utilised for Rajphos*	Available for IBP	To be used in IBP	Excess for next year
2004-05	-	867381	37499	829882	900000	-
2005-06	-	1129093	58876	1070217	900000	170217
2006-07	170217	1088639	47594	1211262	900000	311262
2007-08	311262	937293	81281	1167274	900000	267274
2008-09	267274	797140	100949	963465	900000	63465

It would be seen from the tables above that:

The crusher plant was designed with the rated capacity of 350 tonnes per hour against which an average capacity of 287 tonnes per hour could have been achieved. The average capacity, however, achieved by the Company during the period under review ranged between 182 MT/hour and 200 MT/hour. Despite having sufficient quantity of low grade ore ranging between 9.63 lakh MT (2008-09) and 12.11 lakh MT (2006-07), the crusher plant could not be utilised optimally. Consequently, the IBP could be utilised to the extent of 71 to 94 *per cent* of its installed capacity as given in **Annexure-15**. The achievable production performance of IBP would have further improved had the Company taken timely steps to contain hours lost due to heavy break downs and non-availability of spares ranged between 13 and 44 *per cent*.

The Government while accepting the facts stated (November 2010) that immediately after expansion of IBP, there was major breakdown in the roller press which was imported from Germany. As the spares were not available in the country, there was considerable delay in organizing the spares and the plant remained idle for 2880 hours. It further stated that efforts are being made for enhancement of the capacity of crushing plant by reducing the breakdown hours and enhancing the feed grade.

### **Tailing Dam**

**2.2.17** The waste (tailing) generated from Industrial Beneficiation Plant due to environment concerns was stored in the tailing dam. The dam was designed with a capacity of (1970000 M<sup>3</sup>) 32.11 lakh MT to cater to the expanded capacity of plant for seven and half years and put to charge in September 2002. It was noticed that as against the total capacity of 32.11 lakh MT, the tailing dam was fed with waste to the extent of 29.37 lakh MT leaving a capacity of 2.74 lakh MT only as on March 2009. It was also noticed that the SBU&PC (Rock Phosphate) fed average waste of 4.5 lakh MT every year and thus the balance available capacity

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\* Direct application fertilizer product.



of tailing dam was not sufficient for the year 2009-10.



*Tailing Dam (September 2010)*

In view of decreasing capacity of the tailing dam, problem of water seepage and complaints of villagers, leakage of slurry and procedural delays in acquisition of land, it was proposed (April 2006) to initiate action for construction of new tailing dam or increasing the height of existing dam for smooth operation in coming years.

We observed that the SBU&PC (Rock Phosphate) identified 36.35 hectare of land required for further expansion in the year 2006 itself. The Company, however, sent proposals for allotment of land to the State Government belatedly in April 2009 when the situation of tailing dam reached at alarming stage that might led to closure of IBP. The matter of allotment of land was pending before the State Government (May 2010).

The Government stated (November 2010) that the balance capacity available in the existing tailing dam is sufficient for further period of one and half years and Company is hopeful of finalizing the land for additional capacity by that time. The reply is not acceptable as the Company failed to acquire the land (October 2010), identified in 2006 and the tailing dam at present has reached a very critical stage.

#### ***Under utilisation of Crushing and Screening Plant (CSP)***

**2.2.18** The SBU&PC (Limestone) commissioned (September 1996) a crushing and screening plant (CSP) for sizing of limestone to make it marketable. The design capacity of the plant was 350 TPH and expected finished product from ROM was 161 TPH on basis of 46 *per cent* yield. During 2004-09, the plant was operated for working days ranged between 305 and 347 days in three shifts of eight hours each.

The performance of CSP for the last five years ending on March 2009 is tabulated below:

Year	No. of days plant remained operational	Total available hours	Standard production (MT)	Actual operated hours	Non operational hours	Utilisation in terms of hours in per cent	Actual production (MT)	Production per hour	Capacity utilisation w.r.t standard production in per cent
2004-05	324	6443	1037373	4702	1741	72.98	519866	110.56	50.12
2005-06	305	6053	974533	4347	1706	71.82	483378	111.20	49.60
2006-07	336	7018	1129898	5138	1880	73.21	622537	121.16	55.10
2007-08	346	6943	1117823	4949	1994	71.28	662658	133.90	59.28
2008-09	347	6971	1122331	4588	2383	65.82	585897	127.70	52.20

It could be seen that the plant was not utilised optimally as the percentage utilisation of plant in terms of hours ranged between 65.82 and 73.21 during the period of review. Further, as against the rated capacity of 161 TPH, the production per hour was significantly on lower side and ranged between 110.56 MT to 133.90 MT due to low capacity utilisation.

Scrutiny of logbook of CSP revealed that the plant remained idle considerably in all the five years due to late feeding/no feeding by contractor (4,515.95 hours), electrical breakdown (229.65 hours), mechanical breakdowns (1,206.55 hours), no power (478.70 hours), plant maintenance (1,529.85 hours) and other miscellaneous reasons (1,743.30 hours).

We observed that had the CSP been utilised in optimum way, quantity of Limestone produced could have increased by 5.52 lakh MT and the Company could have earned more revenue amounting to ₹ 23.16 crore.

The Government stated (November 2010) that as per the technical feasibility report (TFR) prepared by Engineers India Limited, the installed production capacity of CSP was 3.5 lakh MT of size 30-80 MM on the basis of two-shift working. It further replied that the Company has operated the plant on three-shift working and the production obtained is more than that and therefore the CSP is properly utilized. The reply does not address the issue as the plant remained idle on account of late feeding/ non-feeding by contractor which could have been avoided.

## Contract Management

**2.2.19** The Company empowered the Group General Manager of each SBU&PC to finalise purchase orders and contracts up to the value of ₹ 50 lakh. Contracts and purchases beyond ₹ 50 lakh were finalised by the Contract Cell/Purchase cell at Corporate Office, Udaipur. The Company adopted two bid

system viz; technical bid and financial bid for finalising the contracts/purchases. The deficiencies noticed in this regard are discussed in succeeding paragraphs.

### ***Injudicious purchase of Excavator***

**2.2.20** The Company placed (May 2005) a purchase order in favour of Bharat Earth Movers Limited (BEML) for supply, installation and commissioning of one diesel Hydraulic Excavator with Komatsu Hydraulic System. As per the purchase order, the equipment was to be supplied within eight months with condition of pre-inspection before supply. BEML offered (February 2006) the supply of excavator with Rexroth Hydraulic System instead of Komatsu Hydraulic System. The Company, though not satisfied with the performance of the offered hydraulic system after inspections, accepted (December 2007) the supply of the excavator on trial basis on the assurance of BEML to rectify all the defects. During the trial period, the excavator encountered several problems of serious nature relating to swing braking and load. The problems could not be resolved by BEML and Rexroth experts. The Company constituted three committees at different intervals to report on whether the excavator could be accepted or not. The Company, however, ignoring the recommendations of all the committees for not accepting the excavator and withholding the payment, commissioned (August 2008) the excavator and released the payment of ₹ 4.02 crore to BEML.

**Despite knowing the fact, the Company accepted the supply of defective excavator and paid ₹ 4.02 crore to BEML.**

We observed that the excavator never performed satisfactorily after commissioning as the excavator was available for 2,892 hours as against 4,704 hours available in the year 2008-09. Despite this, the Company did not deduct compensation as per purchase order for assured 85 *per cent* availability of excavator, from outstanding bill of BEML and security deposit.

The Government stated (November 2010) that in case the Company had simply rejected the BEML supplied excavator, then the Company had to wait for the availability of the excavator which is always a long delivery item. The reply is not acceptable as the order for excavator was placed in May 2005 whereas the Company accepted the defective excavator in August 2008. Thus, it is amply clear that there was sufficient time to finalize the new tender.

### ***Award of repair and maintenance contract without obtaining competitive bids***

**2.2.21** The Company invited (September 2008) tenders for purchase of one backhoe excavator. Total three bidders submitted their bids, of which the supply order was finalised in favour of TELCON (supplier) at a cost of ₹ 3.27 crore. Since the Company was using BEML make excavators only, inventory of which could not be used in TELCON make excavator as such it was decided to ask the lowest supplier to quote rates for maintenance and repair contract. The supplier quoted ₹ 7.56 crore for maintenance and repair contract for a period of eight years. The supplier also offered rebate of ₹ 1.80 crore on maintenance and repair contract in case the Company opts for purchase of two excavators and its maintenance and repair contract.

We observed that the action of the Company to offer additional work for maintenance and repair contract without inviting fresh bids was against the financial prudence and thus not transparent as the same was not included at the time of floating the tender. This tantamounts to award of contract without obtaining competitive bids. It was also noticed that even knowing the requirement of two excavators, the Company did not exercise the beneficial option given by the supplier as evident from the tender proceedings that the Company procured another excavator from BEML on trial basis in the same tender.

The Government stated (November 2010) that with reference to the issues raised with respect of MARC the observations of the Audit are relevant and have been taken care of in future.

