Chapter II

Performance Audit relating to Government Companies

West Bengal State Electricity Distribution Company Limited

2.1 Performance of power distribution utility in West Bengal

Executive Summary

Electricity is an essential requirement for all facets of our life and critical infrastructure for country's socio-economic development. Supply of electricity at reasonable rate to all the sectors is very crucial for sustained economic development. In West Bengal, electricity distribution is undertaken by five agencies i.e. West Bengal State Electricity Distribution Company Limited (Company) and The Durgapur Projects Limited (DPL) in the State sector, Damodar Valley Corporation (DVC)in the concurrent sector and CESC Limited and DPSC Limited in the private sector.

As on 31 March 2011, the State had distribution network of two lakh CKM, 549 sub-stations and 7,600.33 MVA distribution transformers (DTR) of various categories. There were 105.72 lakh consumers as of March 2011. The turnover of the State distribution companies was ₹17,084.67 crore in 2010-11, which represents 3.71 per cent of State Gross Domestic Product. These companies employed 31,430 employees as on 31 March 2011.

Distribution network planning

The increase in Company's distribution capacity did not match the pace of growth in consumer demand since connected load grew at 48 per cent while transformer capacity increased at 27 per cent during 2006-11. The gap of transformation capacity to total connected load ranged between 0.63 and 0.82 resulting in frequent tripping and adverse voltage regulation with consequential higher quantum of energy losses.

Implementation of Centrally sponsored schemes

Under RGGVY, 3,665 villages were electrified out of 4,283 villages taken up, while only 12.75 lakh out of 26 lakh BPL households were provided electric connection during 2006-11. The Company incurred extra expenditure of ₹102.08 crore in execution of works due to placement of orders at higher rates compared to approved estimate, inclusion of price variation clause instead of fixed cost envisaged in the scheme and double payment on earthing materials. Besides, Company had to forego administrative charges of ₹66.08 crore as estimates exceeded sanction limits.

Implementation of Restructured Accelerated Power Development Reforms Programme (RAPDRP), intended to strengthen Distribution Management System and upgradation of sub-transmission & distribution network, fell short of target and the Company utilised 24 per cent of the funds released due to delay in completing loan formalities and slow progress of work.

Operational efficiency

The power purchases from State and Central PSUs were not adequate to fulfill the demand in the State and shortfall was met through purchases from IPPs and other sources at higher rates ranging from ₹2.49 per unit to ₹4.30 per unit. The energy losses of 3,396 MUs valuing ₹1,311.47 crore were in excess of norms approved by WBERC. The main reasons for such losses were inadequate transformation capacity, high interruption, non rationalisation of feeders, low power factor, low feeder availability, theft of electricity, etc. The Company delayed in rationalising feeders that led to non reduction of line loss of 865.24 MUs valued ₹269.96 crore. Further, there was significant shortfall in addition of capacitor banks which led to loss of targeted energy saving of 73.60 MUs valued at ₹22.96 crore. The percentage of consumers checked was negligible in all the years and the unrealised amounts were on the rise.

Financial management

The Company's Accumulated Losses decreased by 45 per cent between 2007-08 to 2010-11 as they had earned profit of ₹305.25 crore. In this period, Annual Revenue Requirement petitions were filed on time. However, the percentage of deficit in recovery of fixed cost varied from 8 to 38 per cent during 2007-11. Besides, as of March 2011 the Company had retained Regulatory Assets aggregating to ₹3,320.05 crore. Agriculture was heavily subsidised with only 31 to 50 per cent of cost of supply being recovered. Commercial consumers bore this burden.

Billing efficiency

Energy billed during 2007-11 rose from 73.47 to 79.80 per cent of the total energy available for sale. This increase was due to installation of electronic meters which led to accurate billing. Average billing declined from 4.42 per cent to 1.13 per cent during this period due to decline in consumers with defective meters.

Wrong classification of commercial units as industrial units led to loss of revenue of ₹1.20 crore to the Company. In 15 divisions during 2008-09 to 2010-11, 21.63 lakh bills against 5.67 lakh L&MV consumers were short of minimum charges. Besides, average bills for 86,057 consumers with defective meters could not be raised since previous meter readings were not recorded.

Revenue collection efficiency

The outstanding dues from consumers decreased from ₹1,234.81 crore in 2006-07 to ₹1,047.80 crore in 2010-11. Of the above, dues of ₹585.51 crore from 15 divisions indicated that dues outstanding for more than three years amounted to ₹136.37 crore (23.29 per cent) while an amount of ₹85.20 crore (14.55 per cent) was due from disconnected consumers. Further, arrears of more than rupees one lakh was due from 3,834 L&MV consumers in 15 divisions and 3,029 HT and EHT consumers of the Company, for three to 318 months but their supply was not disconnected resulting in accumulation of arrears of ₹236.13 crore (March 2011).

The Company had temporarily disconnected supply of power to 79 L&MV consumers in 15 divisions and 449 HT and EHT consumers of the Company, having arrear of more than rupees one lakh for four to 189 months but were not permanently disconnected. This resulted in non-realisation of arrears amounting to ₹22.05 crore (March 2011). In addition, cheques of ₹3.12 crore had not been credited by the concerned banks in six divisions but the Company could not identify the consumers.

Consumer satisfaction

The Company created (January 2009) Customer Relation Management (CRM) Cell to look into the grievances of consumers and their redressal. The Company paid ₹3.26 crore as compensation to the consumers for non-compliance of WBERC Regulations.

Energy Conservation

The Company is State Designated Agency (SDA) under the Energy Conservation Act, 2001 (Act). BEE had disbursed (January 2008 to April 2011) ₹1.95 crore to the Company for energy conservation. The Act stipulates that the State Government was to constitute Energy Conservation Fund for promotion of efficient use of energy and its conservation. The State Government belatedly (September 2010) notified creation of West Bengal Conservation Fund. They are yet to contribute their share to the fund.

Energy accounting and audit

The Company placed (October 2006/ April 2007) orders on Secure Meters Limited (SML) for erection of 15,230 energy accounting meters at an extra expenditure of ₹2.43 crore towards higher erection charges and payment of service tax included in the rates. Further, the Company incurred extra expenditure of ₹10.15 crore by allowing maintenance charges on these meters though the purchase orders provided for maintenance of these meters free of cost for five years.

Due to erroneous stock accounting, the Company procured 4.42 lakh meters worth ₹40.58 crore in excess of requirement. Besides, we could not vouchsafe existence of 1.40 lakh meters valued ₹13.17 crore.

Conclusion and Recommendations

The Company did not prepare target for annual capacity development of sub-stations over the review period. The increase in distribution capacity did not match the pace of growth in consumer demand. They incurred extra expenditure on execution of rural electrification work on placement of orders at higher rates. High energy losses were due to low feeder availability, high interruption, voltage fluctuation, inadequate number of shunt capacitors and low power factor. The Company lost opportunity to earn higher revenue due to incorrect application of tariff, under assessment of revenue and short levy of minimum charges. The review contains six recommendations which include creation of infrastructural facilities keeping in view demand growth, reduction of high energy losses by installing adequate number of shunt capacitors, minimising interruptions and voltage fluctuations. Achieving 100 per cent energy billing, applying correct tariffs and levying minimum applicable consumer charges as well as optimising internal resource generation by improving billing and collection efficiency and vigorously pursuing outstanding dues.

Introduction

2.1.1 Electricity is an essential requirement for all facets of our life. It has been recognized as a basic human need. It is a critical infrastructure on which the socio-economic development of the country depends. Supply of electricity at reasonable rate to rural India is essential for its overall development. Equally important is availability of reliable and quality power at competitive rates to Indian industry to make it globally competitive and to enable it to exploit the tremendous potential of employment generation. Service sector has made significant contribution to the growth of our economy. Availability of quality supply of electricity is very crucial to sustained growth of this segment.

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

Major responsibility for achieving the key parameters of the above said importance of electricity devolves on the distribution sector. Distribution sector is very near to people. Distribution Companies (DISCOMs) are first point of contact in the electricity sector for millions of Indians. This is the sector, which provides electricity to the doorstep of every household. It serves various objectives of electricity sector such as access to electricity for all households, supply of reliable and quality power of specified standards in an efficient manner and at reasonable rates and at the same time protects the consumer interest. To achieve the above objectives, DISCOMs need to make a financial turnaround and they should be commercially viable.

In this review, it is proposed to analyse how far the West Bengal State Electricity Distribution Company Limited (Company) planned their operations to achieve above objectives, their financial turnaround and the problems encountered during the five year period from 2006-07 to 2010-11.

Power sector reforms in West Bengal

2.1.2 As part of power sector reforms, the erstwhile West Bengal State Electricity Board (Board) was unbundled and two companies[1] were formed. The distribution of electricity is carried out by West Bengal State Electricity Distribution Company Limited (Company). This Company, incorporated on 16 February 2007 under the Companies Act 1956, is under the administrative control of Power and Non Conventional Energy Sources Department.

Vital parameters of Electricity Supply in West Bengal

2.1.3 In West Bengal, electricity distribution is undertaken by five agencies i.e. West Bengal State Electricity Distribution Company Limited and The Durgapur Projects Limited[2] in the State sector, Damodar Valley Corporation in the concurrent sector and CESC Limited and DPSC Limited in the private

[1] West Bengal State Electricity Transmission Company Limited (WBSETCL) and West Bengal State Electricity Distribution Company Limited (WBSEDCL).
[2] The Durgapur Projects Limited is primarily a power generating utility with consumer base of only 39,668 as of March 2011.

sector. During 2006-07, 28,143.61 MUs of energy was sold by the distribution companies which increased to 39,775.34 MUs in 2010-11, i.e. an increase of 41.33 *per cent* during 2006-11. As on 31 March 2011, the State had distribution network of two lakh CKM, 549 sub-stations and 7,600.33 MVA distribution transformers (DTR) of various categories. The number of consumers was 105.72 lakh. The aggregate turnover of the distribution companies was ₹ 17,084.67 crore in 2010-11 which was 3.71 *per cent* of the State Gross Domestic Product. These companies employed 31,430 employees as on 31 March 2011.

Performance review on power sector

2.1.4 Performance Review on Computerisation of Billing and Collection of Revenue in West Bengal State Electricity Board was included in the Report of the Comptroller and Auditor General of India (Commercial), Government of West Bengal for the year ended 31 March 2007. The review was not discussed by COPU (November 2011).

Scope and Methodology of audit

2.1.5 The present performance audit conducted during February 2011 to May 2011 covers the performance of the Company during the period from 2006-07 to 2010-11. The review mainly deals with Network Planning and execution, implementation of Central Schemes, Operational Efficiency, Billing and Collection efficiency, Financial Management, Consumer Satisfaction, Energy Conservation and Monitoring. The audit examination involved scrutiny of records at the Head Office and five[3] out of 17 Circles.

The Circles were selected on the basis of random samples drawn on the basis of proportionate representation with weightage on Aggregate Technical and Commercial (ATC) losses, Distribution Transformers (DTR) failures and feeder tripping. Sample selection process with weightage on above criteria was suggested (February 2011) by the Management in Entry Conference. The selected sample represented over 25 *per cent* of all categories of consumers spread across rural and urban areas of the State.

The methodology adopted for attaining the audit objectives with reference to audit criteria consisted of explaining audit objectives to top management, scrutiny of records at Head Office and selected units, interaction with the auditee personnel, analysis of data (including audit of databases with IDEA[4]) with reference to audit criteria, raising of audit queries, discussion of audit findings with the Management and issue of draft review to the Management for comments.

[3] Burdwan, Bankura, Midnapore, Raiganj & Murshidabad.
[6]Interactive Data Evaluation and Analysis software.

Audit objectives

2.1.6 The objectives of the performance audit were to assess whether:

- aims and objectives of National Electricity Policy/Plans were adhered to and distribution reforms were implemented;
- network planning and its execution was adequate and effective;
- the central schemes such as, Rajiv Gandhi Grameen Vidyutikaran Yojna (RGGVY) and Restructured Accelerated Power Development & Reforms Programme (RAPDRP) were implemented efficiently and effectively;
- operational Efficiency was achieved in meeting the power demand of the consumers in the State;
- Financial Management was effective and the subsidy due from Union/ State Governments were released in time;
- ARR and tariff revision petition was submitted timely to ensure adequacy of tariff to cover the cost of operations and cross-subsidisation at prescribed level;
- billing and collection of revenue from consumers was efficient;
- effective system was in place to assess consumers' satisfaction and redressal of grievances;
- effective energy conservation measures were undertaken; and
- effective monitoring system was in place and the same was being utilised in review of overall working.

Audit criteria

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

- National Electricity Policy, Plans and norms concerning distribution network of DISCOMs and planning criteria fixed by the West Bengal Electricity Regulatory Commission (WBERC);
- Standard procedures for award of contract with reference to principles of economy, efficiency and effectiveness;
- Norms prescribed by various agencies with regard to operational activities;
- Norms of technical and non-technical losses;

- Guidelines/ instructions/ directions of WBERC;
- terms and conditions contained in the Central Scheme documents;
- comparison with best performers in the regions/ all-India averages; and
- Provisions of Electricity Act 2003.

Audit findings

2.1.8 We explained the audit objectives to the Company during an 'Entry Conference' held on 7 February 2011. Subsequently, audit findings were reported to the Company and the State Government in October 2011. An 'Exit Conference' held on 8 December 2011 which was attended by the Principal Secretary, Department of Power and Non Conventional Energy Sources, Government of West Bengal and Chairman-cum-Managing Director of the Company. The replies given by the Company was duly endorsed by the State Government. The views expressed by them have been considered while finalising this Review. The audit findings are discussed in subsequent paragraphs.

Distribution network planning

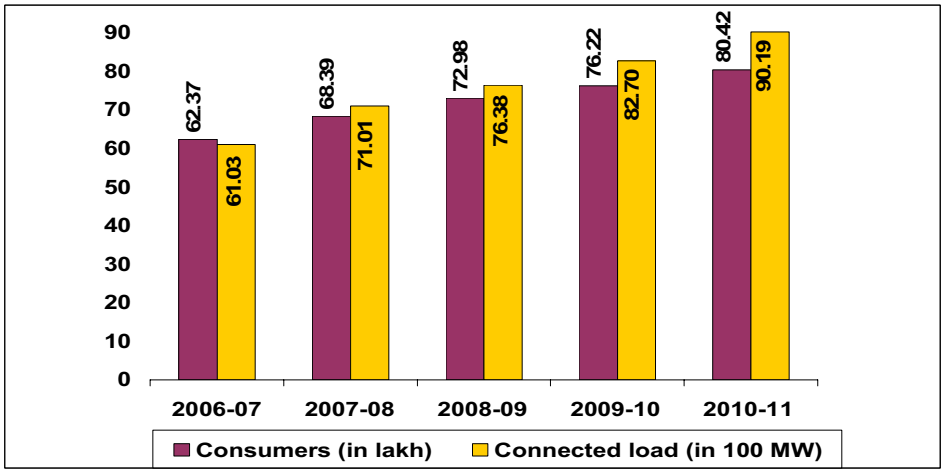
2.1.9 The National Electricity Policy 2005 was evolved with the following aims and objectives to be achieved.

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

To ensure power to all, the Company is required to prepare long term/ annual plan for creation of infrastructural facilities for efficient distribution of electricity so as to cover maximum population in the State. Besides the upkeep of the existing network, additions in distribution network are planned keeping in view the demand/ connected load, anticipated new connections and growth in demand based on Electric Power Survey (EPS). Considering physical parameters, Capital Investment Plans are submitted to the State Government/ WBERC. The major components of the outlay include normal development and system improvement besides rural electrification and strengthening of IT enabled systems.

The particulars of consumers and their connected load of the Company[5] during review period are given below in bar chart.

[5] Data for West Bengal State Electricity Distribution Company Limited only, as reliable data for Private Sector was not available.



System improvement and rural electrification schemes are discussed in subsequent paragraphs. The particulars of distribution network planned *vis-à-vis* achievement there against by the Company is depicted in **Annexure 7**.

Inadequate distribution network planning

The increase in distribution capacity could not match the pace of growth in consumer demand.

2.1.10 It may be seen from the annexure that despite availability of load forecast as per 17th report of Electrical Power Survey Committee and Perspective plan for the State, the Company did not prepare target of annual capacity build up for sub-stations over the review period. However, during 2006-11, 70 number of 33/11KV sub-stations were actually added. Further, compared to the growth of connected load of 5,364 MW[6] (equivalent to 6,310 MVA) in 2006-07 to 7,939 MW[6] (equivalent to 9,340 MVA) in 2010-11 (48 *per cent*) for consumers connected to 33/11KV sub-stations, the transformer capacity increased from 4,205 MVA to 5,332 MVA (27 *per cent*). Thus, the increase in distribution capacity did not match the pace of growth in consumer demand. Further, taking into account the connected load of 7,939 MW as at the end of March 2011, the required transformers capacity would be 9,340 MVA without considering the requirement of spin reserve. Ideally the Company should estimate a minimum spin reserve of transformation capacity, but there was no such effort. Consequently, the Company operates without spin reserve. Since there was no planned addition of 33/11 KV sub-stations, the Company's 5,332 MVA transformation capacity was not adequate to meet the projected load demand. After giving margin for maximum load (70 *per cent*) at which transformers can function in normal manner, the transformers capacity would work out to 3,732 MVA. This led to overloading of network and consequential rotational cuts in distribution of electricity.

The Management however contended (May 2011) that Capacity planning was more practical based on Maximum Demand. Company's 33/11 KV transformation capacity was 5,332 MVA along with WBSETCL[7]'s capacity of 1,019 MVA. Thus, at Maximum Demand of 3,441 MW (equivalent 4,048 MVA at 0.85 power factor), only 63.7 *per cent* of transformation was

[6] At 0.85 Power Factor
[7] West Bengal State Electricity Transmission Company Ltd. is the Transmission utility for the State.

utilised. The Management however admitted that there was uneven availability of 33/11KV transformation capacity across the State, and this resulted in interruptions particularly in the agricultural season. The Management also submitted (December 2011) that they have started planning for capacity implementation and new sub-stations based on actual growth. They have targeted addition of 660 MVA of transformation capacity to be completed by September 2012.

The Management's approach to capacity planning addressed the *ex post* scenario i.e. after execution, we address the issue *ex ante* i.e. as it should have been at the planning stage.

Instance of irregularities in implementation of developmental work, as analysed by us, are given in the Project and Contract Management highlighting time and cost overruns. This led to avoidable extra expenditure besides postponing the envisaged benefits to the consumers.

Inadequate distribution transformation capacity

2.1.11 Transformer is a static device installed for stepping up or stepping down voltage in transmission and distribution of electricity. The energy received at high voltage (132 KV, 66 KV, 33 KV) from primary sub-stations of the transmission companies is transformed to lower voltage (11 KV) at 33/11 KV sub-stations of the distribution companies. The voltage at 11KV is further transformed to 0.433 KV by distribution transformers (DTR) to make it usable by the consumers[8]. In order to cater to the entire connected load, the transformation capacity should be adequate. The ideal ratio of transformation capacity to connected load is considered as 1:1. The table below indicates the details of DTR capacity and connected load of the consumers in the State during the period from 2006-11.

(In MVA)

Year	DTR Capacity	Connected load to DTRs	Gap in Transformation capacity	Ratio of Transformation capacity to connected load
2006-07	3,973	5,472	1,499	0.73
2007-08	4,142	6,433	2,291	0.64
2008-09	4,372	6,981	2,609	0.63
2009-10	6,144	7,498	1,354	0.82
2010-11	6,227	8,167	1,940	0.76

It can be seen from the table above that the ratio of transformation capacity to total connected load ranged between 0.63 and 0.82. This represented a wide gap of transformation capacity. Such a high gap of transformation capacity led to overloading of the system resulting in frequent tripping and adverse voltage regulation with consequential higher quantum of energy losses.

The Management stated (December 2011) that considering diversity factor[9] 1.80, their transformation capacity was adequate. The reply does not address the real scenario since assumption of diversity inherently assumes that the

[8] Mostly L& MV Consumers.
[9] Diversity factor is the ratio of sum & individual peak loads to peak load of the system.

peak load of parts of the system do not converge. In reality however, peak loads tend to converge in the evening hours adversely affecting the system due to inadequate transformation capacity. Besides, we observed that diversity factor for March 2011 ranged between 1.35 in Baharampur Zone to 1.65 in Burdwan Zone of the Company.

We noticed that the Company did not prepare target of adequate annual capacity build up for sub-stations during 2006-11 resulting in distribution capacity not matching with the pace of growth in consumer demand since connected load grew by 48 *per cent* for consumers connected to 33/11KV sub-stations, while the transformer capacity increased only by 27 *per cent*. The ratio of gap of transformation capacity to total connected load ranged between 0.63 and 0.82 leading to frequent tripping and adverse voltage regulation with consequential higher quantum of energy losses.

Recommendation :-

- *The Company must prepare Long Term/ Annual Plan for creation of infrastructural facilities for efficient distribution of electricity so as to cover maximum population in the State keeping in view the demand/ connected load, anticipated new connections and growth in demand based on Electric Power Survey.*

Implementation of Centrally sponsored schemes

Rural electrification

2.1.12 The National Electricity Policy states that the key objective of development of the power sector is to supply electricity to all areas including rural areas for which the GOI and the State Governments would jointly endeavour to achieve this objective. Accordingly, the Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) was launched in April 2005, which aimed at providing access to electricity for all households in five years for which the Central Government provides 90 *per cent* capital subsidy through Rural Electrification Corporation (REC), the nodal agency for Rural Electrification. The RGGVY works were to be executed by four CPSUs[10] and the Company.

Besides, the GOI notified the Rural Electrification Policy (REP) in August 2006. The REP *inter-alia* aims at providing access to electricity for all households by 2009 and minimum lifeline consumption of one unit per household per day as a merit good by the year 2012. The other RE schemes *viz.* 'Accelerated Electrification of one lakh villages and one crore households', 'Minimum Needs

[10] Power Grid Corporation of India Limited (PGCIL), Damodar Valley Corporation (DVC), NTPC Electric Supply Company Limited (NESCL) and National Hydro Power Corporation Limited (NHPC).

Programme' were merged into RGGVY. The features of the erstwhile 'Kutir Jyoti Programme' were also suitably integrated into this scheme.

