

Chapter II

2. Performance Reviews relating to Government Companies

2.1 Power Distribution Companies in Andhra Pradesh

Executive Summary

The power distribution in Andhra Pradesh is carried out by four Power Distribution companies namely Andhra Pradesh Central Power Distribution Company Limited (APCPDCL), Andhra Pradesh Eastern Power Distribution Company Limited (APEPDCL), Andhra Pradesh Northern Power Distribution Company Limited (APNPDCL) and Andhra Pradesh Southern Power Distribution Company Limited (APSPDCL) which were incorporated on 01 April 2000 under the Companies Act, 1956.

As on 31 March 2011, the State had distribution network of 8.60 lakh Circuit Kilo Meters (CKM) of lines (33/11 KV and LT), 3,871 sub-stations, 5,226 Power transformers (PTR) and 7,92,841 Distribution transformers (DTR) catering to 2.24 crore consumers.

Distribution Network planning

Against the planned additions of 1,649 sub-stations only 1,200 sub-stations were actually added. As against the growth of connected load from 28,157 MW in 2006-07 to 41,872 MW in 2010-11 (48 per cent), the corresponding increase in DTR capacity was from 26,025 MVA to 34,650 MVA (33 per cent). Thus, the increase in distribution capacity could not match the pace of growth in connected load.

Delay in implementation of HVDS works resulted in non-achievement of

envisaged benefits amounting to ₹ 147.71 crore.

Implementation of centrally sponsored schemes

Under RGGVY the percentage of achievement, of electrification of BPL houses, against target in the State ranged between 71.09 and 82.72 per cent during 2006-10, which decreased to 49.16 per cent in 2010-11. APEPDCL was lagging behind in achievement with only 32 to 55 per cent of electrification of households during the review period.

The DISCOMs could utilise only 32.74 per cent of RAPDRP funds out of ₹ 326.93 crore received till end of March 2011, due to delay in selection of IT implementing agency. DISCOMs may lose opportunity of conversion of loan into grant by GoI, if RAPDRP projects are not implemented within stipulated time.

In respect of APCPDCL the AT&C losses were beyond 15 per cent and ranged between 17.26 and 18.34 per cent during 2006-11.

Operational efficiency

Due to Sub transmission and distribution losses in excess of APERC norms, APCPDCL suffered a loss of revenue to the tune of ₹ 1,633.96 crore.

Wide gap between transformation capacity and connected load led to overloading of distribution system, excess failure of DTRs and higher quantum of energy losses.

Financial position

Subsidy towards purchase of high cost power alarmingly increased from ₹ 617 crore in 2006-07 to ₹ 6,542 crore in 2008-09, which stood at ₹ 1,619 crore in 2010-11, in respect of all the DISCOMs.

As against total subsidy claim of ₹ 10,415.87 crore during 2006-11 by APCPDCL and APEPDCL, GoAP released only ₹ 5,356.13 crore, resulting in dependence on more borrowings.

The Loan funds and Current liabilities of APCPDCL and APEPDCL increased from ₹ 4,006.21 crore and ₹ 1,603.96 crore in 2006-07 to ₹ 11,073.99 crore and ₹ 4,827.58 crore in 2010-11, respectively.

Billing and Revenue collection efficiency

APERC disallowed 7,530.51 MU of free power to agriculture consumers, consequent to which APCPDCL and

APEPDCL could not claim subsidy amounting to ₹ 2,519.94 crore from GoAP.

The outstanding dues of APCPDCL and APEPDCL were ₹ 1,633.50 crore at the end of March 2011, out of which ₹ 466.26 crore was outstanding for more than three years; ₹ 444.15 crore was involved in court cases and ₹ 465.52 crore was due from Government departments and local bodies.

Energy Audit

Out of 7,464 Nos. 11 KV feeders existing in APCPDCL and APEPDCL, energy audit was conducted only on 2,571 feeders. Energy audit was not conducted on the rural feeders. Consumer mapping was also not done in the above case.

Monitoring by Top Management

The monitoring system is inadequate as the follow up action was not effective due to which increase in arrears, excess failure of DTRs, high distribution losses, shortage of transformer oil etc., continued to occur.

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. Services sector has made significant contribution to the growth of our economy. Availability of quality power is very crucial to sustain the growth of this segment.

Recognizing 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 electricity for 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 are first point of contact in the electricity sector for millions of Indians. This is the sector which provides electricity to the door step 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, Distribution Companies need to make a financial turnaround and they should be commercially viable.

In this review, we propose to analyse how far the Distribution Companies (DISCOMs) in Andhra Pradesh planned their operations to achieve above objectives, their financial turnaround and the problems encountered during the last five year period from 2006-07 to 2010-11.

Electricity Reforms and electricity scenario in Andhra Pradesh

2.1.2 As part of power sector reforms, the erstwhile Andhra Pradesh State Electricity Board (APSEB) was unbundled into Andhra Pradesh Power Generation Corporation Limited (APGENCO) and Transmission Corporation of Andhra Pradesh Limited (APTRANSCO). APTRANSCO was further unbundled into "Transmission Corporation" and four "Distribution Companies" (DISCOMs). Consequently, the business of distribution of power in Andhra Pradesh is carried out by the four DISCOMs namely Andhra Pradesh Central Power Distribution Company Limited (APCPDCL), Andhra Pradesh Eastern Power Distribution Company Limited (APEPDCL), Andhra Pradesh Northern Power Distribution Company Limited (APNPDCL) and Andhra Pradesh Southern Power Distribution Company Limited (APSPDCL), which were incorporated on 01 April 2000 under the Companies Act, 1956 under the administrative control of Department of Power, Government of Andhra Pradesh (GoAP).

Vital parameters of Electricity Supply in Andhra Pradesh

2.1.3 Sale of energy increased from 45,314.19 MU in 2006-07 to 63,304.78 MU in 2010-11, registering an increase of 39.70 *per cent* during the five year period 2006-11. As on 31 March 2011, the State had distribution network of 8.60 lakh Circuit Kilo Meters (CKM) of lines (33/11 KV and LT); 3,871 sub-stations; 5,226 Power transformers (PTR) and 7,92,841 Distribution transformers (DTR) of various categories. The number of consumers was 2.24 crore. The turnover of the four DISCOMs was ₹ 20,456.40 crore in 2010-11, which was equal to 38.88 *per cent* and 3.06 *per cent* of the State PSUs turnover and State Gross Domestic Product, respectively. The four DISCOMs employed 56,774 employees as on 31 March 2011.

Performance Review of electricity sector

2.1.4 Performance reviews on ‘Purchase, performance, maintenance and repair of Transformers in power sector companies’ and ‘Outsourcing of activities/ functions in APCPDCL’ were included in the Report of the Comptroller and Auditor General of India (Commercial), Government of Andhra Pradesh for the year ended 31 March 2007. The Reports are yet to be discussed by COPU. This performance audit was conducted on the functioning of Power Distribution Companies in Andhra Pradesh.

Scope and Methodology of Audit

2.1.5 The present performance audit conducted during February to May 2011 covers the performance of APCPDCL and APEPDCL (selected out of four DISCOMs in the State) during the period from 2006-07 to 2010-11. While APCPDCL was selected, as it is the largest of the four DISCOMs and having high percentage of losses and DTR failures, APEPDCL was selected as the company is best performer with low distribution losses and DTR failures. 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, four out of 11 circles in APCPDCL and two out of five circles in APEPDCL (selection based on the statistics of Energy draws, number of Sub-stations, industrial and other feeders, DTRs existing etc.).

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 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.

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 achieved;
- Adequacy and effectiveness of network planning and its execution;
- Efficiency and effectiveness in implementation of the Central schemes such as Restructured Accelerated Power Development & Reform Programme (RAPDRP) and Rajiv Gandhi Grameen Vidyutikaran Yojna (RGGVY);
- Operational efficiency in meeting the power demand of the consumers in the state;
- Billing and collection efficiency of revenue from consumers;
- Whether Financial Management was effective and surplus funds, if any, were judiciously invested;
- Whether a system is in place to assess consumer satisfaction and redressal of grievances;
- That energy conservation measures were undertaken; and
- That a monitoring system is in place and the same is utilised in review of overall working of DISCOMs.

Audit Criteria

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

- Provisions of Electricity Act 2003;
- National Electricity Plan, Plans and norms concerning distribution network of DISCOMs and Planning criteria fixed by the SERC;
- Terms and conditions contained in the Central Scheme Documents;
- 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 State Government/SERC; and
- Best performance under various parameters in the regions/all India averages.

Audit Findings

2.1.8 We explained the audit objectives to the two Companies during the 'Entry Conference' held on 28 February 2011. Subsequently, audit findings were reported to the Company and the State Government in June 2011 and discussed in an 'Exit Conference' held on 20 October 2011. The Exit Conference was attended by Principal Secretary, Energy Department, GoAP and Chairman and Managing Directors of APCPDCL and APEPDCL. The Companies replied to audit findings in August/ September 2011. The views

expressed by them have been considered while finalizing this Review. The audit findings are discussed in subsequent paragraphs.

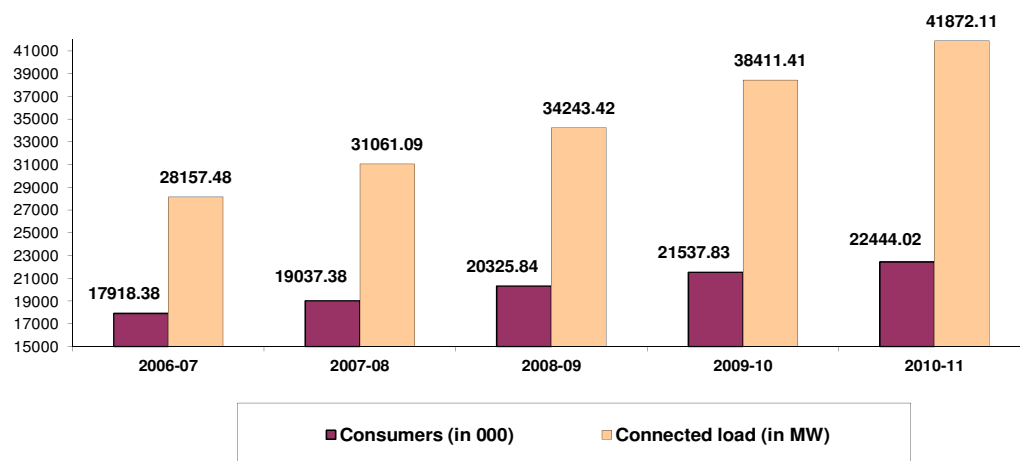
Distribution Network Planning

2.1.9 The National Electricity Policy was evolved with the following objectives:

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

To ensure access to electricity by all, the Power Distribution Companies in the State are 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 Companies are required to upkeep the existing network and expand the distribution network keeping in view new connections and growth in demand. We observed that both APCPDCL and APEPDCL did not prepare plans for augmentation of their distribution network.

2.1.9.1 The particulars of consumers and their connected load are given below in bar chart.



The particulars of distribution network planned vis-à-vis achievement there against in respect of the four DISCOMs in the State are depicted in **Annexure-7**.

2.1.9.2 Against the planned additions of 1,649 sub-stations during 2006-11 only 1,200 sub-stations were actually added. Further, as compared to the growth of connected load from 28,157.48 MW (35,196.85 MVA) in 2006-07 to 41,872.11 MW (52,340.14 MVA at 0.80 Power Factor) in 2010-11 as depicted in the graph, the increase in DTR capacity was from 26,025 MVA to 34,650 MVA (33 per cent). Thus, the increase in distribution capacity could not match the pace of growth in consumer demand as discussed in para 2.1.10.

Some of the observations on poor planning are discussed below:

Inadequate transformation capacity

2.1.10 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 to make it usable by the consumers. 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 transformation capacity at 33/11 KV sub-stations and connected load of the consumers in respect of four DISCOMs during the period 2006-11.