### ***Delay in exploration***

**2.2.22** The SBU&PC (Limestone) had explored 991 hectare area out of total 3022.33 hectare area available at Gotan up to December 2007. In order to expand excavation activity, the Company invited (December 2007) tenders for spot leveling, exploratory core drilling of NX/BE size by double tube core barrel, its logging, sampling and report writing for Basani Limestone mines. Out of three bidders, only one bidder qualified the technical evaluation for opening of price bid. The financial bid was opened in (June 2008) wherein the quoted rate was found 37 *per cent* higher than the internal estimates prepared by the Company. The contract cell of the Company studied the prevailing Government rates for similar work and found that the Government rates were ₹ 56 lakh which was higher by 71.21 *per cent* than its internal estimates. The Company made (June 2008) counter offer at internal estimate of ₹ 32.76 lakh as against ₹ 44.82 lakh offered by the bidder. The bidder did not accept the counter offer and hence it was decided to scrap the tender. Thereafter, the Company made (August 2008) limited tender enquiry but no response was received as such it was decided (October 2008) to get the work done through DMG at the prevailing rates. SBU&PC Limestone approached (October 2008) DMG with all relevant data but DMG advised to submit an application along with prescribed fee but till date (April 2010) the Company had not submitted the application.

Thus lack luster approach of the management led to delay in exploration work as well as expansion of Limestone business as per long term planning.

The Government stated (November 2010) that the normal rate for exploration of the DMG was very high, hence the Company approached Director (DMG) and Secretary (Mines), Government of Rajasthan for undertaking the work on concessional rates. It further replied that the present area available with the Company is sufficient to meet the present market demand. The reply is not acceptable as the Company approached the Government in May 2010, only after being pointed out by audit and there is no assurance from DMG for undertaking the work at the rates of internal estimates of the Company. The Company's production at Gotan is merely 12.68 *per cent* of total production in the area

against which the Company's land holding was 43.58 *per cent* which confirms that the production is not commensurate with the market demand.

***Defective structure of contract***

**2.2.23** The Company supplies SMS (Steel Melting Soap) grade limestone to steel plants of Steel Authority of India Limited (SAIL) through Railway. As per the conditions of transportation, penal/dead freight (punitive charges) levied by the Railways for overloading of the wagons would have to be borne by the Company. A review of the system revealed that the Company outsourced the work of transportation and loading of material into railway wagons on yearly basis to four transporters during the period of review. It was noticed that the Company included the condition of punitive charges to be borne by the transporters, if any, levied by the Railways for overloading of wagons in all the four contracts. It was also noticed that the Company appointed (October 2003) Mitra S. K. Private Limited (another contractor) for determining the quality control aspects who was responsible for deciding the filling limits/mark of the material to be loaded in the railway wagons.

**The Company failed to hold the transporters liable for overloading due to appointment of another contractor for determining load limits in wagons.**

The Railways imposed (between September 2002 and March 2009) penalty of ₹ 11.22 crore for overloading of wagons, of which ₹ 6.84 crore had been paid up to December 2008 by the Company. The matter regarding payment of remaining penalty was under litigation with the Railways. As against the penalty charges paid, the Company could only withhold ₹ 1.80 crore from the bills of the transporters. The balance penalty paid by the Company could not be recovered from the transporters despite having provision in the terms and conditions of the transport contract as the transporters approached the Court on the plea that the wagons were filled up to the mark/limits determined by Mitra S.K. Private Limited (representative of the Company) and thus they were not responsible for the penalty imposed by the Railways.

We observed that the wagons were being loaded on the directions of Mitra S.K. Private Limited, despite this, the Company did not include any provision in the terms and conditions of the contract to recover the penalty from him, in case, the Railways imposed any penalty for overloading.

Thus due to appointing another contractor for determining the mark/limits for loading of wagons, the Company failed to hold the transporters liable for overloading and indulged itself in unnecessary litigation besides making payment of penalty charges to Railways.

The Government stated (November 2010) that even if the feeding limit/mark is given, the responsibility of the correct loading will always rest with the contractor. It further stated that the total amount paid by the Company was only ₹ 10.26 crore which had also been recovered. The reply is not acceptable because transporters got stay on levy of penalty due to defective agreement with Mitra S.K. Private Limited. Further amount of ₹ 10.26 crore was infact recoverable or

security deposit as per books of accounts of the Company, hence same is doubtful of recovery.

***Non-recovery of land tax from assisted sector***

**2.2.24** The e-RSMDC earmarked mine area (approximately 1.1 Km.) in favour of two private companies (assisted sectors) for their captive consumption and sale in the open market for a period of 20 years with effect from 1997 and 2001 respectively. The Company allowed the assisted sectors to continue after merger of RSMDC. The assisted sectors were required to pay service charges at different rates for captive/open market sale at the rates fixed by the Company from time to time for using the earmarked area. As per terms and conditions of the agreements executed with the assisted sector, all statutory levies were to be borne by them.

We noticed that after introduction of land tax in April 2006 by the State Government, the Company raised (June 2007) demand for payment of land tax of ₹ 44 lakh by the assisted sector for the area earmarked for them. The assisted sector, however, refused (June 2007) to pay the land tax on the plea that they were liable to pay the statutory levies being imposed under Minor Minerals and Concession Rules only. Subsequently the case was referred (February 2009) to arbitrator whose award was awaited (May 2010). Meanwhile the Company paid ₹ 81.38 lakh towards land tax against the earning of the Company of ₹ 44.65 lakh during the period 2006-09 from the earmarked area.

We observed that despite having provision to terminate the contract after giving a notice of 30 days, the SBU&PC (Limestone) did not initiate any action immediately against the assisted sectors after their refusal to pay the land tax.

The Government stated (November 2010) that even if the contract was terminated, the liability of land tax could not have been avoided and there was no possibility of putting this land in alternate use because of the surface right being with the assisted sector contractor. The reply is not acceptable because as per the conditions of agreement, the surface rights and lease hold rights would have been with the company in case of expiry or termination of contract and there were other parties who were willing to enter into long term supply agreement.

***Non-reclamation of mined out area at Sanu Mines***

**2.2.25** The SBU&PC (Limestone) obtained (May 1995) environmental clearance for mining of limestone at its two major mining leases viz; Sanu-I and Sanu-II at Jaisalmer. A revised environmental clearance in view of increased production was obtained in August 2007. The specific terms and conditions of the both the environmental clearance provided for concurrent backfilling of the excavated area and no external over dumping of the overburden. The mining operations on these mines were being carried out through contractors.

We noticed that in view of the environmental requirement of concurrent backfilling, the scope of work of the contractor required that the level of back filled rejects dump area up to the original ground level. It was, however, noticed that as against the cumulative excavated area of 549.59 hectares, backfilled area was only 278.75 hectares *i.e.* 50.72 *per cent* leaving non-backfilled area of 270.84 hectares by the end of March 2009. The excavated area in the particular year was not being backfilled in the ratio of area excavated which resulted in increase of non-backfilled area. As a result, 170.93 hectares of non-backfilled area in April 2004 increased to 270.84 hectares at the end of March 2009.

During 2004-09, the Company had awarded excavation contracts to four contractors. The SBU&PC (Limestone), however, released full payments to these contractors without ensuring completion of the entire work including backfilling. Since backfilling of excavated area was the specific condition of environmental clearance, the Company would have to bear ₹ 67.71 lakh towards the cost of backfilling.

The Government stated (November 2010) that the recovery of marketable grade is around 46 *per cent* of the total ROM. Out of the 54 *per cent* of non-marketable ROM, 12 to 14 *per cent* is in the size range of 10 to 30 mm which is now finding some market in the thermal and sintering plants. Thus, the backfilled material is nearly 40 *per cent* of the total excavated material and there will always remain gap between excavated area and backfilled area. The reply is not acceptable because as per the specific terms and conditions of environmental clearance, the Company had to undertake backfilling in such a manner that original topography should be maintained by concurrent backfilling.

### **Marketing/ Sales Management**

**2.2.26** The Company offered minerals to the buyers against 100 *per cent* payment of value of mineral including taxes etc. in advance as per price prevailing on the date of despatch. The Company, however, depending on market conditions extended the facility credit sales to its customers. SBU&PC in such a eventuality proposed the case with justifications for the prior approval of the competent authority *i.e.* Managing Director of the Company.

Table given below indicates mine/lease wise budget estimates (BE) for sale of Rock Phosphate and Limestone and actual there against for the last five years ended on 31 March 2009.

**(Quantity in lakh MT)**

Mine	Particulars	2004-05	2005-06	2006-07	2007-08	2008-09
Rock Phosphate at Jhamarkotra mines	BE	12.80	13.05	12.80	12.40	12.80
	Actual	12.91	12.55	12.88	13.30	12.19
	Percentage	101	96	101	107	95
SMS Grade Lime stone at Sanu mines	BE	17.00	17.50	18.25	20.25	20.00
	Actual	16.80	16.59	17.70	20.16	20.32
	Percentage	99	95	97	100	102
Chemical Grade Lime stone at Gotan mines	BE	4.21	4.20	4.20	4.00	4.00
	Actual	3.42	3.11	2.31	2.82	4.77
	Percentage	81	74	55	71	119

It could be seen from the table above that the actual sale ranged between 95 and 107 per cent, 95 and 102 per cent and 55 and 119 per cent at Jhamarkotra, Sanu and Gotan respectively. It was further observed that the performance of Gotan was not satisfactory during 2006-07 and 2007-08 due to non-lifting of committed quantities by the buyers.