As on 1 April 2005, out of 40,794 villages in the State,[11] 34,140 villages were electrified (83.69 *per cent*) with 6,654 villages to be electrified within five years. Of this, 4,283 villages in 13 districts were taken up under RGGVY, with the Company to cover 457[12] villages in nine districts while four[13] CPSUs were entrusted by the State Government/ REC to cover 3,826 villages in four districts. RE works in the remaining 2,371 villages were to be taken up under State Plan.

Against the target of 4,283 villages 3,665 were electrified upto March 2011.

We noticed that 34,389 villages were electrified at the beginning of 2006-07 and 3,665 villages were electrified during the review period out of targeted 4,283 villages. Thus as on 31 March 2011, 38,054 villages were electrified out of total villages of 40,794 (93.28 *per cent*).

In the Xth Plan, REC sanctioned ₹ 485.12 crore for electrification of 3,944 villages in the State. Between 2005-06 and 2008-09, REC released ₹ 480.30 crore with which 3,914 villages (Company: 455, CPSUs: 3,459) were electrified and 90,853 BPL service connections (Company: 11,360, CPSUs : 79,493) provided. We noticed that -

- The Company had received ₹ 43.20 crore from REC (sanction: ₹ 48.28 crore) but had incurred expenditure of ₹ 55.15 crore. This additional expenditure of ₹ 11.95 crore out of their own funds arose due to placement of work orders at variable rates instead of fixed rates sanctioned by REC.

- Further, the Company released ₹ 7.96 crore to three CPSUs *viz.* NESCL, PGCIL and NHPC beyond ₹ 1,500[14] payable for each service connection including ₹ 200 for spike earthing with galvanised iron wire. The Company stated (June 2011) that this additional amount was on account of individual earthing at each BPL household, in line with the Company's existing practice. The reply belied the fact that cost of earthing was included in the cost.

559 BPL families at 62 villages did not get service connection for want of equipments.

- In Bankura district, PGCIL had completed (August 2006 – August 2007) 8,372 BPL service connections in 368 villages, at an expenditure of ₹ 37.02 crore. While the Company had released 7,813 connections in 306 villages, remaining 559 connections in 62 villages had not been released till March 2011 due to failure to install cradle guard, defective pole alignment, earthing not completed, low-tension cable not fixed, non-installation of distribution

[11] As per 2001 Census.
[12] As per the reply given by the Government in December 2011, two villages were dropped.
[13] NTPC Electric Power Supply Corporation Limited (NESCL), Power Grid Corporation of India Limited (PGCIL), Damodar Valley Corporation (DVC) and National Hydel Power Corporation Limited (NHPC).
[14] PVC cable (30 m): ₹ 540, energy meter: ₹ 240, connector ₹ 120, GI bend pipe etc.: ₹ 400, spike earthing: ₹ 200.

transformer metering etc. Consequently, infrastructure created at a cost of ₹ 1.18 crore remained unutilised.

The Government replied (December 2011) that they did not have information as to stalling of BPL connections for want of materials. The contention is not correct since work completion certificate of PGCIL certified by Bankura RE Circle recorded the non release of connection to 62 villages due to non installation of necessary equipments. This indicated that achievement of objective of RGGVY scheme was not monitored at Headquarters level of the Company.

Similarly, in the XIth Plan, REC sanctioned ₹ 1,956.11 crore for intensification in 25,065 villages with connection for 39.10 lakh rural households (RHHs) including 26 lakh BPL households (Company: 15.39 lakh, CPSUs: 10.61 lakh). Between 2008-09 and 2010-11, REC released ₹ 864.78 crore with which 12.75 lakh BPL service connections (Company: 4.41 lakh, CPSUs: 8.34 lakh) provided till March 2011. We noticed that –

Administrative charges of ₹ 66.08 crore foregone.

- In eight[15] of ten districts, the Company had forgone administrative charges at eight *per cent* (₹ 66.08 crore) with the view to obtaining approval of the Ministry of Power, GOI within the sanctioned limit of ₹ 1,074.92 crore. Yet, against sanctioned cost of ₹ 1,074.92 crore, the Company awarded (January- February 2009) works for intensification in 14,113 villages for service connections to 15.39 lakh BPL RHHs at a cost of ₹ 1,157.09 crore. In the same period, CPSUs had, however, awarded RGGVY works at ₹ 763.53 crore against sanctioned cost of ₹ 881.19 crore. The reasons for additional cost were placement of orders at higher prices as discussed hereafter.

  - The Company had evaluated three packages (Nos. 19, 20 and 21) on 23 September 2008. They engaged (February 2009) A to Z Maintenance & Engineering Services Private Limited (AZ) for two packages (Nos. 19 and 20) in Burdwan at ₹ 51.35 crore and ₹ 61.07 crore respectively. Under package 20, the Company had placed order on AZ at higher rates of two *per cent* to five *per cent* for supply of 152 items in comparison to rates for supply of same materials in package 19. This resulted in extra expenditure of ₹ 1.19 crore.

  - Similarly, in Burdwan, the Company had awarded (January 2009) Supreme & Company Private Limited (SC) supply (package 21) of the same 152 items at a cost of ₹ 83.83 crore. These rates were higher by six *per cent* to 252 *per cent* than those of package 19 resulting in excess expenditure of ₹ 14.12 crore.

  - Again, at Raiganj, the Company engaged (February 2009) Lumino Industries Limited (LIL) for execution of job of two packages (Nos. 5 and 6). The Company had, however, allowed higher rates of around five *per cent* for supply of 176 items in package 6 over

[15] Howrah, Hooghly, 24-Parganas (South), Burdwan , Cooch Behar, Nadia, Malda & Siliguri Mahakuma Parishad of Darjeeling district.

rates paid for the same items under package 5. This resulted in excess expenditure of ₹ 1.61 crore.

The Government stated (December 2011) that the lowest bidder was considered for awarding the works and there was no scope to negotiate these rates in view of the purchase policy. The reply is not acceptable because laid down purchase policy of the Company emphasised that procurement of materials/ award of works should be at competitive rates to secure financial interest of the Company. This policy was overlooked by not ascertaining the reasonability of L1 rates since those were above the estimates and CPSUs had awarded the similar works below the estimated cost.

- The Company awarded works for 4.40 lakh service connections to BPL consumers in Birbhum, Burdwan and Raiganj Circles without inviting quotations. The rates excluding cost of meters varied from ₹ 292.02 to ₹ 1,119 per BPL service connection as detailed below –

Sl. No.	Circle	Pack-age no.	Vendor	No. of BPL service connections	Rate per service connection (₹)	
					Material & erection	Meter cost
1	Birbhum	18	Ramsarup Industries Limited	75,343	292.02	1,492.33
2	Burdwan	21	Supreme & Co. Pvt. Ltd.	96,332	900.00	1,000.00
3	Raiganj	5 & 6	Lumino Industries Ltd.	1,06,569		1,900.00
4	Burdwan	20	A to Z Maintenance & Engg.	81,527	1,098.00	792.00
5	Burdwan	19	Services Pvt. Ltd.	79,843	1,119.00	771.00
			Total	**4,39,614**		

REC had prescribed normative cost of ₹ 2,200 per BPL connection. The Company had undertaken the works at cost varying from ₹ 1,784.33 to ₹ 1,900 per BPL connection.

The Government stated (December 2011) that the offer of the turnkey contractors were uniform. The reply was not acceptable because no quotations were invited from the parties in this regard.

- Though the works were scheduled for completion within 18 months with subsequent extension by another six months i.e. March 2011, only 29 *per cent* (4.41 lakh) of BPL connections had been released till March 2011. This slow progress of work was attributable to Company's utilisation of only ₹ 505.73 crore i.e. 58 *per cent* only out of ₹ 864.78 crore received between 2008-09 and 2010-11.

- In Burdwan and Dakshin Dinajpur, out of target of 3.65[16] lakh BPL connections, 1.58[17] lakh were ready whereas only 0.87 lakh had been energised. Thus, in Burdwan only 28 *per cent* of targeted BPL

[16] Burdwan: 2.58 lakh, Dakshin Dinajpur: 1.07 lakh.
[17] Completed- Burdwan: 1.25 lakh, Dakshin Dinajpur: 0.33 lakh; BPL RHHs energised - Burdwan: 0.72 lakh, Dakshin Dinajpur: 0.15 lakh.

household had been energised with another 21 *per cent* awaiting connection, while corresponding figures for Dakshin Dinajpur were 14 *per cent* and 17 *per cent*.

Thus, due to slow implementation of the scheme, the anticipated objectives were not fulfilled.

Restructured Accelerated Power Development Reforms Programme

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

In order to carry on the reforms further, the GOI launched the Restructured APDRP (R-APDRP) in July 2008 as a Central Sector Scheme for XI Plan. The R-APDRP scheme comprises of Part A and B. Part A was dedicated to establishment of IT enabled system for achieving reliable and verifiable baseline data system in all towns besides installation of SCADA[18]/Distribution Management System. For this, 100 *per cent* loan is provided, and was convertible into grant on completion and verification of same by Third Party independent evaluating agencies. The Part B of the scheme deals with strengthening of regular sub-transmission & distribution system and upgradation projects. GOI would route the funds through Power Finance Corporation Limited (PFC).

Financial performance

2.1.14 The details of the funds released, utilisation thereagainst and balances in respect of Company in the State are depicted at next page.

(₹ in crore)

Scheme	Year	Funds released by		Funds available	Funds utilised	Balance	Percentage of balance to funds available
		GOI	Others (PFC)				
APDRP	Upto March 2006[19]	126.42[20]	72.65	199.07	199.07	Nil	NA
	2006-07	Nil	41.31	41.31	41.31	Nil	NA
	2007-08	Nil	Nil	Nil	Nil	Nil	NA
	2008-09	Nil	26.32	26.32	26.32	Nil	NA
RAPDRP	2009-10 (Part-A)	47.99	Nil	47.99	14.26	33.73	70.29
	2010-11 (Part-B)	20.51	61.54	115.78	25.40 (Part A)	90.38	78.06

[18] Supervisory Control And Data Acquisition – It generally refers to computerised industrial control systems that monitor and control industrial, infrastructure or facility-based processes.
[19] A performance audit on 'Implementation of APDRP Scheme' was included in the Audit Report Commercial 2005-06, West Bengal.
[20] Grant of ₹ 89.58 crore and Loan of ₹ 36.84 crore

From the table it would be seen that the Company utilised 24 *per cent* of the funds released in the R-APDRP scheme. Reasons for such low utilisation were slow progress of work, delayed arrangement of materials by the contractor *etc*.

The Company was deprived of Central grant of ₹ 21.36 crore due to non lodging of claim.

As per APDRP scheme the Company was entitled to receive 25 *per cent* of estimated project cost of ₹ 443.79 crore as grant from GOI, for 20 projects sanctioned between August 2002 and April 2005. Against entitlement of ₹ 110.94 crore, they received ₹ 89.58 crore only. Balance grant of ₹ 21.36 crore was not received by the Company due to non-lodging of claim. Further, the Scheme was closed in March 2009 and our analysis revealed that the actual expenditure was ₹ 449.89 crore till February 2009 due to lack of proper survey and wrong estimation. Thus, the Company lost ₹ 1.53 crore as grant from GOI (25 *per cent* of ₹ 6.10 crore) due to excess expenditure of ₹ 6.10 crore.

Though prime objective for drawing low tension aerial bunched (LTAB) cable was reduction of line losses, the Company strung 181.14 Km LTAB Cable in Burdwan town against which 33.60 Km was energised and the balance 147.54 Km was not energised. As a result, the expenditure incurred to the tune of ₹ 1.81 crore remained idle.

The Company accepted/ acquired the excess materials valued ₹ 1.48 crore from the turnkey contractors contrary to the fact that there were no provisions in the contract that excess material procured for the above jobs to be returned by the turnkey contractors.

We observed that the Company failed to implement the APDRP scheme as they could not achieve the desired objectives of reducing aggregate technical & commercial (ATC) Losses, reducing interruption and increasing consumer satisfaction as discussed in paras 2.1.20, 2.1.28 and 2.1.55 although APDRP scheme was closed in March 2009. Further, there was no monitoring of the scheme after 2008-09 to assess the sustainability of improvement.

Establishment of IT enabled system

2.1.15 Part – A of the R-APDRP scheme is dedicated to establishment of IT enabled system and SCADA/ Distribution Management System. GOI sanctioned (June 2009) loan of ₹ 159.98 crore against project cost of ₹ 171.73 crore. The Company engaged (October 2009) Tata Consultancy Services Limited (TCS) at a cost of ₹ 195.36 crore (including Facility Management Services cost of ₹ 54.99 crore for five years) as IT implementing agency and execution of R-APDRP (Part-A) project in 62 towns with data centre at Kolkata and Disaster Recovery Centre at Baharampur. The cost of civil and electrical infrastructure, fire fighting, furniture *etc* of ₹ 11.75 crore was to be spent by the Company from their own sources. The project involved 16 components scheduled to be completed and service rolled out by March 2011. We, however, noticed that the TCS did not achieve the target of service rolling out and the activity wise milestones submitted by the agency revealed that only one out of 16 milestones had been completed so far (September 2011). Our analysis of contracts under R-APDRP revealed the following deficiencies:

Extra expenditure

2.1.16 The system requirement specifications (SRS) provide for two communication networks *viz*. primary network over MPLS-VPN[21] with back up over ISDN[22]. Originally, the contract on TCS included network connectivity to the Company. Since, GoI directives prohibited (October 2009) resale of bandwidth, the Company selected (March 2010) BSNL to provide MPLS-VPN at 517 locations including 254 under R-APDRP for ₹ 17.38 crore. BSNL also provided free ISDN connectivity to the Company. Thus BSNL provided both the primary and a back up network as required under the Scheme. In March 2010, TCS indicated that it would not be in a position to execute the project if TATA Teleservices Limited (TTL) was not considered for providing network services. Consequently the Company had to award (February 2011) another contract for ₹ 17.39 crore to TTL for same services already awarded to BSNL.

The Government replied (December 2011) that there was no provision in the LOA for BSNL to provide ISDN/CDMA connectivity. They further stated that post award delay was attributable to change in the drawings and specifications of the works, delays in handing over site and submission of drawings.

The reply was not acceptable as the LOA included the ISDN/ CDMA connectivity. From the reply it is evident that reasons of delays were controllable. However the reply was silent about the reasons of pre contract award delay which led to acceptance of higher rates.

2.1.17 The Board approved (October 2009) the proposal for procurement of 6,250 number of meters as TCS was not assigned to do this job under metering of un-metered Distribution Transformers (DTR) of the said 62 towns. As per procurement policy, the Company requested (June 2010) other DISCOMs for last procurement price of Tri-vector energy meter. In response, Chhattisgarh State Power Distribution Company Limited (CSPDL) stated that the procurement cost for Tri-vector energy meter was ₹ 3,000 ex-works price. The Company placed (September 2010) purchase order on Secure Meters for procurement of 7,700 meters at ₹ 5,628 per meter ex-works price. The Company neither made any correspondence with CSPDL regarding the source of supply nor went for re-tendering process. Thus, due to non-consideration of the rate submitted by CSPDL, the Company incurred an additional expenditure of ₹ 2.02 crore.

The Government replied (December 2011) that detailed specification was not mentioned (July 2010) by CSPDL. The reply was not acceptable as the description of material in both cases were same. The detailed specification could have been obtained prior to issue of LOA which was however not done.

[21] Multi Protocol Level Switching – Virtual Private Network.
[22] Integrated Services Digital Network.

Awarding of work at higher cost

2.1.18 The Company invited restricted tender and placed (November 2009) LOI for civil works in favour of Manna Engineering Construction Company Limited for construction of Data Centre at Rajarhat at a cost of ₹ 1.21 crore to be completed in February 2010 but the job was completed after delay of seven months (September 2010). Similarly, for the Disaster Recovery Data Centre at Baharampur and construction of road at Rajarhat the work orders were placed (March 2010 and September 2010) on restricted tender (February 2010/ July 2010) in favour of Sony Construction at a cost of ₹ 1.60 crore and ₹ 42.68 lakh with scheduled dates of completion of three months (June 2010) and two months (November 2010) respectively. The Disaster Recovery Data Centre at Baharampur was completed in January 2011 and construction of road at Rajarhat was not completed till March 2011.

Though GoI approved the scheme in September 2008, the Company placed (November 2009- September 2010) work orders on the above three jobs on restricted tender on the ground of urgency after a delay of 14 to 21 months from the date of approval. Hence urgency of work was not justified. The rates offered by the bidders were 19.90 and 21 *per cent* higher than state PWD Schedule of Rates (SOR) resulted in excess expenditure of ₹ 58.29 lakh.

For architectural and interior works of Data Centre (Rajarhat) and Disaster Recovery Centre (Baharampur), the Company invited (March 2010) restricted tenders from three vendors and TCS was lowest bidder for both works. The Company placed LOAs (September 2010) at a cost of ₹ 7.95 crore and ₹ 7.79 crore respectively. In the two LOAs, there was a difference of ₹ 16.73 lakh for supply of various types of furniture.

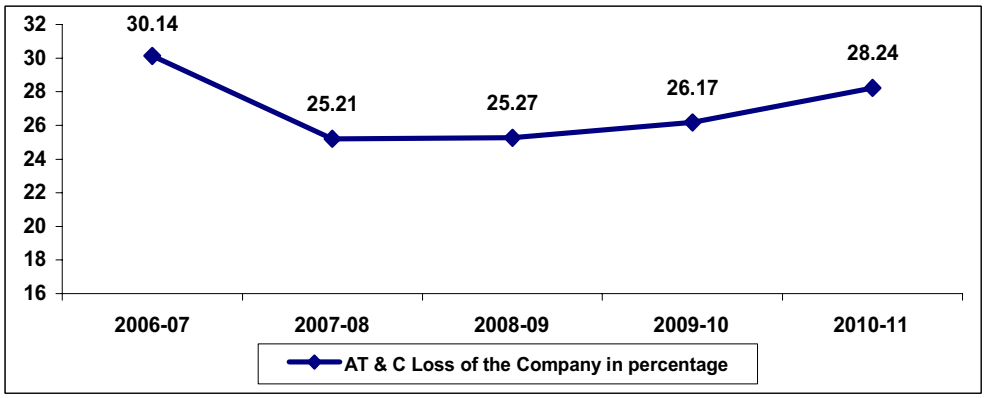
Strengthening of sub-transmission and distribution system

2.1.19 The focus in this part (Part B of R-APDRP) was on reduction of AT&C losses on sustainable basis. According to the scheme 25 *per cent* of loan is to be provided and up to 50 *per cent* of scheme cost is convertible to grant depending on maintaining AT&C loss level at 15 *per cent* for five years. We observed that though PFC sanctioned (August 2010) ₹ 547.02 crore for 45 towns, the Company received ₹ 82.05 crore after a delay of six months (March 2011) due to delayed compliance of the terms and conditions of PFC.

The Government accepted the facts in December 2011.

Aggregate technical & commercial losses

2.1.20 The graph at next page depicts the AT & C losses over the review period for the Company.



It may be seen from the above table that AT& C losses decreased from 30.14 *per cent* (2006-07) to 25.21 *per cent* (2007-08) but steadily increased from 25.27 *per cent* (2008-09), to 26.17 *per cent* (2009-10) and to 28.24 *per cent* (2010-11). The increase in AT&C loss was attributable to billing and collection deficiency discussed in paragraphs 2.1.43 to 2.1.53.

We found that under RGGVY, 3,665 villages were electrified out of 4,283 villages taken up, while only 12.75 lakh out of 26 lakh BPL households were provided electric connection during 2006-11. The Company incurred extra expenditure of ₹ 102.08 crore in execution of works due to placement of orders at higher rates compared to approved estimates, inclusion of price variation clause instead of fixed rates envisaged by REC and double payment on earthing materials. Besides, the Company had to forego administrative charges of ₹ 66.08 crore since the estimates, exceeded sanctions.

Recommendations :-

The Company should

- *accelerate the pace of electrification and intensification as well as provide electric connections to BPL households at the earliest to fulfill the objective of rural electrification. Works should be executed within the specified time and costs.*
- *adhere to payment terms as per the terms of contract and institute an effective mechanism to prevent double payments.*

Operational efficiency

2.1.21 The operational performance of the DISCOM is judged on the basis of availability of adequate power for distribution, adequacy and reliability of distribution network, minimizing line losses, detection of theft of electricity, *etc*. These aspects have been discussed in subsequent paragraphs.

Purchase of power

2.1.22 The demand for energy has been increasing year after year in the State due to economic development. Assessment of future demand and requirement of power is calculated on the basis of past consumption trends, present requirement, load growth trends and T & D losses and its trend. WBERC approves the sources of purchase of power and the purchase cost based on the estimates made in the ARR.

The Company forecast their energy requirement for ensuing years by obtaining trends of sales for past years and drawing projection on that basis. They, however, do not make any reference to either the perspective plan for the State or the EPS report.

Quantification of power purchased

2.1.23 The details of demand of power assessed for the State based on the 17th Electric Power Survey, purchase of power approved by WBERC and actual power purchased (including own generation) during the period 2006-07 to 2010-11 in respect of the State as a whole were as under:

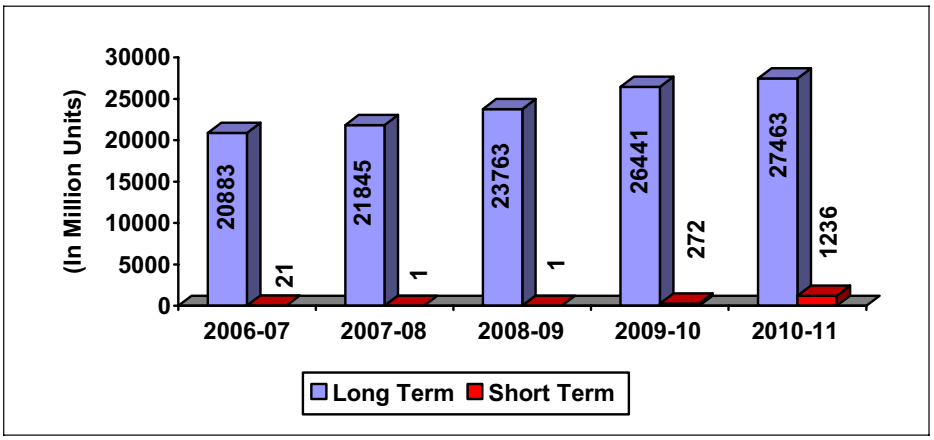
(In million units)

Year	Proportionate Demand assessed in 17th EPS	Purchases approved by *WBERC*	Actual Power purchased[23]	Power Deficit	Excess/ Shortfall in purchase against approved
(1)	(2)	(3)	(4)	(5) = (2 – 4)	(6) = (3 – 4)
2006-07	17,479	19,340	21,300	NIL	(-) 1,960
2007-08	19,100	23,911	22,617	NIL	1,294
2008-09	20,772	23,733	24,705	NIL	(-) 972
2009-10	22,351	27,867	27,827	NIL	40
2010-11	23,614	31,891	29,914	NIL	1,977

It may be seen from the above table that the Company suffered from shortage of energy in two out of five years. Such shortfall however occurred primarily during normal hours to peak hours of the day and predominantly during summers. This shortage was primarily due to non availability of capacity during corresponding period.