(in MVA)

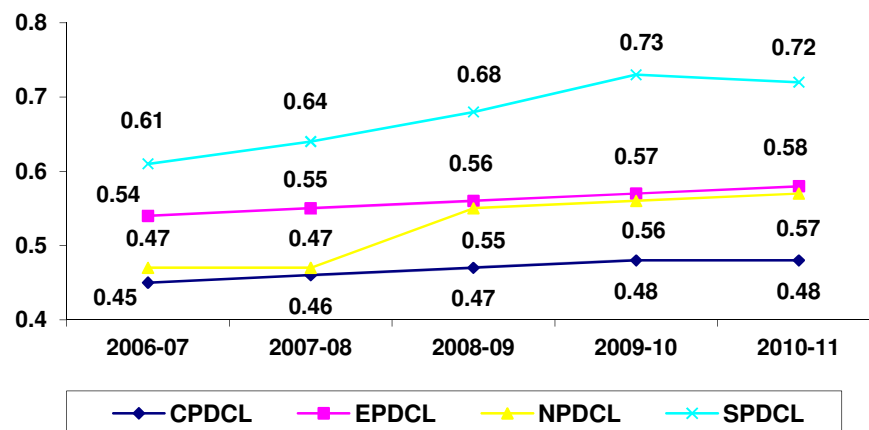
Year	Transformation Capacity	Connected load	Gap in Transformation capacity	Ratio of Transformation capacity to connected load
2006-07	19851.60	35196.85	15345.25	0.56:1
2007-08	22210.75	38826.37	16615.62	0.57:1
2008-09	24593.90	42804.28	18210.38	0.57:1
2009-10	27190.35	48014.27	20823.92	0.57:1
2010-11	28302.90	52340.14	24037.24	0.54:1

It can be seen from the table above that the ratio of transformation capacity to total connected load in the State ranged between 0.54:1 and 0.57:1. This represented a wide gap of transformation capacity. Such a high gap of transformation capacity led to overloading of the system, frequent tripping, and adverse voltage regulation with consequential higher quantum of energy losses. The increase in transformation capacity could not match the pace of growth in consumer demand. This led to overloading of network and consequential rotational cuts in distribution of electricity.

2.1.11 High Voltage Distribution System (HVDS) is an effective method for reduction of technical losses, prevention of theft, improved voltage profile and better consumer service. The GoI had also stressed (February 2001) the need to adopt LT less system of distribution through replacement of existing LT lines by HT lines to reduce the distribution losses. National Electricity Policy 2005 laid down that the Distribution Companies should be prompted to reduce LT/HT ratio keeping in view the techno economic considerations.

Implementation of LT less system

2.1.12 The HT-LT ratio over the review period in respect of all the four DISCOMs in the State is depicted in the graph below:



It may be seen from the above graph that the HT network was half the LT network in respect of APCPDCL and APEPDCL. The ratio registered nominal increase from 0.45 to 0.48 and 0.54 to 0.58 respectively, during 2006-11. On a review of implementation of HVDS, which is aimed at conversion of LT to HT, we observed the following:

APCPDCL

2.1.12.1 The Company formulated (2004-05) a scheme to convert Low Tension Distribution System to HVDS in a phased manner. The Company, after inviting tenders, awarded (February 2006 – February 2009) HVDS schemes under 35 packages to various contractors in three phases. Details of financial and physical progress of HVDS works taken up by the Company in five districts (Anantapur, Mahabubnagar, Nalgonda, Kurnool, and Ranga Reddy) in three phases are given in the **Annexure-8**. We observed that overall physical and financial progress of the works were low at 37.63 and 44.96 *per cent* as of 31 March 2011. Against total target of 74,615 DTRs only 33,554 DTRs, were erected even after 24 to 60 months after award of the works as against scheduled completion period of 12 to 18 months from the date of award resulting in non-achievement of envisaged benefits of containing of energy loss, theft of energy etc., amounting to ₹ 129.75 crore. Further, conversion of LT line into AB Cable was very poor (16.90 *per cent*) during the review period, as only 5,227 Kms of AB Cable was laid against target of 30,925 Kms.

Poor physical and financial progress in HVDS works in APCPDCL resulted in non-achievement of targeted benefits of ₹ 129.75 crore.

APCPDCL replied that the contractors had not properly programmed the execution of works. There was steep increase in steel and cement prices and seasonal effect on labour and supply of material resulted in abnormal delays in execution of the projects and conceded the fact of non-erection of AB Cable due to short closure of agreements of HVDS Phase I & II. However, the work was proposed under Phase III of HVDS. The reply is not acceptable as lack of timely supervision resulted in non achievement of the envisaged benefits.

APEPDCL

2.1.12.2 APEPDCL formulated (December 2005) a scheme under HVDS in Rajahmundry circle covering five divisions at an estimated cost of ₹ 50.35 crore (2005-06 cost data). The Rural Electrification Corporation (REC) sanctioned a loan of ₹ 45.31 crore in June 2006 towards 90 per cent cost of scheme. Though APEPDCL floated tenders based on the division-wise survey quantities, those were cancelled and retendered four times between June 2008 and Jan 2009 on account of high/ abrupt rates quoted.

APEPDCL belatedly (March 2009) entrusted the detailed survey of 11 KV feeders in respect of three out of the five divisions to a private consulting agency for verification of divisional estimates. After receipt of survey reports (July 2009), the actual requirement of work was identified and a revised estimate was prepared wherein the cost of works in respect of five divisions worked out to ₹ 59.33 crore against the original estimate of ₹ 50.35 crore. On noticing the cost escalation, APEPDCL decided to defer works costing ₹ 12.82 crore of two divisions.

Inordinate delay in taking up HVDS works by APEPDCL resulted in cost escalation by ₹ 9 crore and failure to derive envisaged benefits to the tune of ₹ 17.96 crore.

APEPDCL awarded works of three divisions (Rajahmundry, Jaggampeta, RCpuram) along with partial work of two divisions (Kakinada, Amalapuram) on lowest tender basis to five contractors at a value of ₹ 46.31 crore during the period September 2010 to January 2011 and the works are still under execution. It is noticed that the cost of works of five divisions, earlier included in 2005-06 estimates but taken up after a delay of four years, escalated by ₹ 9 crore in 2009-10. Thus, delay in conducting proper survey of feeders and taking up HVDS works in Rajahmundry circle has resulted in failure to derive the envisaged benefit of reduction in energy losses to the tune of 45.20 MU valued at ₹ 17.96 crore within the planned time frame.

APEPDCL replied that works were awarded for all the divisions for an amount of ₹ 46 crore, which is less than the sanctioned amount of ₹ 50.35 crore and hence there was no cost overrun. The reply is not acceptable as it had awarded only partial works leaving works estimated to cost ₹ 12.82 crore in respect of two divisions (Kakinada and Amalapuram).

Implementation of Centrally Sponsored Schemes

Rural Electrification

2.1.13 The key development objective of the power sector is supply of electricity to all areas including rural as mentioned in Section 6 of the Electricity Act. Rural Electrification Corporation of India is the nodal agency to implement the programme of giving access to electricity to all households in the next five years beginning from 2005. The Rajiv Gandhi Gramin Vidyutikaran Yojana (RGGVY) scheme initiated by REC aims at electrifying all villages and habitations.

As per the new definition of village electrification with effect from 2004-05, a village would be declared as electrified if,

- a) Basic infrastructure such as Distribution Transformers and Distribution lines are provided in the inhabited locality as well as the Dalit Basti hamlet where it exists.
- b) Electricity is provided to public places like schools, Panchayats office, health centers, dispensaries, community centers etc.
- c) The number of households electrified should be at least 10 *per cent* of the total number of households in the village.

2.1.13.1 As on 31 March 2006, we observed that all the 26,613 villages in the State (as per 2001 census) were electrified (100 *per cent*). However, the DISCOMs, in order to provide electricity to all BPL households and habitations implemented RGGVY in the State. The year-wise target *vis-à-vis* achievement of electrification of various BPL households in villages under RGGVY scheme during the review period in respect of the State is shown in the table below:

(in numbers)

Year	Electrified in the beginning of the year	Targeted for electrification during the year	Electrified during the year	Electrified at the end of the year	Percentage of achievement against target during the year
2006-07	16322	595200	423111	439433	71.09
2007-08	439433	709109	538127	977560	75.89
2008-09	977560	983514	801212	1778772	81.46
2009-10	1778772	599293	495720	2274492	82.72
2010-11	2274492	323900	159241	2433733	49.16

We observed that the overall percentage of achievement of electrification of BPL houses against target in the State ranged between 71.09 and 82.72 *per cent* during 2006-10. It had decreased to 49.16 *per cent* in 2010-11. APCPDCL performed well with achievement of 100 *per cent* electrification of the households during 2006-10 and 69.75 *per cent* in 2010-11 due to revision of targets in anticipation of increase in the BPL households. APEPDCL was lagging behind in achievement with only 32 to 55 *per cent* electrification during the review period mainly due to slow progress in registration of BPL households.

APEPDCL stated that though the targets were achieved in four districts, the same in respect of East Godavari district was not achieved due to taking up works two years later than the commencement of works in other districts.

2.1.13.2 With a view to test check the implementation of Rural Electrification Schemes in APEPDCL, We visited Jajivalasa village, Ramavaram Mandal under Jaggampeta Division. We noticed that direct connection from poles was being given without fixing meters in most of the BPL houses, consequently electricity bills were not raised. Thus, supply of power to consumers without fixing meters was irregular and results in loss of revenue to the Company.

2.1.13.3 DISCOMs received funds under RGGVY for rural electrification. The position of the funds available *vis-à-vis* utilised under RGGVY Scheme during the five years ending 31 March 2011 is depicted in **Annexure- 9**.

We observed from the annexure that as against ₹ 596.86 crore received under RGGVY, funds to the extent of ₹ 556.65 crore were utilized by all the DISCOMs till end of March 2011. Test check of implementation of the scheme in the selected DISCOMs revealed the following:

2.1.13.4 APEPDCL awarded (October 2008) the work for construction of infrastructure facilities in East Godavari district, for ₹ 7.03 crore to Katakam Constructions. During the execution of works the use of new items (R.S.Joists poles) were necessitated due to which the agreement value was enhanced to ₹ 34.04 crore from ₹ 7.03 crore (an increase of 384 *per cent*) based on the prevailing rates of R.S Joists in the market in October 2008.

APEPDCL lost opportunity to obtain competitive rates and incurred avoidable expenditure of ₹ 4.11 crore.

Audit observed that the Company lost the opportunity to obtain competitive rates due to entrusting new items of work to the same contractor without calling for fresh tenders. Audit further observed that though the market rates of the new items were showing decreasing trend the Company continued to allow higher rates fixed initially for R.S.Joists as there was no price variation clause in the contract which resulted in avoidable expenditure of ₹ 4.11 crore.

The reply is also silent as to why decreasing market rates were not considered in respect of R.S.Joists.

Loss of opportunity to get waiver of interest due to non-completion of targeted electrification of Dalitawadas within in the scheduled time

2.1.13.5 REC sanctioned 52 nos of electrification schemes to APEPDCL, at an estimated cost of ₹ 91.25 crore for electrification of 3,396 nos of Dalitawadas and Hamlets in five districts. As per the scheme, the GoAP released ₹ 64.39 crore as loan during the period from May 2004 to June 2007. The terms of loan sanctioned by REC, inter-alia, specified waiver of interest, provided the Scheme is successfully completed within schedule.

We observed that only 3,067 nos of Dalitawadas and Villages/ Hamlets were actually electrified against the target of 3,396 nos during the scheduled completion period up to 21 March 2005. APEPDCL attributed the delay and non-completion of targeted electrification to the remoteness and non-approachability of Dalitawadas located in Hilly areas and sought for deviation from target and waiver of interest on loan from REC.

APEPDCL requested the GoAP (December 2008) for arranging waiver of interest and refund of already paid interest since works were completed. However REC rejected the claim by pointing out that the scheme was not completed in time and in full. And no waiver of interest could be given. We observed that APEPDCL did not proceed with a proper plan for implementation of the targets as projected to REC with reference to field conditions and location of BPL families. Further the Company failed to obtain completion certificates from Gram Panchayats immediately after

electrification as a proof of successful implementation within time frame even in respect of the 3,067 BPL households electrified.

Thus, due to failure to achieve completion of scheme within the scheduled time frame, the Company has lost opportunity to get waiver of interest payment amounting to ₹ 8.12 crore (for the period 2004-05 to 2010-11) out of which payment of ₹ 2.33 crore is yet to be made to REC.

Other points in Contract Management

Extra expenditure in HVDS works

2.1.14 For conversion of LT net works into HVDS, APCPDCL invited (July 2008) tenders at an estimated cost of ₹ 300 crore and awarded (February 2009) the works on turnkey basis. After opening price bids the Company found that the quoted prices were in excess of estimates ranging between 17.2 to 26.10 *per cent*. As per GO No. 94 of GoAP, dealing with tender premium, the maximum premium at which tenders can be accepted have been set at 10 *per cent*. In case of receipt of tenders at more than 10 *per cent* of the estimated cost they need to call for revised tender. However, we observed that the Company, without calling revised tender to get better rates, revised the estimated rates of 16 KVA and 25 KVA DTRs from ₹ 43,112 and ₹ 48,118 to ₹ 47,800 and ₹ 64,913, respectively, to match with quoted rates of the tender. We further observed that the revised estimated price of 25 KVA DTR was more than the lowest quoted price of various bidders, which ranged between ₹ 55,264 and ₹ 57,857 after applying the respective tender premium. Thus, irregular increase of estimated prices, after opening the price bids, which were more than the lowest quoted prices, resulted in extra expenditure of ₹ 14.88 crore.