### **Review of sales price**

**2.2.27** The determination of sales price of different minerals marketed by the Company is governed by “Manual for determination of price of different minerals 2005” which provides for quarterly review of the price of mineral unless it is required to be changed earlier due to statutory or other reasons such as change in Government levies/duties, royalty, policies and cost of production. The manual further provides that each SBU&PC will frame a sales policy.

It was, however, noticed that the price of saleable minerals was not calculated as per the procedure prescribed in the manual. SBU&PC Rock Phosphate decided the price on the basis of landed cost of imported Rock Phosphate. SBU&PC Limestone reviewed the prices of SMS grade Limestone every year, however, price for Chemical grade Limestone was not reviewed for more than eight years up to 2006 and thereafter it was being reviewed annually.

We observed that:

- There was wide gap between price of imported Rock Phosphate and the selling price of the Company during the review period. The Company, however, did not correspondingly review the price as prescribed in the manual to reduce the gap.
- There was no documented sales policy at SBU&PC Rock Phosphate. The management considered the import price of Rock Phosphate as only major criteria for determining the price of the products and did not prepare any quarterly reports/forecasts indicating the increase or decrease in other major factors effecting the long term profitability and pricing of different

**Non-review of sale price in comparison to effective increase in cost led to loss of revenue of ₹ 60.23 crore in 2007-08.**



elements viz; cost of production, administrative overheads, selling and distribution cost and the increased burden of statutory levies as envisaged in the manual. A study of increase in cost of various factors affecting the sales price during the period 2004-09 revealed that as against the average increase of ₹ 524 per MT in cost price, the average sales price was increased by ₹ 71 per MT only in 2007-08 which led to loss of revenue of ₹ 60.23 crore due to non-revision of sales price appropriately as given in **Annexure-16**.

- Non-review of the prices of Chemical grade limestone resulted into wiping out of profit for Gotan unit continuously from 2002-03 onwards. The loss of ₹ 18.84 lakh in year 2002-03 was increased to ₹ 49.88 lakh in the year 2006-07. The losses of the unit were further increased exponentially to ₹ 14.81 crore in 2007-08 due to imposition of land tax by the State Government and subsequently decreased to ₹ 8.70 crore in 2008-09 as the Company surrendered 1888.98 hectare of land.

The Government stated (November 2010) that the Company has started reviewing the sales price of Rock Phosphate on quarterly basis. It further stated that the imported price will always remain an important criterion as it is essential to keep the sale price lower than the imported price. As regards to Limestone, it has been stated that prior to enforcement of the price manual, the prices of the Gotan were revised on the basis of the prevailing market conditions. The market conditions were not allowing for increase in the prices as there are number of private mine owners operating in that area who are offering discount either on quality or quantity basis. The reply is not acceptable as there was no price revision during review period as per procedure mentioned in price manual and there was always a wide gap between the Company prices and imported Rock phosphate. Further, as regards to Gotan, there was no restriction on the price revision as the private mine owners were keeping the prices declared by the Company.

#### ***Non-identification of risks due to change in Government levies***

**2.2.28** The price circulars issued by the Company are legally binding documents defining various terms and conditions which necessarily had to be agreed on and accepted by the buyer of the product. As per the terms and conditions of the price circulars issued from time to time, in case of any revision in Royalty/ Sales Tax/ VAT even with retrospective effect, were to be borne by the buyer.

The State Government imposed (February 2008) Environmental and Health cess on mineral rights on the minerals (Rock Phosphate at the rate of ₹ 35 per tonne) being mined and dispatched by the Company. The State Government further enhanced (January 2009) the cess to ₹ 500 per tonne with retrospective effect from 1 April 2008. The Company incorporated the increased rate of cess in price circular issued on 6 February 2009 and accordingly raised demand letters to the buyers for payment of enhanced portion of cess on the quantity sold between

1 April 2008 and 5 February 2009. On a writ petition of buyers against retrospective demand of cess, the Hon'ble High Court stayed (April 2009) the retrospective increase of cess.

**Delay in issue of price circular after issue of Government notification, resulted in non-recovery of Mineral Right Cess of ₹ 2.14 crore.**

We observed that the Company did not analyse the associated risks and thus failed to include cess along with other statutory levies like Royalty/Sales Tax/VAT in the price circular wherein it was mentioned that any retrospective increase in statutory levies was to be borne by the consumers resultantly it could not recover ₹ 46.27 crore from the consumers. Further, delay in issue of price circular after issue of Government notification on 23 January 2009, resulted in non-recovery of ₹ 2.14 crore\* on dispatches between 23 January 2009 and 5 February 2009. Interestingly it was noticed that the Company issued (April 2009) letters to the buyers, who did not approach the Court, for not depositing the retrospective demand of cess. It was also noticed that the State Government imposed/increased the taxes on the Company with retrospective effect during the end of financial year to reduce the state deficit, despite this, the Company did not take up the matter with the State Government on increase of cess with prospective effect.

The Government stated (November 2010) that many of the customers have preferred to approach Hon'ble High Court which stayed the collection of increased cess with retrospective effect. The reply is not acceptable because the Company delayed implementation of the notification and did not take up the matter with the State Government.

## **Financial Management**

**2.2.29** The Company issued (June 2003) guidelines for operation of each SBU&PC which *inter alia* provided that all payments and remittances initially deposited with the SBU&PC would be transferred to the Corporate office on the same day. For day-to-day functioning, the SBU&PC were required to send their funds requirement with a detailed weekly break to the Finance and Accounts Division of the Corporate Office at least one week before the beginning of the month. It was also provided that the SBU&PC would also have a cash credit limit available with it to meet the contingent requirements. As per State Government directives, the surplus fund with the company was to be deposited monthly in Personal Deposit Account (PD Account) *i.e.* an account with Government treasury. The shortcomings noticed in financial management are discussed below:

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\* 46,054.53 MT x ₹ 465 per MT.

***Non-adherence to the guideline of the corporate office***

**2.2.30** The SBU&PC (Limestone) having Current Accounts with three banks\* at Jodhpur did not adhere to the guidelines. Despite having funds (ranging between ₹ 30.24 lakh and ₹ 7.12 crore) in the bank accounts during the review period, it did not transfer the same to the Corporate office. It was also noticed that the Corporate Office had arrangement with its Bank of Rajasthan (BOR) under which the funds in excess of ₹ 4.50 lakh were transferred to Flexible Fixed Deposit (FFD) whereas at SBU&PC (Limestone) such limit for transferring the funds to FFD with BOR was ₹ 50 lakh. Despite this discrepancy neither the Corporate Office nor the SBU&PC (Limestone) took up the matter with the Bank. It was also observed that at number of times the funds in excess of ₹ 50 lakh were lying with the Bank but the Bank did not transfer the same to FFD. Thus, the Corporate Office not only failed in evolving a suitable mechanism with its banker for transfer of funds immediately but also failed in monitoring the fund lying with SBU&PC (Limestone).

The Government stated (November 2010) that considering the advance payment of freight made by customers and necessity of funds for regular payment to the contractors/supplier bill as well as employees' payment, SBU&PC Limestone made arrangement with the bank where excess funds are converted in FFD in similar manner as done at Corporate Office. The reply is not acceptable as the SBU had not adhered to the guidelines which resulted in blockage of funds to the extent of ₹ 50 lakh on which no interest was earned.

***Irregularities in financial assurance for progressive mine closure plan***

**2.2.31** Rule 23 B of MCDR as amended in 2003 provides that the owner of mining lease would submit Progressive Mine Closure Plan (PMCP) in the manner specified in the standard format and guidelines issued by IBM along with submission of financial assurance for the same under rule 23 F. Rule 23F (2) further provides that "The financial assurance shall be submitted in one of the following forms to Regional Controller of Mines or the officer authorised by the State Government in this behalf, as the case may be, or any amendment to it"

- a) Letter of credit from any scheduled bank;
- b) Performance or surety bond;
- c) Trust fund build up through annual contributions from the revenue generated by mine and based on expected amount sum required for abandonment of mine; or
- d) Any other form of security or any other guarantees acceptable to the authority.

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\* Bank of Rajasthan, State Bank of India and IDBI.

The SBU&PCs, in compliance with the statutory requirements, submitted (between September 2006 and June 2008) PMCP and financial assurance to the IBM.

The Company created a trust with a corpus fund of ₹ one crore in 2006. One of the prime objectives of this trust was to make available the fund for reclamation, remediation/restoration of degraded land for environment protection. We, however, noticed that despite creation of corpus fund, it was not utilised for the purpose of financial assurance and each SBU&PCs except SBU&PC (Limestone) adopted different methods *i.e.* pledging of fixed deposit, bank guarantee *etc.* for the financial assurance. It was further noticed that the trust did not have sufficient funds as against the corpus fund of ₹ one crore, the liability of SBU&PC (Limestone) alone was ₹ 1.65 crore as on 31 March 2009.