2.1.24 For the above purchases, the Company entered in Long term and Short term power purchase agreements with various agencies *viz*., State Generation Companies, Central PSUs, IPPs, *etc*. The break-up of the total power purchased into these categories was as follows.

[23] Includes own generation 2006-07:396 MU, 2007-08:771 MU, 2008-09:941 MU, 2009-10: 1,114 MU and 2010-11: 1,215 MU.



It may be seen from the above graph that the Company procured power primarily from their long term contractual sources. However, given that these sources despite being most reliable and cheap were not sufficient to meet the total requirement of power. Consequently, short term purchases were negotiated from time to time. The source-wise purchase of power during review period is given in the **Annexure 8**. We observed that-

- Energy purchased from State Generation PSUs was cheapest in all five years.

- There has been an increase in energy requirement from 2006-07 to 2010-11, 70 *per cent* of which was met by the State PSUs. In this period, the purchases from the Central sector remained static. Consequently, the Company's purchases of energy from IPPs and other sources increased from one *per cent* in 2006-07 to six *per cent* in 2010-11. These purchases were at higher rates of ₹ 2.49 per unit to ₹ 4.30 per unit.

Sub-transmission & distribution losses

2.1.25 The distribution system is an important and essential link between the power generation source and the ultimate consumer of electricity. For efficient functioning of the system, it must be ensured that there are minimum losses in sub-transmission and distributing the power. While energy is carried from the generation source to the consumer, some energy is lost in the network. The losses at 33 KV stage are termed as sub-transmission losses while those at 11 KV and below are termed as distribution losses. These are based on the difference between energy received (paid for) by the Distribution Company and energy billed to consumers. The percentage of losses to available power indicates the effectiveness of Distribution system. The losses occur mainly on two counts, *i.e.*, technical and commercial. Technical losses occur due to inherent character of equipment used for transmitting and distributing power and resistance in conductors through which the energy is carried from one place to another. On the other hand, commercial losses occur due to theft of energy, defective meters and drawal of unmetered supply, *etc*.

The table below indicates the energy losses for the power distribution companies in the State as a whole for last five years upto 2010-11.

(In MUs)

Sl. No.	Particulars	2006-07	2007-08	2008-09	2009-10	2010-11
1	Energy purchased	20,904	21,846	23,764	26,713	28,699
2	Own generation	396	771	941	1,114	1,215
3	Net UI, grid loss, transmission losses, consumption for PPSP and power swap out	969	2,434	2,678	3,790	3,460
4	Energy available for sale (1+2-3)	20,331	20,183	22,027	24,037	26,454
5	Energy sold	14,937	15,887	17,577	18,976	20,436
6	Energy losses (4 – 5)	5,394	4,296	4,450	5,061	6,018
7	Percentage of energy losses {6/ 4) x 100}	26.53	21.29	20.20	21.06	22.75
8	Percentage of losses allowed by WBERC	23	19.5	18.75	18.25	17.75
9	Excess losses (in MUs)	718	361	319	675	1,323
10	Average realisation rate per unit (in ₹)	3.19	3.20	3.35	3.49	4.72
11	**Value of excess losses (₹ in crore) (9 x 10)**	**229.04**	**115.52**	**106.87**	**235.58**	**624.46**

Sub-transmission and distribution losses were higher than the norms for entire review period which cost the Company ₹ 1,311.47 crore.

It would be seen from the above table that losses ranged between 26.53 and 20.20 *per cent* during the last five years ending 31 March 2011. These were higher than the WBERC stipulated norms in each of these years. The aggregate of such excess loss was 3,396 MUs valued at ₹ 1,311.47 crore during 2006-11. Reduction in these losses is the most significant step towards making the Company financially self-sustaining. The importance of reducing losses can be gauged from the fact that a one *per cent* decrease in losses could add ₹ 124.87 crore[24] to the profits of the Company annually. Besides, given that there were shortfall of power at peak load, it was imperative that the Company take stronger measures to reduce distribution losses.

Reasons of high energy losses

2.1.26 The main reasons for such high energy losses were insufficient transformation capacity, low feeder availability, high interruption, voltage fluctuation, inadequate working capacity of capacitor banks, low power factor, and theft of electricity etc.

Performance of distribution transformers

2.1.27 WBERC had not fixed norms for failure of Distribution Transformers (DTRs) in their tariff orders for the Company. The details of norms fixed, actual DTRs failed in last five years for the Company is depicted in the table at next page.

[24] Based on figures for 2010-11.

Sl. No.	Particulars	2006-07	2007-08	2008-09	2009-10	2010-11
1	Existing DTRs at the close of the year (in Number)	1,05,065	1,09,138	1,13,926	1,18,343	1,24,666
2	DTR Failures (in Number)	10,417	10,066	8,513	12,225	12,434
3	Percentage of failures	9.91	9.22	7.47	10.34	9.97
4	Norm allowed by WBERC (in *percentage*)	No such norm prescribed				
5	Expenditure on repair of failed DTRs (₹ in crore)	Not Available				

It may be seen from the above table that in absence of any target for improvement over the years, there has been no significant improvement in DTR failure rates. Further, the Company did not maintain or analyse the reasons for failure of DTRs. They also did not maintain any record regarding failure of DTRs within guarantee period, average down time of DTRs and amount spent on repair and maintenance of DTRs. The Company is yet to undertake hundred *per cent* metering of DTRs.

However, in September 2010, the Company has embarked on developing a Transformer Transaction Management System through a web based system developed by PriceWaterhouseCoopers. This system would capture all data relating to DTRs including each and every transaction. Failure of DTRs could be minimised by taking adequate steps for preventive maintenance and avoiding over-loading of the same.

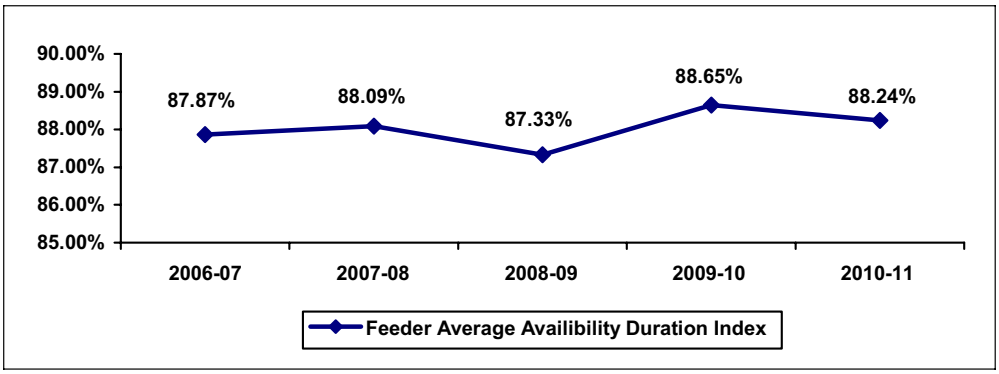
High interruption

2.1.28 The table below indicates interruptions across all divisions of the Company.

Sl No.	Particulars	2006-07	2007-08	2008-09	2009-10	2010-11
	No. of interruptions due to:					
1	Power Failures	1,80,364	1,53,204	1,14,871	1,31,539	90,636
2	Break down, Shut Down etc.	2,96,576	6,18,007	5,79,869	8,54,044	5,05,452
	Total Interruptions	**4,76,940**	**7,71,211**	**6,94,740**	**9,85,583**	**5,96,088**
3	Interruption due to Break down, Shut Down (*per cent)*	62.18	80.13	83.47	86.65	84.79

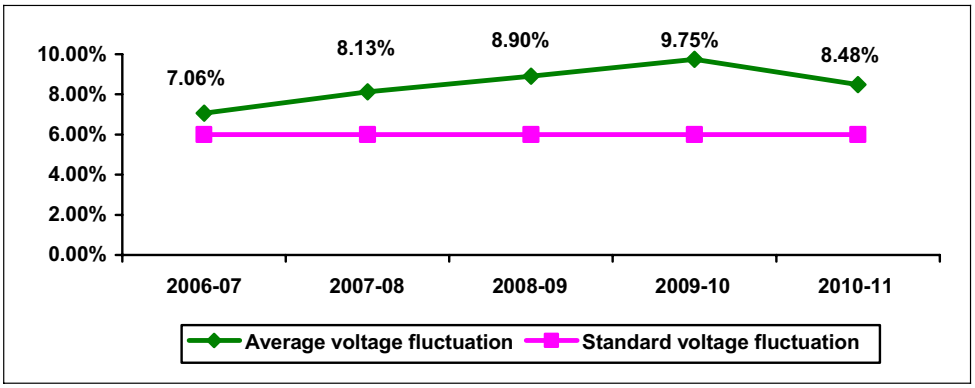
The above table shows that most of the interruptions were due to break down and shut down. This in turn indicates deficiencies in maintenance. We observed that divisions (which are primarily responsible for O&M) did not have any schedule of annual maintenance. Most maintenance operations were on contingent basis. The maintenance work was taken up before the 'Durga puja' to ensure uninterrupted power supply during the festival season. Further, as the Company handled more power and higher demand in progressive years, increasing number of break downs occurred as lack of adequate maintenance decreased reliability of the network. This in turn lowered FAADI[25] as reflected in the following graph.

[25] Feeder Average Availability Duration Index



Voltage fluctuation

2.1.29 One of the principal responsibilities of power distribution company is to ensure quality power. This in turn means that there should be proper voltage regulation. The graph below shows mean voltage fluctuations both above and below the desired voltage level.



The above graph also shows that as the networks handled more energy and higher demand in successive years, wider fluctuations in voltage were noticed across the divisions. Voltage drops were most acute in the North Bengal, especially in the hills.

The Government/ Management replied (December 2011) that they had opened a Condition Monitoring Cell and procured required equipments to address the issue of high interruption as pointed out by us. The Management further submitted that the projects mentioned in subsequent paragraphs (para 2.1.30, 2.1.31 and 2.2.32), would enable better voltage regulation.

Feeder rationalisation

2.1.30 The Company had identified (July 2007) 506 numbers of 11 KV feeders that catered to load of more than one supply station area. This created difficulties in assessing ATC loss of individual supply stations. Moreover, due to overloading and long length of line, voltage regulation could not be maintained within permissible limit. Rationalisation of these feeders would enable delivery of quality power to the customers, reduce line loss and enable energy accounting.

The net annual reduction in distribution loss was assessed at 576.83 MUs valued at ₹ 179.97 crore for each year. The expected completion date was August 2009. However, as of March 2011, 386 (76 *per cent*) feeders have only been rationalised with target date of completion revised to June 2011. The delay led to loss of 865.24 MUs at total cost of ₹ 269.96 crore.

Conversion of LT conductors into Aerial Bunch Cables

2.1.31 Aerial Bunch cables prevent illegal tapping of low voltage distribution lines and help in reducing overloading of DTRs and maintain voltage of the supply. The Company had decided in July 2007 to draw LTAB cables in theft prone urban/semi urban areas. Besides reducing theft it would ensure quality power with limited breakdown and interruption. A pilot project of 220Km of LTAB cables was drawn to be completed by August 2010 which would enable in reduction in ATC losses in these areas by nine *per cent*. However, the project was completed after delay of eight months in April 2011, resulting in loss of energy (13.83 MUs) valued at ₹ 4.31 crore.

Capacitor banks

2.1.32 Capacitor bank improves power factor by regulating the current flow and voltage regulation. In the event of voltage falling below normal, the situation can be set right by providing sufficient capacity of capacitor banks in the system as it improves the voltage profile and reduces dissipation of energy to a great extent thereby saving loss of energy. Our observations on installation of HT capacitor bank at 33/11KV sub-stations have been included in paragraph 3.1 of Audit Report (Commercial) for 2009-10.

73.60 MUs energy valued ₹ 22.96 crore could not be saved due to non installation of capacitor banks.

The Company has also taken up a project of installing LT shunt capacitors at the premises of industrial L&MV consumers. Total of 6,53,405 KVAr[26] was to be added to 65,775 consumers' premises. The project was approved in August 2007. It was assessed that against estimated cost of ₹ 28 crore and project completion time of one year, the Company would earn ₹ 37 crore annually. However, tenders were floated after delay of 28 months in December 2009. The delay in award of tender was attributed to finalisation of technical specification by CPRI[27], Bangalore although we observed that the Management had already finalised technical specifications. Eventually the work was awarded in August 2010 with target completion time of one year. As of January 2011, (42 *per cent* time expired) 7,000 capacitors (*10 per cent*) have been installed. The delay in floating of tenders for the project, led to loss of targeted energy saving of 73.60 MUs valued at ₹ 22.96 crore over two years.

Management attributed the delay to finalisation of specification by CPRI, finalising the contract with the contractor and resistance by a section of consumers. However, the project lacked urgency in finalisation of tenders and subsequent execution which led to the loss.

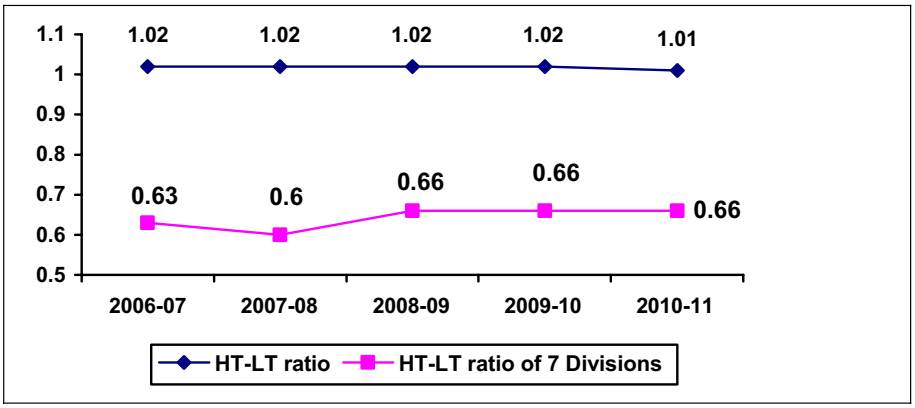
[26] Reactive Kilo volt ampere
[27] Central Power Research Institute.

Commercial losses

2.1.33 The majority of commercial losses relate to consumer metering and billing besides pilferage of energy. While the metering and billing aspects have been covered under energy accounting and audit, the other observations relating to commercial losses are discussed below.

Implementation of LT less system

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



It may be seen from the above graph that the Company had maintained a high HT-LT ratio for the Company as a whole. However, test checks of seven divisions[28] revealed that HT-LT ratio in these divisions were much lower at average of 0.64:1.

High incidence of theft

2.1.35 Substantial commercial losses are caused due to theft of energy by tampering of meters by the consumers and unauthorised tapping/ hooking by the non-consumers. As per section 135 of Electricity Act, 2003, theft of energy is an offence punishable under the Act. The targets for number of checking, theft cases and amount realised thereagainst are given below:

Year	No. of checking	Theft cases	Amount Realised (₹ in crore)
2006-07	15,975	3,643	12.84
2007-08	16,193	3,111	24.25
2008-09	14,423	3,881	19.33
2009-10	13,784	2,419	11.42
2010-11	11,822	3,527	12.65

An analysis revealed that there were no targets or plans to conduct raids. Ideally the meter readers are the first to notice instances of meter tampering,

[28] Medinipore, Kharagpur, Ghatal, Baharampur I&II, Uttar and Dakshin Dinajpur.

hooking/ tapping *etc*. However, no system of gathering requisite information for checking of possible offenders was in vogue.

Performance of raid team

2.1.36 In order to minimise the cases of pilferage/ loss of energy and to save the Company from sustaining heavy financial losses on this account, Section 163 of Electricity Act 2003, provides that the licensee may enter the premises of a consumer for inspection and testing the apparatus. Vigilance team of the Company, headed by the Officer of the rank of Inspector General of Police at their headquarters was entrusted with the work of conducting raids of checking the premises of the consumers with the assistance of AE and other departmental officers of the Company. Superintendent Engineers of the concerned circles were supposed to prepare work plan to conduct raids by identifying such consumers/ areas where large scale theft was suspected. Due to lack of coordination between the vigilance wing and the concerned divisions, raids did not yield the desired results. Following is the position of raids conducted during review period.

Year	Total number of consumers as on 31 March	No. of consumers checked	Assessed amount	Realised amount	Unrealised amount	Percentage of checking to total nos. of consumer
			(₹ in crore)			
2006-07	62,37,105	7,909	13.15	8.17	4.98	0.13
2007-08	68,39,074	7,871	13.84	7.47	6.37	0.12
2008-09	72,98,142	7,221	13.14	8.24	4.90	0.10
2009-10	76,22,122	9,034	6.97	4.53	2.44	0.12
2010-11	80,41,678	7,017	11.50	4.63	6.87	0.09

In the absence of any target, percentage of consumers checked for theft of energy has been decreasing. Simultaneously, unrealised claims have also gone up from 37.87 *per cent* in 2006-07 to 59.73 *per cent* in 2010-11. There was need to conduct more raids to drastically reduce theft of energy. At the same time vigorous persuasion of claims should be undertaken.

In conclusion we found that sub-transmission and distribution losses ranged between 26.53 and 20.20 *per cent* during the review period, which was in excess of WBERC norms. The main reasons for such high energy losses were low feeder availability, high interruption, voltage fluctuation, inadequate number of shunt capacitors, low power factor etc.

Recommendation :-

- *The Company should restrict sub transmission and distribution losses within the WBERC norms, install adequate number of shunt capacitors, minimise interruptions and voltage fluctuations.*

Financial management

2.1.37 One of the major objectives of the National Electricity Policy 2005 was ensuring financial turnaround and commercial viability of electricity sector. The financial position of the Company for the four years[29] ending March 2011 is as under.

(₹ in crore)

Particulars	2007-08	2008-09	2009-10	2010-11
A. Liabilities				
Paid up Capital	2,223.00	2,307.72	2,558.40	2,558.40
Reserve & Surplus	235.79	579.28	1,085.77	1,693.68
Borrowings (Loan Funds)				
Secured	225.09	238.50	389.99	1,127.31
Unsecured	4,704.84	4,583.71	4,468.33	4,382.64
Current Liabilities & Provisions	3,479.69	5,460.11	6,617.24	7,412.29
Total	**10,868.41**	**13,169.32**	**15,119.73**	**17,174.32**
B. Assets				
Gross Block	9,122.95	9,825.92	10,577.07	12,044.33
Less: Depreciation	2,629.11	2,887.05	3,196.89	3,728.11
Net Fixed Assets	6,493.84	6,938.87	7,380.17	8,316.22
Capital Works-in-Progress	530.84	566.40	710.70	1,525.77
Investments	11.17	20.95	75.36	96.78
Current Assets, Loans and Advances	3,442.22	5,280.71	6,680.42	7,019.97
Accumulated Losses	390.34	362.39	273.08	215.58
Total	**10,868.41**	**13,169.32**	**15,119.73**	**17,174.32**
Debt Equity ratio	**1.60:1**	**2.03:1**	**1.81:1**	**1.98:1**
Net Worth	**2,068.45**	**2,524.61**	**3,371.09**	**4,036.50**

It may be seen from the above that the Accumulated Losses of the Company decreased by 44.77 *per cent* from ₹ 390.34 crore in 2007-08 to ₹ 215.58 crore in 2010-11. Further, the debt-equity ratio of the Company decreased from 1.60:1 to 1.37:1 during the review period.

Since reorganisation, the Company had steadily earned profits aggregating ₹ 305.25 crore. They however lost opportunities to earn higher margins due to poor project management (para 2.1.10, 2.1.11, 2.1.31 & 2.1.32), low collection efficiency (para 2.1.43, 2.1.44, 2.1.45, 2.1.46, 2.1.47, 2.1.48, 2.1.49, 2.1.50, 2.1.51 2.1.52 & 2.1.53) high ATC losses (para 2.1.20, 2.1.29 & 2.1.30), rudimentary Operation and Maintenance (O&M) practices (para 2.1.27, 2.1.28 & 2.1.35).

The particulars of cost of electricity *vis-à-vis* revenue realisation per unit are indicated at next page:

[29] Data is for four years as the Company had come into existence on unbundling of West Bengal State Electricity Board w.e.f 1 April 2007.

(₹ in crore)

Sl. No.	Description	2007-08	2008-09	2009-10	2010-11
1	**Income**				
(i)	Revenue from Sale of Power	5,426.44	6,609.12	7,526.01	9,395.55
(ii)	Regulatory Assets[30]	0.00	1763.83	1083.46	328.45
(iii)	Other income	639.80	797.76	528.35	537.75
	Total Income	**6,066.24**	**9,170.71**	**9,137.82**	**10,261.75**
2	**Distribution (in MUs)**				
(i)	Total power purchased / generated	22,617	24,705	27,827	29,914
(ii)	Less: Net UI, grid loss, transmission losses, consumption for PPSP and power swap out	2,434	2,678	3,790	3,460
(iii)	Net Power available for Sale	20,183	22,027	24,037	26,454
(iv)	Less: Sub-transmission & distribution losses	4,296	4,450	5,061	6,018
(v)	**Net power sold**	**15,887**	**17,577**	**18,976**	**20,436**
3	**Expenditure on distribution of electricity**				
(a)	**Fixed cost**				
(i)	Employees cost	457.63	2,273.63	901.37	855.45
(ii)	Administrative and General expenses	71.48	70.30	65.99	101.07
(iii)	Depreciation	190.09	258.26	277.26	294.62
(iv)	Interest and finance charges	370.24	466.98	461.29	440.94
(v)	Transmission/ Wheeling Charges[31]	553.89	808.06	820.72	791.80
(vi)	Other Expenses	110.99	269.12	203.61	294.52
	Total fixed cost	**1,754.32**	**4,146.35**	**2,730.24**	**2,778.40**
(b)	**Variable cost**				
(i)	Purchase of Power	4,109.45	4,874.81	6,213.55	7,233.98
(ii)	Repairs & Maintenance	102.21	110.74	122.98	154.24
	Total variable cost	**4,211.66**	**4,985.55**	**6,336.53**	**7,388.22**
(c)	**Total cost 3(a) + (b)**	**5,965.98**	**9,131.90**	**9,066.77**	**10,166.62**
4	**Net Profit {1 – 3 (c)}**	**100.26**	**38.81**	**71.05**	**95.13**
5	Realisation (₹ per unit)	3.82	5.22	4.82	5.02
6	Fixed cost (₹ per unit)	1.10	2.36	1.44	1.36
7	Variable cost (₹ per unit)	2.65	2.84	3.34	3.62
8	Total cost per unit (in ₹) {3(c)/ 2}	3.76	5.20	4.78	4.97
9	Contribution (5-7) (₹ per unit)	1.17	2.38	1.48	1.40
10	**Profit (+)/ Loss (-) per unit (in ₹) (5-8)**	**0.06**	**0.02**	**0.04**	**0.05**

It may be seen from the above that though the realisation per unit increased from ₹ 3.82 to ₹ 5.02 during review period (31 *per cent*), the cost per unit increased from ₹ 3.76 to ₹ 4.97 (32 *per cent*) during the corresponding period. Further, the contribution per unit had decreased by 20 *per cent* during 2007-11.