Irregular increase of estimated prices by APCPDCL in excess of lowest quoted prices resulted in extra expenditure of ₹ 14.88 crore.

APCPDCL replied that the estimates were prepared after applying price variation clause to the previous purchase price. Reply is not acceptable as revision of estimated prices after opening bids is irregular.

Non-levy of labour welfare cess

2.1.14.1 As per Section 3(1) of Building and Other Construction Workers' Welfare Cess Act, 1996 labour welfare cess shall be levied and collected at such rate not exceeding two *per cent* but not less than one *per cent* of the cost of construction incurred by an employer.

We observed from test check of 265 contracts (APCPDCL: 240; APEPDCL: 25) entered during 2007-11 valued ₹ 434 crore (APCPDCL: ₹ 293.76 crore; APEPDCL: ₹ 140.24 crore) that labour welfare cess at the rate of one *per cent* amounting to ₹ 4.34 crore was not deducted from the contractors' bills, resulting in liability to the DISCOMs for payment of the cess. Both the companies accepted that necessary clause towards labour cess would be included in the contracts.

Unauthorised payment of ₹ 2.80 crore towards price variation claims in excess of approved limit

APEPDCL

Allowing price variation without limit by APEPDCL resulted in excess payment of ₹ 2.80 crore.

2.1.14.2 As per the provisions of the Purchase Manual (Clause 5.13), where variable prices are permitted, the price variation should be subject to a ceiling of 10 *per cent*. The Company placed four purchase orders in November 2005 for supply of 4,000 nos 25 KVA Distribution Transformers (DTR) at an ex-works price of ₹ 30,684 each, allowing price variation without any limit. We observed that the Company paid (January 2006 to August 2007) ₹ 2.80 crore towards price variation claims, which ranged between 11 to 40 *per cent* and thus, contrary to the provisions of the Purchase Manual. Thus, allowing price variation without any limit resulted in excess payment of ₹ 2.80 crore.

Restructured Accelerated Power Development & Reforms Programme

2.1.15 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 with Power Finance Corporation (PFC) as nodal agency. 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*/ 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.

Financial Performance

2.1.15.1 The details of the funds released by GOI, mobilised from other agencies (including REC/ PFC/ Commercial Banks), utilisation there against and balances in respect of the all DISCOMs in the State is given in the **Annexure-10**. We observed from the annexure that all the four DISCOMs utilised ₹ 107.03 crore as against the fund of ₹ 326.93 crore received till end of March 2011 (32.74 *per cent*). Delay in utilisation of funds was mainly on account of delay in awarding of contracts, slow progress of works and delay in

* **Supervisory Control And Data Acquisition** – It generally refers to industrial control systems, computer systems that monitor and control industrial, infrastructure, or facility-based processes.

finalization of Request For Proposal (RFP) and System Resource Specification (SRS) of IT enabling works. These are discussed in subsequent paras.

Establishment of IT enabled system

2.1.15.2 Part – A of the R-APDRP scheme is dedicated to establishment of IT enabled system and SCADA/ Distribution Management System which *inter alia* includes establishment of data center, Disaster recovery center and providing solutions for all operational modules viz., meter data acquisition, Energy audit, new connections, GIS based customer indexing, customer care services, billing, material management etc.

Though the DISCOMs received funds under R-APDRP during March 2009, it took more than one year (May 2010) to call for tender and award the work of implementation of IT infrastructure to Tata Consultancy Services (TCS), Hyderabad for a contract value of ₹ 131.23 crore (APCPDCL: ₹ 105.15 crore; APEPDCL: ₹ 26.08 crore). Though the work was to be completed by October 2011, we observed that only GIS survey work was taken up, the progress of which was also less at 5.79 and 51 *per cent* (APCPDCL and APEPDCL respectively). We further observed that though the bid document/ tender was silent about charging of interest on any advance paid, interest free mobilization advance of ₹ 9.67 crore (APCPDCL: ₹ 7.84 crore; APEPDCL: ₹ 1.83 crore) was paid (December 2010/ March 2011) to the contractor resulting in extending undue benefit to the contractor to the tune of ₹ 21.56 lakh*.

Non inclusion of indemnity clause

2.1.15.3 As per the terms and conditions of sanction for loan under R-APDRP, loan will not be converted into grant in case projects are not completed within three years from the date of sanctioning of the project. We observed that the DISCOMs failed to include corresponding indemnifying clause in the agreement signed with TCS, which is detrimental to the interests of the DISCOMs. Subsequent request to include such a clause in agreement did not fructify.

APCPDCL and APEPDCL replied that the project is first in the country and required lot of time in finalization of RFP and SRS before award of contracts. Further it was replied that the bid documents approved by PFC does not provide for charging interest on the mobilization advance. It was also replied that there is no practice of including indemnifying clause in the agreement. The reply is not acceptable as indemnifying clause should be included in the agreement to protect its financial interest of the companies.

* APCPDCL: Interest on advance of ₹ 7.84 crore @ 11 *per cent* for three months up to March 2011 -
₹ 7.84 crore X 11/100 X 3/12 = ₹ 21.56 lakh.

SCADA Project

APEPDCL incurred unfruitful expenditure of ₹ 8.60 crore due to failure in implementation of SCADA project.

2.1.15.4 APEPDCL took up (December 2006), before launching of R-APDRP scheme, a pilot project of installation SCADA system in 50 sub-stations of Visakhapatnam circle and awarded the work at a cost of ₹ 4.98 crore in December 2006 to ABB, Mumbai to be completed in 12 months. For creation of communication network to the proposed SCADA project a separate contract was awarded to BSNL. The SCADA project was not completed till date due to technical problems. Due to dispute with the contractor the contract of ABB was terminated (December 2010) after encashment of his Bank guarantee amounting to ₹ 50 lakh. APEPDCL replied that apart from technical problems in ABB contract, non-maintenance of consistency and stability in the BSNL network caused problems to SCADA project. The reply is not acceptable as the main reason for technical problem was non-provision of desired earth resistance at work site by APEPDCL. We observed that the expenditure of ₹ 8.60 crore incurred on the project over a period of four years remained unfruitful, besides depriving the APEPDCL of the envisaged benefits under SCADA.

Un-fruitful expenditure of ₹ 4.61 crore on establishment of IT enabled system

2.1.15.5 In order to enhance the efficiency of distribution system and reduce the T&D losses, APEPDCL took up IT enabled system works and entered into three contracts viz., first one with M/s GECE in May 2004 for Geographical Information System (GIS) based consumer indexing, asset coding survey and installation of hard ware in 29 towns of five circles with targeted completion by Feb 2005 at a cost of ₹ 3.42 crore; second one with Rolta, Mumbai in September 2005 for installation of GIS software at a cost of ₹ 1.66 crore to be completed by March 2006 and the third one with TCS under R-APDRP scheme in May 2010 for complete installation of hardware and software for GIS based consumer indexing and asset coding in all the 29 towns.

The first contract with M/s GECE was short closed in March 2008 after partial execution of work valued at ₹ 2.36 crore out of ₹ 3.42 crore agreed value; the second contract with M/s Rolta was executed with a delay of six years against targeted completion of six months at a value of ₹ 2.25 crore against enhanced agreement value of ₹ 2.55 crore and the third contract with TCS is a repeat project of consumer indexing and asset coding at a value of ₹ 26 crore which is under execution.

Incomplete survey and inordinate delay in implementation resulted in infructuous expenditure of ₹ 4.61 crore.

Audit observed that i) the incomplete survey and delayed consumer indexing by GECE (the first contractor) in turn affected the second contract awarded to Rolta which was delayed inordinately with repeated time extensions. The second contract was terminated at incomplete stage. ii) by the time the work was decided to be taken up through TCS the consumer indexing and mapping already done by Rolta became obsolete.

APEPDCL replied that the field engineers would utilize the GIS software developed by M/s Rolta for day to day work. The reply is not tenable since entire work is again taken up by TCS and due to incomplete execution, the

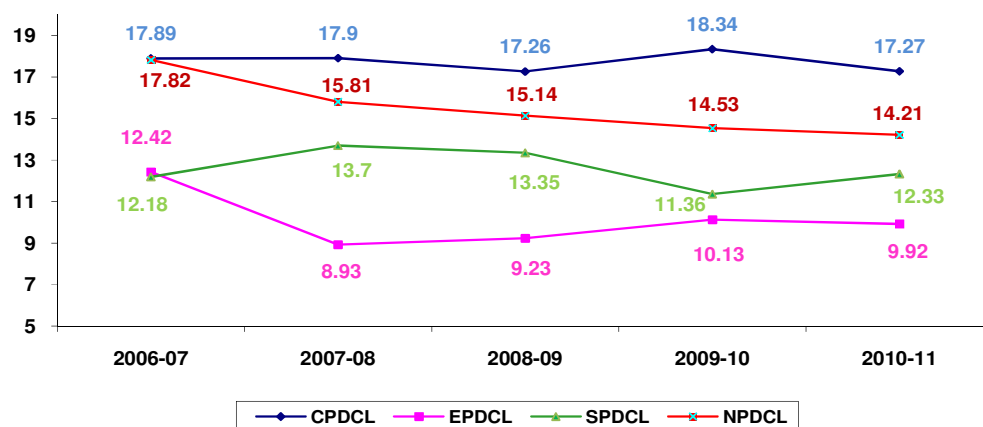
expenditure of ₹ 4.61 crore incurred on first two contracts has become infructuous.

Strengthening of sub-transmission and distribution system

2.1.15.6 Against total Project Cost of ₹ 826.91 crore (APCPDCL: ₹ 823.91 crore; APEPDCL: ₹ 3 crore) for implementation of Part-B of R-APDRP, PFC released an amount of ₹ 124.08 crore (APCPDCL: ₹ 123.58 crore, APEPDCL: ₹ 0.50 crore, -July/September 2010). Both the companies are yet to implement projects resulting in non-utilisation of funds. Undue delay in taking up the works under R-APDRP Scheme would result in non-reduction in AT&C losses in APCPDCL as discussed in subsequent paragraphs.

Aggregate Technical & Commercial Losses

2.1.15.7 One of the prime objectives of R-APDRP Scheme was to strengthen the distribution system with the focus on reduction of Aggregate Technical & Commercial losses (AT&C losses) on sustainable basis. Main objective of implementing the R-APDRP scheme is to reduce AT&C losses below the level of 15 *per cent*. The graph below depicts the AT&C losses over the review period in the four DISCOMs for five years ending 31st March 2011.



It could be seen from the above line graph that except in case of APCPDCL where the AT&C losses ranged from 17.26 to 18.34 *per cent*, all other DISCOMs maintained the AT&C losses below 15 *per cent*.

Consumer metering

2.1.15.8 Attainment of 100 *per cent* metering was one of the objectives of the R-APDRP scheme. However, in respect of all the DISCOMs metering programme under the scheme was not taken up so far inspite of having 27.70 lakh un-metered agricultural consumers (LT Category V) as on 31 March 2011.

Operational Efficiency

2.1.16 The operational performance of the DISCOMS 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 below.

Purchase of Power

2.1.17 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. APERC approves the sources of purchase of power and the purchase cost based on the estimates made in the ARR. In addition depending on the requirements, additional power purchases are made, out of which some portion will be subsidised by the Government.

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

(In Million Units)

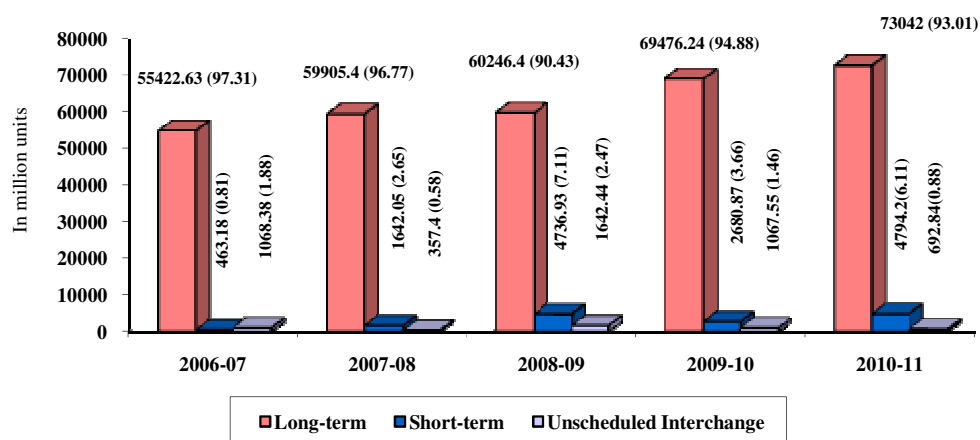
Year	Demand assessed in EPS	Purchases approved by APERC (including Government approved)	Actual Power purchased [†]	Power Deficit	Excess/ Shortfall in purchase against approved
(1)	(2)	(3)	(4)	(5) = (2 - 4)	(6) = (3 - 4)
2006-07	52854	55097.64	56954.19	0	1856.55
2007-08	62338	58042.12	61904.85	433.15	3862.73
2008-09	67967	69365.00	66625.78	1341.22	-2739.22
2009-10	74288	71041.06	73224.66	1063.34	2183.60
2010-11	81404	77861.27	78529.00	2875.00	-667.73

We observed that though the demand for power increased over the years, the actual power purchased was always less than the demand resulting in power deficit ranging between 433.15 MU and 2,875 MU in the last five years. The power purchases by the DISCOMs was more than the approved quantity of APERC resulting in purchase of high cost power to the tune of 7,902.88 MU amounting to ₹ 4,285.76 crore.