Thus from the above it could be seen that the SBU&PCs not only adopted different method for financial assurance but also violated the statutory requirement as the financial assurance at SBU&PC (Lime Stone) was short by ₹ 65 lakh.

The Government while accepting the facts stated (November 2010) that common system of providing financial assurance to be followed by all the SBUs does not exist in the Company but financial assurance are being given only on those forms which are acceptable to the statutory authorities. It further stated that the Company would look into the matter of building up a suitable common system for all the SBUs in this respect.

### ***Loss of interest***

**2.2.32** The terms of payment in the sale orders yearly signed with Steel Authority of India Limited (SAIL) for sale of Limestone provides that the 90 *per cent* of payment would be made within 30 days from receipt of bills supported with duly attached copy of Railway Receipt and sellers' analysis certificate for chemical and size. The balance 10 *per cent* payment was to be made by SAIL within 45 days from the date of invoice and acceptance of material at the respective plants.

The Company appointed (October 2007) a consultant for timely collection of revenue from the consumers. The Company, however, did not incorporate any clause to safeguard its interest in case of delay in receipt of payments from buyers or delay in collection by the consultant.

We observed that payment of 1,293 bills valuing ₹ 156.11 crore (out of total 2026 bills) was received with a delay ranging between 2 and 158 days during 2005-09 from various plants of SAIL. Thus, non-insertion of suitable clause to safeguard its interest coupled with delay in realisation of payments, the Company suffered a loss of interest of ₹ 99.53 lakh during the period 2005 to 2009.

**The Company sustained a loss of interest of ₹ 99.53 lakh during 2005-09 due to delay in realisation of sale proceeds.**

The Government while accepting the facts stated (November 2010) that penal provision for delayed payments are now being enforced strictly and thus the receipt could be expedited.

### ***Excess deposit of land tax***

**2.2.33** Rule 18 (18) of RMMCR, 1986 provides that the lessee can surrender the lease at any time by giving an application in writing which shall be accepted with immediate effect provided that there are no dues against the lessee towards dead rent. The SBU&PC (Limestone) applied (March 2007) for surrender of 1888.98 hectares of mining area of Gotan-I, II and Basni which was accepted by the DMG from the date of application. The acceptance was, however, communicated between July 2007 and February 2008. Meanwhile, the SBU&PC (Limestone) received notice of demand for payment of land tax for the year 2007-08. The Company paid (March 2008) ₹ 6.20 crore being 50 *per cent* of the total demand under protest. The excess amount of ₹ 2.20 crore was neither refunded nor adjusted against the demand of 2008-09.

**The Company deposited the land tax which also includes the demand for the land already surrendered.**

It was, however, noticed that the SBU&PC (Limestone), without evaluating the demand notice properly, deposited the land tax which includes the demand for the land which had already been surrendered.

The Government stated (November 2010) that in order to challenge the order of assessing authority, it was necessary to deposit the 50 *per cent* amount and thus the amount was rightly deposited. It further stated that the Company was not at liberty to reassess the demand of assessing authority at its own level. The reply is not acceptable because as per the provisions of land tax Act 2006/Finance Act, the Company was to deposit only 50 *per cent* of the demand notice for land under possession and not on the surrendered land, for challenging the assessment order.

## **Manpower analysis**

### ***Improper placement of manpower***

**2.2.34** The consultant appointed to assess the requirement of manpower at each SBU&PC after amalgamation of the Company with RSMDC suggested (March 2003) manpower of 110 executives and 949 workmen for SBU&PC Rock Phosphate and 93 executives (combined for proposed SBU&PC Gypsum and Limestone) and 110 workmen exclusively for limestone mines.

We noticed that there was a shortage of manpower (38 to 70 workmen) at SBU&PC (Rock Phosphate) during the year 2007-09 due to which the shift for crushing of HGO plant had been cancelled number of times. It was also noticed that the manpower at SBU&PC (Limestone) was in excess (41 to 35 workmen) in

2007-09, the Company, however, did not initiate any action to rationalise the manpower deployed at various SBU&PC.

It was further observed that two officials of the Company were deployed in Department of mines, Government of Rajasthan, Jaipur since January 2004 and had drawn salary and allowance of ₹ 25.82 lakh (during the period January 2004 to March 2010) from the Company. It was also observed that the Company paid incentive to these officials, at par with the employees of the corporate office. Thus, the Company had paid salary and allowance to these officials without any fruitful work done by them for the Company since January 2004.

The Government stated (November 2010) that after periodically examination of the strength at SBU&PC Limestone, the sanctioned strength in March 2010 was 159 and the existing strength was only 145 with shortage of 14 workers. It further replied that the Company had deployed the stated work force to provide logistic support, as well as for co-ordination and liaison work in the Ministry of Mines in its own interest. The reply is not acceptable as the intimated strength for workers after merger with e-RSMDC was already more despite the fact that departmental mining has been off loaded and Company did not consider the report of the consultant.

#### ***Excess payment of incentive at Gotan***

**2.2.35** The manpower deployed at SBU&PC (Limestone) received incentives on the basis of total dispatches being made on yearly basis. We, however, observed that SBU&PC (Limestone) had also considered the quantity excavated for captive consumption and sold by two assisted sectors for the purpose of working out the amount of incentives despite the fact that the manpower deployed at SBU&PC did not contribute in excavation of mineral from these two assisted sectors. Consequently, the SBU&PC (Limestone) paid excess incentive to its employees to the extent of ₹ 23.02 lakh during 2004-09.

The Government stated (November 2010) that the points raised by the audit will be kept in mind while finalizing the incentive for the year 2010-11.

### **Monitoring/Internal Control**

**2.2.36** In order to achieve its objectives, every organisation requires an effective system of Internal Control, so as to ensure that all the activities of the Company are performed in accordance with the rules, standardised procedures and system for accomplishment of desired goals. It was noticed in audit that the Company had not prepared any manuals relating to its core functions such as Cost and Budget, Marketing and Sales, Internal Audit *etc.* till March 2010. In absence of these manuals, the standardised procedures and systems are deficient and vulnerable to

deviations/manipulations, which may remain undetected by the management. This is a major area that required action.

The Company also failed to exercise internal control on the issues like adhering to the mine plan, timely review of sale price, identification of insurance item, disposal of non moving items, payment of incentive to employees, vetting of contract resulting in defective structure of contract, maintenance of log books for HEMMs to analyse the breakdown hours and consumption of diesels, and identification of risks due to change in Government levies.

The Company outsourced Internal Audit to Chartered Accountants firms. The Statutory Auditor, however, in their report (2004-05 to 2008-09) under section 227 (4A) of the Companies Act, 1956 have reported that Internal Audit needs to be strengthened. The Company appointed different firms of Chartered Accountants for different SBU&PCs, as a result uniformity could not be achieved. However, from the year 2009-10 the company had appointed single Internal Auditor of all the SBU&PCs.

### ***Excess consumption of diesel***

**2.2.37** Stores and spares inventory also includes diesel. The cost of diesel consumed during the review period ranged between 26 and 33 *per cent* of total stores and spares consumed. It was noticed that there was no internal control mechanism over diesel consumption as discussed below:

The Company fixed (1996) diesel consumption norms for shovel and dumper at the rate of 50 and 60 litre per hour respectively. The study of diesel consumption pattern by HEMMs at Jhamarkotra mine revealed that dumpers and shovels were the major consumers, consuming 57 and 20 *per cent* respectively of the total diesel consumed during the period 2004-09 as given in the table below:

<b>Particulars</b>	<b>2004-05</b>	<b>2005-06</b>	<b>2006-07</b>	<b>2007-08</b>	<b>2008-09</b>
<b>Total diesel consumed</b>	<b>3900871</b>	<b>4314550</b>	<b>4273682</b>	<b>4179671</b>	<b>4536804</b>
<b>Shovels</b>					
Consumption as per norms	708250	738700	741650	757150	762900
Actual diesel consumed	783054	878480	883332	885258	912915
No. of hours operated	14165	14774	14833	15143	15258
Actual consumption (lt/hr)	55	59	60	58	60
Excess consumption on the basis of Company norms (in litres)	74804	139780	141682	128108	150015
Excess consumption (in <i>per cent</i> )	11	19	19	17	20
<b>Dumpers</b>					
Consumption as per norms	2210100	2529060	2561220	2435880	2360280
Actual diesel consumed	2287962	2397819	2459979	2402688	2596136
No. of hours operated	36835	42151	42687	40598	39338
Actual consumption (lt/hr)	62	57	58	59	66
Excess consumption on the basis of Company norms (in litres)	77862	-	-	-	235856
Excess consumption (in <i>per cent</i> )	4	-	-	-	10

A review of diesel consumption by shovels and dumpers in comparison to the norms fixed by the Company revealed that the average consumption in case of shovel and dumper ranged between 55 and 60 litre per hour and 57 to 66 litre per hour respectively during the period 2004-2009.

We observed that:

- Although the diesel consumption in shovels was always more than the established norms yet the SBU&PC (Rock Phosphate) did not analyse the reasons of higher consumption of diesel. Further the SBU&PC (Rock Phosphate) also did not have the proper records of diesel filled, hours operated at the time of refilling of diesel at the field level. The daily shift reports were being used for creating database only and no internal control system as well as vigilance exists. In absence of adequate internal control and vigilance check, the 20 cases of theft of diesel (1403 litre) were noticed during the period of review for which First Information Reports (FIR) were lodged by the Company but no measures to control such malpractices in future were taken.