It was also evident from the above table that cost of power, employees cost and transmission & wheeling charges constituted the major elements of cost in 2010-11 which represented 71.20, 8.42 and 7.79 *per cent* of the total cost in that year. On

[30] Regulatory assets representing cost admissible for recovery through tariff, but yet to be included in tariff.

[31] Transmission charges are payable by the Company irrespective of quantum of energy transmitted by WBSETCL as per tariff orders, hence, it is treated as Fixed Cost.

the other hand, sale of power and other charges constituted the major elements of revenue in 2010-11 which represented 91.61 and 5.18 *per cent* of the total revenue.

2.1.38 The financial viability of the DISCOM is generally influenced by the various factors such as:

- Filing of Aggregate Revenue Requirement (ARR) and revision of tariff;
- Adequacy of tariff to cover the cost of operation;
- Timely release of promised subsidy by the Government;
- Cross subsidisation policy of the Government and its implementation by the DISCOMs;
- The Fund Management of DISCOMs; and
- The Revenue billing and collection efficiency.

Each of these factors is discussed in the following paragraphs.

Filing of ARR

2.1.39 The tariff structure of the DISCOMs are subject to revision by WBERC after the objections, if any, received against Aggregate Revenue Requirement (ARR) petition filed by them within the stipulated date. DISCOMs were required to file the ARR for each year in November of the preceding year for the respective year. In case of Multi Year Tariff (MYT), ARR was to be filed by November of the preceding year of the control period. The WBERC accepts the application filed by the DISCOMs with such modifications/ conditions as may be deemed just and appropriate and after considering all suggestions and objections from public and other stakeholders. The table below shows the due date of filing ARR, actual date of filing and date of approval of ARR.

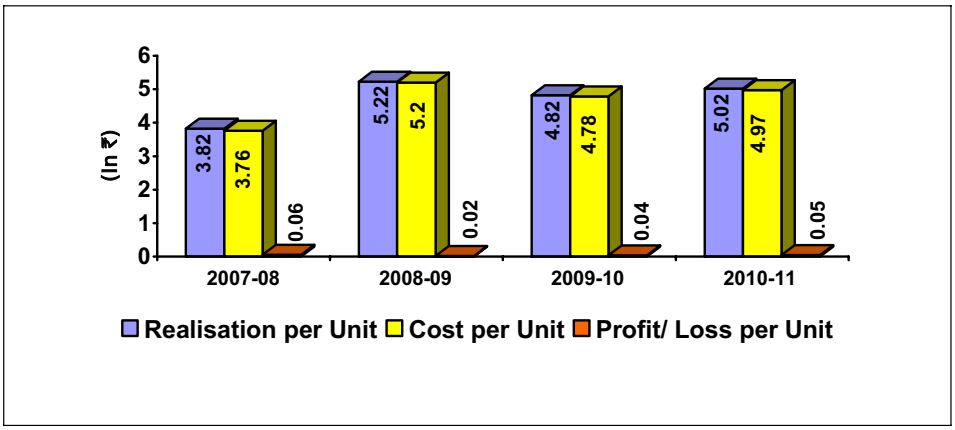
Year	Admissible date of filing[32]	Actual date of filing	Delay in days	Date of approval	Effective date
2006-07	30.11.2005	19.12.2005	19	08.05.2006	April 2006
2007-08	23.04.2007	23.04.2007	-	01.08.2007	April 2007
2008-09	31.05.2008	31.05.2008	-	30.09.2008	April 2008
2009-10	31.05.2008	31.05.2008	-	28.07.2009	April 2009
2010-11	31.05.2008	31.05.2008	-	29.07.2010	April 2010
Filing of APR					
2006-07	31.03.2008	31.03.2008	-	26.09.2008	Determined by WBERC on case to case basis.
2007-08	28.02.2009	02.03.2009	-	28.05.2009	
2008-09	31.12.2009	30.12.2009	-	26.07.2010	
2009-10	30.11.2010	29.11.2010	-	Not yet finalised	
2010-11	30.11.2011	-	-		

[32] As ultimately allowed by WBERC.

From the above it may be seen that although the Company had delayed filing of tariff application, such delays were condoned by WBERC mostly due to reorganization of the erstwhile Board to Company and introduction of Multi Year Tariff fixation mechanism.

Recovery of cost of operations

2.1.40 The Company was able to recover their cost of operations marginally during the last four years ending 2010-11.



The revenue surplus of ₹ 100.26 crore in 2007-08 declined to ₹ 95.13 crore of surplus in 2010-11 despite recognising income from Regulatory Assets during. The cost of sale of energy as compared to revenue from sale of power is attributable to high ATC loss.

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

(₹ in crore)

Year	Sales	Variable costs	Fixed costs	Contribution	Deficit in recovery of fixed costs	Deficit as percentage of sales
(1)	(2)	(3)	(4)	(5) = (2) – (3)	(6) = (4) – (5)	(7)={(6)/ (2)} X 100
2007-08	5,426.44	4,211.66	1,754.32	1,214.78	539.54	9.94
2008-09	6,609.12	4,985.55	4,146.35	1,623.57	2,522.78	38.17
2009-10	7,526.01	6,336.53	2,730.24	1,189.48	1,540.76	20.47
2010-11	9,395.55	7,388.22	2,778.40	2,007.33	771.07	8.21

It could be seen from above table that increasingly the Company was unable to recover their fixed costs due to lower tariff fixation by WBERC to avoid steep power costs. As already pointed out, WBERC allows certain costs, but exclude them from tariff. The Company retains such unrealised costs as Regulatory Assets. As of March 2011 total Regulatory Assets retained by the Company were ₹ 3,320.05 crore representing 62 *per cent* of unrealised Fixed Costs which was not realised affecting the liquidity position of the Company.

Though it appears that the tariff is on lower side and needs to be revised for recovery of the costs, it may be highlighted here that the same can be brought about by improving operational efficiency, *viz.*, reduction in/ control of AT & C losses, conversion of LT lines to HT lines, replacement of defective meters, improving billing and collection efficiency, *etc.*, which have been discussed separately in the review. Further, reduction of cross subsidisation among various categories of consumers might also help in improving the position.

Subsidy support

2.1.41 The Company does not receive any subsidy from the Government towards cost of operations. However, the Government has subsidised cost of power of the consumers based on volume of consumption each month. In compliance with Section 65 of Electricity Act 2003, the Company estimated consumption for each billing cycle, claimed and received subsidy on behalf of the consumer. In turn, the Company passed on the benefit of consumption to the consumer through their bills. During 2009-10 and 2010-11, the Company had received ₹ 70.77 crore and ₹ 95.13 crore as subsidy on behalf of consumers.

Cross subsidisation

2.1.42 Section 61 of Electricity Act, 2003 stipulates that the tariff should progressively reflect the average cost of supply (ACOS) of electricity and also reduce cross subsidy in a phased manner as specified by the Commission. National Tariff Policy envisaged that the tariff of all categories of consumer should range within plus or minus 20 *per cent* of the ACOS by the year 2010-11. The position as regards cross-subsidies in all sectors is depicted in the table below:

Particulars	**2006-07**		**2007-08**		**2008-09**		**2009-10**		**2010-11**	
Average cost of supply (in paise *per* unit)	319		320		335		349		472	
Average Revenue from	**Paise *per* unit**	**Percen-tage of ACOS**	**Paise *per* unit**	**Percen-tage of ACOS**	**Paise *per* unit**	**Percen-tage of ACOS**	**Paise *per* unit**	**Percen-tage of ACOS**	**Paise *per* unit**	**Percen-tage of ACOS**
Domestic	267	83.70	276	86.25	274	81.79	331	94.84	407	86.23
Commercial	443	138.87	462	144.38	474	141.49	564	161.60	614	130.08
Industrial	394	123.51	413	129.06	417	124.48	457	130.95	553	117.16
Agricultural	146	45.77	121	37.81	169	50.45	141	40.40	146	30.93
Others	313	98.12	385	120.31	478	142.69	431	123.50	395	83.69

It may be seen from the above table that the cross subsidies allowed was not in convergence with the NEP. Agricultural activities were heavily subsidised, while commercial consumers were charged at higher rates. Such rates for commercial consumer also induced reporting of commercial activities as industrial activities (para 2.1.44).

In conclusion we observed that the Company earned Profits in all four years aggregating to ₹ 305.25 crore after accounting for Regulatory Assets of ₹ 3,320.05 crore which was recoverable as at March 2011. In deviation of National Tariff Policy, agricultural consumers were heavily subsidised and average revenue was only 31 to 50 *per cent* of average cost of supply, while commercial consumers were charged at higher rates.

Recommendation :-

- *Adhere to National Tariff Policy and not cross subsidise agriculture consumers beyond the norms.*

Billing Efficiency

2.1.43 As per directives of WBERC, the Company is required to take the reading of energy consumption of each consumer at the end of the notified billing cycle. After obtaining the meter readings, the Company issues bills to the consumers for consumption of energy. Sale of energy to metered categories consists of two parts *viz*., metered and assessed units. The assessed units refer to the units billed to consumers in case meter reading is not available due to meter defects, door locked *etc.* WBERC had not stipulated any ceiling for assessed bills. They had however stipulated timeframe within which defective meters are to be replaced by the licensee.

Billing of all L&MV[33] consumers are being done at division level. Domestic consumers are billed on quarterly basis, while other consumers were being billed on monthly basis. HV[34] consumers with connected load below 500 KVA are metered from Circles and EHV[35] consumers with connected load of 500 KVA are billed from head office of the Company. HV and EHV consumers are billed on monthly basis.

The efficiency in billing of energy lies in distribution/ sale of maximum energy by the Company to their consumers and realising the revenue therefrom in time.

Sl. No.	Particulars	2006-07	2007-08	2008-09	2009-10	2010-11
		(Figures in MUs)				
1	Energy available for sale	20,331	20,183	22,027	24,037	26,454
2	Energy billed	14,937	15,887	17,577	18,976	20,436
3	Percentage of energy billed to energy available	73.47	78.71	79.80	78.94	77.25
4	Assessed / Average sale	660.46	254.04	256.59	291.95	230.63
5	Assessed sales as percentage of energy billed	4.42	1.60	3.67	1.54	1.13

It would be seen from the above that energy billed during review period ranged between 73.47 to 79.80 *per cent* of the total energy available for sale. This was due to increase in use of electronic meters in consumer billing.

[33] Low and Medium Voltage.
[34] High Voltage.
[35] Extra High Voltage.

Further, instances of assessed/ average billing declined from 4.42 *per cent* to 1.13 *per cent* during this period due to decline in consumers with defective meters.

Instances of undue favour to consumers are illustrated below:

Incorrect application of tariff

2.1.44 Tariff rates applicable to commercial consumers, poultry and food processing is higher than that applicable for industrial consumers. Test check of actual tariff applied in five[36] circles and six[37] divisions for the year 2007-08 and 2008-09 showed that the Company had classified motor garage, cinema hall, training institutes, bottling plant, poultries and hatcheries, fisheries and food processing units, which are commercial units, as industrial units. This resulted in loss of revenue of ₹ 1.20 crore to the Company.

Under assessment of revenue

2.1.45 According to clause 3.6 of WBERC (Electricity Supply Code) Regulation, 2007 effective from September 2007 where the meter of a consumer is found defective, the consumer shall be billed for the period on the basis of average consumption of previous three billing cycles prior to the date of meter becoming defective.

We observed (May 2011) that in fifteen Divisions, meters of 2.12 lakh consumers became defective during 2006-11. Of these, previous meter readings of 86,057 consumers were not recorded. Consequently, their subsequent bills could not be drawn as average consumption was not ascertainable.

The Management stated (December 2011) that our observation was not according to Regulations. However, our calculations were based on West Bengal Electricity Regulatory Commission (Electricity Supply Code) Regulations, 2007.

Short levy of minimum charges

2.1.46 WBERC determined (August 2007 and September 2008) the minimum charges applicable for L&MV domestic consumer from 2007-08 would be ₹ 28 and for L&MV commercial consumer from 2008-09 would be ₹ 40 each month. Test check (May 2011) of bills in 15 divisions revealed that during 2008-09 to 2010-11, 21.63 lakh bills against 5.67 lakh consumers were less than minimum charges.

The Management replied (December 2011) that there was no provision for minimum charges in 2007. We observed that WBERC had provided (August 2007) for minimum charges in their tariff orders applicable for 2007-08.

Loss due to inaction against consumers running with low power factor

2.1.47 As per tariff schedule, in case an industrial consumer is billed on KWh basis and its power factor falls below 0.85, the consumer pays for less energy than

[36] Bidhannagar, Birbhum, 24 Parganas South, 24 Parganas North and Howrah.
[37] Arambagh, Basirhat, Contai, Behala, Kalna and Kharagpur.

the energy actually supplied to him. To compensate this loss, the tariff provides for power factor surcharge on energy charge payable by the consumer. However, tariff does not provide for power factor surcharge on non industrial consumers. We observed (May 2011) that against 26,544 bills raised by the Company on non-industrial consumers, they could not collect power factor surcharge from these consumers despite power factor falling below 0.85.

Revenue collection efficiency

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

- Consumers may make payments of the bills by cash, cheques or by demand draft.

- Revenue billed in respect of HT services is collected at collection counters located at every circle office. In respect of LT services, electricity bills are generally collected by the group supply offices except in some areas where collection work is entrusted to certain private collection agencies.

- WBERC stipulated (September 2007) that consumers should have a minimum time of seven days between receipt of bill and its due date for payment. Consumers are liable for payment of additional charges of 1.25 paisa per rupee pro-rata on the amount of the bill for the period of the delay, progressively increasing this charge to two paise per rupee for delay beyond six months.

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

Sl. No.	Particulars	2006-07	2007-08	2008-09	2009-10	2010-11
		(₹ in crore)				
1	Balance outstanding at the beginning of the year	1,264.81	1,234.81	698.90	839.10	946.97
2	Revenue assessed/Billed during the year	5,593.07	5,426.44	6,609.12	7,526.01	9,395.55
3	Total amount due for realisation (1+2)	6,857.88	6,661.25	7,308.02	8,365.11	10,342.52
4	Amount realised during the year	5,520.70	5,961.72	6,464.69	7,417.51	9,293.94
5	Amount written off during the year	102.37	0.63	4.23	0.63	0.78
6	Balance outstanding at the end of the year	1,234.81	698.90	839.10	946.97	1,047.80
7	Percentage of amount realised to total dues (4/3)	80.50	89.50	88.46	88.67	89.86
8	Arrears in terms of No. of months assessment	2.65	1.55	1.52	1.51	1.34

We observed from the above details that:

The balance dues outstanding at the end of the year decreased from ₹ 1,234.81 crore in 2006-07 to ₹ 1,047.80 crore in 2010-11. This was due to better recovery of dues from customers.

Of the above, dues of ₹ 585.51 crore from 15 divisions indicated that dues outstanding for more than three years amounted to ₹ 136.37 crore (23.29 *per cent*) while an amount of ₹ 85.20 crore (14.55 *per cent*) was due from disconnected consumers**.**

Non-disconnection of supply of consumers with heavy arrears

2.1.49 As per WBERC (Electricity Supply Code) Regulation 2004 and 2007, in case the electricity dues are not deposited by the consumer within due date indicated in the bill, the supply shall be disconnected temporarily. We observed (May 2011) that, of 3,834 L&MV customers in 15 divisions and 3,029 HT and EHT consumers had arrears of more than ₹ 1 lakh each. They had not paid their dues for three to 318 months but their supply was not disconnected as per the above provisions. Non-disconnection of supply of these defaulting consumers, resulted in accumulation of arrears to ₹ 236.13 crore (March 2011).

The Management stated (December 2011) that power supply is liable to be disconnected only after expiry of notice period if payment is not received as per section 56 of Indian Electricity Act 2003. The reply does not justify inaction on the part of Management since the section provides for 15 days clear notice only and thereafter electricity connection in respect of defaulting consumers was liable for disconnection.

Failure to finalise permanent disconnection cases

2.1.50 Seventy nine L&MV consumers in 15 divisions and 449 HT and EHT consumers of the Company had arrear of more than ₹ one lakh and did not deposit their dues for four to 189 months. Supply to these consumers was disconnected temporarily and billing was stopped. The Company neither disconnected supply permanently nor finalised the accounts of these consumers. This resulted in non-realisation of arrears amounting to ₹ 22.05 crore (March 2011).

We conclude that energy billed during review period ranged between 73.47 to 79.80 *per cent* of the total energy available for sale. The Company lost opportunity to earn higher revenue due to incorrect application of tariff, under assessment of revenue and short levy of minimum charges. Further, non disconnection of supply to defaulting consumers resulted in accumulation of arrears of ₹ 236.13 crore as well as non realisation of ₹ 22.05 crore from temporarily disconnected consumers.

Recommendation :-

- *Achieve 100 percent energy billing, apply correct tariffs and levy minimum applicable charges on consumers.*

Un-cashed cheques

2.1.51 In six divisions of the Company cheques worth ₹ 9.45 crore deposited in bank during review period were not credited (February to April 2011) into the accounts of the Company by the concerned banks. The divisions had not noted the details of consumers, their billing months, *etc.* against payment of these cheques. We scrutinised with IDEA[38] the data base table "paymast" and "onlnrcol" which records payments relating to energy bills of consumers and other payments received from the consumers; against the details of cheques deposited in the bank but remaining un-credited.

Scrutiny revealed (May 2011) that cheques valued ₹ 3.12 crore (six[39] divisions) that were received (March 2005 to March 2011) from the consumers could not be identified against any consumer in the database. This casts doubt as to whether these sums were actually received and deposited by the Company. Further, at Ghatal division of the Company, 36 bank drafts (October 2007 to January 2011) remitted by Group supplies valuing ₹ 21.35 lakh remained uncleared (April 2011). These included 16 bank drafts (₹ 5.61 lakh) drawn (October 2007 to December 2007) on State Bank of India Ghatal Branch, where the bank account of Ghatal division was maintained, that remained unrealised for reasons not found on record. At Baharampur II division, cheques of ₹ 5.67 lakh received (July 2009 to December 2010) from post offices against collection from consumers remained unrealised.

Dishonoured cheques

2.1.52 The consumers, whose cheques are dishonoured, should be informed immediately so that the payment may be made by them in cash against such dishonoured cheques. Moreover, the Company should bill such consumers for bank charges so incurred. However, test check of seven divisions of the Company revealed that cheque receipt registers were not maintained at the divisions. Rudimentary records of cheque receipts were maintained in the memorandum cash books, which often did not record the consumer number to identify the consumer whose cheques may be dishonoured.

Misappropriation /embezzlement of revenue

2.1.53 During the period under review, instances of misappropriation/ embezzlement of cash involving a sum of ₹ 36.42 lakh were noticed (April 2011). Although the Company had conducted enquiry to bring out the clear facts of embezzlement and financial mis-appropriation to establish distinct responsibility of the employee, such repeated misappropriation/ embezzlement of cash is an indication of lack of adequate control and supervision over cash.

[38] A data analysis and audit software.
[39] Midnapore, Kharagpur, Ghatal, Baharampur I & II and Uttar Dinajpur

Consumer satisfaction

2.1.54 One of the key elements of the Power Sector Reforms was to protect the interest of the consumers and to ensure better quality of service to them. The consumers often face problems relating to supply of power such as non availability of the distribution system for the release of new connections or extension of connected load, frequent tripping of lines and/ or transformers and improper metering and billing.

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

Redressal of grievances

2.1.55 In January 2006 WBERC[40] specified the mode and time frame for redressal of grievance in pursuance of the Electricity Act, 2003. The Standards of Performance (June 2004 and May 2010) prescribe time limit for rendering services to the Consumers and compensation payable for not adhering to the same was laid down. The nature of services contained in the Standards *inter-alia* include time limit for restoring unplanned interruption in power supply due to line breakdown, distribution transformer failures, voltage variations, meter complaints, installation of new meters and new connections, *etc.*

WBSEDCL created (January 2009) Customer Relation Management (CRM) Cell to look into the grievances of consumers and their redressal. To enable the compilation of complaints for assessing the performance on this account, separate registers were maintained by the Company. The overall position as regard receipt of complaints and their clearances is depicted in the table below:

Sl. No.	Particulars	2006-07	2007-08	2008-09	2009-10	2010-11
		(in numbers)				
1	Total complaints received	NA	6,612	16,673	28,698	8,81,979
2	Complaints redressed within time	NA	4,628	12,995	24,184	8,11,387
3	Complaints redressed beyond time	NA	1,521	3,127	2,476	17,415
4	Pending complaints	NA	463	551	238	33,145
5	Percentage of complaints redressed beyond time to total complaints	NA	23	18.75	8.62	1.97
6	Compensation paid, if any, to Consumers (₹ in lakh)	NA	NA	NA	142.90	114.93

The Company paid ₹ 2.58 crore as compensation to the consumers for non-compliance of WBERC Regulations. In addition, Bishnupur Division paid ₹ 68.36 lakh as compensation, the information of such payment was not

[40] West Bengal Electricity Regulatory Commission.

known to the CRM Cell of the Company. Further, similar compensation by other divisions cannot be ruled out.