For the above purchases, DISCOMs entered into Long term and Short term power purchase agreements with various agencies viz., State Generation Companies, Central PSUs, IPPs, etc., besides Unscheduled Interchange

[†] Indicates units supplied by generators/ traders into Transmission system.

purchases on need basis. The break-up of the total power purchased into long term, short term and UI was as follows.



Note: figures in brackets indicate percentage of units to total purchased units.

It may be seen from the above graph that the percentage of short term purchases including UI to the total purchases increased from 2.69 (2006-07) to 9.58 per cent (2008-09), which however decreased to 6.99 per cent in 2010-11 indicating that the Company did not have proper plans for long-term purchases at a cheaper rate and instead depended on the short term purchases and Unscheduled Interchange (UI) at higher rates, which ultimately burdened the consumers.

The source-wise purchase of power during review period in respect of the State is given in the **Annexure-11**.

We observed that the average purchase cost per unit increased from ₹ 1.98 in 2006-07 to ₹ 2.89 in 2010-11 (45.95 per cent). We also observed that while the quantum of purchase of power registered an increase of 37.88 per cent, the increase in corresponding cost of power purchase registered 101.72 per cent during 2006-11 indicating purchase of power from traders including UI at higher cost per unit ranging between ₹ 4.95 (2006-07) to ₹ 7.15 (2008-09).

Non-realization of Cross subsidy surcharge from Captive Power Plants

2.1.18 As per Section 42 of Electricity Act 2003 and Rule 3(a) of Electricity Rules 2005, any captive generator shall consume 51 per cent of generation for its own use. In the case of below 51 per cent captive consumption, a captive user has to pay cross subsidy surcharge (CSS) to the distribution Licensee for the energy drawn from CPP in accordance with Section 42 of the Electricity Act, 2003. The CSS is determined by APERC in its tariff orders from year to year.

APCPDCL

APCPDCL failed to levy and collect cross subsidy surcharge of ₹ 12.31 crore from Captive Power plants.

2.1.18.1 We observed that three captive consumers of Penna Cements have consumed less than 51 *per cent* of the captive generation and wheeled the balance power to DISCOMs, which attracted levy of CSS of ₹ 12.96 crore. However the Company raised (June 2011) CSS for ₹ 0.65 crore for the period April and May 2010 only. Thus, the Company has extended undue benefit by not raising demand for CSS for the remaining 10 months amounting to ₹ 12.31 crore (₹ 12.96 crore - ₹ 64.68 lakh).

Non-levy of maintenance expenses for interconnection facilities on Non-Conventional Energy (NCE) Power Plants

2.1.18.2 The interconnecting facilities viz., bus bar, switch yard etc., at the generating stations of Non-Conventional Energy Power (NCE) Plants were being maintained by DISCOMs. As per terms and conditions of PPA (article 3.3) entered into by DISCOMs with the NCE plants, maintenance expenses for interconnection facilities were to be paid from commercial operation date (COD). However, we observed that action was not taken to get reimbursement of the maintenance charges so far, resulting in non-realisation of ₹ 3.01 crore.[‡] Both APCPDCL and APEPDCL agreed and issued notices at the instance of audit for recovery of maintenance expenses, which are yet to be recovered (August 2011).

Excess Transmission losses borne by DISCOMs

2.1.18.3 Transmission loss is the difference between energy received from the generating station to the transmission network and energy sent to DISCOMs. As per the APERC directions, the transmission losses as approved by the Commission shall be borne by the DISCOMs. During the review period the Transmission losses ranged between 4.76 (2007-08) to 5.97 (2008-09) *per cent* against the APERC approved norms of 4.02 (2010-11) to 4.45 (2006-07) *per cent*. Thus, due to inefficiency of APTRANSCO all the four DISCOMs suffered revenue loss of ₹ 1,120.08 crore due to short receipt of 3,733.60 MU.

Sub-transmission & Distribution Losses

2.1.19 The losses at 33 KV stage are termed as sub-transmission losses while those at 11 KV and below are termed as distribution losses. 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 un-metered supply, etc. The loss of energy on account of these factors must be kept at bare minimum.

[‡] APCPDCL: ₹ 0.68 crore from 41 generators; APEPDCL: ₹ 0.24 crore from 15 generators; ASPDCL: ₹ 2.10 crore from 55 generators.

The table below indicates the energy losses in respect of the State for last five years up to 2010-11 (DISCOM wise details are given in **Annexure-12**).

Sl. No.	Particulars	2006-07	2007-08	2008-09	2009-10	2010-11
1.	Energy purchased [§] (MU)	53982.74	57373.87	62706.95	69398.22	72951.54
2.	Energy sold (MU)	45314.19	48791.88	53626.14	59664.99	63304.78
3.	Energy losses (1 – 2) (MU)	8668.55	8581.99	9080.81	9733.23	9646.76
4.	Percentage of energy losses (per cent) $\{(3 / 1) \times 100\}$	16.06	14.96	14.48	14.03	13.22
5.	Percentage of losses allowed by SERC (per cent)	DISCOM wise details vide Annexure-12				
6.	Excess losses (in MU) Details in annexure-12	37.04	427.87	850.02	1891.72	1578.01
7.	Average realisation rate per unit (in ₹)	DISCOM wise details vide Annexure-12				
8.	Value of excess losses (₹ in crore) (details in Annexure-12)	5.74	131.10	329.03	670.20	598.88

Loss of ₹ 1,734.95 crore on account of failure to control distribution losses within permissible limits.

We observed that losses in the State as whole ranged between 13.22 (2010-11) and 16.06 per cent (2006-07) during the last five years ending 31 March 2011. We further observed that 94 per cent value of excess loss relates to APCPDCL.

Overloading of HT lines

APCPDCL

2.1.19.1 Each 33 KV feeder will have a maximum thermal load limit (TLL) of 300 amps. Scrutiny of the load flow data on the 33 KV feeders revealed that, 130 out of 727 feeders in APCPDCL were loaded above the maximum permissible TLL of 300 amps. Loading of the lines beyond capacity resulted in voltage fluctuations, higher distribution losses and 3,17,999 numbers of interruptions and 21,933 numbers of breakdowns.

APCPDCL replied that Sufficient number of 33/11 KV lines are being laid to reduce the overloading of the feeders.

APEPDCL

2.1.19.2 In APEPDCL out of 298 nos. of 33KV feeders existing as on 31 March 2011, 18 numbers feeders recorded more than 100 per cent load and 90 numbers feeders recorded between 80 to 100 per cent load. Further, out of 2,179 numbers 11 KV feeders existing at the end of March 2011, 172 feeders had recorded more than 100 per cent load whereas 306 feeders recorded loads between 80 to 100 per cent. Overloading of lines resulted in higher distribution losses, interruptions (71,874 numbers) for 66,159 hours and breakdowns (9,927 numbers) for 20,730 hours.

Performance of Distribution Transformers

2.1.19.3 APERC had not fixed any norm for failures of DTRs. However, the Companies were fixing internal norms for failure of DTRs. The details of

[§] Indicates units received into Distribution system excluding transmission losses.

norms fixed, actual DTRs failed and the expenditure incurred on their repairs in respect of APCPDCL and APEPDCL is depicted in the **Annexure-13**.

We observed from the annexure that there were excess failure of DTRs above the norms ranging from 4.24 to 9.76 *per cent* in APCPDCL (2006-11), while in APEPDCL these were 0.16 and 2.48 *per cent* in 2007-08 and 2010-11 respectively. Both the companies incurred ₹ 117.02 crore (APCPDCL: ₹ 101.09 crore; APEPDCL: ₹ 15.93 crore) on repairs to DTRs during the review period, out of which ₹ 38.62 crore (APCPDCL: ₹ 34.45 crore; APEPDCL: ₹ 4.17 crore) was incurred on DTRs failed in excess of the norms. Failure of DTRs could be minimized by preventive maintenance and avoiding overloading of the same. Cause-wise analysis of failure of DTRs revealed that the percentage of failure due to over-loading ranged between 14.44 to 24.64 *per cent* in respect of APCPDCL and 13.81 to 26.98 *per cent* in respect of APEPDCL during the years under review as shown in the table below:

Year	Name of Company	Total Number of DTRs failed during the year	Number of failures due to over-loading	Percentage of failures due to over-loading
2006-07	CPDCL	37819	9319	24.64
	EPDCL	2554	422	16.53
2007-08	CPDCL	38891	5616	14.44
	EPDCL	2238	471	21.05
2008-09	CPDCL	37525	8785	23.41
	EPDCL	1684	454	26.98
2009-10	CPDCL	38838	9512	24.49
	EPDCL	5070	700	13.81
2010-11	CPDCL	40151	9892	24.63
	EPDCL	4612	612	13.27

APCPDCL

2.1.19.4 On scrutiny of the load flow details of the DTRs in APCPDCL we observed that out of 2,50,345 DTRs existing to the end of 31 March 2011, 1,16,161 nos. were loaded between 80 to 100 *per cent* and 10,549 nos. were loaded beyond 100 *per cent* capacity as against targeted maximum load of 80 *per cent*. Further, detailed analysis of three selected circles in APCPDCL revealed that failure apart from overloading were due to poor maintenance, low oil and bad lines which could be controlled by undertaking timely preventive maintenance which accounted for 56,144 i.e., 36.67 *per cent* of the total failures (other than manufacturing defects) during the review period in these circles.

APCPDCL replied that due to unauthorized agricultural connections the DTRs are overloaded and added that several preventive maintenance steps are taken to reduce overloading of DTRs. The reply is not acceptable, as preventive maintenance of DTRs stated to have been taken by the Management has not shown any results.

2.1.19.5 In APEPDCL, DTR failure percentage due to overloading has increased from 16.53 to 26.98 *per cent* upto 2008-09 but decreased to 13.27 *per cent* in 2010-11. However, an analysis of circle wise position indicated that the DTR failures due to overloading was very high in Srikakulam circle and ranged between 49.75 to 65.22 *per cent* and was on increasing trend during review period. Further, cause-wise analysis of DTR failures revealed

that the incorrect load balancing of DTRs (8.54 to 15 *per cent*), low level of oil (4 to 8 *per cent*) and bad tree clearance (9 and 23.24 *per cent*) also resulted in the DTR failures during the years from 2006-07 to 2010-11.

APEPDCL stated that action is being taken for balancing of loads on DTRs and procurement of additional DTRs etc., and also stated high failure rate of DTRs in Srikakulam circle was due to floods and cyclone and instructions for balancing were issued from time to time. Apart from overloading, the cause-wise analysis of DTR failures revealed that absence of preventive maintenance resulted in more failures.

Delay in repair of Distribution Transformers

2.1.19.6 APCPDCL and APEPDCL undertake repair of damaged transformers both in-house and through outside agencies also. Further, as per the general terms and conditions of purchase order, the suppliers were required to guarantee the performance of DTRs for 5 years from the date of supply/installation. DTRs failed within guarantee period were required to be replaced/ repaired in 60 days. There were 7,718 DTRs (APCPDCL: 5,750; APEPDCL: 1,968) which failed within the guarantee period and were awaiting repair/ replacement at the end of 2010-11.

Capacitor Banks

2.1.20 Capacitor bank (CB) 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 CBs to the system as it improves the voltage profile and reduces dissipation of energy to a great extent thereby saving loss of energy. The position as regards CBs in respect of APCPDCL and APEPDCL is shown in the **Annexure-14**.

The AP Grid code (3.2.12.5) states the DISOCMs shall install capacitors at various locations of the distribution system so that the PF is not less than 90 *per cent* which was not done as required.