Non-adherence to the established norms of diesel consumption resulted in extra expenditure of ₹ 2.60 crore.

- The productivity of shovels decreased from 12.57 tonnes/litre in 2004-05 to 9.54 tonnes/litre in 2008-09 and in case of dumpers it decreased from 4.30 tonnes/litres to 3.35 tonnes/litres during the same period. The Company, however, did not analyse the reasons despite declining trend of production per litre. A comparison of productivity obtained from the old and new dumpers in audit revealed that the performance of old dumpers in term of diesel consumption and rock handling per hour was better than the new dumpers. The SBU&PC (Rock Phosphate) had never assessed the low performance of new dumpers and reasons for high fuel consumption.

The Government stated (November 2010) that the diesel consumption norms recommended by the original equipment manufacturer i.e BEML in case of shovels and dumpers were 53 to 57 litres/hour and 57 to 62 litres/hour respectively. It further stated that the shovels had outlived their economic lives as per OEM's recommendations which also contributed to excess diesel consumption. As regards to security vigilance and theft of diesel, it was replied that the threat of theft was primarily on account of the fact that the mine area has not been fenced due to presence of private lands and houses in the mining lease area. The reply is not acceptable as the excess diesel consumption commented by us, was always higher than the highest ceiling limits recommended by BEML except in 2004-05 for shovels and the Company had not framed any policy to analyse the economic viability for replacing the old shovels.

**The Company did not analyse the reasons for higher consumption of diesel than the prescribed norms which caused extra expenditure of ₹ 2.60 crore.**



***Monitoring of handling and processing loss***

**2.2.38** The Company fixed (August 1977) norm of 3 *per cent* of production and purchase for handling and processing losses of Rock Phosphate (all stages covered).

We noticed that the handling and processing losses were not calculated correctly as the Company while calculating the losses considered the sale component also as against the prescribed factor of production and purchase.

The Government stated (November 2010) that the handling losses booked during the period under review are within the norms fixed by the Company. The fact remains that handling and processing loss norms are not within norm if calculated as percentage of production/purchases.

**Conclusion**

**The Company's planning was inadequate as it failed to prepare long term plan. The mining schemes were also faulty as it did not specify cross section-wise and level-wise excavation to be carried out in respect of Limestone mines. The Company also did not comply with the statutory requirement *viz*; obtaining environment clearance, preparation of mine plan, operating mines under minor mineral despite covered under major mineral, delay in reclamation of excavated mine area. The production performance of the Company was at variance with both Mine Plan and Annual Plan. Despite having sufficient market demand of limestone and wide mine area, the production of Limestone was not commensurate with the demand. The reclamation of excavated area was not done as per EIA/EMP plans at Limestone mines. Delay in obtaining environment clearance and surrendering the mine leases for inoperative mines resulted in idle expenditure of ₹ 62.46 crore. The Company could not utilise the heavy earth moving machines optimally in excavation of mineral. Non-utilisation of the crusher plant optimally, the performance of the Industrial Beneficiation Plant was affected substantially. There was no documented sales policy at SBU&PC Rock Phosphate and Limestone. The price of saleable minerals was also not calculated as per the procedure prescribed in the manual. Absence of structured manpower study resulted in deployment of excess manpower at SBU&PC (Limestone) and short manpower at SBU&PC (Rock phosphate).**

## **Recommendations**

**The Company needs to ensure:**

- **preparing broad strategic corporate plan with specific targets;**
- **compliance of the statutory requirements;**
- **excavation of mineral broadly as per mine plan;**
- **enhance production of Limestone to wipe out the losses;**
- **optimal utilisation of HEMMs;**
- **optimal utilisation of Industrial Beneficiation Plant;**
- **best practices for contract management to safeguard its financial interest;**
- **documented sales policy for each SBU&PC; and**
- **deployment of manpower as per requirement.**

## Jodhpur Vidyut Vitran Nigam Limited

### 2.3 IT Audit on computerisation of revenue billing system by Jodhpur Vidyut Vitran Nigam Limited

#### Executive summary

*Jodhpur Vidyut Vitran Nigam Limited (Company) outsourced (2008) work of generation of electricity consumption bills of all the nine circles. It awarded generation of electricity bills of five circles including electricity bills of all HT consumers to K & D Engineers and Consultants and the work of electricity bills of remaining four circles to KLG Systel Limited, Gurgaon (Haryana). An Information Technology Audit on billing system of the Company was attempted to ascertain that the Company before awarding the work of its core activity of revenue realisation has adequately addressed the associated risks of outsourcing. Further, the audit was also conducted to evaluate controls of application software and to ascertain completeness, regularity and consistency of data.*

*Computerisation of revenue billing of the Company was assessed against the Tariff for supply of electricity-2004, and Terms and Conditions of Supply (TCOS) - 2004, Rules, notifications, directions issued by the Rajasthan Electricity Regulatory Commission*

*(Commission) and orders and circulars issued by the Company. The data available with the Company was analysed with the help of Computer Assisted Audit Techniques.*

*Though the system developed by both the service providers was adequate as regards to processing of billing data and generation of electricity bills yet there were many shortcomings leading to incorrect billing as well as not achieving full potential of IT applications. The observations of audit have been categorised as deficiencies of general controls, system design drawbacks, mapping of business rules and lacunae in application controls such as deficient input controls and validation checks. Besides, some contractual deficiencies, non-reconciliation of data available in the system with financial statements of the Company were also noticed. It is also felt that there is a requirement for effective IT application internal control mechanism so as to get the best results of computerisation of billing system.*

## Introduction

**2.3.1** Jodhpur Vidyut Vitran Nigam Limited (Company) was incorporated on 20 July 2000 after unbundling of erstwhile Rajasthan State Electricity Board (RSEB). The activity of the Company is spread in nine\* circles. For revenue purposes, the Company is empowered to collect revenue from different categories of consumers for electricity supplied as per latest tariff orders issued by the Rajasthan Electricity Regulatory Commission (Commission).

The Company outsourced (2008) the work of generation of electricity consumption bills of all the nine circles and awarded generation of electricity bills of five\*\* circles including electricity bills of all HT consumers to K & D Engineers and Consultants and the work of electricity bills of remaining four\* circles to KLG Systel Limited, Gurgaon (Haryana). Prior to it, the work of generation of electricity bills was outsourced to Aditi Computers. The service providers developed the software using standard RDBMS of SQL/Oracle and Windows as operating system under multi user requirement.

As on 31 March 2009, the Company had 20,77,773 consumers comprising of Domestic, Non-domestic, Street light, Agricultural, Small Industrial Power (SIP), Medium Industrial Power (MIP), Large Industrial Power (LIP) and Mixed load consumers. During 2008-09, the total revenue realised by the Company from all categories of the consumers was ₹ 2,401.69 crore as given in **Annexure-17**.

## Scope and methodology of audit

**2.3.2** The billing system pertaining to HT and LT consumers of the Company was reviewed by audit during the period from January to June 2010. The data as maintained by the billing agencies *i.e.* by K & D Engineers and Consultants and KLG Systel Ltd. for the period 2008-09 in respect of all HT consumers and data relating to LT consumers of two circles<sup>§</sup> was analysed. Questionnaires were issued to elicit information from the Company to evaluate controls of application software and to ascertain completeness, regularity and consistency of data. Further, two sub-divisions<sup>∇</sup> from each circle were selected for detailed analysis.

Audit methodologies adopted was the use of questionnaire and management response/clarification there upon, scrutiny and verification of manual records, collection of computerised data and analysis thereof with the help of

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\* Barmer, Bikaner, Churu, Hanumangarh, Jalore, Jodhpur (City), Jodhpur (District), Pali and Sriganganagar.

\*\* Bikaner, Churu, Jodhpur (City), Pali and Sriganganagar.

\* Barmer, Hanumangarh, Jalore and Jodhpur (District).

§ Jodhpur district circle (M/s KLG Systel Ltd.) and Pali circle (M/s K & D Engineers and Consultants).

∇ Jodhpur district circle: Luni and Mandore sub-division;  
Pali circle : Pali and Sirohi sub-division.

Computer Assisted Audit Techniques (CAATs), issue of preliminary audit observations to the management for response with a view to firming up the audit conclusion and discussion and also interaction with the various officers of the Company and billing agencies.

### **Audit objectives**

**2.3.3** Information Technology (IT) audit of computerisation of revenue billing of the Company was carried out to examine, analyse, evaluate and to assess the adequacy and effectiveness of IT policy of the Company, mapping of business rules, completeness and correctness of the data, reconciliation of revenue realised and achievement of overall objectives of the Company.

### **Audit criteria**

**2.3.4** IT audit of computerisation of revenue billing of the Company was assessed against the following parameters:

- Tariff for supply of electricity (Tariff)-2004, Terms and Conditions of Supply (TCOS)-2004, Rules, notifications, directions issued by the Commission;
- Orders and circulars issued by commercial wing of the Company; and
- Best practices pertaining to IT system and management.