Bishnupur Division had 550 pending (February 2011) STW/SMP[41] connections which could not be effected due to scarcity of materials. WBERC Regulation states, service connections to be effected within six months from deposit of service connection charges by consumers. As of February 2011, 401 connections were pending beyond six months which resulted in accrued liability of ₹ 2.75 crore.

The Company should charge meter rent on operating meters of their consumers. Records showed the Company was charging meter rent for defective meters also. Meter rents of ₹ 1.18 crore were collected in five[42] divisions on defective meters which was not prudent as it puts unnecessary burden on their consumers.

Energy conservation

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

The Company is State Designated Agency (SDA) under the Act. For energy conservation measures BEE[43] had disbursed (January 2008 to April 2011) ₹ 1.95 crore to the Company during the period under review for undertaking various measures as tabulated below:

(₹ in lakh)

Year	Amount received	Purpose for which amount disbursed by BEE
2007-08	46.50	For strengthening State Designated Agency (SDA)
2008-09	51.75	For conducting investment grade energy audit in 20 buildings, Essay competition on energy awareness programme and for various other activities of SDA
2009-10	81.10	LED village campaign project, implementation of pilot LED street light project with KMC and for various other activities of SDA
2010-11	15.35	For various other activities of SDA

The investment grade energy audit commenced in February 2011 and their report is awaited. LED village (Dandirhat) campaign project was taken up in

[41] Shallow Tube wells and Submersible Pumps.
[42] Asansol, Kalna, Memari, Bankura and Bishnupur.
[43] Bureau of Energy Efficiency.

February 2011 and LED street light project with KMC[44] started in January 2011 and was scheduled to be completed in March 2011 but same was not completed so far (May 2011).

Energy Conservation Act, 2001 stipulates State Governments to constitute Energy Conservation Fund for promotion of efficient use of energy and its conservation. Government of West Bengal belatedly (September 2010) notified creation of West Bengal Conservation Fund (WBCF).

This fund received (January 2011) ₹ two crore from BEE to undertake the following jobs, all of which are yet to commence.

1. Preparation of Sector Specific Energy Savings Plan of the State.

2. Preparation of the Waste Heat Recovery Policy of the State.

3. Implementation of Projects on Waste Heat Recovery.

4. Revolving Investment Funds for self financing projects.

BEE contribution was 50 *per cent* of the total amount to be disbursed as first instalment. The remaining 50 *per cent* of the fund would be disbursed only after the State Government provided a matching contribution to the amount disbursed for the first instalment. The State Government was yet to contribute their share to the fund.

Energy accounting and audit

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

- better and more accurate monitoring of the consumption of electricity by consumers;
- elimination of wastages;
- reduction of downtime of equipment;
- massive savings in operational costs and increase in revenue, *etc*.

The Company engaged (April 2005) Secure Meters Limited (SML) for conducting energy audit for two years at a fee of ₹ 10.74 crore (inclusive of service tax). Energy audit reports/ returns during the review period showed that the reports submitted by SML did not mention accurate monitoring of the consumption of electricity by the Company; elimination of wastages and reduction of downtime of equipments rather they reported only distribution transformer metering, feeder metering, under/over/unbalanced distribution

[44] Kolkata Municipal Corporation.

transformers and 11 KV feeder line loss. Award of contracts for energy audit revealed following deficiencies.

Undue benefit to contractor

2.1.58 The Company placed (April 2005) an order for 13,502 energy accounting meters to be installed across distribution network, at ₹ 9.89 crore inclusive of service tax[45] on SML. The Company placed further two orders for 11,015 meters (October 2006) for ₹ 9.03 crore and 4,215 meters (April 2007) for ₹ 3.51 crore on SML exclusive of service tax. We observed that the erection charge for 11,015 (October 2006) meters was higher compared to the orders placed in April 2005 and in April 2007. Non inclusion of service tax and higher erection rate, resulted in extra expenditure of ₹ 2.43 crore and undue benefit to SML by way of allowing service tax[46] separately (₹ 1.28 crore) and higher erection charges (₹ 1.15 crore).

Management stated (December 2011) that they had accepted (October 2006) higher price from SML as they believed that re-tender would have resulted in higher rates.

The reply did not address the fact that in subsequent procurement (April 2007), the Company actually enjoyed lower price.

Extra expenditure

2.1.59 The aforesaid purchase orders mentioned that the maintenance of meter would be free of cost for a period of five years from the date of commissioning or five and a half years from the date of dispatch by SML. Again, the orders for data collection, preparation of reports also included similar clause towards service maintenance. Thus Company incurred an extra expenditure of ₹ 10.15 crore due to inclusion of same element in subsequent order.

Consumer metering

2.1.60 Attainment of 100 *per cent* metering was one of the objectives of the R-APDRP scheme. The Company did not take up any separate scheme/ project to attain the above objective but as a normal practice, the work of metering of un-metered consumers and replacement of defective and stopped meters in 52 divisions of the Company was a continuous process. The achievement of metering of all consumers (of various categories) in the State is indicated in the **Annexure 9**. It can be seen from the annexure that though the Company achieved the targets during the review period (except 2008-09) in respect of installation of meters in case of L&MV consumers but actual achievements against the targets in case of decentralized bulk consumers were ranging from 57.94 to 82.33 *per cent*. The detailed analysis of the selected Units/ circles revealed the following:

[45] @ 10.2 *per cent.*
[46] Calculated at 10.2 *per cent.*

- The Company decided (January 2010) to procure 24.06 lakh single phase energy meters from six different firms at landed cost of ₹ 940.50 per meter. Scrutiny showed that actual landed cost of meter varied from ₹ 940 to ₹ 958 due to non inclusion of statutory duties at the time of evaluation of offers and resulted in excess expenditure of ₹ 1.03 crore.

- The Company had procured (May 2011) 40 lakh meters on the basis of submission before their Board that they had stock of only 38,405 meters as of March 2011. However, on the basis of procurement and installation of meters in last five years, we observed (May 2011) that closing stock of meters for the Company as of March 2011 should have been 6.21 lakh. The Management replied (December 2011) that their closing stock was 4.81 lakh meters as of March 2011 while an unidentified number of meters were in transit between various units of the Company.

  We observed that the Company had purchased 4.42 lakh meters in excess of their requirements by understating closing stock of meters before their Board. This resulted in excess expenditure of ₹ 40.58 crore. Moreover, even after lapse of eight months (December 2011), the existence of 1.40[47] lakh meters worth ₹ 13.17 crore is doubtful.

Monitoring by top management

2.1.61 The Power Distribution Company plays an important role in the State economy. For such a giant organisation to succeed in operating economically, efficiently and effectively, there has to be a Management Information System (MIS) for monitoring by top management.

We observed that proper MIS report was not placed before the Board of the Company for better control, monitoring and follow up actions. CMD of the Company once in every month discussed divisions' performances with the divisional managers. For this meeting, the divisions submit Progress Revenue Reports (PRT).

The content of the PRT did not always depict the true picture of the performances of the divisions. Contents of the PRT also changed from year to year. For instance, in 2006-07 the divisions reported the LT-HT ratio which was subsequently left out. Audit scrutiny revealed that ATC loss figure of the Company as mentioned in the PRT varied from the actual.

Besides above, the Company was not monitoring the following aspects;

a. 100 *per cent* billing of the consumers.

[47] Opening balance 84,417 *add* purchases 53,00,500 *less* utilisation 47,64,399 *less* closing stock 4,80,499 = 1,40,019 meters @ ₹ 940.50

b. Uncredited cheques.

c. Balances lying in the collection accounts.

d. Physical disconnection of the defaulting consumers.

e. Utilisation of the materials lying at different Stores.

The Board of Directors had stressed for an integrated MIS report which should highlight details of power purchase, planned and un-planned shutdown load shedding, and consumer status. The reports were never placed before the Board.

The Government replied (December, 2011) that a MIS report placed to the Board meeting / Board committee meeting consisting of ATC/ T&D loss, collection efficiency, replacement of defective meters, physical disconnection, prevention of theft, status of approved projects, cash flow statement *etc*. However, no action has been taken to incorporate consumer grievances, distribution failures, details of power purchases, planned and un-planned shutdown, load shedding and consumer status in the report. The reply was silent about standardisation of report.

We observed that although the Board of Directors had highlighted the need for submission of an integrated MIS report for better control, monitoring and follow up; this was not complied with. The PRT reports did not depict the fair picture of the Divisional performance and the ATC Losses appearing in these reports were at variance with actuals.

Recommendation :-

- *The Company should devise integrated MIS reports reflecting actual performances and follow-up on deviations and shortfall.*

The Management accepted all the recommendations and assured to implement them.

Durgapur Chemicals Limited

2.2 Post restructuring performance and implementation of modernisation scheme

Executive Summary

Durgapur Chemicals Limited (Company) was incorporated in July 1963 with the object of manufacturing phenol, phthalic anhydride (both since discontinued), caustic soda, chlorine and hydrogen with mono-chlorobenzene (MCB), mixed dichloro benzene (DCB), sodium penta chlorophenate (SPCP), stable bleaching powder (SBP) and synthetic hydrochloric acid (syn-HCL) as the primary downstream chlorinated products by use of salt, benzene, hydrated lime and phenol as main raw materials. The Company played a marginal role in caustic chlorine industry (seven per cent production) of eastern India.

In order to turn around the Company from incurring continuous losses due to obsolete plant and technology, higher cost and increasing dependence on budgetary support to meet operational deficit, the State Government undertook financial cum operational restructuring and business optimisation during February 2004 to July 2010. The performance audit covered the period from 2006-07 to 2010-11 to assess the post restructuring performance of the Company.

Financial management

As a result of financial restructuring the Paid up Capital reduced from ₹406.01 crore to ₹57.28 crore as on March 2011. For implementation of modernisation of projects the borrowings of the Company increased from ₹6.29 crore to ₹62.60 crore during 2006-11 registering a growth of 895 per cent. The Company failed to mobilise adequate working capital due to their inability to generate own resources. The Company could not recover their cost of operation as cost growth outstripped the growth of sales realisation during 2007-11. The poor financial health of the Company was attributable to high cost of raw materials, power, utility and lack of flexibility of product mix that could fetch higher margins.

Financial, Administrative and Business restructuring

Under capital restructuring State Government Loan and Interest of ₹369.92 crore was first converted into Equity and then Paid up Capital was reduced to ₹57.28 crore as of March 2011, by setting off the Accumulated Loss of ₹351.93 crore.

Though the Company reduced their manpower by implementing Early Retirement Scheme they failed to restrict their employee cost to industry benchmark due to non implementation of variable pay structure and thereby incurred extra expenditure of ₹26.06 crore during 2006-11.

Delay in implementation of modernisation project led to time overrun of 21 months and cost overrun of ₹35.77 crore. Deviation from DPR during implementation caused mismatch in capacities of different up and down stream plants and also created shortage of working capital. Lack of proper planning and injudicious decision making with respect to various functional activities of the plants led to reduced production and high costs affecting profitability of the Company.

Production performance

Capacity utilisation of caustic chlorine plant was 71 per cent and that of MCB, DCB and SBP plants were 34, 22 and 45 per cent during 2006-11. The production loss due to non achievement of targets was 70,044 MT valued at ₹160.12 crore with contribution loss of ₹20.74 crore. Poor production performance was attributed to delay/ non-completion of plant modernisation, inadequate provision to utilise byproducts, shortage of storage capacity and working capital. The Company did not follow industry norms fixed in DPR for consumption of salt and chemicals resulting in excess consumption of 22,992 MT of salt, benzene, caustic soda and other chemicals over norms and thereby incurred avoidable expenditure of ₹14.95 crore during 2006-11.

Procurement of salt

The Company procured primary raw material, (salt) largely from a single vendor during 2006-11 at 16 to 75 per cent higher prices than their competitors. Besides, due to poor procurement mechanism, the Company could

not ensure capacity utilisation of the plant and ran the risk of zero stock. Purchase through traders instead of direct purchase from manufacturers cost the Company avoidable expenditure of ₹ 5.10 crore during 2006-10.

Energy management

Though DPR recommended for captive power plant for cheap source of power, the Company did not visualise importance of power cost sensitivity to project profitability. Power cost ranged between ₹ 2.90 to ₹ 4.01 per unit during 2008-11 as against the envisaged cost in DPR of ₹ 2.25 to ₹ 3 and competitors' cost at ₹ 2.05 to ₹ 2.20 per unit. Besides, the Company consumed excess energy valued at ₹ 9.69 crore over the norms during 2006-11, affecting their profitability further. They incurred extra expenditure of ₹ 7.48 crore on steam generation due to use of costly furnace oil instead of cheaper coal.

Sales performance

Despite high level of acceptability of the Company's products in the market, sales targets were not met due to inefficiency and bottlenecks in production. Due to faulty agreement with a contractor, forward sale contract with a buyer and lower realisation from sales through agents, the Company incurred loss of revenue of ₹ 4.90 crore. Further, injudicious decision to appoint commissioning agents before commencement of enhanced production resulted in unfruitful expenditure of ₹ 43.23 lakh.

Internal control

Weak internal control and monitoring mechanism resulted in acceptance of substandard quality of salt, lack of preventive maintenance of the plants leading to excess down time and resultant loss of production, lack of vigorous pursuance of debtors resulting in bad debts and salt being issued without recording the quantity of salt. Further, internal audit was not effective because neither the management took corrective actions on shortcomings noticed in internal audit nor did the BoD seek action taken note thereagainst.

Conclusion and Recommendations

Restructuring plans were implemented partially and belatedly, affecting production performance and profitability and thereby frustrating the objectives of revival of the Company and breaking free from dependence on the budgetary support of the State Government. Besides, lack of focused sales, faulty agreements and failure to utilise own marketing setup resulted in lower sales realisation. The Company should explore inexpensive and steady sources of power, rejig their debt structure, adhere to operational norms, procure raw materials directly from source, introduce new value added products, increase sale of downstream products, streamline marketing activities by widening customer base and strengthen control mechanism in all operational areas.

Introduction

2.2.1 Durgapur Chemicals Limited (Company) was incorporated in July, 1963 as a wholly owned Government Company to utilise benzene and naphthalene, by-products of the coke oven plants of The Durgapur Projects Limited, another PSU of State Government, to manufacture phenol and phthalic anhydride.

A caustic chlorine plant (CCP) based on mercury cell technology was set up at the Company in April 1968 to provide necessary inputs for manufacturing phenol and phthalic anhydride. However, due to technical hurdles and technological obsolescence, the phenol and phthalic anhydride plants were closed down in 1975 and 1988 respectively.

With their main products being phased out, the Company continued producing caustic soda (CS) lye, chlorine and hydrogen at the CCP with mono-chlorobenzene (MCB), mixed dichloro benzene (DCB), sodium penta chlorophenate (SPCP) and synthetic hydrochloric acid (syn-HCl) as the primary downstream chlorinated products by use of salt, benzene, hydrated lime and phenol as main raw materials.

In an effort to increase revenues, the Company also set up a stable bleaching powder (SBP) plant in 1998. They also started bottling and selling a part of the left over hydrogen (a co-product in the caustic soda manufacturing process) after being used for manufacturing syn-HCL.

Production of caustic chlorine (chlor alkali) constituted 47 *per cent* (35.44 lakh MT) of major inorganic chemicals produced in the country during 2009-10. During this period, the Company played a marginal role as they produced 0.21 lakh Metric Ton (MT) which was seven *per cent* of the eastern region production of 2.92 lakh MT.

2.2.2 The Company was incurring cash losses since 1970-71 due to obsolescence of plant and technology, sub optimal product mix, high fixed and variable costs with consequent higher interest burden on State Government loans drawn to meet operational deficit. In order to turn around the Company in the prevailing competitive scenario, the State Government undertook (February 2004 - July 2010) a restructuring exercise which included both financial-cum-operational restructuring and business optimisation.

2.2.3 The Management of the Company is vested in a Board of Directors consisting of eleven directors including Chairman and Managing Director (MD). Ten directors were appointed by the State Government while the remaining one was nominated by Financial institutions. The MD is the Chief Executive of the Company who is assisted by General Manager (Works), General Manager (Commercial) and Controller of Finance and Accounts (COFA). COFA is officiating as MD since March, 2010.

2.2.4 A performance review of the Company was included in the Report of the C&AG of India for the year ended 31 March 1998 (Commercial), Government of West Bengal. The Committee on Public Undertakings had not

selected the review for discussion. The review identified the reasons for the poor performance of the Company and recommended that modernisation of plant and technology, reduction of manpower and effective cost control were essential to improve performance. The present review evaluated the post restructuring performance of the Company, as discussed below.

Scope of audit

2.2.5 This performance audit conducted during the period February to May 2011 covers the activities of the Company for the period 2006–07 to 2010-11. The audit findings were arrived at after test check of records at the Company's registered office and factory at Durgapur and sales office at Kolkata. The sample selected for audit was based on quantum of production of major products *vis-à-vis* corresponding sales figures which represents 65 and 71 *per cent* of total production and turnover respectively during the period from 2006 to 2011, with emphasis on post restructuring period (2008-11).

Audit objectives

2.2.6 This performance audit was undertaken to assess whether:

- an effective long term strategic plan for modernisation and renovation of plants was devised and effectively implemented;
- targets set in the post-restructuring period were achieved, both in operational and resource management fields;
- sales performance indicated improvement commensurate with investment; and
- effective internal control mechanism and internal audit were in operation.

Audit criteria

2.2.7 Audit criteria adopted for assessing the audit objectives were:

- long term strategic plan for modernisation and renovation of plants;
- recommendations of consultant (PriceWaterhouseCoopers) on business plan (May 2003);
- Detailed Project Reports (DPR) of membrane cell plant;
- industry norms for production and consumption of raw materials;
- budgeted/ proposed target for production and sale;
- purchase policy, sales policy, Management information system (MIS); and

- internal audit and cost audit reports.

Audit methodology

2.2.8 Audit adopted a mix of the following methodologies for achieving the audit objectives:

- examination of agenda notes and minutes of meetings of the Board of Directors;
- examination of Critical Path Method (CPM) prepared by consultant, agreement with foreign suppliers of equipment etc. for effective implementation of modernisation scheme;
- examination of reports of monthly production and sales of different products and by-products, capacity utilisation and consumption of raw materials *vis-a-vis* norms; MIS, internal audit report and cost audit reports; and
- interaction with the management.

Audit findings

2.2.9 An Entry Conference was held in 13 May, 2011 with the Principal Secretary, Public Enterprises Department and Managing Director of the Company to discuss the audit criteria, broad objectives and seek the views of Management on critical areas for focus in audit. The audit findings were reported to the Company and the Government in October 2011. An 'Exit Conference' held on 9 December 2011, was attended by the Managing Director of the Company. The views expressed by them have been considered while finalising this Performance Audit.

Restructuring plans for turning around the Company were implemented partially and belatedly, affecting production performance and profitability. Besides, deficiencies in planning, internal control in operational areas and sales led to loss of ₹ 151.21 crore during 2006-11. The audit findings are discussed below.

Financial management

Financial position and working results

2.2.10 The financial position and working results of the Company for the five years ending 2010-11 are given in **Annexures 10 and 11.**

An analysis of the financial position and the working results indicated the following:-

- The Paid up Capital of the Company had increased due to release of fresh Equity of ₹ 31.00 crore by the State Government during 2006-07 to 2009-10.

- As a result of financial restructuring, the Paid up Capital as on 31 March 2011 was reduced to ₹ 57.28 crore from ₹ 406.01 crore by setting off the Accumulated Loss of ₹ 351.93 crore and addition of fresh Equity of ₹ 3.20 crore during 2010-11. This had left the Accumulated Loss at ₹ 56.22 crore as on 31 March 2011.

- The Borrowings of the Company had progressively increased from ₹ 6.29 crore in 2006-07 to ₹ 62.60 crore in 2010-11 by 895 *per cent*.

- The Company's debt to equity ratio increased from 0.02:1 in 2006-07 to 1.09:1 in 2010-11 indicating that the Company had to depend more on external resources.

- The Company's current ratio increased from 1.72:1 in 2006-07 to 1.86:1 in 2007-08, but decreased to 0.48:1 in 2010-11 indicating negative working capital.

- Though the Company had been making positive contribution in all the five years but rate of contribution decreased from 24 *per cent* in 2006-07 to 20 *per cent* in 2010-11.

- The proportion of power and fuel cost in variable cost increased from 39 *per cent* in 2006-07 to 51 *per cent* in 2010-11.

The main reasons for loss as analysed in Performance Audit were:

- faulty planning for modernisation of plants and mismatch in capacities of different linked plants and facilities;

- under utilisation of capacity due to shortage of working capital;

- failure to implement the arrangement for uninterrupted steady power supply;

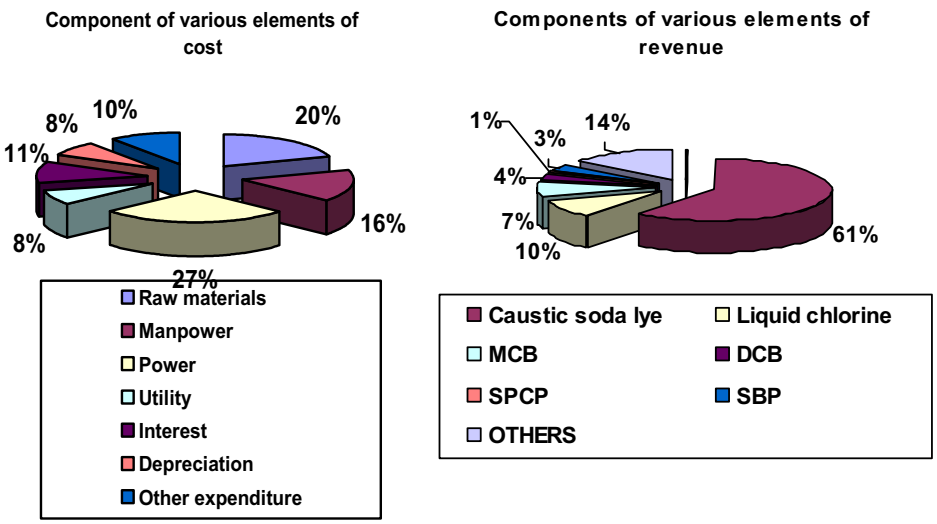
- excess consumption of raw materials and cost of utilities; and

- deficient sales policy and failure to meet the demands of the market.