2.1.20.1 We observed that APCPDCL has not fixed any targets but adopted the actually installed number of CBs in a year as the target for that year. Though the Company installed 2,038 CBs (600 KVAR; 2 and 5 MVAR) for a total capacity of 2,664.2 MVAR, there was shortage in reactive energy ranging between 439 (2009-10) and 248 (2006-07) MVAR during 2006-11, due to non-working of 1,064 CBs (791 MVAR), which were old and became defective. This led to loss of energy saving of 22.02 MU valued at ₹ 7.71 crore. Similarly, in APEPDCL against the targeted addition of the capacitor banks of 300 MVAR the actual addition was only 217 MVAR, which led to loss of targeted energy savings of 0.82 MU valued at ₹ 24.77 lakh. Further, the Companies also incurred additional expenditure of ₹ 2.50 crore towards reactive energy compensation charges.

Commercial losses

2.1.21 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 implementation of R-APDRP scheme and billing efficiency, respectively, the other observations relating to commercial losses

are discussed below.

High incidence of theft

2.1.22 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 checkings, theft cases, assessed amount and amount realized there against in respect of APCPDCL and APEPDCL are given in **Annexure-15**. An analysis of the annexure revealed the following:

2.1.22.1 We observed that both APCPDCL and APEPDCL did not provide for any targets for inspection of services, assessment and realisation of amounts by checking and yard stick for checking of services. As against the assessed amount of ₹ 24.20 crore and ₹ 10.88 crore booked on theft cases, only ₹ 10.85 crore and ₹ 7.20 crore was realized, respectively, which indicate lack of effective persuasion for realisation.

Performance of Raid Team

2.1.22.2 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 in the premises of a consumer for inspection and testing the apparatus. Vigilance Wing in the DISCOM consists of Chief Vigilance Officer of the rank of Superintendent of Police/ Additional Superintendent of Police having the powers of the Police Station for investigation over his jurisdiction. Each Operation Circle has one Anti Power Theft Squad (APTS) and one Detection of Pilferage of Energy (DPE) Wing. The DPE wing prepares work plan to conduct raids by identifying such consumers/areas where large scale theft was suspected based on the energy audit reports. The DPE wing assists the raid teams during inspections. Following is the position of raids conducted during the review period in respect of APCPDCL and APEPDCL.

(Amount ₹ in crore)

Year	Company	Total number of consumers as on 31 March	No. of consumers checked	Assessed amount	Realised amount	Un-realised amount	Percentage of checking to total No. of consumers
2006-07	CPDCL	5486545	236350	0.44	0.24	0.20	4.31
	EPDCL	3554312	37903	11.28	3.77	7.51	1.06
2007-08	CPDCL	5822215	175994	9.88	6.29	3.59	3.02
	EPDCL	3797331	49238	10.17	4.85	5.32	1.30
2008-09	CPDCL	6273279	183301	31.89	20.74	11.14	2.92
	EPDCL	4095755	51807	22.25	14.35	7.90	1.27
2009-10	CPDCL	6671407	209480	35.45	22.04	13.40	3.14
	EPDCL	4348110	43002	18.46	13.32	5.14	0.99
2010-11	CPDCL	7021703	188018	28.00	12.45	15.54	2.68
	EPDCL	4603600	36539	33.66	19.56	14.11	0.79

It may be seen from the above table that the percentage of unrealised amount against assessed amount was fluctuating and ranged between 34.93 (2008-09) and 55.50 per cent (2010-11) in APCPDCL & 27.84 (2009-10) and 66.58 per cent (2006-07) in APEPDCL indicating poor persuasion. At the same time the percentage of checking of number of consumers also decreased from

4.31 in 2006-07 to 2.68 per cent in 2010-11(APCPDCL) and from 1.06 in 2006-07 to 0.79 per cent in 2010-11 (APEPDCL). This shows that there was need to conduct more raids in respect of both the DISCOMs to drastically reduce theft of energy.

APEPDCL replied that targets were fixed for conducting inspections on annual basis but did not clarify reason for reduction in percentage of checking the consumers and audit suggestion were accepted to be followed scrupulously in future.

Financial Position and Working Results

2.1.23 One of the major aims and objectives of the National Electricity Policy of 2005 is ensuring Financial Turnaround and commercial viability of electricity sector. The tables below summarize the financial position and working results of two selected DISCOMs for the period from 2006-07 to 2010-2011. (The details in respect of APSPDCL and APNPDCL were given in **Annexure-16** and **Annexure-17**).

A. Financial Position

(₹ in crore)

Particulars	CPDCL					EPDCL				
	2006-07	2007-08	2008-09	2009-10	2010-11	2006-07	2007-08	2008-09	2009-10	2010-11
A. Liabilities										
Paid-up Capital	728.48	728.48	728.48	728.48	728.48	121.23	121.23	121.23	121.23	121.23
Reserve & Surplus**	750.09	937.75	1118.66	1264.17	1383.01	492.57	534.96	773.81	803.28	896.83
Borrowings										
Loans	1242.46	1449.92	2608.22	3895.99	5510.23	707.73	828.63	1715.63	2012.22	3187.88
Current Liabilities & Provisions	2763.75	2624.36	3954.92	4630.27	5563.76	896.23	951.29	1177.85	1511.91	1639.70
Total	5484.78	5740.51	8410.28	10518.91	13185.48	2217.76	2436.11	3788.52	4448.64	5845.64
B. Assets										
Gross Block	3170.98	3807.74	4433.91	5124.12	5783.18	1809.33	2061.31	2396.75	2649.96	2856.36
Less: Depreciation	1543.66	1777.36	2037.96	2333.26	2659.58	789.81	819.24	973.2	1141.6	1317.61
Net Fixed Assets	1627.32	2030.38	2395.95	2790.86	3123.60	1019.52	1242.07	1423.55	1508.36	1538.75
Capital works-in-progress	650.19	620.39	609.73	605.33	696.07	186.52	186.75	194.11	192.17	181.6
Investments	22.52	24.12	24.12	24.14	86.95	9.41	9.41	9.23	25.55	70.84
Current Assets, Loans and Advances	2949.19	2841.41	5193.46	6911.46	9100.02	1002.31	997.88	2161.63	2722.56	4054.45
Accumulated losses	235.56	224.21	154.21	117.74	114.62	0	0	0	0	0
Deferred tax	-	-	32.81	69.38	64.22	-	-	-	-	-
Total	5484.78	5740.51	8410.28	10518.91	13185.48	2217.76	2436.11	3788.52	4448.64	5845.64
Debt equity ratio	1:1	1.01:1	1.54:1	2.08:1	2.76:1	1.15:1	1.26:1	1.92:1	2.18:1	3.13:1
Net worth	1243.01	1442.02	1692.93	1874.91	1996.88	613.80	656.19	895.04	924.51	1018.06

** Reserves and surplus includes capital grants but excludes depreciation reserve.

B. Working results

(₹ in crore)

Sl.No.	Description	CPDCL					EPDCL				
		2006-07	2007-08	2008-09	2009-10	2010-11	2006-07	2007-08	2008-09	2009-10	2010-11
1	Income										
(i)	Sale of Power	4978.04	5871.64	6475.85	7811.67	9860.06	2236.39	2609.02	2735.75	2982.75	3472.09
(ii)	subsidy & grants	498.65	1108.00	3371.74	2262.65	1601.57	8.27	0	671.54	887.97	857.66
(iii)	Other income	221.39	425.37	396.72	515.06	571.03	78.01	122.30	126.85	113.11	141.08
	Total Income	5698.08	7405.01	10244.31	10589.38	12032.67	2322.67	2731.32	3534.14	3983.83	4470.83
2	Expenditure on Distribution of Electricity										
(a)	Fixed cost										
(i)	Employees cost	307.64	388.7	357.93	380.06	625.18	165.65	210.07	209.60	255.86	429.75
(ii)	Administrative and General expenses	68.94	60.67	71.75	71.17	86.93	37.33	39.91	40.47	46.79	49.42
(iii)	Depreciation	198.76	233.69	260.92	295.30	326.32	139.04	111.82	157.63	168.43	179.66
(iv)	Interest and finance charges	223.15	121.74	273.97	461.06	579.93	103.5	118.51	124.07	171.98	186.31
(v)	Other Expenses	51.54	698.76	398.49	121.83	96.47	1.73	19.99	2.62	3.93	2.39
	Total fixed cost	850.03	1503.56	1363.06	1329.42	1714.83	447.25	500.3	534.39	646.99	847.53
(b)	Variable cost										
(i)	Purchase of Power	4935.97	5797.58	8666.29	9105.90	10173.80	1939.74	2252.47	2953.09	3305.67	3589.41
(ii)	Repairs & Maintenance	79.89	102.73	116.29	151.34	137.80	11.19	13.46	22.91	13.90	17.86
	Total variable cost	5015.86	5900.31	8782.58	9257.24	10311.06	1950.93	2265.93	2976	3319.57	3607.27
(c)	Total cost 3(a) + (b)	5865.89	7403.87	10145.64	10586.66	12025.92	2398.18	2766.23	3510.39	3966.56	4454.8
	Profit/loss	-167.81	1.14	98.67	2.72	6.75	-75.51	-34.91	23.75	17.27	16.03

2.1.24 The financial viability of the DISCOMs are generally influenced by the various factors such as

- a) Timely revision of tariff;
- b) Adequacy of revision of tariff to cover the cost of operation;
- c) Timely release of promised subsidy by the Government;
- d) Cross subsidization policy of the Government and its implementation by the DISCOMs;
- e) The Financial Management of DISCOMs; and
- f) The Revenue billing and collection efficiency.

Each of these factors are discussed in the following paragraphs.

a) Timely revision of tariff

2.1.24.1 The tariff structure of the power distribution companies is subject to revision and approval by the APERC after the objections, if any, received against Aggregate Revenue Requirement (ARR) petition filed by them within the stipulated dates. Each DISCOM was required to file the ARR for each year

120 days before the commencement of the respective financial year. The APERC accepts the ARR filed by the Company with such modifications/conditions as may be deemed just and appropriate and after considering all suggestions and objections from public and other stakeholders.

Delay in filing ARR resulted in loss of revenue of ₹ 187.28 crore and avoidable payment of ₹ 47.69 crore towards load factor incentive.

We observed that all the DISCOMs delayed the filing of ARR by 30 days in 2006-07 and 140 days in 2010-11. Though the delay did not affect the Tariff Order coming into effect in 2006-07, delayed filing of ARR by 140 days in 2010-11 resulted in delay in issue of Tariff Order by four months (August 2011). Consequently, APCPDCL and APEPDCL suffered loss of revenue of ₹ 136.12 crore and ₹ 51.16 crore, respectively due to billing in respect of some Categories (against which Tariff was hiked for 2010-11) at Old Tariff rates for the period 1 April 2010 to 31 July 2010. We further observed that due to delayed implementation of new tariff, both APCPDCL and APEPDCL incurred an avoidable expenditure of ₹ 42.74 crore and ₹ 4.95 crore respectively as load factor incentive allowed to HT consumers for the first four months which was removed in the new tariff order. Further, the companies allowed excess HT incentive since 2002 to December 2009 to the extent of ₹ 4.88 crore (APCPDCL: ₹ 1.80 crore; APEPDCL: ₹ 3.08 crore) which was to be recovered as per APERC directions. Both the companies agreed to recover the excess HT incentive from the consumers.

APCPDCL and APEPDCL attributed the delay in filing of ARR to non-availability of data on energy requirement for Lift Irrigation (LI) schemes in the State. However, they could have assessed the energy requirement of LI schemes based on the capacities declared in the project reports, to avoid delays in filing ARR, keeping in view the substantial impact on revenues due to delay in implementation of new tariff. Thus, the delay in filing of ARR and its implementation deprived a total revenue of ₹ 178.86 crore in case of APCPDCL and ₹ 56.11 crore in case of APEPDCL.

2.1.24.2 We observed that both APCPDCL and APEPDCL earned profits during the review period except for the year 2006-07 when APCPDCL suffered a loss of ₹ 167.81 crore and for the years 2006-07 and 2007-08 APEPDCL suffered loss of ₹ 75.51 crore and ₹ 34.91 crore respectively.

We further observed that in both APCPDCL and APEPDCL power purchase, employee cost and interest and finance charges constituted the major elements of cost in 2010-11 which represented 84, five and five *per cent* and 80, 10 and four *per cent*, respectively, of the total cost in the year. On the other hand sale of power, subsidy and other income constituted the major elements of revenue which represented 82, 13 and five *per cent* and 78, 19 and three *per cent*, respectively, of the total revenue.

b) Timely release of promised subsidy by the Government

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

The Government released ₹ 4,513.63 crore and ₹ 842.57 crore to APCPDCL and APEPDCL, respectively, during the last five years, which was delayed by 13 days to 145 days against the advance release. Though the Government has released the subsidy allowed in the tariff orders to the DISCOMs, there were heavy arrears of subsidy yet to be released as discussed in the subsequent para.