### **Audit findings**

**2.3.5** Audit findings based on scrutiny of records and database are as under:

### **General Controls**

#### ***Lack of formulated and documented IT policy and IT security policy***

**2.3.6** A well formulated and documented IT policy is essential to assess the time frame, key performance indicators and cost benefit analysis for developing and integrating various functions. The Company, however, had not formulated a formal IT policy. Further, the Company has also not constituted a planning/steering committee with clear roles and responsibilities to monitor each functional area in a systematic manner.

The Company also did not have an IT security policy regarding the security of IT assets, its software, its hardware and databank. We observed that in the

absence of IT security policy, modifications made in the master data relating to the consumer service, meters, meter readings, payments, arrears, adjustment in assessments *etc.* by the outsourced agency were not subjected to any supervisory review by the Company staff/officers periodically so as to ensure that the changes were authorised before committing them to the databank. It was also observed that there was no control procedure/system to monitor the cases of creation of new database of consumers, deletion of consumers from the master data bank, acceptance of duplicate or unauthentic records. In absence of these precautions, the possibilities of unauthorised changes made in the master database can not be ruled out.

### ***Business continuity and disaster recovery plan***

**2.3.7** The revenue billing system is a critical system. If there is any untoward incident or disaster and the consumers' bills are not generated in time, revenue earning capacity of the Company may be substantially affected. It is, therefore, essential for the entity to prepare and document a disaster recovery and business continuity plan, outlining the action to be undertaken immediately after a disaster and to effectively ensure that information processing capability can be resumed at the earliest. We, however, noticed that there was no documentation and testing of business continuity plan detailing the back up and recovery procedures in the Company. There was no offsite storage of backups. Even the retrieval of data from onsite backup had not been tested. The backup data for the year 2007-08 was not available with the Company.

The Government while accepting the facts stated (September 2010) that now billing data back up is being taken in CDs at three different levels and a contract has been awarded to HCL Infosystems Limited to develop the software for each activity. The fact remains that the Company did not have a documented disaster recovery and business continuity plan.

## **System Design Deficiencies**

**2.3.8** The system design and its operation by the service providers should be adequate and sound to capture the data from the inputs provided by the Company. In case of deficiencies in the system itself, there are possibilities of generation of incorrect bills. We noticed certain system design deficiencies:

### ***Inaccurate meter reading brought forward***

**2.3.9** Difference between current reading and previous reading denotes the consumption of energy by a consumer and on the basis of the same the energy bill is computed. As such, previous reading being carried forward should obviously remain unchanged during the process of brought forward during next billing cycle. An analysis of billing data of HT/LT consumers revealed that the system was deficient to the extent that instead of taking the previous reading by default, it accepts the manual intervention hence there was difference in the meter reading being carried forward in previous billing cycle

and brought forward in current billing cycle. Due to this discrepancy it was observed that:

- In HT billing, the system brought forward incorrect meter reading of previous cycle in case of 45 consumers. Further analysis revealed that the system brought forward 21,98,178 units of electricity in excess of previous consumption in 14 cases (11 consumers) during the period between May 2008 and March 2009. Due to this, the bills for the present cycle were prepared for less consumption and therefore the Company short recovered energy charges amounting to ₹ 88.15 lakh.
- In LT billing, differences in carried forward and brought forward meter reading were noticed in 22,821 cases (in 2,072 cases, the opening balance of current month was more than the closing balance of previous month) between April 2008 and June 2008 in selected sub-divisions. The discrepancies noticed in LT consumer database pertained to different categories of consumers and hence the actual financial impact could not be ascertained.

The Government stated (September 2010) that in case of HT consumer's data base, the changes were got done through manual intervention by billing officer whereas in LT consumer's cases, some times due to wrong reporting of readings by meter reader or wrong punching of data by operator, the differences in old and new reading occurs but it could not be corrected/updated in billing back up data. The reply is not acceptable as the system was deficient as it did not take the previous consumption of the consumer by default.

#### ***Undue benefit of power factor rebate to consumers***

**2.3.10** Tariff -2004 provides that consumers having sanctioned connected load more than 25 HP (18.65 KW) shall maintain an average power factor of not less than 0.90 (90 *per cent*). In case the average power factor falls below 0.90, a surcharge at one *per cent* of energy charges for every one *per cent* fall in average power factor below 0.90, shall be charged. Also an incentive of one *per cent* of energy charges shall be provided if average power factor is above 0.95 (95 *per cent*) for each one *per cent* improvement above 0.95.

In a *suo moto* petition in the matter of rationalisation of retail tariff for the Company, the Commission amended the above clause and decided (August 2007) that incentive be provided for each 0.001 (0.1 *per cent*) improvement in average power factor beyond 95 *per cent* (0.950) and surcharge be levied for fall of each 0.001 (0.1 *per cent*) of average power factor below 90 *per cent* (0.900). This facility was, however, applicable only where the installation of the meters at the consumer's premises were compliant to the requirements of Central Electricity Authority (Installation & Operation of Meters) Regulation, 2006 which stipulated that in case of supply of electricity above 33 KV, the accuracy class of meters should be 0.2S. Further the accuracy class of Current Transformers and Voltage Transformers shall not be inferior to that of associated meters.

We observed that the system did not have a field in the table to define the accuracy class of meters in absence of which the system was deficient to compute the power factor incentive as per the applicable provisions and therefore allowed incentive up to three digit of improvement in average power factor beyond 95 *per cent* (0.950). Due to this design deficiency in billing system, the Company allowed ₹ 33.87 lakh pertaining to the period November 2007 to May 2008 in the bills of the consumers. On being pointed out by audit through draft paragraph, the Company debited the amount of incentive against the consumers. Analysis of database, however, revealed that though the incentive allowed up to May 2008 was debited but the measures to control this deficiency were not included in the system as a result the system again allowed incentive of ₹ 27.76 lakh to these consumers during the period June 2008 to March 2009.

The Government while accepting the fact of system deficiency of not indicating accuracy class of meters stated (September 2010) that the rebate was allowed on two digit basis. The reply is not acceptable in view of the fact that the incentive was allowed on three digit basis in the cases pointed out by audit.

***Absence of system alert for low power factor***

**2.3.11** Power factor clause of Tariff -2004 regarding Large Industrial Services provides that if the average power factor falls below 0.70 (70 *per cent*), the installation shall be disconnected and will not be reconnected till the average power factor is improved to the satisfaction of the Company. Section 139 and 140 of Electricity Act 2003 also reproduce the same.

The State of Rajasthan is suffering from power shortage and had to import it from other states. It was, therefore, necessary to adopt measures to save energy from being wasted by providing reactive power compensation throughout the network (as also contemplated in the Indian Electrical Grid Code).

The software designed for billing did not automatically provide alerts by printing notices on the bills. An analysis of data back up of HT consumers for the year 2008-09 by audit revealed that the required action as per the prescribed procedure was not taken in cases ranging between 27 and 48 during May 2008 to March 2009, despite the fact that their power factor was low and ranged between 0.009 and 0.695. Thus, due to not taking the action, the Company sustained an estimated loss of 28.07 lakh units\* valued at ₹ 1.13 crore.

The Government accepted (September 2010) the facts of non-issuance of notices/disconnection of power in case of power factor falls below 0.70 in accordance with tariff as well as Indian Electrical Grid Code. The Company, however, did not agree to the loss worked out by audit. The reply is not acceptable in view of the fact that stringent condition imposed in tariff/Indian

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\* Difference of PF 0.70 and actual PF of the consumer during a month.



Electrical Code for disconnection in such cases itself evident that the Company is bound to lose.

### ***Discrepancies in Delayed Payment Surcharge***

**2.3.12** Clause 36(1) and 38 of TCOS-2004 provides that all bills for electricity charges may be paid within twelve days from the date of their issue at the concerned sub-divisional office or at other collection centers; either in cash or by pay order/bank draft/bankers cheque or a cheque failing which a Delayed Payment Surcharge (DPS) at the rate of 2 *per cent* and 4 *per cent* on unpaid dues be levied in case of monthly and bi-monthly billed consumers respectively.

Analysis of database revealed that the system was deficient as it did not correlate the bill payment date of previous cycle with reference to the date on which the bill was actually paid by the consumer. Due to this, in case a consumer paid the bill of previous cycle after due date, the system did not indicate alert and generate the bill of next billing cycle without showing the arrear of DPS. It was also noticed that during the period of May and June 2008 out of 43,776 consumers, in 1,060 cases of Jodhpur district circle, the system did not indicate DPS of ₹ 75,431 in the previous arrear column. Thus, due to design deficiency, an amount of ₹ 75,431 was short recovered.

The Government while accepting the design deficiency stated (September 2010) that delay occurred due to extension/change of due date by the billing officer at sub-division where the bills were not distributed timely. The fact remains that the system did not have provision to correlate bill payment date with due date of payment.