These issues are discussed in subsequent paragraphs 2.2.20, 2.2.21, 2.2.25, 2.2.28, 2.2.29, 2.2.32, 2.2.36, 2.2.38, 2.2.39, and 2.2.40.

Elements of cost and revenue

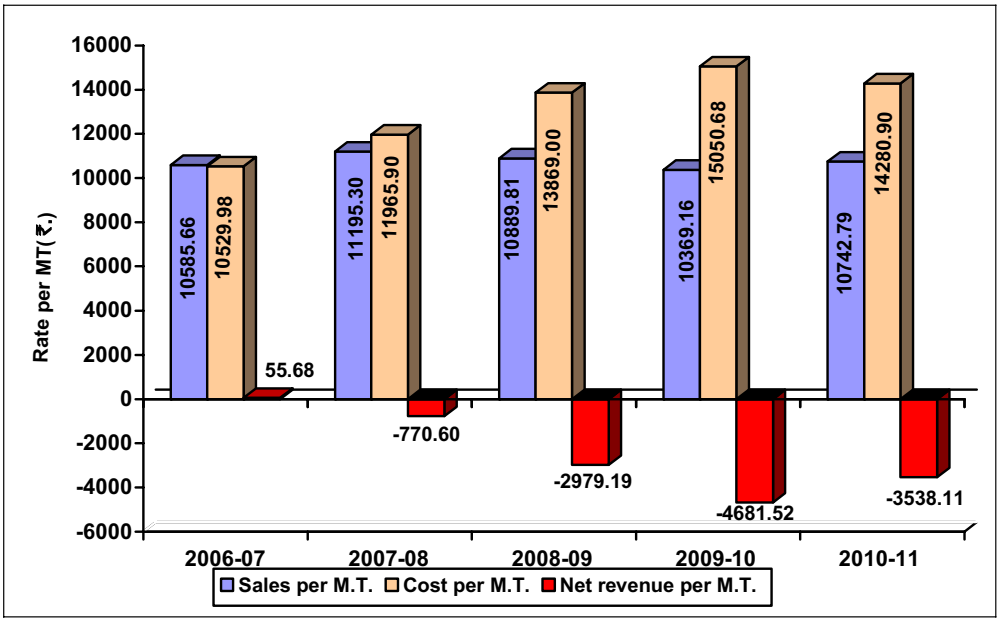
2.2.11 The percentage break-up of costs and revenue for 2010-11 is given below in the following pie charts.



During 2010-11 power, raw material and manpower cost constituted 63 *per cent* of total cost of the Company whereas sale of caustic soda lye, mono-chlorobenzene and liquid chlorine constituted 78 *per cent* of revenue.

Recovery of cost of operations

2.2.12 Sales per MT, cost per MT and net revenue from per MT production of different items during 2006-11 is depicted below.



Analysis of recovery of cost of operations revealed that net revenue of ₹ 55.68 per MT in 2006-07 turned into loss which increased from ₹ 770.60

in 2007-08 to ₹ 3,538.11 per MT in 2010-11 due to cost growth at CAGR[1] 6.25 *per cent* compared to growth of sales realisation at CAGR 0.30 *per cent*. The primary reasons for such poor financial health of the Company were high cost of raw materials, power and utility compared to those of their competitors and lack of flexibility of product mix that could fetch higher margins as discussed in paragraphs 2.2.30, 2.2.32 and 2.2.36.

Failure to avail financial incentive

2.2.13 The Company failed to avail incentive of ₹ 96.94 lakh towards industrial promotion assistance under West Bengal State Support for Industries Scheme, 2008 (Scheme) for expansion/ modernisation of 100 TPD membrane cell plant from 30 TPD mercury cell plant due to non-compliance with modalities specified under the Scheme.

Restructuring exercise

2.2.14 In order to revive the Company, the State Government appointed PriceWaterhouseCoopers (PWC) in December 2002 to suggest modalities of restructuring of the Company. PWC recommended (May 2003) a three pronged strategy of financial, administrative and business restructuring. These included:

Restructuring plans were implemented partially and belatedly, affecting production performance and profitability.

- improvement of capacity utilisation by enhancing operational efficiency,
- improvement of sales of downstream products like MCB, SBP, SPCP by intensive marketing in western parts of the country and exploring export potential,
- reduction of consumption of power by 200 units per MT in next two years in production of caustic soda lye,
- induction of professional management and introduction of variable pay structure with performance based increments,
- reduction of manpower from 798 to 347,
- reduction of State Government loan by converting it to equity and capital reduction with accumulated debit balance in the profit and loss account, and
- fresh investment for modernisation of caustic soda plant by conversion of mercury cell technology to membrane cell technology.

Though the State Government accepted the recommendation, no memorandum of understanding was signed between the Government and the Management for its implementation. The time schedule for implementation of the

[1] Compounded annual growth rate.

restructuring plan **(Annexure 12)** envisaged completion of the process by March 2006. The implementation of the financial, administrative and business restructuring is discussed in the subsequent paragraphs.

Financial restructuring

2.2.15 In order to achieve normative debt equity ratio of 1:1, the Company implemented the Capital restructuring plan formulated by PWC whereby the outstanding Loan and Interest of ₹ 369.92 crore as on 31 March 2007 was converted into Equity with the approval of the State Government in January 2005/ July 2007. With the approval of the Capital reduction scheme by Ministry of Corporate Affairs in June 2010, the Company adjusted the Accumulated Loss of ₹ 351.93 crore against the share capital. With the infusion of further Equity Capital of ₹ 34.20 crore by the State Government, the Share Capital and the Accumulated Loss stood at ₹ 57.28 crore and ₹ 56.22 crore respectively as on 31 March 2011.

With the above financial restructuring coupled with availing of loan (₹ 56.31 crore) from financial institution for execution of modernisation project the debt equity ratio of 0.02:1 in 2006-07 increased to 1.09:1 in 2010-11.

Administrative restructuring

2.2.16 PWC recommended (May 2003) administrative restructuring which included:

- Reducing manpower from existing strength of 798 to 347.
- Introduction of performance management system for measuring performance and adoption of a variable pay structure, linked to individual and Company performance.
- Induction of professional management with compensation package in line with industry standards.
- Development of organisational structure with aggregation of allied functions within a particular department.

The Company implemented (February 2004) early retirement scheme (ERS) for 429 employees with financial assistance (₹ 27.36 crore) from the State Government. Consequently, the Company earned profits in 2004-05 and 2005-06 with Company's employee cost to net sales being 11.05 *per cent* and 10.62 *per cent* respectively. Thereafter, it would be seen from **Annexure 13** that the Company's employee cost to net sales increased from 12 to 21.58 *per cent* during 2006-07 to 2010-11. The Company had not implemented performance linked variable pay structure. Instead, the State Government enhanced (October 2009) the pay structure of the Company's employees across the board at par with that of State Government employees based on Fifth Pay Commission recommendations.

During 2006-2010, the Company's competitors (ABCL and KCIL)[2] employee cost to net sales was ranged between 5.72 and 7.89 *per cent*. Considering the benchmark of seven *per cent*[3], the Company incurred extra expenditure of ₹ 26.06 crore during 2006-11. This led to the diversion of working capital to meet additional liability on employee cost with adverse impact on production. Besides, the Company was dependent (March 2011) on budgetary support of ₹ 13.30 crore to meet their liabilities, defeating the primary objective of restructuring.

2.2.17 Though PWC/ DPR suggested induction of professional management, key managerial posts like General Manager (Works), Chief Mechanical Engineer, Chief Electrical and Instrument Engineer, Manager (Production), Chief Chemist, Chemical Engineer, Manager (Sales & Purchase) and Personnel Manager are lying vacant. The post of Managing Director is being held (March 2010) by the Controller of Finance and Accounts as a Director in Charge leading to possibilities of conflict of interest in independent decision making. Moreover, organisational restructuring for allocation of related activities under particular departments by reducing duties of the MD in routine matters to allow him to concentrate on strategic decision making, was partially implemented.

The Management stated (November 2011) that poor compensation package and short term contract are main deterrent factors in attracting professional management at top and mid levels. The reply indicates that the Company failed to address the challenge by offering variable pay structure at par with the industry.

Business restructuring

2.2.18 The Company had a 30 tonne per day (TPD) caustic chlorine plant (CCP) commissioned in April 1968 based on mercury cell technology. Since this technology was old, power intensive and caused mercury pollution, the Company contemplated (November 1998/ January 2000) a technological upgradation-cum-expansion plan by installing a membrane cell plant in place of mercury cell plant. Further, the Ministry of Environment and Forest (MOEF) recommended (September 2002) phasing out of existing mercury based plants in the country by 2012. PWC also recommended in May 2003 that the Company should switch over to membrane cell technology by March 2006 to improve the financial viability of the Company. The Company therefore decided (May 2005) to replace the existing mercury cell by a 100 TPD membrane cell and entrusted the work of preparation of the DPR at a cost of ₹ 11 lakh to Development Consultants Private Limited (DCPL), which submitted the DPR in November 2005.

Implementation of membrane cell project

Time overrun

2.2.19 As per the DPR, the project was to be implemented at a cost of ₹ 61.56 crore and to be commissioned in May 2007 i.e. within 16 months from the date of financial closure of the project (February 2006). However, as the

[2] Aditya Birla Chemicals Limited (ABCL) and Kanoria Chemicals Industries limited (KCIL).
[3] Chemical industry norms in the country.

Company could mobilise adequate financial resources only by April 2007, they started implementing the project in April 2007, conducted the trial runs in November 2008 and started commercial production on 01 February 2009. The project suffered delay of 21 months in its execution. The time overrun of 21 months was attributable to delay in arrangement of finance (11 months) and handing over the project by the project consultant *viz.* Simon India Limited (10 months).

Despite presence of the project management consultant, activities were not synchronised and coordinated, resulting in civil works being completed in July 2008 and supply of materials in November 2008. Fifty-six suppliers delayed supply from three to 48 weeks beyond scheduled dates, but the Company did not levy liquidated damages of ₹ 2.52[4] crore in contravention of contractual provisions, reasons for which were not found on record.

The plant was commissioned in February 2009 with a delay of 21 months leading to loss of production of 36,337 MT of caustic soda with consequent contribution loss of ₹ 33.06 crore to the Company.

Cost overrun and consequent effects due to deviation from DPR

2.2.20 Details of actual expenditure incurred on project against estimates in DPR and excess expenditure incurred thereagainst are indicated below:-

Sl. No.	Item	Projected cost	Actual expenditure	Excess expenditure	Percentage of increase
		(₹ in crore)			
1	Plant and machinery including miscellaneous fixed assets	49.46	77.48	28.02	57
2	Building & Civil works with site development	3.20	3.77	0.57	18
3	Technical service	1.80	2.07	0.27	15
4	Preoperative expenses, contingency & startup	7.05	13.76	6.71	95
5	Preliminary expenses	0.05	0.25	0.20	412
		61.56	**97.33**	**35.77**	**58**

Delayed implementation of modernisation project led to time overrun of 21 months and extra expenditure of ₹ 35.77 crore.

It may be seen from the above table that actual project cost stood at ₹ 97.33 crore as against the estimated cost of ₹ 61.56 crore leading to excess expenditure of ₹ 35.77 crore mainly due to extra expenditure (₹ 28.02 crore) on procurement of major plant and machinery for 150 TPD membrane cell plant and cost escalation for preoperative expenses (₹ 6.71 crore).

It was also observed that without approval of the Government, the Company went ahead (November 2006) with the procurement of a higher capacity (150 TPD) membrane cell plant (MCP) as against the original plant with 100 TPD capacity, with an electrolyser of lower capacity (100TPD), 135 TPD capacity caustic soda concentration unit (February 2007), 150 TPD capacity rectifier (April 2007) and two dual fired boilers (February 2008) at a cost of

[4] After adjusting recovery of ₹ 17.27 lakh.

₹ 36.49 crore. This increased the cost of procurement of plant & machinery without adding to any further capacity of MCP.

To justify the purchase of 150 TPD plant, the Company got (January 2008) a revised DPR prepared for 150 TPD plant by DCPL at a cost of ₹ 12 lakh for which no approval of Government was taken. The revised cost of the project was estimated at ₹ 115.18 crore.

As against the revised cost of the project, the Company could mobilize only ₹ 95.01 crore and modernisation/ expansion activities of downstream plants could not be undertaken. This adversely affected the overall production capacity. The restructuring remained incomplete and partially effective as discussed in the following paragraphs 2.2.21, 2.2.23 and 2.2.25 to 2.2.28.

Mismatch in capacities projected as required and actually installed

2.2.21 The plant commissioned in November 2008 has the following capacity *vis-à-vis* the capacity as per DPR of November 2005 and revised DPR of January 2008.

Name of the plant/ components/ facilities	Required/ projected capacity as per DPR of November 2005	Required/ projected capacity as per DPR of January 2008	Actual capacity
Electrolysers	100 TPD	150 TPD	100 TPD
Chlorine liquefier	68.60 TPD[5]	116 TPD[6] *(required for 150 TPD CCP)*	55 TPD
Caustic concentration unit	100 TPD	150 TPD	135 TPD
Monochloro benzene plant	9,900 MT (On renovation/ upgradation of derated plant)	9,900 MT (On renovation/ upgradation of derated plant)	4,950 MT (De-rated)
Stable bleaching powder plant	4,950 MT	9,900 MT (With additional one reactor)	4,950 MT
Hydrochloric acid (100 *per cent*) plant	6,600 MT	6,600 MT	14,850 MT
Hydrogen bottling plant	50[7] lakh NM^3	81[8] lakh NM^3	23.76 lakh NM^3
Storage for salt	7,200 MT[9]	10,463 MT[10]	4,000 MT
Conveyer belt and bucket elevator in brine section	Each of 10 THP capacity (As standby for continuous process plant)	Each of 10 THP capacity.	Not installed.

[5] Against 88.60 TPD chlorine to be produced by a 100 TPD plant, 20 TPD would be used in HCl plant. No projection made in DPR for capacity augmentation of liquefier.
[6] Against 136 TPD chlorine that would be generated if a 150 TPD Caustic Chlorine Plant is installed, 20 TPD would be used in gaseous form for downstream products. No projection in DPR for capacity augmentation of liquifer.
[7] Surplus hydrogen for bottling: 50 lakh NM^3 (produced in electrolysis-92.10 lakh NM^3 *less* required in boiler-42.10 lakh NM^3).
[8] Surplus hydrogen for bottling: 81 lakh NM^3 (produced in electrolysis-144.14 lakh NM^3 *less* required in boiler-63.14 lakh NM^3).
[9] 45 days stock required @ 160 MT per day.
[10] 45 days stock required @ 232.50 MT per day.

As may be seen from the above, the Company neither followed the DPR of November 2005 in full nor the DPR of January 2008 in full. Having acquired the membrane cell plant for 150 TPD capacity, they installed electrolysers only for 100 TPD capacity in which case the capacity of Caustic Concentration Unit (CCU) should have been limited to corresponding capacity of 100 TPD whereas they installed the CCU at 135 TPD resulting in 35 TPD being the unused capacity of the plant.

While the DPR envisaged the capacity of 68.60 TPD for chlorine liquefier plant corresponding to the installed capacity of 100 TPD membrane cell plant, they installed chlorine liquefier plant only with the capacity of 55 TPD with which the membrane cell plant can be used only to the extent of 83 *per cent* of installed capacity leaving 17 *per cent* of capacity of membrane cell plant idle.

Further, the capacity of MCB plant was not increased to 9,900 tonnes *per annum* and against the anticipated capacity its capacity derated to 4,950 tonnes *per annum*. The capacity of hydrochloric acid (HCl) plant was increased to 14,850 MT as against the anticipated capacity of 6,600 MT per annum.

Mismatch in projected capacities rendered modernisation works incomplete affecting optimal production.

Consequently, the restructuring and modernisation activities remained incomplete. Further, on account of old and obsolete downstream plants and the capacity of chlorine liquefier not being enhanced, the Company could neither optimally increase production of caustic soda lye, the main product, nor the profitable downstream products like monochlorobenzene (MCB), dichlorobenzene (DCB), stable bleaching powder (SBP) and hydrogen, leading to the entire exercise being only partially effective on production front and non-viable on the financial front, even after substantial financial investment.

State of the art membrane cell plant

The Management stated (November 2011) that non enhancement of chlorine liquefier neither restricted production of CS lye nor MCB, DCB and HCl

plants as these plants did not require liquid chlorine. The contention overlooked the fact that against 88.60 TPD chlorine to be produced by a 100 TPD plant, targeted production by existing old MCB, DCB, SPCP plants and installed capacity of HCl plant could consume 25.16[11] TPD gaseous chlorine during 2008-11 leaving 63.44 TPD chlorine to be liquefied. Since the installed capacity of Chlorine liquefier remained at 55 TPD, the optimal production of CS lye had to be restricted in absence of adequate arrangement for liquefaction even if adequate salt and power was available. Creation of unused capacities of 50 TPD in the membrane cell plant and 35 TPD in CCU resulted in additional expenditure of ₹ 28.02 crore for purchase of plant and machinery which eroded the cash balance available with the Company, thereby restricting their liquidity position.

Performance of rectifier

2.2.22 As part of the membrane cell project, the Company procured a rectifier at a cost of ₹ 6.59 crore from JOC International Technical Engineering Company Limited (JOC), China who had guaranteed 99 *per cent* efficiency.

The agreement (April, 2007) with JOC provided for levy of liquidated damages towards non performance of equipment limited to five *per cent* of the total contract value. The efficiency of the new rectifier varied in the range of 70.65 *per cent* to 91.74 *per cent* during the period of its performance (December 2008 to March 2011) as against 99 *per cent* guaranteed and the loss of energy on this account upto March 2011 worked out to 2.27 crore units valued at ₹ 7.90 crore.

Rectifier

This was attributed (November 2011) by the Management to operation of the rectifier at 30 to 50 *per cent* of the rated capacity due to non commissioning of 50 TPD membrane cell.

The reply is not acceptable because **(i)** guaranteed rectifier efficiency implied that rectifier should able to convert 99 *per cent* of AC power into DC power which was never achieved since its commissioning. **(ii)** Rectifier efficiency was not linked to plant capacity or additional load in case of expansion of membrane plant. **(iii)** Moreover when the existing 100 TPD plant operated at 100 per cent capacity for few days (during July & August 2010) the rectifier efficiency was 82 to 88 *per cent*.

Effect of non-installation of additional chlorine liquefier

2.2.23 Chlorine and hydrogen gas are by-products inevitably produced during the production of caustic soda. Caustic soda and chlorine have different end

[11] MCB, DCB, SPCP plants: 5.16TPD and HCl plant: 20 TPD.

uses with differing market dynamics and demand for the two rarely coincides. The Indian chlor-alkali industry is driven by the demand for caustic soda rather than that for chlorine.

Therefore production of caustic soda entirely depends on the utilisation of chlorine produced through electrolysis, which being a hazardous gas cannot be vented out in the atmosphere. In the process adopted by the Company for utilisation of chlorine gas, it was first cooled and compressed for liquefaction and then used in downstream plants including sale of liquid chlorine to other consumers besides use of gaseous chlorine in hydrochloric acid (HCl) plant.

However, in the DPR (November 2005), the enhancement of chlorine liquefier capacity from the current 55 TPD was not envisaged though the production of gaseous chlorine was scheduled to increase from 27 TPD to 88.60 TPD.

Therefore, the Company was compelled to divert excess chlorine to HCl plant for production of the less profitable HCl leading to reduced profitability as discussed in paragraph 2.2.26 and 2.2.28.

We conclude that restructuring plans were implemented partially with substantial delay of 21 months for execution of modernisation project leading to extra expenditure of ₹ 35.77 crore. Deviations from the DPR (100 TPD) during implementation caused mismatch in capacities of the plants. These led to a liquidity crunch and affected profitability of the Company.

Recommendations :-

- *Company may consider implementing the project completely, avoiding mismatch of capacities of the plants, within the anticipated cost and scheduled timeframe.*

Production performance

Production planning

2.2.24 Based on market dynamics, sales targets, production capacity of respective plants and contribution of each product, the Company planned production targets at the beginning of each financial year. The details of year wise target and achievement of production of four major products *viz*. CS Lye, MCB, DCB and SBP during the last five years upto 2010-11 are tabulated as follows:

Sl. No.	Name of the product	2006-07		2007-08		2008-09		2009-10		2010-11	
		Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement
1	CS Lye	11,075 (110)	11,164 (101)	11,810 (118)	10,746 (91)	24,512 (125)	11,783 (48)	37,951 (115)	20,665 (54)	34,806 (105)	20,873 (60)
2	MCB	2,520 (51)	1,320 (52)	2,500 (51)	2,242 (90)	3,960 (80)	1,740 (44)	6,997 (141)	2,370 (34)	3,600 (73)	778 (22)
3	DCB	800 (32)	571 (71)	900 (36)	413 (46)	1,485 (60)	495 (33)	2,608 (105)	772 (30)	900 (36)	530 (59)
4	SBP	3,600 (73)	2,557 (71)	3,200 (65)	2,327 (73)	5,000 (101)	2,250 (45)	5,600 (113)	2,035 (41)	3,600 (73)	2,079 (58)

Figures in bracket represents the percentage of target to installed capacity and achievement to target.

It would be seen from the above that in case of CS Lye production targets were fixed at 105 to 125 *per cent* of installed capacity while the achievement against target after installation of membrane plant was ranging between 48 and 60 *per cent*. This indicated unrealistic fixation of targets.

In downstream plants (MCB, DCB and SBP), production targets were fixed below the installed capacity except in 2009-10. However, targets were not achieved during 2006-07 to 2010-11 due to under-utilisation of capacity of CCP since direct use of gaseous chlorine from CCP was not provided for, insufficient liquefaction capacity of chlorine was available as well as diversion of chlorine produced to hydrochloric acid plant.

The Management stated (November 2011) that targets were fixed on optimistic assumption of higher capacity utilisation of plants which remained unachieved due to non receipt of required quantum of uninterrupted power after commissioning of membrane cell plant.

The Management's response admits that they could not arrange for uninterrupted power even though the DPR envisaged a captive power plant as part of the modernisation process.

The flowchart of the production processes, as is being used currently, is shown in **Annexure 14**.