2.1.24.4 As per the directives of GoAP, issued from time to time, to ensure adequate and quality power supply in the State by all means, if necessary, by means of need based power purchases (the cost of which would be reimbursed by GoAP in the next financial year), DISCOMs resorted to purchase of high cost power from inter state power traders at high rates ranging between ₹ 4.46 and ₹ 7.15 per unit (as against average cost of purchase of ₹ 1.98 to ₹ 2.89 per unit) during 2006-11. Subsidy towards purchase of high cost power alarmingly increased from ₹ 617 crore in 2006-07 to ₹ 6,542 crore in 2008-09, which stood at ₹ 1,619 crore in 2010-11, in respect of all the four DISCOMs.

Further, as against the total subsidy claim (including tariff subsidy) of ₹ 10,415.87 crore (APCPDCL: ₹ 8,856.83 crore; APEPDCL: ₹ 1,559.04 crore) during 2006-11, only ₹ 5,356.13 crore (APCPDCL: ₹ 4,513.63 crore; APEPDCL: ₹ 842.50 crore) was actually paid by State Government leaving a balance of ₹ 5,059.74 crore as detailed below.

(₹ in crore)

Particulars	CPDCL					EPDCL				
	2006-07	2007-08	2008-09	2009-10	2010-11	2006-07	2007-08	2008-09	2009-10	2010-11
Opening balance	-	-	-	2325.48	3561.81	-	-	-	544.54	716.54
Add: Due from State Government during the year	498.65	1108	3378.45	2270.17	1601.56	8.27	-	671.54	606.64	272.66
Less: Received during the year	498.65	1108	1052.97	1033.84	820.17	8.27	-	127.00	434.64	272.66
Closing balance	-	-	2325.48	3561.81	4343.20	-	-	544.54	716.54	716.54

Non-release of subsidy of ₹ 5059.74 crore by State Government resulted in increase in borrowings.

The DISCOMs have financed purchase of power at high cost through short term borrowings. The loan funds and current liabilities of APCPDCL have increased from ₹ 4,006.21 crore in 2006-07 to ₹ 11,073.99 crore in 2010-11 similarly in case of APEPDCL, they have increased from ₹ 1,603.96 crore in 2006-07 to ₹ 4,827.58 crore in 2010-11. Both APCPDCL and APEPDCL while accepting the audit observation did not mention any measures proposed for improvement of the situation.

c) Cross subsidization policy of the Government and its implementation

2.1.24.5 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 consumers should range within plus or minus 20 per cent of the ACoS by the year 2010- 2011.

The position as regards cross-subsidies in various major sectors in respect of four DISCOMs is depicted in the **Annexure-18**.

2.1.24.6 It could be observed from the Annexure that in APCPDCL, while the cross subsidy in respect of domestic category is within the prescribed limit of 20 per cent of ACoS, in respect of commercial and industrial categories, the variation is high ranging from 116.3 to 242.48 per cent. The agriculture category is subsidized but the cross subsidy is borne more by the commercial and industrial consumers.

APCPDCL replied that due to non-increase of power Tariffs, DISCOMs are not able to maintain the level of 20 per cent of ACoS but efforts are made to reduce the deviations from NEP.

2.1.24.7 It could be observed from the Annexure that in APEPDCL cross subsidy of Domestic Consumers was reduced to 6.98 per cent in 2008-09 from 26.2 per cent in 2006-07 but increased to 24.12 per cent in 2009-10 and 26.58 per cent in 2010-11, whereas realization of revenue as a percentage of ACoS from commercial and industrial consumers ranged between 103.59 and 213.15 per cent, respectively.

APEPDCL replied that reduction of cross subsidy levels was the prerogative of APERC and DISCOM would obey the orders. The reply was not acceptable as the tariff has been revised by the Commission every year. Though the level of cross subsidy is determined by the Commission on the directions of Government, as per Section 108 of the Electricity Act, the Government and Commission's decision about the cross subsidy should have been guided by the spirit of Section 61 of the Electricity Act, 2003 and para 8.3(2) of National Tariff Policy.

d) The financial management of DISCOMs

2.1.24.8 As evident from the declining debt equity ratio of APCPDCL and APEPDCL, the companies started relying on borrowed funds for their management than their own generation of surplus from core activities. Some of the instances of bad financial management are detailed below:

Incorrect communication of agricultural dues resulted in loss of ₹ 7.56 crore

APCPDCL

2.1.24.9 As against the amount of ₹ 577.65 crore reimbursable by the Government of Andhra Pradesh (GoAP) towards waived agricultural dues the APCPDCL informed only ₹ 570.09 crore to GoAP. The incorrect communication deprived the release of funds to the tune of ₹ 7.56 crore towards waived agricultural dues.

Pool Account Settlement

APEPDCL

2.1.24.10 The sister DISCOMs of AP owe an amount of ₹ 1,446.42 crore to APEPDCL towards cost of Power draws from the Company upto 2010-11

on account of imbalance pool settlement. Non-realization of heavy dues from the sister DISCOMs pending since 2005-06 had an adverse impact on the financial health of APEPDCL which is resorting to borrowings at higher rates of interest, while the Company did not earn any interest on the pool imbalance dues.

e) The revenue billing and collection efficiency

Incorrect estimation of agricultural consumption

2.1.24.11 In accordance with APERC direction (June 2001) DISCOMs prepared a database (as per 2001 census) showing the details of number of mandals where agricultural consumption took place, number of agricultural pump sets in each mandal and connected load of each agricultural pump set. On the basis of readings obtained from meters fixed at selected DTRs in selected villages in each mandal, agricultural consumption is arrived at after extrapolation for the entire population of pump sets duly making adjustments for LT line losses.

2.1.24.12 A test check of the records in APCPDCL revealed that out of 6,277 sample DTR meters, readings were taken only from 4,475 DTR meters as the remaining were not working rendering the assessed agricultural consumption unrealistic/ unreliable. Consequently APERC was admitting assessed consumption in respect of number of agricultural connections as per 2001 census only (8.58 lakh services) though the number of services were increased year after year which stood at 9.94 lakh services by the end of March 2011. This resulted in disallowance of 7,530.51 MU of agricultural consumption valued ₹ 2,519.94 crore by APERC during 2006-11.

Further, the Company in the process of regularising unauthorised agriculture connections, identified 3,41,892 agriculture services during the review period, out of which 2,59,488 services (75.90 per cent) were yet to be regularized, on which an amount of ₹ 25.95 crore (at ₹ 1,000 per HP towards development charges) was to be realized. Management replied that constant drive is made to detect the unauthorised agricultural services and to regularize them.

2.1.24.13 A review of the estimated agricultural consumption in APEPDCL revealed that the assessment was done without considering number of inactive pump sets, which resulted in showing excess consumption of agricultural units to the extent of 729.40 MU valued ₹ 273.38 crore for the period 2007-11 (up to January 2011).

APCPDCL replied that the new methodology suggested by APERC is under implementation for realistic assessment of agricultural consumption.

Non-filing of Fuel Surcharge Adjustment (FSA) claim in time

2.1.24.14 As per Section 62(4) of Electricity Act 2003, additional fuel and power purchase costs have to be passed on to the consumers as Fuel Surcharge Adjustment (FSA). DISCOMs were to work out and file the FSA claim at the end of each quarter to APERC. For the year 2008-09 the DISCOMs filed the

Delay in filing of FSA claims resulted in loss of ₹ 10.08 crore.

FSA proposals with APERC belatedly in February 2010 i.e., after a delay of 12 to 20 months. Out of approved FSA of ₹ 819.86 crore (APCPDCL: ₹ 538.86 crore; APEPDCL: ₹ 281 crore) recoverable from the consumers, the companies raised demand through monthly bills for ₹ 400.18 crore (APCPDCL: ₹ 235.78 crore; APEPDCL: ₹ 164.40 crore) but could recover only ₹ 242.61 crore (APCPDCL: ₹ 174.09 crore; APEPDCL: ₹ 68.52 crore) till March 2011, as claims amounting to ₹ 185.13 crore (APCPDCL: ₹ 132.30 crore; APEPDCL: ₹ 52.83 crore) were disputed and legal cases were filed by consumers. Out of this an amount of ₹ 10.08 crore (APCPDCL: ₹ 9.84 crore; APEPDCL: ₹ 0.24 crore) was irrecoverable as the consumers were not identified.

APCPDCL replied that there were delays in collection of data in filing FSA proposals. The reply is not acceptable as huge amounts are involved for collection from consumers, the Company could have arranged for collection of data which was possible with computerization and filed the FSA proposals in time.

Further, FSA claim of ₹ 958.73 crore (APCPDCL: ₹ 677.40 crore; APEPDCL: ₹ 281.33 crore) for the year 2009-10 was filed with APERC with a delay of one to 11 months. For the year 2010-11 FSA claim to the extent of ₹ 1,993 crore (APCPDCL: ₹ 1,408 crore; APEPDCL: ₹ 585 crore) was filed in time but the same is yet to be finalised by the APERC.

Instances of undue favour to consumers in various forms are illustrated below:

Incorrect application of tariff

2.1.25 As per the terms of tariff orders, HT Category-I is applicable to industrial consumers having Contracted Maximum Demand of 70 KVA and above, whose industrial purpose is manufacturing, processing and/or preserving goods for sale. HT Category-II is applicable to those other than above.

2.1.25.1 A review of records in APCPDCL revealed that 15 printing presses (which are not manufacturing, processing and/or preserving goods for sale) were categorized under HT Category-I instead of HT Category-II, while six printing presses having the same nature of business were classified under HT Category-II. Wrong categorisation of the above 15 services, resulted in loss of revenue of ₹ 5.31 crore for the period from April 2006 to March 2011.

2.1.25.2 In APEPDCL, Garrison Engineers, Naval Dockyard, Visakhapatnam, engaged in the activity of ship repairs etc., which is not manufacturing, processing and/or preserving goods for sale, was being billed incorrectly under HT Category-I instead of HT Category-II, which resulted in loss of revenue to the tune of ₹ 24.65 crore for the period from November 2006 to March 2011. APEPDCL replied that necessary clarification with regard to classification of the customer will be sought from the APERC.

Wrong categorization of services led to loss of revenue ₹ 29.96 crore.

Non-collection of Additional Consumption Deposit

2.1.26 APERC issued (May 2004) orders prescribing the initial Security to be deposited by various consumers for getting electricity connection as well as Additional Consumption Deposit (ACD) to be paid by various consumers. As per clause 6 of the order, a security deposit to cover the estimated power consumption for two months was to be determined at the time of connection and to be reviewed every year. The ACD was to be paid by the consumer within 30 days of the notice. If there was a delay in payment of ACD, the consumer was to pay Surcharge there on at 18 *per cent* and in case the Consumer fails to deposit the ACD the supply of the defaulting consumers was to be disconnected.

2.1.26.1 A review of records relating to assessment and collection of ACD for the year 2010-11 revealed that APCPDCL assessed ACD at ₹ 105.74 crore which was to be collected from 2,40,945 consumers. Out of this, the Company collected ₹ 64.66 crore leaving a balance of ₹ 41.08 crore. In respect of APEPDCL as against assessed ACD of ₹ 39.66 crore to be collected from 98,612 consumers, the Company collected ₹ 25.34 crore only from 33,569 consumers leaving a balance of ₹ 14.32 crore.

APCPDCL replied that most of the ACD amount is due from Government and Local bodies and surcharge was also being levied for late payment. APEPDCL replied that uncollected ACD would be included in the next year. However the fact remains that huge amounts of ACD remained uncollected.

Engagement of Private Accounting Agencies (PAAs) despite availability of Energy Billing System

2.1.27 APCPDCL and APEPDCL developed billing application software which enabled, availability of billing data of all the locations of the Companies at centralised location. Main advantage of this IT application software was elimination of Private Accounting Agencies being engaged by the Companies at each section office level for all bill related activities. We observed that both the Companies continued to engage PAAs inspite of introduction of billing software resulting in avoidable expenditure of ₹ 43.55 crore (APCPDCL: ₹ 34.67 crore; APEPDCL: ₹ 8.88 crore) during the period 2006-11.

APCPDCL, while agreeing that the work load to PAAs has been reduced, stated that the reduction of remuneration is under consideration. Reply is not acceptable since the main advantage of implementation of EBS was elimination of engagement of PAAs.

Avoidable expenditure of ₹ 43.55 crore due to continuation of PAAs even after introduction of billing software.

Revenue collection efficiency

2.1.28 As revenue from sale of energy is the main source of income of DISCOM, prompt collection of revenue assumes great significance. The table below indicates the balance due for collection at the beginning of the year, revenue assessed, amount realized and written off during the year and the balance outstanding at the end of the year in respect of APCPDCL and

APEPDCL during last five years ending 2010-11. (In respect of APSPDCL and APNPDCL the outstanding dues are given in **Annexure-19**).