### **Mapping of business rules**

**2.3.13** The Company frames rules in accordance with the tariff provisions and TCOS, duly approved by the Commission, issues necessary circulars and periodically reviews them. These are communicated to the service providers to update the system. The discrepancies noticed where either the rules framed by the Company were not adhered to or those were not appropriately incorporated in the system are as under:

### ***Rebate in case of defective meters***

**2.3.14** Clause 30(2) of TCOS- 2004 stipulates that in case a stopped/defective metering system is not replaced within a period of two months of its detection, a rebate of 5 *per cent* on the total bill of the consumer excluding electricity duty shall be allowed from third monthly bill in case of monthly/fortnightly billing and second bill in case of bimonthly billing after such detection till the meter is replaced.

Scrutiny of billing data of LT consumers of selected sub-divisions for the month of April 2008 and March 2009, we observed that out of

69,672 consumers, 1,042 consumers were billed on average basis during 2008-09 indicating that the meters were defective during this period. The legitimate rebate of ₹ 56,106 at the rate of five *per cent* was, however, not allowed to these consumers. Further scrutiny of balance sheet of the Company revealed that in none of the cases, the Company has allowed the rebate of five *per cent* in case of defective meters which remained un-replaced for more than two months indicating that provisions to allow rebate was not incorporated in the system.

The Government while accepting the fact assured (September 2010) to take corrective measures.

### ***Computation of fixed charges***

#### ***Domestic and non-domestic consumers***

**2.3.15** Tariff -2004 provides for the 'Fixed Charges', calculated on the basis of average monthly consumption of previous financial year.

Scrutiny of database revealed that the fixed charges computed by the system were not correct as the system while computing the fixed charges did not correlate it with the average consumption of previous year. During the analysis of records of April 2009 it was noticed that an amount of ₹ 17.78 lakh towards fixed charges (which is to be based on average monthly consumption of 2008-09) was charged in excess of tariff in respect of 35,441 domestic consumers of selected circles.

Similarly, in case of Non-domestic consumers, the fixed charges amounting to ₹ 2.26 lakh in respect of 2,447 consumers of selected circles were charged in excess of tariff.

The Government stated (September 2010) that the fixed charges were computed correctly. The reply is not convincing in view of the fact that the fixed charges were charged in excess of the tariff provision in the cases pointed out by audit.

### ***Allowance of rebate***

**2.3.16** To promote non-conventional sources, Tariff -2004 provides a rebate of five paise per unit in the "Energy Charges" for usage of "Solar Water Heating System". Scrutiny of database of selected circles, however, revealed that this provision of the tariff was not mapped in the system and as a result the system was not allowing the rebate to 102 eligible consumers.

The Government stated (September 2010) that such rebate was allowed under tariff code "1000Y". The reply is not acceptable in view of the fact that data provided did not have tariff code "1000Y". Further the revenue manual of the Company provides tariff code 1400 for such consumers and no rebate was allowed to these consumers.

### ***Non payment of enhanced Security Deposit amount***

**2.3.17** Clause 16 of TCOS provides that the provisional amount of security for payment of Nigam dues be deposited in accordance with clause 3 of Part II and the security amount may be reviewed at the beginning of each financial year to cover actual average consumption. In case, if the security deposited by the consumer is found insufficient, the Nigam may give a notice to the consumer to deposit the difference within 30 days of service of notice. The Company also paid interest on the security deposit amount at the prescribed rate.

Scrutiny of database, however, revealed that the above provisions were not mapped in the system and therefore the work of assessing the security deposit annually was being done by the Commercial Wing of the Company. Audit scrutiny revealed that the notices for depositing additional security were issued by the Commercial Wing but action under section 56 (1) of the Indian Electricity Act, 2003 to disconnect power supply of such consumers who have not deposited the additional security even after issue of notice was not undertaken by the Sub-divisional office. The details of HT consumers who had not deposited the additional security are given in **Annexure 18**.

Further analysis of system data relating to security deposit and security deposit register maintained at Sub-Division, a difference of ₹ 31.72 lakh was noticed in respect of security deposits of the consumers as detailed in **Annexure 19**.

The Government while accepting the facts stated (September 2010) that notices have now been served to the consumers to deposit additional security.

## **Application Controls**

### ***Input control and validation check***

**2.3.18** To ensure correctness, completeness and reliability of the database, it is necessary to ensure appropriate input control and data validation during the data entry. This would help in reduction in duplication of efforts and redundancy. The following deficiencies were noticed in audit in this regard.

## **Input Controls**

### ***Rebate for domestic connections in rural areas***

**2.3.19** Tariff-2004 provides a rebate of ten *per cent* in the tariff for domestic connections in rural areas only. This rebate was, however, not to be allowed in such villages where round the clock supply of electricity was provided. The system has given tariff code '1500' in such villages where round the clock supply of electricity was provided.

Scrutiny of database, however, revealed that:-

- as per Management Information System (MIS), all the 1,058 and 915 villages in Jodhpur district circle and Pali circle have been electrified upto March 2008 and round the clock supply of electricity was provided in these villages. The system was, however, not being updated and therefore it allowed rebate to domestic connections in rural areas amounting to ₹ 17.84 lakh<sup>1</sup> in the month of April 2008;
- in absence of necessary validation check, the system indicated tariff code '1500' in case of urban connection also;
- the rebate of 10 *per cent* was directly reduced from the tariff/energy charges instead of showing it separately in the column of other rebate.

The Government accepted (September 2010) that the rebate was allowed in such villages where round the clock supply was provided.

### ***Security deposit for Meter and CTPT set***

**2.3.20** Clause 3(2) of TCOS-2004 Part II provides that security towards Meter and Current Transformer Potential Transformer (CTPT) set is required to be charged at prescribed rates\* in case metering equipments were provided by the Company.

Analysis of HT database revealed that this provision was not mapped in the system. The system did not contain the information about the ownership of Meter and CTPT set and thus both the fields indicating Meter and CTPT set were found blank in the database. The cases test checked during audit where HT consumers did not deposit the Meter and CTPT security amount of ₹ 2.82 lakh is as given in **Annexure 20**.

The Government while accepting the facts stated (September 2010) that notices have now been served to the consumers to deposit the CTPT charges.

### ***Incorrect insertion of Industrial Code***

**2.3.21** For the purpose of identifying the HT consumers with nature of their industry the industrial codes 1 to 31 were given to them. These codes were necessary to charge the various Tariff provisions viz; seasonal industries, Arc/furnance industries, oil and ginning industries *etc.* The following deficiencies were, however, noticed:

- In 16 to 84 cases pertaining to different months, Industrial Codes were not found entered.

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<sup>1</sup> 1,05,572 consumers of Jodhpur district circle and Pali circle.

\* HT Trivector Meter ₹ 8,000, 11 KV CTPT Set ₹ 20,000, 33 KV CTPT Set ₹ 50,000, EHT CT ₹ 2,80,000, EHT PT ₹ 5,80,000.

- In case of Public Health and Engineering Department (PHED) to which Industrial code 11 was allotted, other codes were also found entered. Similar deficiency was also noticed in case of Textile industry to which industrial code 01 was given.

Insertion of wrong code may lead to incorrect calculation of electricity charges in case of seasonal industries and charging of electricity duty in cases of PHED where it was exempted.

The Government assured (September 2010) to take corrective measures to overcome this deficiency.

### ***Completeness of data***

#### ***Area code and Village code***

**2.3.22** In HT consumer billing data for the year 2008-09, the area codes of the consumers in various cases ranging between 223 and 238 consumers noticed during different months were not shown. Similarly, in LT consumer billing data of selected sub-divisions of two circles, village code was not found entered in 1,670 cases. Further in 11,726 cases, the village codes were shown as 9999999 in the database.

The Government assured (September 2010) to take corrective measures based on actual condition.

#### ***Security deposit from LT consumers***

**2.3.23** Clause 16 of TCOS provides that the provisional amount of security in respect of electricity to be supplied shall require to be deposited by the person applying for supply of electricity.

In Jodhpur district circle, details of security amount in respect of 59,754 consumers (55,867 regular consumers) were not given in database for the month of April 2008 whereas in Pali circle the details of security amount were not shown in the database provided to audit.

The Government assured (September 2010) to incorporate these fields in new master data creation work which is in process.

#### ***Feeder Code***

**2.3.24** Appendix-A of Revenue Manual, 2004 provides that Feeder Codes should be of eight digits consisting of first two digits as circle code, third digit as division code, fourth and fifth digits as sub-station code, sixth digit as 11 KV feeder number, seventh and eight digits of the transformer number. The feeder code helps the Unit Officer/Junior Engineers in identifying the feeders having pilferage/leakage of electricity by analysing the reports having details of consumers, the consumption actually recorded and computed in the consumers' ledgers and the energy actually supplied on that feeder.

We, however, noticed that in 1,28,815 cases and 2,54,039 cases of Jodhpur district circle and Pali circle respectively, the feeder code was found incorrect. Thus, the very purpose of indicating feeder code was defeated.

The Government assured (September 2010) to take corrective measures.

#### ***Discrepancies in Service Connection Order***

**2.3.25** SCO number and date is required to verify the issuance of release of new connection to a consumer. However, in 96 cases of LT database of Jodhpur district circle for the year 2008-09, the Service Connection Order (SCO) were not shown. Further in 55,257 cases, SCO number field displayed as “00000000” and in 56,787 cases, SCO date shown as “00000000”.