Production of Caustic Soda Lye

2.2.25 The main product, CS lye is produced in electrolysers by electrolysis of purified brine[12] prepared with salt and water using electricity. The mercury cell plant with capacity of 10,050 MT *per annum* was replaced in November 2008 by a membrane cell plant with capacity of 33,000 MT *per annum*. The subsequent table indicates the installed capacity, actual production, capacity utilisation, norms fixed by DPR and shortfall in production of caustic soda for the years 2006 – 11:

[12] At 32 *per cent* concentration.

Year	Installed capacity (MT)	Actual production (MT)		Capacity utilisation (Percentage)	Projected production as per DPR	Shortfall in production (MT)	Loss of production (₹ in lakh)	Captive Consumption (MT)	
		Mercury plant	Membrane plant					Mercury Plant	Membrane Plant
1	2	3		4	5	6 (5-3)	7	8	9
2006-07	10,050	11,164	-	111	-	-	-	414 (3.71)	-
2007–08	10,050	10,746	-	107	23,100	12,354	2,681.07	312 (2.90)	-
2008–09	5,862[13] 13,750[14]	4,560	 7,223	78 53	29,700	17,917	4,029.35	115 (2.52)	192 (2.66)
2009–10	33,000	-	20,665	63	29,700	9,035	1,982.91	-	496 (2.40)
2010–11	33,000	-	20,873	63	29,700	8,827	1,607.75	-	537 (2.57)
		26,470	**48,761**					**841**	**1,225**
	1,05,712	**75,231**		**71**	**1,12,200**	**48,133**	**10,301.08**	**2,066**	

Figures in bracket indicate percentage of captive consumption.

During 2006–07 and 2007–08, capacity utilisation of mercury cell plant was satisfactory. However, as per DPR, the mercury plant was to be replaced by membrane cell plant (MCP) by March 2007, in which case the achievable production of CS lye should have been 23,100 MT (at 70 *per cent* capacity utilization during the first year of production) against the actual production of 10,746 MT in 2007-08. This led to a potential loss of production of 12,354 MT costing ₹ 26.81 crore. The loss of contribution was ₹ 5.84 [15]crore.

Production loss of 35,779 MT CS lye due to delayed modernisation of CCP with consequential loss of ₹10.45 crore to the Company.

After installation of MCP, the actual capacity utilisation varied between 53 to 63 *per cent* during 2008–09 to 2010–11 which was short by 35,779 MT compared to achievable production as per DPR. The loss of revenue on account of shortfall of production of 35,779 MT CS lye was ₹ 76.20 crore with potential loss of contribution of ₹ 10.45 [16]crore.

While delay in conversion of mercury cell plant to MCP led to loss of potential production, actual loss of revenue, after installation of MCP, was due to inadequate provision to utilise hazardous by-product chlorine in downstream plants either in liquefied or gaseous form and shortage of working capital.

Production of Chlorine

2.2.26 Chlorine and hydrogen are two by-products in the process of manufacture of CS lye. As already mentioned in paragraphs 2.2.21 and 2.2.23, adequate arrangements are required in the downstream plants of chlor-alkali industry for utilisation of chlorine. In production of one MT CS lye in CCP, 0.9 MT chlorine is discharged at anode of electrolyser. CCP of the Company, when operational in full capacity after modernisation, would produce 29,700 MT chlorine annually.

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[13] For mercury plant upto September 2008.
[14] For Membrane Cell plant from November 2008 to March 2009.
[15] Production shortfall- 12,354 MT X ₹ 4,727 being the contribution per MT.
[16] Loss of contribution: 17,917 MT X ₹ 4,098 (2008-09) *plus* 9035 MT X ₹ 2,725 (2009-10) plus 8,827MT X ₹ 733 (2010-11) = ₹ 10.45 crore.

The production of chlorine and its utilisation for the last five years upto 2010-11 are shown in **Annexure 15**.

It would be seen from the Annexure 15 that the utilisation of chlorine in HCl plant during 2006-11 ranged between 21.05 to 35.36 *per cent* of chlorine produced, while in case of MCB/ DCB plant it varied between 5.78 to 19.41 *per cent.* In case of SBP plant, it was 4.58 to 10.64 *per cent*.

However, the sales realisation (₹ 14.71 crore) through HCl could recover value of chlorine consumed (₹ 10.92 crore) but the product could not generate positive contribution in any period under review. Since the Company installed 45 TPD of HCl plant (100 *per cent* concentration) in deviation from DPR which proposed 20 TPD capacity, the Company should endeavor for value addition of HCl by diversifying into production of aluminum chloride.

Faulty planning for chlorine neutralisation led to shortfall in production of value added product.

Further, scrutiny of contribution analysis of MCB/ DCB and SBP plants for the period 2009-11 revealed that the Company earned either positive contribution or better realisation of chlorine consumed in each such product. All those down stream plants could have been run at 90 *per cent* capacity with chlorine produced, if direct sale of liquid chlorine, which had lesser realisation than the products of MCB, DCB and SBP plants, was restricted.

The Management stated (November 2011) that decision to utilise chlorine in downstream plants depended upon market dynamics, logistical advantages and variation in demand.

For prioritising chlorine utilisation in HCl plant in lieu of MCB, DCB and SBP plants, the argument put forth by the Company is factually incorrect as they failed to earn any contribution in HCl during 2006-11 whereas all those three products registered positive contribution [17] throughout the period. Moreover, the fact that the Company could sell all downstream products with sufficient margin indicates that there was no constraint in demand despite being located far from the consumption centres.

Production of Hydrogen

2.2.27 In production of 1 MT CS Lye, 280 normal cubic meter (NM^3) hydrogen is released at the cathode aggregating to 92.40 lakh NM^3 hydrogen annually. Some portion of this hydrogen is used for utilisation of chlorine for manufacturing hydrochloric acid (33 *per cent* concentration), while another portion is compressed in hydrogen bottling plant and sold as end product. Remaining portions of hydrogen are either burnt as fuel in the boiler of caustic concentration unit or simply vented to the atmosphere, in absence of better means of utilisation.

The production of hydrogen and its utilisation for the last five years upto 2010-11 are shown in **Annexure 16**.

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[17] Contribution earned in MCB: ₹ 1,805 to ₹ 4,816/ MT; DCB: ₹ 70 to ₹ 4,216/ MT and SBP: ₹ 441 to ₹ 1,146/ MT.

It would be seen from Annexure 16 that the capacity utilisation of hydrogen bottling plant ranged between 18 to 29 *per cent* during 2006-07 to 2010-11 resulting in wasteful venting of 61.24 lakh NM^3 hydrogen in the atmosphere while the demand of hydrogen in the market was gradually increasing and the market price of hydrogen increased from ₹ 14.58 in 2006-07 to ₹ 25.85 in 2010-11 per NM^3.

Faulty planning led to wasteful venting of hydrogen valued at ₹ 10.91 crore.

This resulted in loss of revenue of ₹ 10.91 crore due to non-utilisation of 56.42[18] lakh NM^3 hydrogen produced which was vented to the atmosphere.

The Company could not meet the requirement of 44.55[19] lakh NM^3 hydrogen in the boiler despite availability of 49.24 lakh NM^3during 2008-09 to 2010-11 due to their failure to maintain required pressure level of hydrogen and chlorine in CCP.

The Management stated (November 2011) that in view of limited market demand they were initially planning to burn surplus hydrogen in dual fired boiler. Since the demand and sales realisation of bottled hydrogen improved subsequently, use of hydrogen as fuel got less priority. Moreover most of the reported wastage of hydrogen and its non-utilisation in boiler were due to low pressure arising from low capacity utilisation of CCP and power restriction.

The reply is not supported by facts since sales of bottled hydrogen fell short of the target[20] by 29 *per cent* during 2007-11. **To prevent wasteful venting of hydrogen and maintain hydrogen pressure in boiler, utilisation should be first for the boiler, then for bottling plant and lastly for HCl plant.** As mentioned in paragraphs 2.2.21, 2.2.23 and 2.2.26, **in absence of adequate capacity of liquefier, chlorine neutralisation got priority and 45 *per cent* of hydrogen was sent to HCl plant whereas bottling plant and boiler received 10 and 12 *per cent* of hydrogen produced respectively during 2008-11 indicating production planning was against the industry practice.**

Production performance in downstream plants

2.2.28 The Company produced mainly three downstream chlorinated products *viz.* monochloro benzene (MCB), dichloro benzene (DCB) and stable bleaching powder (SBP). The installed/ annual capacity, target, actual production and shortfall in production to target in respect of MCB, DCB and SBP plants during 2006-11 is given in **Annexure 17**.

Company suffered contribution loss of ₹ 4.45 crore in MCB, DCB and SBP.

It could be seen from the Annexure 17 that the Company could attain 43 (MCB), 42 (DCB) and 54 (SBP) *per cent* of production targets for the past five years upto 2010-11. This shortfall in production resulted in loss of production of 21,911 MT[21] valuing ₹ 57.11 crore and contribution forgone of ₹ 4.45 crore based on average sale price of the respective years. We analysed the following reasons for the shortfall :-

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[18] Hydrogen vented out during 2006-07 (6.03 lakh NM^3), 2007-08 (5.96 lakh NM^3), 2008-09 (7.56 lakh NM^3), 2009-10 (19.57 lakh NM^3 i.e. Col. 8-col. 5) and 2010-11 (17.30 lakh NM^3 i.e. Col. 8-Col. 5) of Annexure 16.

[19] The difference between hydrogen gas required for boiler (62.20 lakh NM^3) and utilized in boiler (17.65 lakh NM^3).

[20] Sales target were fixed based on market demand.

[21] MCB : 9,080 MT, DCB : 3,779 MT and SBP : 9,052 MT.

- Modernisation/ major renovation of the downstream MCB and DCB plants to enhance chlorine consumption was not undertaken. Consequently, quality and quantity of output could not be maintained due to damaged equipments[22] and lack of preventive maintenance.

- Due to insufficient storage capacity of hydrochloric acid, the MCB/ DCB plants remained idle or were operated intermittently.

- A circuit for separation of DCB from MCB and removing the presence of HCl was not functional.

- During 2006-07 to 2009-10, the Company could not raise production of SBP to its optimum level due to diversion of chlorine to HCl plant and shortage of lime.

The Management stated (November 2011) that there was no further scope for additional production since capacity utilisation of downstream plants in the industry was based on value addition and availability of market. The contention was not correct as the action taken in production planning of down stream products during 2006-11 was against the industry practice of maximising value addition. Moreover, other competitors either increased SBP production or opened new units, indicating adequate demand in the market.

Excess consumption of raw materials, chemicals and caustic soda

2.2.29 The Company consumed raw materials, chemicals and caustic soda in excess of industrial standards valuing ₹ 14.95 crore as detailed below:

(Figures in MT)

Raw materials, chemicals and caustic soda	**Industrial standard for item's use (to produce one MT of end product)**	**DCL's usage (in MT/ percentage)**	**Excess consumption between 2006-2011**	**Financial implication (₹ in crore)**
Industrial salt	1.55	1.85 – 1.95	15,060.00	4.89
Benzene for MCB	0.693	0.709 to 0.723	332.77	1.37
Benzene for DCB	0.530	0.575 to 0.590		
Hydrochloric acid	0.06	0.064 to 0.162	4,025.23	0.95
Sodium carbonate	0.0035	0.0068 to 0.0085	178.00	0.33
Sodium sulphite	0.0011	0.0018 to 0.0047	109.76	0.38
Caustic soda				
(a) Captive consumption	0.015	0.024 to 0.027	493.57	1.00
(b) Sodium hypochlorite plant (SHC)	Two *per cent* of total chlorine output	4.84 per cent	2,792.98	6.03
Total			**22,992.31**	**14.95**

[22] . Re-boiler, storages, pipe lines, two distillation columns, existing control valves etc.

Avoidable expenditure of ₹ 14.95 crore on excess consumption of salt, chemicals and caustic soda.

The excess consumption was due to (i) frequent tripping of power, (ii) presence of high quantity of impurities and insoluble particles, (iii) brine leakage from the gland of slurry pump, clarified brine pump and return brine pump, (iv) poor quality of salt, (v) draining of vertical saturator, (vi) wastage of salt during handling at improper place outside the godown, (vii) running of plant below 80 *per cent* capacity, (viii) washing out of salt during heavy rain, (ix) low capacity of brine pit, (x) break down of caustic circulation pump, chiller machine/ boiler problem and D.M. water fluctuation, (xi) frequent stoppage and shut down of the plant and (xii) failure to restrict the consumption of caustic soda in brine purification/ effluent treatment and excess chlorine consumption in SHC plant. The Company did not ensure the quality of salt at the time of inspection.

This indicates inadequate internal control on quality check and quantum of usage of raw materials, chemicals and caustic soda in production of caustic soda, MCB, DCB and sodium hypochlorite (SHC).

Admitting the fact of excess consumption the Management stated (November 2011) that the loss worked out in case of SHC did not consider their sales proceeds which was actually a cost towards environment protection. The argument was faulty as the chlorine could have been neutralised and the environment protected as well by utilising the chlorine in production of various other downstream products where returns would have been more. It would also have minimised loss by reducing consumption of CS lye which is a costlier input.

In conclusion we found that capacity utilisation of caustic chlorine plant was 71 *per cent* and that of MCB, DCB and SBP plants were 43, 22 and 54 *per cent* during 2006-11 resulting in production loss of 70,044 MT valued ₹ 160.12 crore with contribution loss of ₹ 20.74 crore suffered by the Company. Poor production performance was attributed to delay/ non completion of plant modernisation, inadequate provision to utilise byproducts, shortage of storage capacity and working capital.

Further, we observed that consumption of 22,992 MT excess salt, benzene, caustic soda and other chemicals over industry norms led to avoidable expenditure of ₹ 14.95 crore during 2006-11.

Recommendations :-

- *The Company may consider optimising the production of chlorine by exploring the possibility of alternative usage and priorities hydrogen utilisation in value added product/ facilities.*
- *Arrest loss of hours due to controllable factors by introducing preventive measures in different plants/ facilities.*

Procurement of salt

Procurement of salt

2.2.30 The Company has an approved purchase policy which stipulates that procurement of raw materials for rupees two lakh and more should be done through

press advertisement in at least three leading news papers and subsequent evaluation of bids by tender committee. The Central Vigilance Commission guidelines also provided (January 2002) that purchases on single tender basis required detailed justification in its support. Salt being the primary raw material, constituted 16 to 29 *per cent* of input cost of caustic soda during 2006-2011. The Company's procurement cost of salt was 16 to 75 *per cent* higher than that of their competitors in the region during the same period as shown in the chart below.

(Average Rate: ₹ per MT)

Name of the manufacturers	2006-07	2007-08	2008-09	2009-10	2010-11
ABCL[23]	1,825	1,864	2,269	2,187	2,064
KCIL[24]	1,555	1,728	1,747	2,092	2,097
DCL[25]	2,110	2,361	3,052	3,464	2,779

The Company incurred extra expenditure of ₹ 5.10 crore by purchasing salt largely from a single vendor at 16 to 75 *per cent* higher prices than their competitors.

The Company did not follow the prescribed procedure for procurement of salt and we observed that the Company continued to procure the salt from the single source of supply Ankur Business Private Limited (ABPL) for the last five years. We noticed that average landed price[26] of industrial salt from Gujarat ranged from ₹ 1,989 to ₹ 2,581 per MT during 2006-10 as against the Company's average procurement price of ₹ 2,110 to ₹ 3,464 per MT from traders during this period. Procurement of salt through competitive bidding would have enabled the Company to save ₹ 5.10 crore in procurement of 93,807 MT of salt during the period 2006-07 to 2009-10. Yet, the Company had not prepared detailed justification in support of these purchases at higher prices from a trader.

Moreover, ABPL repeatedly failed to deliver the entire ordered quantity on time. Though 63 *per cent* of the ordered quantity was delivered after scheduled delivery periods, the Company failed to recover ₹ 95.84 lakh from the party due to non-imposition of penalty.

The Management replied (November 2011) that the Company had a strong system of procurement under which a designated committee represented by all concerned departments procured salt and lime with wide circulation of tender notice. Further, comparison of procurement cost with that of ABCL and KCIL was not fair due to difference in distance, high overhead and material handling cost for direct sourcing of salt from Gujarat for a low capacity plant of the Company, flexibility in making purchase decision by the competitors and relaxed norms followed by them to comply with purchase procedures. They further added that cost-benefit analysis of direct procurement of salt from Gujarat indicated expected benefit would be much less than incremental cost.

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[23] Aditya Birla Chemicals Limited
[24] Kanoria Chemicals Industries Limited.
[25] Durgapur Chemicals Limited.
[26] Landed price comprising of base price of salt at Gandhidham, Gujarat, railway freight, material handling cost at both ends and cost of working capital. *(Source: Annual reports of Salt Department, Ministry of Commerce & Industry, Government of India, Railway freight table and actual loading/ unloading cost.)*

The reply was hypothetical because landed price comprising of base price[27] of salt at Gandhidham, Gujarat, railway freight, material handling cost at both ends and cost of working capital was six to 26 *per cent* lower than the procurement cost of the Company.

In 2010-2011, the Company selected other traders for supplying salt and procured 81,000 MT of salt from four salt traders at lower rates (₹ 2,925/ ₹ 2,645/ ₹ 2,600 per MT) than that of ABPL. However, ABPL still supplied 11,109 MT salt at the rate of ₹ 3,100 per MT in 2010-11 against earlier orders.

Thus, the Company had to incur an extra expenditure of ₹ 19.44[28] lakh in procuring 11,109 MT salt from ABPL during 2010-11 due to delay in expansion of vendor base, dependence on a single party and undue favour shown.

Inadequate stock holding

2.2.31 The Company failed to maintain stock of salt required for production level of, at least, 80 per *cent* of installed capacity of CCP, as per standard operation manual of original equipment manufacturer, resulting in risk to the life and compromising efficiency of the new membrane cell plant.

Analysis of monthly consumption of salt revealed that after installation of new plant, closing balance of salt in each month fell short of 45 days requirement (7,200 MT as per DPR), actually ranging from nil stock to 6,835 MT during July 2009 to March 2011 except in November and December 2009.

We observed that the Company relied on a single vendor for procurement of salt during 2006-11 at 16 to 75 per cent higher prices than their competitors. Loss due to purchase from traders instead of direct purchase from manufacturers amounted to ₹ 5.10 crore during 2006-10.

Recommendation :-

Company may consider to:

- *procure salt directly from Gujarat instead of depending on traders;*
- *plan its procurement and production activities simultaneously so that adequate stocks are maintained to ensure continuous flow of production.*

Energy management

Absence of alternative to high cost power

2.2.32 The Company being a power intensive industry had a contract demand of 7,000 KVA from 11 KV line. To meet the demand of expanded

[27] 'Annual reports of Salt Department', Ministry of Commerce & Industry, Government of India.
[28] 11,109 MTX ₹ 175 (being the differential rate of ABPL and highest bidder of the tender).

capacity of membrane cell plant, the contract demand was enhanced (October 2008) to 14,900 KVA from a 33 KV line by surrendering 11 KV line.

Energy cost constituted 39 to 48 *per cent* of total input cost of production during 2006-11. The DPR had recommended that cheap power source, preferably captive power plant, may be ensured. However, the Company relied solely on DPL for additional source of continuous power.

The DPR worked out the profitability of the project envisaging power cost of ₹ 2.25 to ₹ 3 per unit, against which the actual cost per unit ranged between ₹ 2.90 to ₹ 4.01 per unit during November 2008 to March 2011.

Though the other manufacturers of CS lye in the eastern region have their own captive power plant and had managed to restrict their power cost at ₹ 2.05 to ₹ 2.20 per unit, the Company made no effort to combat increased power cost.

The Company's power cost per MT was highest amongst their competitors in the industry resulting in lower margin.

Moreover, power sourced from DPL was erratic and membrane cell plant was shut down for 1,223 hours (25 *per cent* of total hours lost during last five years) for want of power, voltage fluctuation *etc*. during 2006-11.

Resultantly, the Company had highest power cost per MT which ranged between ₹ 9,519 to ₹ 10,997 during 2008-09 to 2010-11 compared to their competitors'[29] cost of ₹ 4,030 to ₹ 5,476 per MT.

Excess consumption of power

2.2.33 Upto September 2008 the Company on an average consumed monthly 37.71 lakh units power and thereafter 50.75 lakh units. Nearly 74 to 87 *per cent* of electrical energy was consumed for electrolysis of brine for caustic soda production and the balance 13 to 26 *per cent* for other auxiliaries like compressors, pumps, boilers, blowers *etc*. For direct heating in CCP and steam generation in boilers, furnace oil was used.

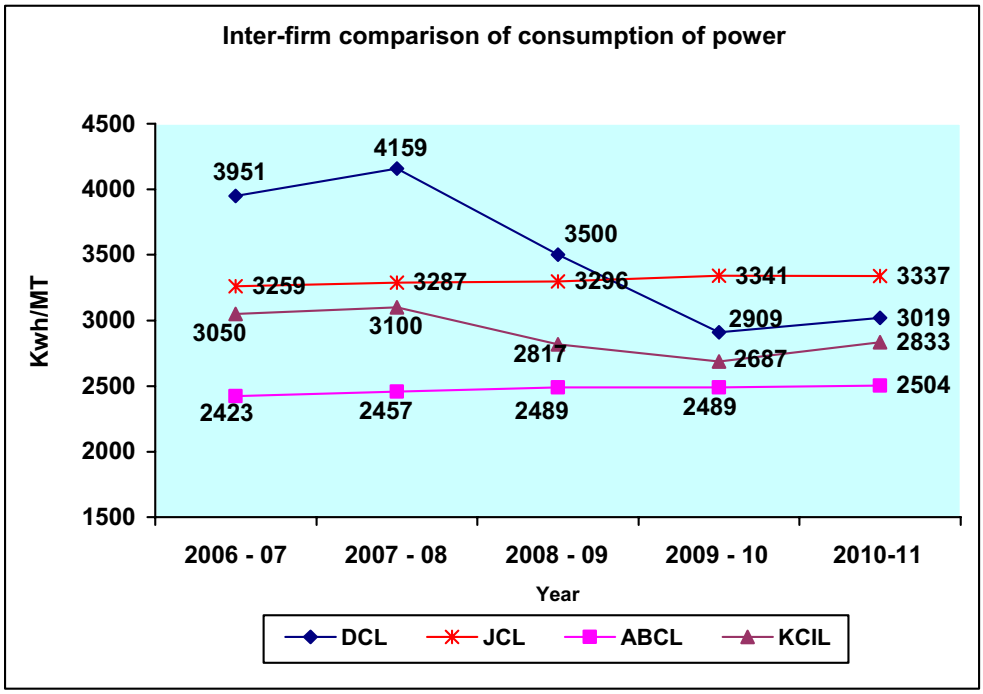
Although it can be reasonably expected that energy intensive industries should make all efforts to minimise energy consumption through constant monitoring of consumption by different sub-sections, the Company did not have separate meters for measurement of consumption by various auxiliary plants. Only the gross consumption and electrolyser consumption was metered and auxiliary consumption was allocated on ad-hoc basis.