(₹ in crore)

Particulars	CPDCL					EPDCL				
	2006-07	2007-08	2008-09	2009-10	2010-11	2006-07	2007-08	2008-09	2009-10	2010-11
Amount due for realization at the beginning of the year	1179.86	1216.76	1281.37	902.54	1014.01	134.62	145.78	140.82	152.07	208.37
Revenue assessed/billed during the year	5036.93	5955.26	6543.48	7269.92	8848.62	2126.63	2334.04	2534.19	2800.81	3393.89
Total Amount due for realization	6216.79	7172.02	7824.85	8172.46	9862.63	2261.25	2479.82	2675.01	2952.88	3602.26
Amount realized/written off during the year	5000.03	5890.65	6922.31	7158.45	8544.33	2115.47	2339.00	2522.94	2744.51	3287.06
Outstanding at the end of the year	1216.76	1281.37	902.54	1014.01	1318.30	145.78	140.82	152.07	208.37	315.20
Outstanding for more than three years	559.32	664.33	523.57	530.04	392.44	NA	NA	53.56	68.99	73.82
Debts prior to 1999-2000	152.93	142.07	76.79	61.74	41.07	NA	NA	5.83	5.81	4.06
Disconnected Services	230.21	277.73	109.52	101.48	116.19	14.59	10.26	9.45	8.27	9.82
Court cases	220.78	198.67	217.13	248.70	280.97	54.65	59.02	66.11	84.47	163.18
SPSUs/CPSUs	159.37	175.46	54.27	73.40	72.43	Included with state and central government dues				
Local bodies	43.74	53.69	47.19	109.12	236.79	8.34	11.20	15.54	31.19	51.15
State/ Central Government dues	21.23	25.55	81.64	84.14	155.94	7.42	6.66	11.46	22.34	21.64

An analysis of the balances outstanding revealed that

Dues of ₹ 466.26 crore were outstanding for more than three years due to ineffective persuasion.

- Dues outstanding for more than three years amounted to ₹ 466.26 crore (APCPDCL: ₹ 392.44 crore; APEPDCL: ₹ 73.82 crore equivalent to 29 and 23 *per cent* of the total dues) consisting of dues from LT and HT categories. This indicated ineffective persuasion of old debts.
- Group-wise analysis of debts outstanding as on 31 March 2011 revealed that an amount of ₹ 126.01 crore (APCPDCL: ₹ 116.19 crore; APEPDCL: ₹ 9.82 crore) was due from disconnected services.
- Dues from State/Central Government departments abnormally increased from ₹ 21.23 crore and ₹ 7.42 crore in 2006-07 to ₹ 155.94 crore and ₹ 21.64 crore in 2010-11, in APCPDCL and APEPDCL respectively, registering steep increase of 634.52 and 191.64 *per cent* respectively indicating lack of effective persuasion at higher management level to realise the huge arrears from Government departments.
- Dues against Local Bodies also increased from ₹ 43.74 crore and ₹ 8.34 crore in 2006-07 to ₹ 236.79 crore and ₹ 51.15 crore in 2010-11 in APCPDCL and APEPDCL, respectively.

Failure to finalise Permanent Disconnection cases

2.1.29 Test check of billing details of LT consumers during 2006-11 revealed that in APCPDCL 398 consumers having arrears of more than ₹ 1 lakh did not deposit their dues of ₹ 8.40 crore for four to 197 months and

in APEPDCL arrears of ₹ 1.93 crore was due from 70 consumers for six to 36 months. The supply of these consumers was disconnected temporarily and billing was stopped. The Companies neither disconnected supply permanently nor finalized the accounts of these consumers. This resulted not only in non-realisation of arrears amounting to ₹ 10.33 crore (August 2011), but also risk of unauthorised use/ theft of power.

Consumer Satisfaction

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

The Company was required to introduce consumer friendly actions like introduction of computerized billing, online bill payment, establishment of customer care centers, 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

2.1.30.1 The APERC specified the mode and time frame for redressal of grievance in Regulation No. 7 of 2004 in pursuance of the Electricity Act 2003. The Commission had also prescribed the standards of Performance for DISCOMs in which the time limit for rendering services to the Consumers and compensation payable for not adhering to the same are specified. The nature of services contained in the Standards inter-alia include line breakdowns, Distribution Transformers failures, period of load shedding/scheduled outages, voltage variations, meter complaints, installation of new meters/connections or shifting thereof, etc.

Consumer Redressal System Existing in the DISCOMs

2.1.30.2 APCPDCL has given wide publicity of the measures and activities of Consumer Grievance Redressal Forum (CGRF) in print and electronic media, apart from conducting Circle level consumers' courts, awareness programmes in sub-station level meetings and 'Rythu Sadassu' (meetings with farmers). The Company provides all inputs required by CGRF to enable its functioning independently and to conduct hearings systematically and regularly in all Circles by providing supporting staff, accommodation for conducting court proceedings. Compliance reports of CGRF orders are being submitted to APERC.

2.1.30.3 APEPDCL has a CGRF and in order to implement proper redressal of complaints relating to supply of meters, New Services Connection, Title Transfer, Category, and bills etc. The Company prepared a Citizen Charter

fixing standards of performance such as time limits for each problem within which the complaints were to be solved. Customers can make calls to 155333 to register their Complaints and the same are entered into the system and recorded, then the registered complaints are being forwarded to concerned area of operation (Section) to meet/ attend the problems. The Company also takes Consumer feedback periodically to review the performance of service.

2.1.30.4 To enable the compilation of complaints for assessing the performance on this account, online data was maintained by the Companies. The overall position as regard receipt of complaints and their clearance in respect of APCPDCL and APEPDCL is depicted in the table below (data in respect of APSPDCL and APNPDCL is given in **Annexure-20**).

(in lakh number)

Particulars	2006-07		2007-08		2008-09		2009-10		2010-11	
	CPDCL	EPDCL	CPDCL	EPDCL	CPDCL	EPDCL	CPDCL	EPDCL	CPDCL	EPDCL
Total complaints received	0.32	3.94	0.61	3.50	0.79	3.21	0.95	2.67	1.01	3.36
Complaints redressed within time	0.29	3.67	0.56	3.31	0.74	3.07	0.87	2.32	0.84	2.70
Complaints redressed beyond time	0.02	0.14	0.02	0.07	0.04	0.05	0.08	0.18	0.17	0.47
Pending complaints	0.02	0.13	0.04	0.12	0.04	0.09	0.04	0.17	0.04	0.19
Percentage of complaints redressed beyond time to total complaints	6.25	3.55	3.28	2.00	5.06	1.56	8.42	6.74	16.83	13.99
Compensation paid, if any, to Consumers (₹ in lakh)	-	0.05	-	-	-	-	-	0.10	-	-

In APCPDCL the percentage of complaints redressed beyond scheduled time, increased from 3.28 to 15.84 *per cent* during 2007-11, indicating necessity of more speedy and timely attention to the consumers' complaints.

In APEPDCL the number of Complaints redressed beyond time increased from 3.55 *per cent* in 2006-07 to 13.98 *per cent* in 2010-11. The pending complaints also increased to 7.44 *per cent* in 2010-11 (25,487) from 3.04 *per cent* in 2006-07 (11,974). The Company has not disposed off 102 complaints under Consumer Grievance Redressal Forum (CGRF) during the year 2010-11. The Company incurred ₹ 2.02 lakh towards compensation awarded to Consumer for the year 2009-10, for delayed redressal of complaints under CGRF. Thus, the Company needs to redress all the Complaints within time.

Energy Conservation

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

energy consumption for various sectors, implementation of standards and provision of fiscal and financial incentives.

APCPDCL

2.1.31.1 Government of India announced “Bachat Lamp Yojana” (BLY) on 28 May 2007 to reduce electricity consumptions by households during peak hour by using energy efficient Compact Florescent Lamps (CFL) as an alternative to energy inefficient Incandescent Lamps (ICL). Though the Company entered (August 2008) into MOU with an international firm (International Reserve Corporation Ltd, USA) the Company is yet to commence the Project and reap the benefits of energy conservation (May 2011).

APCPDCL stated that registration process with international agencies took considerable time and presently the work is in progress. The fact remains that the scheme which was initiated more than four years ago is yet to take shape to reap the benefits of saving energy.

2.1.31.2 The APCPDCL implemented (2006-07) energy conservation scheme in distribution network at a cost of ₹ 133.99 crore with loan assistance of REC. Under the scheme the Company constructed 96 numbers of 33/11 KV SSs and augmentation of 89 SSs. Though the scheme envisaged a saving in energy of 83 MU and additional sale of 383.85 MU the Company has not conducted any analysis to ascertain the extent of envisaged benefits.

APCPDCL replied there is general increase in sales volume due to taking up of the project. The fact however remained that the APCPDCL had not analysed the benefits as envisaged in the project.

Energy Audit

2.1.32 A concept of comprehensive energy audit was put in place with the objective to identify 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.

APCPDCL

2.1.32.1 A test check of the energy audit reports/ returns revealed that, out of 5,276 numbers of 11 KV feeders (1,519 urban; 3,014 rural and 743 industrial feeders) energy audit is being done only on 1,606 town and Mandal Head Quarter (MHQ) feeders (351 MHQ and 1,255 town feeders). Energy audit is not being conducted on the rural feeders. It was observed that though

50 per cent of energy is being consumed by the rural areas including agriculture, till date no mapping is done in case of rural feeders and the energy audit is not being conducted. Out of 5,276 feeders, MRI compatible meters were fixed only to 1,903 feeders. Out of 2,058 PTRs in the Company 1,928 PTRs were MRI compatible. Absence of the MRI compatible meters will result in non-availability of data relating to the load in MW, MVA, MVAR, voltage, PF etc., and hence overloading of SS cannot be identified and losses cannot be monitored. We also observed that though negative losses were recorded in many feeders the Company has not taken any action to verify the reasons for such abnormality, which may have impact on overall losses.

APCPDCL while accepting that mapping of rural feeders is not done, MRI dump inputs of all rural feeders has been taken up and instructions are issued to take up energy audit in rural feeders.

APEPDCL

2.1.32.2 As against 2,188 nos. of 11 KV feeders (Town: 412; Mandal: 193; Industrial: 360 and Rural: 1,223) energy audit is being conducted on 965 feeders only. Energy audit on 1,223 rural feeders could not be conducted due to incomplete consumer mapping. Though overloading of 44 nos. 11 KV feeders (Town and MHQ) were identified, no action has been taken for relieving overloads and analyzing the abnormalities.

APEPDCL replied that action is being taken for consumer mapping on rural feeders with clear action plan on overloaded feeders.

Monitoring by top Management

2.1.33 The Power Distribution Companies play an important role in the State economy. For such a giant organization to succeed in operating economically, efficiently and effectively, there has to be a Management Information System (MIS) for monitoring by top management. In APCPDCL and APEPDCL though, the management is monitoring various aspects such as T&D losses, AT&C losses, DTR failures, collection of revenue etc., regularly, the follow up action, however, was not effective due to which increase in arrears, excess failure of DTRs, shortage of transformer oil etc., continued to occur.

APCPDCL stated that the information furnished by the functional heads through APCPDCL intranet is consolidated by the IT wing in co-ordination with different wings into the standard MIS Reports and the same is reviewed by the CMD during the monthly Review Meetings at Corporate Office/ Circle Offices. During the Review Meetings, the CMD gives necessary instructions and it is the responsibility of the concerned Directors and Superintending Engineer/ Operations to ensure that the CMD instructions are complied with.

APEPDCL replied that conclusion and suggestion are noted for further improvements.

We could not verify from the records of monthly and quarterly meetings the action taken, directions issued by the top management of the DISCOMs. In the absence of such documentary evidence of follow up action taken by the management, audit examined a sample item of the MIS which requires follow up action and the results are as follows:

Shortage of Transformer oil

2.1.33.1 Whenever any DTR fails the DISCOMs should retrieve the transformer oils from the failed transformer. The DISCOMs fixed the shortage of retrieval of transformer oil as two *per cent*. We, however observed from the review of records relating to recovery of Transformer Oil that in both APCPDCL (two circles) and APEPDCL short fall of retrieval of transformer oil exceeded the targeted shortage by 23.52 lakh liters from 1,06,119 DTRs amounting to ₹ 5.64 crore. The shortages were neither investigated to ascertain the shortfall in retrieval and fix responsibility. The shortage of transformer oil was also not put up to the higher management for write off.

APCPDCL while stating many reasons for shortage of oils in transformers stated that efforts are made by arranging meeting at Corporate Office level to reduce the shortage of transformer oil. However, the shortage of oil increased during 2010-11.

APEPDCL replied that reason for shortage of transformer oil was due to leakage in gaskets and loose connections of bushings bolts, nuts and leakage at the time of transportation to hill top areas. It was however stated that explanation for abnormal shortage of transformer oil is being called for from the concerned offices.