In Pali circle, the SCO number and date were not shown in the database. Further analysis of database revealed that fields in Master files in respect of SCO number were found left blank.

In absence of adequate input control, the system accepted the master data of consumers even without SCO number and “connection date”, “first bill date” and “meter reading date”. In such cases the date of service connection released and subsequently the issuance of first bills to the consumers could not be verified during audit.

The Government assured (September 2010) to rectify this deficiency during creation of new master data which is in process.

#### ***Absence of Meter Number***

**2.3.26** In HT database for the year 2008-09, meter numbers of regular consumers were found absent in several cases ranging between 2 to 17 consumers during different months. In absence of meter numbers any change in meter and its corresponding effect on multiplication factor could not be vouched in audit.

In LT database for the period 2008-09, meter numbers of 358 consumers were found absent. In selected sub-divisions of two circles, duplicate meter numbers in 2,479 cases of regular domestic consumers were also noticed. Further test check of Meter Change Order (MCO) in Mandore sub-division, it was noticed that in various cases<sup>2</sup> meter numbers mentioned in MCO did not match with the meter number shown in the databases.

The Government accepted the fact and stated (September 2010) that instructions have now been issued to the service provider to take corrective action.

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2. Account Number 15150047, 16150184, 22010135, 22020126, 22080028, 22080048, 22080147, 22110075 and 22130002.

## Validation Checks

### *Multiplication factor*

**2.3.27** Multiplication factor ratio is being calculated on the basis of CTPT and meter value. MF is being used for the purpose of computation of energy charges of the consumer. System did not have the field to indicate the CTPT installed at the consumers' premises with CTPT numbers, in absence of which the system was not able to validate the change in MF in case the CTPT installed at consumers' premises was replaced.

The Government assured (September 2010) to rectify this deficiency during creation of new master data which is in process.

### *Compliance of tariff provisions*

**2.3.28** Tariff -2004 provides that if the sanctioned connected load of a SIP consumer exceeds 18.65 KW then the consumer should charge either at the rate of MIP service or the consumer should apply for separate connection under non-domestic services category.

Analysis of database, however, revealed that the system did not validate the sanctioned connected load of the consumer with reference to its category as a result 1,376 consumers\* whose sanctioned connected load was more than 18.65 KW were being charged under SIP category. Due to this discrepancy in the system, the energy charges and fixed charges amounting to ₹ 9.40 lakh and ₹ 9.07 lakh respectively were short recovered.

The Government stated (September 2010) that the compliance of tariff provisions are being made. However, it was silent on the issue of conversion of SIP consumers to MIP consumers in case the sanctioned connected load exceeds 18.65 KW.

### *2.3.29 Acceptance of invalid dates*

- The system lacked validation check with reference to dates as it accepted invalidate dates. In HT consumers billing data, the invalid dates such as 1/1/1900, 24/5/2088 were found entered.
- In LT consumers billing data of Pali circle, the connection date, reconnection date and disconnection date field columns displayed as "01/01/1900" in 85,478, 85,430 and 2,49,849 cases respectively.
- In LT consumers billing data for the month of April 2008, the dates after April 2008 were also found entered.

The Government accepted the fact and stated (September 2010) that instructions have now been issued to the service provider to take corrective action.

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\* 751 consumer in Jodhpur district circle and 625 consumers in Pali circle.

***Non-reconciliation of MIS with system data***

**2.3.30** The Company did not evolve system to reconcile the information provided in the MIS with the system database. The following discrepancies were noticed:

- As per Monthly Progress Report (MPR) for the month of March 2009, there were 858 regular HT consumers whereas the system displayed 878 regular consumers. Similarly, the MPR indicated eight permanently disconnected consumers (PDC) whereas as per the system there were 584 PDC.
- As per LT consumers' data of Jodhpur District Circle, there were 1,63,187 consumers whereas the MPR indicated 1,77,238 regular consumers. Similarly, as per MPR there were 43,804 PDC whereas the system indicated only 7,684 PDC.
- Similar discrepancies in regards to number of consumers of various types were also noticed in LT consumers' data of Pali Circle.
- The category-wise discrepancy in number of consumers in selected circles is given in **Annexure-21**.

The Government assured (September 2010) to take corrective measures during creation of new master data which is in process.

***Non-adjusting security deposits against outstanding dues of Permanently Disconnected Consumers***

**2.3.31** As on 31 March 2009, there were 584 HT consumers, whose electricity connections were permanently disconnected. We noticed that:

- the system data did not contain the date of disconnection and dues outstanding *i.e.* agewise position of dues of these PDC;
- no security deposits was available against 38 PDC having outstanding towards Board dues and Electricity duty amounting to ₹ 148.51 lakh and ₹ 10.58 lakh respectively. In absence of security deposit, the possibility of recovery of dues was bleak.
- The difference in outstanding amount against the PDC as shown in MIS (Board Dues ₹ 502.12 lakh, Electricity Duty ₹ 4.76 lakh) of Revenue Section and as per the system (Board Dues ₹ 497.21 lakh and Electricity Duty ₹ 21.74 lakh) was not reconciled.

It is evident from above that the outstanding balances against PDC as per Revenue section and as per the system were not reconciled which may affect the final accounts being prepared by the Company.



The Government stated (September 2010) that date of disconnection and age wise position of outstanding dues was available in the system. The reply is not accepted in view of the fact that data provided to audit did not have the same.

### **Compliance of terms and conditions of the work order**

#### *Terms and conditions of the work order*

**2.3.32** The work order for design, maintenance of billing software, data processing of billing data, printing of bills and preparation of various management reports in respect of HT/LT consumers of the Company was awarded in favour of K & D Engineers and Consultants and KLG Systel Ltd. As per terms and conditions of the work order, both the service providers were required to submit deliverables such as:

- the contractor was responsible for proper storage of billing data of last 3 years/available years. The billing data was required to be got insured and insurance charges for safety of data was to be borne by the agency (service provider);
- the flow chart of programme and source code on hard copy as well as on CD of the software along with detailed write up and algorithm before commencement of work;
- enabling the billing software web/net enabled with proper interface for accessing the data and for viewing of consumer wise billing status/outstanding/security deposit and other consumer related information;
- providing requisite operational and other training to the personnel of the Company.

It was, however, noticed that both the service providers failed to comply with the above contractual liabilities and the Company also did not insist that the service provider should comply with the provisions of the contract.

The Government accepted the fact and stated (September 2010) that both the service providers have now been instructed to comply with the various clauses of the contract.

### **Internal Controls**

**2.3.33** The activity of billing system comprising of processing and generation of bills of HT/LT consumers was very important as timely assessment, billing and realisation of revenue is critical for survival for the Company and can be considered as backbone system of the Company. This mission critical activity has been outsourced. The Company was expected to exercise prudent controls

over the outsourcing activity as well as on outsourced agency to which this activity was assigned.

It was, however, noticed that the Company did not evolve any mechanism to review the adequacy, efficiency of the billing system with reference to the correctness of mapping of tariff/business rules in the system and to ensure the reliability of outsourced billing system, infrastructure security being maintained by service providers.

Thus, the internal control in respect of IT application was non-existent. The Company also could not address the associated risks of outsourced billing system.

The Government assured (September 2010) to take corrective measures during creation of new master data which is in process.

***Release of more than one industrial/non-domestic connection in the same premises***

**2.3.34** Clause 11(1) of TCOS-2004 provides that more than one industrial/non-domestic connection in the same premises and in the same name shall not be allowed. Further clause 11(4) provides that in cases where more than one industrial/non-domestic connections are existing in the same premises in same or other name, a notice of one month shall be issued to the consumers to get the loads clubbed failing which the connection may be disconnected after expiry of notice period.

Analysis of LT database, however, revealed that the provisions of TCOS were not complied with and more than one connections were released in respect of 92 consumers existed in the same premises and in the same name in the selected sub-divisions.

Hence, the system was deficient to this extent as it accepted the entry in such cases and also generated the bills. The respective sub-divisions also failed to take appropriate action either to issue disconnection notices or to direct the consumers to club the load.

The Government stated (September 2010) that the action in these cases can be taken after physical verification of site and documents of such connections. The fact remains that the system did not have provision to identify such cases.

**Conclusion**

**The Company does not have an IT policy or a business continuity plan as the recovery of data and offsite storage were not ensured. The design deficiencies and inadequate input controls resulted in short realisation of electricity charges, allowance of inadmissible incentives and loss of energy. The outputs generated by the system were not reconciled with MIS of the Company. The Company could not ensure the reliability and**

effectiveness of the system as the outsourced billing system was not included under the scope of internal control/audit. Thus, the Company could not enforce the use of technology to its maximum potential for achieving its goal.

### Recommendations

The Company should:

- formulate and implement a clear and comprehensive IT policy and periodically review it in view of changing scenario;
- conduct periodical reconciliation of system data and MIS;
- build in adequate input controls and validation checks into the system to prevent duplicate entries and to ensure complete and correct data entries;
- cover the outsourced IT application under the scope of internal control/audit to enhance the reliability and effectiveness of billing system;
- prepare a disaster recovery plan and ensure periodical data backup;
- host billing data of consumers on company website for better transparency.