The Company consumed energy in excess of the norms valued at ₹ 9.69 crore.

Consumption of power during 2006-07 to 2010-11 revealed that against the designed norm of mercury and membrane plant at 3,400 and 2,500 Kwh/ MT respectively, the actual month wise consumption in mercury plant varied between 3,771 and 4,548 Kwh/MT and in membrane plant between 2,803 and 3,471 Kwh/MT. Compared to norms, the excess consumption of power by the two plants of the Company during the five years upto March 2011 worked out to 29.95 million units valued at ₹ 9.69 crore. In comparison, another caustic

[29] Aditya Birla Chemicals Limited (ABCL) and Kanoria Chemicals Industries Limited (KCIL).

soda manufacturer (Jayshree Chemicals Limited, Orissa - JCL) adopting mercury cell technology consumed 3,259 to 3,341 Kwh/MT power during 2006-07 to 2009-10 and other manufacturers having membrane cell technology consumed 2,489 to 2,504 Kwh/ MT (ABCL) and 2,817 to 2,833 Kwh/ MT (KCIL) power during the period 2008-09 to 2010-11 as shown in chart as follows:-



While percentages of cost of power and fuel to net sales of the competitors ranged from two to eight *per cent* (ABCL) and 15 to 19 *per cent* (KCIL), these varied between 35 and 44 *per cent* in case of the Company resulting in lower margins than the competitors.

Admitting the fact that power consumption per MT was marginally higher in 2009-10 than the competitors the Management stated (November 2011) that this was due to frequent power restriction/ tripping, low capacity utilisation of electrolyser and higher auxiliary consumption compared to production. Further, the Management assured to install separate meters for downstream plants.

The reply overlooked the fact that during 2006-11 power restriction was only three *per cent* (1,223 hr.) of total available hours (39,600 hr.) and actual power consumption (2,909 Kwh/ MT) in 2009-10 was 16 *per cent* higher than designed norm (2,500 Kwh/ MT) of membrane cell plant.

Higher cost of steam

2.2.34 The cost of utility comprising of furnace oil, water and coal increased abnormally during December 2008 to March 2011 due to higher consumption of costlier furnace oil in the boiler instead of coal as proposed in the DPR.

The DPR envisaged installation of a new low pressure coal fired boiler to meet additional demand of steam of six to seven tons per hour for concentrating CS

lye from 32 to 50 *per cent*. In deviation to this, the Company installed dual fired boiler and used 3,642.98 MT furnace oil (FO) valued ₹ 10 crore to produce 42,027.85 MT steam during this period. For production of similar quantity of steam, it would require 7,617.81 MT of coal valued at ₹ 2.52 crore.

Extra expenditure of ₹ 7.48 crore on steam generation due to use of costly furnace oil instead of cheaper coal.

Thus, the Company incurred extra expenditure of ₹ 7.48 crore to generate equivalent quantity of steam by using furnace oil instead of coal.

Ill planned usage of dual fired boilers

2.2.35 Notwithstanding the suggestion in the DPR regarding boiler, the Company decided that in order to better utilise the hydrogen produced as a by-product, it should be used as a component of the fuel for boilers. Accordingly, two dual fired boilers were installed at a cost of ₹ 3.27 crore. These were to be operated using both furnace oil and hydrogen as feed fuel in the ratio of 30:70.

Since chlorine and hydrogen are produced simultaneously during electrolysis of brine, chlorine being a hazardous gas has to be utilised on priority. In the absence of a well-planned attempt to utilise increased production of chlorine profitably, additional chlorine was sent to HCl plant to react with hydrogen and produce hydrochloric acid.

This reduced the availability of hydrogen for the boiler, which required additional FO, resulting in increase in input cost. The HCl which was produced using the diverted hydrogen was a less profitable product, further reducing profitability.

As a fall out of this deficient planning, out of additional 136.53[30] lakh normal cubic meter (NM^3) of hydrogen generated from CCP during November 2008 to March 2011, only 17.65[31] lakh NM^3 could be utilised in the boilers against the requirement of 62.20 lakh NM^3. The Company incurred additional expenditure of ₹ 3.21 crore on FO (1,175.67 MT) which was utilised to meet the shortage of 44.55 lakh NM^3 of hydrogen.

Thus, due to lacunae in planning while installing dual fired boilers, not only did the Company incur more cost on dual fired boilers as compared to coal fired boiler, but also incurred avoidable expense on FO.

Uneconomic cost of utility

2.2.36 While other manufacturers of caustic soda in the eastern region restricted the cost of utility during 2006-07 to 2010-11 in the range of ₹ 41 to ₹ 118 per MT on production of caustic soda, the Company incurred cost between ₹ 1,092 and ₹ 2,817 per MT as shown in following chart:-

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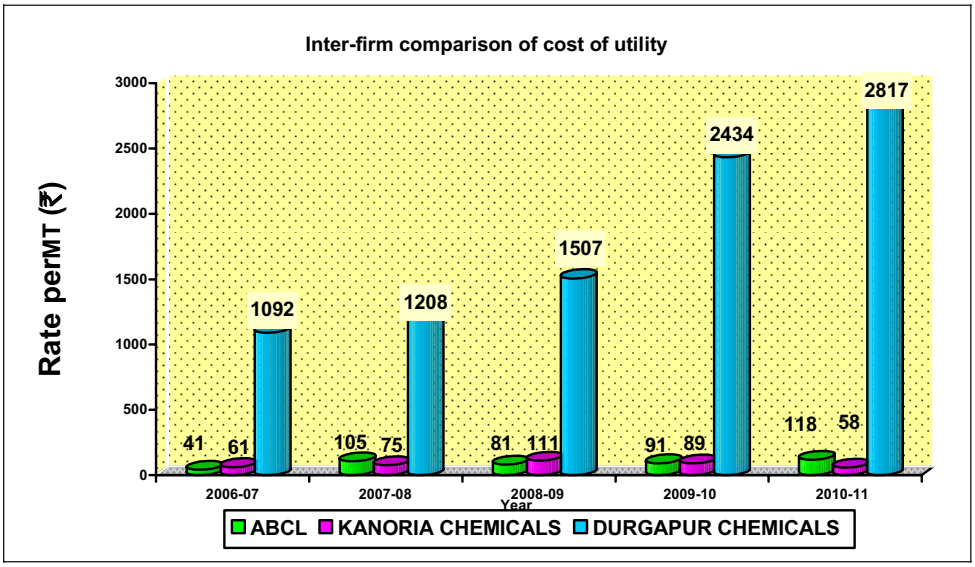
[30] Based on norms of 280 NM^3 hydrogen generated for production of one MT caustic soda, 136.53 lakh NM^3 hydrogen was produced from 48,761 MT caustic soda during 2008-11.
[31] Refer to Annexure 16.



Resultantly the Company incurred 11 to 49 times higher cost than their competitors on the cost of utility due to non-utilisation of hydrogen and excess consumption of FO in the boiler.

Coke oven gas (COG) produced by DPL could have substituted costly FO which was not considered.

The Management stated (November 2011) that due to non availability of required quantum of coal, coal fired boiler was not considered. Moreover, hydrogen was not made available for the boiler due to lower capacity utilisation of CCP, high demand of bottled hydrogen and higher consumption in HCl plant. Further, to reduce the cost of steam the Management was contemplating to bring COG from DPL.

The contention is not acceptable because the Company had not placed a coal fired boiler and instead decided to install dual fired boiler to use hydrogen as main fuel and FO as start up fuel. Non availability of adequate hydrogen was due to (a) non utilisation of 100 TPD CCP and (b) indiscretion in priortising use of hydrogen in HCl plant in lieu of its utilisation in the boiler. This led to higher cost of steam, utility and non utilisation of 44.55 lakh NM^3 available hydrogen.

We noticed that the Company's power cost per MT (39 to 48 *per cent* of total cost of production) was highest amongst their competitors in the industry resulting in lower margin. Besides, the Company consumed energy in excess of the norms valued at ₹ 9.69 crore during 2006-11. Further, they had incurred extra expenditure of ₹ 7.48 crore on steam generation due to use of costly furnace oil instead of cheaper coal.

Recommendation :-

- *Take initiatives for ensuring uninterrupted power supply at cheaper rate in consultation with the State Government or install a captive power plant.*

Sales performance

Sales policy

2.2.37 The Company sells their products through annual contracts and in the open market. For open market sales, they determine monthly product prices after considering their prevailing market prices, demand and contribution from each product through a Pricing Committee (PC) chaired by the Managing Director. In the case of annual contracts, rates are recommended by PC based on monthly price lists and approved by the Company's Board of Directors.

The targeted and actual sales *vis-a-vis* production of five main products during the five years upto 2010-11 are given in **Annexure 18**. It would be seen from the Annexure that under achievement *vis-a-vis* sales targets during the period ranged between 14 and 52 *per cent* in case of CS lye, 16 and 63 *per cent* for liquid chlorine, 25 and 60 *per cent* for SBP, 11 and 76 *per cent* for MCB and 30 and 70 *per cent* for DCB due to under-utilisation of plant capacities.

In this connection the following points were also noticed.

- During 2006-11 actual sales realisation of all the main five products were higher by five to 449 *per cent* than the targeted realisation except for DCB in 2008-09. Besides, the average realisation by the Company was higher by four to 14 *per cent* than their competitors. This indicated high level acceptability of the Company's products in the market which was not met due to inefficiency and bottlenecks in production.

- Since October 2008 the Company discontinued the analysis of the reasons for variances in sales. This created further impediment in correct forecast of sales targets.

Loss due to entering into forward sale contract

2.2.38 Though there was inordinate delay in commissioning of the 100 TPD membrane plant, the Company submitted (March 2008) *suo moto* offer to Hindalco Industries Limited (HIL) for sale of 10,000 MT of CS lye at ₹ 17,600 per MT. The offer was further increased to 12,000 MT at HIL's request. While accepting the offer, HIL reduced the rate and placed purchase order (April 2008) for 12,000 MT at a rate of ₹ 15,350 per MT, to be delivered between April 2008 and March 2009.

The matter was discussed (May 2008) in PC and it was decided (May 2008) to restrict the supply to a maximum of 6,000 MT instead of 12,000 MT. The PC approved the rate of ₹ 15,350 per MT which was below the prevailing market prices (₹ 16,222 to ₹ 17,300 per MT) in eastern region. However, the Company had started the delivery from April 2008, even before the approval of price by PC in May 2008. Moreover, the Company did not abide by the PC's recommendation to restrict sale to 6,000 MT and stayed committed to supplying 12,000 MT.

Till February 2009, they supplied 654.48 MT of CS lye at the ordered rate when the average sale price of DCL during April 2008 to February 2009 was ₹ 17,710 to ₹ 20,327 per MT. Since the total production of CS lye during 2008-09 was only 11,783 MT and price of CS lye was on an upswing, the Company stopped supply from March 2009 and requested (March 2009) HIL to place another purchase order at a basic price of ₹ 23,000 per MT, for parallel supply of 3,000 MT on equal basis with the earlier order. But HIL agreed (March 2009) to purchase only 500 MT of CS lye at ₹ 20,000 per MT on 50:50[32] basis. The Company did not agree and HIL issued (May 2009) legal notice on them for non-supply of ordered quantity.

Due to faulty forward sale contract, the Company suffered loss of ₹ 2.24 crore on sale of caustic soda below the market prices.

After negotiation with HIL, the Company decided (March 2010) to complete the supply of balance quantity of CS lye (11,347 MT) at the ordered rate (₹ 15,350 per MT). During March 2010 to March 2011, the Company despatched 7,786.66 MT when the average basic price of CS lye realised by the Company ranged between ₹ 15,488 and ₹ 19,627 per MT

Thus, sale of CS lye at ₹ 15,350 per MT by the Company below prevailing prices led to loss of revenue of ₹ 2.24 crore on the supply of 8,441.14 MT caustic soda lye during April 2008 to March 2011.

Appointment of commissioning agents

2.2.39 The Managing Director decided (September 2006) to engage external agencies for increasing their sales due to commissioning of 100 TPD membrane plant. Accordingly, three agents[33] were engaged on commission basis based on volume of sales routed through them as early as in May 2006/ January/ October 2008, though commercial production of membrane plant was scheduled to commence from May 2007 but actually started from February 2009.

Since the Company was not in a position to meet the market demand of their existing customers during 2006-07 to 2008-09 and even after expansion of capacity on commissioning of membrane plant their production was still below the regional demand, the appointment of commissioning/ liaison agents lacked justification. Further, the appointed agents failed to spread the market for the Company outside their existing customer base. Nevertheless, the Company paid ₹ 43.23 lakh[34] as agency and liaison commission during 2006-07 to 2009-10. The Company terminated (January/April/May 2010) the contracts with all agents.

Resultantly, the expenditure of ₹ 43.23 lakh became unfruitful due to hasty and improper decision of appointing agents as early as in 2006/ 2008 without assessing the production scenario of new membrane plant.

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[32] Fifty *per cent* supply at the rate of ₹ 15,350 per MT and balance 50 *per cent* at the rate of ₹ 20,000 per MT.
[33] S.S.S. Enterprises, Modern Trading Company and Cetech Corporation.
[34] For sale of hydrochloric acid (17,376.04 MT), stable bleaching powder (1,029.73 MT), CS lye (619.61 MT), sodium hypochlorite (3,907.64 MT) and MCB (677 MT).

During 2006-07 to 2009-10, 16 to 46 *per cent* of total sales of HCl were made through agents. The Company achieved sales realisation of ₹ 1,209 to ₹ 2,408 per MT through sales by agents during that period, while in case of direct sales by their marketing wing, they realised ₹ 1,696 to ₹ 2,855 per MT during that period.

The Company suffered loss of Rs 93.90 lakh on sale of hydrochloric acid at rates below the market price.

Thus, due to delay in taking decision for discontinuing sales through agents, the Company suffered loss of revenue of ₹ 93.90 lakh for sale of 19,569.70 MT HCl during 2006-10.

The Management stated (November 2011) that agents helped the Company to expand customers base for adequate disposal of downstream products. The reply belied the fact that sales through agents fetched lower realisation than their marketing wing.

Undue benefit to a chlorinated paraffin wax (CPW) producer

2.2.40 In order to utilise a part of the increased production of chlorine after commissioning of membrane plant, the Company entered into an agreement (November 2006) with Tara Mercantile Private Limited (TMPL), an ancillary producer of chlorinated paraffin wax (CPW) having requirement of 900 MT chlorine per month in the first phase and anticipated requirement of 1,500 MT chlorine per month in second phase.

Commercial production of CPW plant started from April 2008. As per agreement, the price of chlorine was to be fixed on the formula derived on monthly basis by mutual consent. While fixing the price of chlorine supplied to TMPL, the Company accepted the formula proposed by them at the end of each month which was based on reversed method of deducting the cost of other raw materials, all production, selling and distribution costs and profit element of TMPL from the sale price of CPW to work out the difference, being the cost of chlorine.

Instead of adoption of prevailing market price of chlorine as fixed by Pricing Committee (PC) for other CPW producers, the Company accepted even negative price of chlorine as per formula stipulated by TMPL as discussed below.

The Company's faulty agreement with the contractor resulted in loss of revenue of ₹ 1.72 crore.

The Company raised invoices at the rate of price list. But as per the agreement the formula adopted by TMPL, chlorine value became negative in 12 months and in six months it was at lower than the list price. As a result, the Company had to issue credit notes of ₹ 99.08[35] lakh when the chlorine value became negative and failed to realise ₹ 72.79[36] lakh when chlorine value realized was below the list price.

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[35] ₹ 47.97 lakh (2008-09) + ₹ 51.11 lakh (2009-10)
[36] ₹ 48.18 lakh (2008-09) + ₹ 24.61 lakh (2009-10)

Eventually the Company supplied chlorine to TMPL for 12 months free of cost. Since October 2009 the Management began to realise the cost of chlorine as per list price with a discount on account of transportation.

Thus, due to defective agreement leading to acceptance of price to the disadvantage of the Company, they suffered a loss of ₹ 1.72 crore for supply of 5,662.80 MT of chlorine during the period April 2008 to September 2009.

Despite high level of acceptability of the Company's products in the market, sales targets were not met due to inefficiency and bottlenecks in production. Due to faulty agreement with a contractor, forward sale contract with a buyer and lower realisation from sales through agents, the Company incurred loss of revenue of ₹ 4.90 crore. Further, injudicious decision to appoint commissioning agents before commencement of enhanced production resulted in unfruitful expenditure of ₹ 43.23 lakh.

Recommendation :-

- *Explore the possibility of increased sale of downstream products.*

Internal control & monitoring

2.2.41 Presence of and adherence to a strong internal control system minimises risk of errors and irregularities in operational and financial matters and provides assurance in matters relating to accounting, financial reporting and overall efficiency of operations. Review of the Company's operations revealed the following control deficiencies:

Lack of quality control resulted in extra expenditure of ₹ 1.22 crore towards removal of excess impurities in salt.

- To ensure the quality of salt for production of CS lye, quality checks should have been exercised by the Quality Control department of the Company in accordance with standard specifications[37]. But the Company accepted 18,617.49 MT salt supplied by vendors during 2010-11 containing impurities beyond the mandated limits. To remove impurities in salt, they had to incur extra expenditure of ₹ 1.22 crore towards cost of chemicals used in excess of norms[38]. Instead of rejecting the salt to prevent possible adverse effect on the operating efficiency of the sophisticated membrane cell of CC plant, the Company consumed it in their production and deducted only rupees eight lakh from the bills of the vendors.

The Management stated (November 2011) that acceptance of salt was within the specified tolerance limit of each purchase order and there was no adverse effect on membrane cell since brine was purified at several stages before being fed to cell. The reply was factually incorrect because in four consignments

[37] NaCl – 98.50 *per cent*, Ca^{++} - 0.16 *per cent*, Mg^{++} - 0.08 *per cent*, SO_4 – 0.10 *percent*, water insoluble matter – 0.10 *per cent*, Iodine – 15 p.p.m. max., Crystal size – 3 to 6 mm (60 *per cent*), Heavy Metal content - Nil and moisture content – Maximum 4 *per cent.*

[38] Bureau of Indian Standards/ Caustic chlorine industry norms.

from two suppliers; magnesium, sulphate, iodine, water insoluble matter and moisture were above the tolerance limits. Further, as per report (2008) of Indian Salt Manufacturers Association, presence of water insoluble matter and iodine in salt affects the life of membrane and reduces current efficiency of cell since no viable technology for iodine removal is available.

- To achieve optimum capacity utilisation and steady production, the Company should control factors which affect production. Down time analysis from log books and other records maintained in CC and MCB plants showed (**Annexure 19**) that out of total 4,851 and 13,056 hours of shut down during 2006-11 respectively, 3,319 and 10,064 hours were lost in CCP and MCB plants respectively due to controllable factors like mechanical/ electrical breakdown (in CCP), shortage/ poor quality raw materials, process problems, maintenance and others including labour problem etc. These factors could have been avoided by prompt preventive maintenance of plant, timely procurement of good quality raw materials and focused marketing coupled with appropriate administrative measures for compliance with regulatory requirements. These shutdowns had resulted in loss of production of CS lye (11,167 MT), liquid chlorine (10,050 MT), MCB (6,291 MT) and hydrochloric acid (6,291 MT) valued at ₹ 54.49 crore with contribution forgone of ₹ 4.43 crore based on average sales prices of the products and actual cost incurred in respective years.

Controllable shutdowns led to production loss of ₹ 54.49 crore.

- Despite having policy of selling different products either against advance payment or on credit for periods ranging from 10 – 45 days[39], Sundry Debtors represents 3.43 to 4.56 months sales during 2006-07 to 2010-11. This indicated ineffective follow up by the Management for realisation of book debts and slack credit control mechanism. Out of total debts of ₹ 21.49 crore as on 31 March 2011 the Company provided ₹ 2.73 crore as bad debt during last five years in addition to earlier provision of ₹ 1.59 crore. The Company did not maintain age wise position of Sundry Debtors which hampered categorisation of Debtors outstanding for more than six months on the basis of prospect of realisation.

Twenty *per cent* of book debt became bad due to ineffective recovery mechanism.

- The Company issues salt to brine saturator without recording the quantity issued. Thereafter, they annually reconcile the quantities of salt issued/ consumed and in stock. While the reconciliation for 2006-09 showed no variation, in 2009-10, 5,007 MT of salt valuing ₹ 1.68 crore was found short due to difference in closing balance of 2008-09 with opening balance of 2009-10.

Internal audit

2.2.42 The Company did not have an Internal Audit Wing. They had engaged (January 2007) a firm of Chartered Accountants for internal audit of their production performance, input analysis, capacity utilisation, sale of scrap, sales performance, stock of stores, sundry debtors *etc*. at a cost of ₹ 6.05 lakh till January 2011.

[39] Except in seven cases where the credit period was extended upto 67 days.

There was nothing on record to indicate that the Management had initiated corrective action on the quarterly reports submitted by the firm. The BoD and the Audit Committee though reviewed the reports to assess shortcomings noticed in internal audit did not seek action taken notes thereon. Thus, internal audit was not effective as an important control mechanism.

Weak internal control and monitoring mechanism resulted in acceptance of substandard quality of salt, lack of preventive maintenance of the plants led to excess down time and resultant loss of production, lack of vigorous pursuance of debtors resulted in bad debts and salt being issued to the saturator without recording the quantity leading to shortage of physical stock.

Recommendation :-

- *Company may consider developing a stringent control mechanism and following standards for acceptance and consumption of raw materials/ chemicals; institute an effective preventive maintenance mechanism for the plants regularly and fixing maximum period of debtors outstanding; and ensuring the proper record maintenance of the quantity of salt issued.*

The Management accepted all the recommendations and assured to implement them.

The matter was reported to Government (October 2011); their reply was awaited (November 2011).