Internal Audit

Inadequacy of Internal audit

2.1.34 Erstwhile APSEB was operating departmental Internal Audit (IA) teams at each circle. Consequent on formation of the companies, both APCPDCL and APEPDCL decided in October 2003 to outsource the “Internal Audit” function by engaging teams of Chartered Accountants (CA) consisting of one CA and two assistants by providing remuneration to each team.

Performance of outsourced Internal Audit of APCPDCL

2.1.34.1 During the years 2006-07 to 2010-11 on an average, only 70 *per cent* of the total units were covered. It was observed that after a lapse of nearly six years Management realized that the reports of IA were not to the expectations, therefore IA was entrusted to Institute of Public Auditors of India, Hyderabad, on experimental basis. During the review period out of ₹ 1.83 crore shortfall of amount pointed out only ₹ 1.41 crore (77.08 *per cent*) was recovered so far.

In APCPDCL there was no Internal Audit Manual indicating the scope and coverage of internal audit. No audit plan was prepared during the review

period and audits were arranged on adhoc basis. Details of number of paras raised, dropped after action, balance paras to be pursued are not available with APCPDCL.

Though internal audits were entrusted to CAs since 2003, there was no proper review of the reports, adequacy of audits etc., from time to time by IA wing nor by higher management.

APCPDCL replied that executive summary of IA reports are submitted to CMD and audit committee and directions are issued to the circles concerned for compliance. However, the quality of reports has not improved.

APEPDCL

2.1.34.2 Out of 74 numbers of units of the Company, IA covered an average of 63 number of units per year during the review period and the Company incurred expenditure of ₹ 50.27 lakh towards fees to IA firms. During the review period 3,187 paras valued ₹ 13.28 crore were raised towards shortfall of revenue out of which 1,280 paras were settled/ dropped on recovery and settlement of ₹ 6.96 crore. The balance amount is yet to be recovered by the concerned units. Thus, the APEPDCL is required to take effective steps in recovery of shortfall amounts as pointed out by IA. We observed that:

- (i) Though major part of Company's expenditure (86 per cent) was on power purchase by APPCC, the area was not covered in IA till 2009-10.
- (ii) APEPDCL is yet to strengthen the scope of IA to enlarge its coverage keeping in view the size of the organization and the need for system audit of EDP environment, despite commenting on the same every year in the Annual Reports by Statutory Auditors (from 2006-07 to 2010-11).

Thus, in respect of both APCPDCL and APEPDCL, IA is outsourced which were not effective and did not contribute for improvement of the performance of the companies.

Conclusions

- ❖ *The DISCOMs failed to plan augmentation of their distribution network as per National Electricity Policy (NEP). The DISCOMs failed to add required number of sub-stations as targeted and also failed to complete the centrally sponsored scheme due to defective planning.*
- ❖ *The distribution transformation capacity was far short of connected load which resulted in overloading and consequent failure of DTRs and power outages.*
- ❖ *Actual power purchased was always less than the demand resulting in power deficit leading to purchase of high cost power.*
- ❖ *The DISCOMs failed to collect cross subsidy surcharge from the CPPs whose captive consumption was below 51 per cent, in violation of the terms of Electricity Act, 2003.*
- ❖ *APCPDCL did not contain the distribution losses as per the norms approved by APERC.*

- ❖ *Assessment of agricultural consumption was unrealistic.*
- ❖ *Delay in filing of FSA claims led to loss of interest and revenue. Incorrect application of tariff to HT consumers resulted in loss of revenue.*
- ❖ *Dues from consumers as well as state Government were not pursued and realized promptly to improve financial health.*
- ❖ *Delay in filing of ARR resulted in financial loss.*
- ❖ *Energy audit was inadequate and energy conservation measures were not encouraging.*
- ❖ *Monitoring was not effective due to lack of follow up action on key performance indicators.*

Recommendations

The DISCOMs need to

- ❖ *Plan the distribution network in time with the projected power demand in the state as per NEP.*
- ❖ *Assess and create adequate transformation capacity in tune with the growth in connected load.*
- ❖ *Increase the HT network to reduce distribution losses.*
- ❖ *Monitor the captive power generation and consumption status of CPP so as to levy and collect cross subsidy surcharge promptly wherever necessary.*
- ❖ *Fix targets for inspection of services and conduct intensive raids to control theft of energy.*
- ❖ *Carry out timely preventive maintenance of DTRs to avoid failures due to overloading.*
- ❖ *Conduct intensive drives for collection of arrears.*
- ❖ *Take effective steps for prompt filing of ARRs and FSA claims.*
- ❖ *Take steps to derive the envisaged benefits by timely implementation of schemes and projects.*
- ❖ *Take adequate measures for effective implementation of energy conservation.*
- ❖ *Strengthen the energy audit for reduction of energy losses.*

The Singareni Collieries Company Limited

2.2 Mining and Sales activities

Executive Summary

The Singareni Collieries Company Limited (SCCL/Company) was incorporated in December 1920 with the main objective of development of mines for extraction of coal. Jointly owned by GoI and GoAP, the Company had (31 March 2011) 9,481 million tonnes of proven coal reserves, which were 10.31 per cent of the country's reserves. As on 31 March 2011 the Company has 50 operative mines (16 Open Cast and 34 Under Ground mines). About 63 to 65 per cent of the coal produced in these coalfields is of thermal power grade, ranging from E to G, which is mainly supplied to power sector units.

Project Planning and Execution

During the year 2006-11, 21 projects were completed out of which 11 projects were completed with time over run of one to five years resulting in cost over run of ₹ 39.75 crore and loss of production of 7.34 million tonnes of coal valued ₹ 858.20 crore. Six projects scheduled to be completed during 2006-11 and one project scheduled to be completed in 2011-12 were lagging behind, due to delay in land acquisition and procurement of equipment, which resulted in cost overrun of ₹ 64.46 crore besides shortfall in coal production of 93.78 lakh tonnes valued ₹ 1,247.43 crore.

Production of Coal

Though the overall production achieved by UG & OC mines put together had exceeded the targets, the UG mines could not achieve the

targets and incurred a loss of ₹ 3,483.39 crore during 2006-11. Non re-deployment of surplus manpower to needy areas resulted in payment of ₹ 438.92 crore on account of wages to surplus staff. Output per Manshift (OMS) ranged between 1.91 and 3.59 tonnes, as compared to OMS of Coal India Limited, that ranged between 3.54 and 4.73 tonnes during 2006-11.

Mining Activity

The average stripping ratio of the Company was high at 5.45 as against 1.87 of CIL. Defective clauses in the agreement for removal of overburden resulted in excess payment of ₹ 21.52 crore.

Under utilization of machines in UG mines resulted in loss of production of 78.86 lakh tonnes of coal valued ₹ 1,092.61 crore.

Utilization of HEMM ranged between 20 to 55 per cent as against the norm of 40 to 73 per cent during 2006-11. HEMM consumed HSD oil valued ₹ 24.46 crore over and above the norm.

Sales

There was no coal pricing policy. Non-revision of coal prices (F & G grades) resulted in loss of revenue of ₹ 3,411.96 crore during 2007-11. Non collection of Additional price from APGENCO for supply of coal over and above the linked quantity resulted in loss of revenue of ₹ 432.54 crore.

Internal Control and Monitoring

Technical audit was not conducted and strategic plan covering the risk assessment for audit for three years was not prepared. Internal Audit activity was limited to routine pre-audit checks of various claims but did not cover important issues viz., OB contracts, land acquisition, manpower deployment, FSAs, etc.

Safety Management

The number of accidents recorded had decreased during past five years, but there was a loss of 2.36 lakh man days due to accidents during 2006-10.

Environment Management

Notwithstanding the fact that the Company had been conferred awards during 2006-11 in recognition of their commitment towards the environment, effective action needs to be taken to establish Effluent Treatment Plants at all Coal Handling Plants/ Area Workshops/ Base Workshops; Sewage Treatment Plants in all the colonies; and ensure better survival in all plantations.

Introduction

2.2.1 The Singareni Collieries Company Limited (SCCL/ Company) was incorporated in December 1920 with the main objective of development of mines for extraction of coal. In 1960 Government of India (GoI) participated in the equity of the Company and also started extending loan assistance. Since then the Company is jointly owned by the Government of Andhra Pradesh (GoAP) and the GoI in the ratio of 51 and 49 *per cent* as their share. SCCL, the second largest coal company in the country, is involved in coal extraction on the Pranahita-Godavari valley of Andhra Pradesh.

Against India's total proven coal reserves of 92,000 million tonnes, the Company had (as on 31 March 2011) geological coal reserves of 9,481 million tonnes (10.31 *per cent*). As on 31 March 2011 the Company has 50 operative mines (16 Open Cast (OC) and 34 Under Ground (UG) mines). About 63 to 65 *per cent* of the coal produced in these coalfields is of thermal power grade. The Company's mines were spread over 17,500 sq kms in Khammam, Karimnagar, Adilabad and Warangal districts of Andhra Pradesh. About 65 *per cent* of coal extracted was supplied by the Company to the thermal power units. To cope up with increased demand for coal in power, cement and other industrial sectors, the Company increased mechanisation in mining in addition to manual mining in UG mines.

The Company extracted 2,246.19 lakh tonnes of various grades of coal at a cost of ₹ 28,916.00 crore and sold 2,235.16 lakh tonnes of coal to various industries and realized ₹ 30,885.36 crore during the years 2006-07 to 2010-11. The Company made total investment of ₹ 1,197.79 crore in completed projects during 2006-11 and the total profit after tax was ₹ 351.37 crore during 2010-11. The Company employed about 67,615 employees as at 31 March 2011.

Organisational Set Up

2.2.2 The management of the Company is vested in a Board of Directors (Board). The Chairman and Managing Director is the Chief Executive who is assisted by five Functional Directors.

Scope of Audit

2.2.3 This review conducted between March and June 2011 covers the Performance of Mining, Sales activities and procurement and utilisation of Heavy Earth Moving Machinery (HEMM) during the years 2006-07 to 2010-11.

Audit Objectives

2.2.4 The performance audit was conducted in order to assess whether:

- The project exploration and identification of coal reserves were planned and executed timely, effectively and economically.
- The targets for production of coal were achieved with effective deployment and redeployment of available manpower.

- The mines were operated economically and efficiently, by following the standardised and accepted procedure and the available equipments were fruitfully deployed.
- The sales activities were carried out efficiently keeping in mind the norms laid down regarding costing of coal, sales policy of the company and the Government.
- Proper and adequate attention was paid to safety and environmental factors in operation of the mine.

Audit Criteria

2.2.5 The following audit criteria are considered for assessing the achievement of audit objectives:

- Projections made in the Feasibility Reports;
- Rated Capacity of the Mining Equipment;
- Production/Manpower norms fixed by Target Fixation Committee.
- Pricing Policy and GoI directions thereon;
- Terms of Fuel Supply Agreements;
- Requirements laid down in the Environment Management Plan;
- Directions issued by the Director General of Mines Safety (DGMS) for safety; and
- Audit analysis of follow up action by the Government on earlier audit on “Removal of Overburden” included in the Report of the C & AG of India (Commercial), Government of Andhra Pradesh for the year 31 March 2006.

Audit Methodology

2.2.6 The methodology adopted for attaining the audit objectives with reference to audit criteria consisted of explaining audit objectives to the top management in an Entry Conference held on 28 February 2011, scrutiny of records at Corporate Office, Marketing office and Area offices, interaction with the auditee personnel, analysis of data with reference to audit criteria, raising of audit queries.

Audit Findings

2.2.7 The audit findings were reported to the Company and the Government in July 2011 and discussed in the exit conference held on 20 October 2011 which was attended by the Principal Secretary, Energy Department, GoAP, Chairman and Managing Director and the functional Directors of the Company. The Company replied to the audit findings in September 2011 and the replies were considered while finalising the review. The audit findings are discussed below.

Project Planning and Execution

2.2.8 The Company identifies reserves, prepares a detailed Feasibility Report (FR) for establishing a coal mine. Board of Directors of the Company sanctions projects valued upto ₹ 100 crore and beyond which are approved by

the GoI. Approval limit of Board of Directors increased from ₹ 100 crore to ₹ 500 crore with effect from 17 July 2009. During 2006-11, 22 projects costing ₹ 3,185.67 crore (Sanctioned by the Company: 14 projects - ₹ 749.95 crore; by GoI: Eight projects - ₹ 2,435.72 crore) were sanctioned for extraction of 42.373 million tonnes of coal. Details of projects at the beginning of the year, sanctioned and completed during the year, in progress and backlog at the end of each year for the period 2006-11 are as given below:

Projects	2006-07	2007-08	2008-09	2009-10	2010-11	Total
At the beginning of the year	31	35	31	28	24	-
Sanctioned during the year	7	7	3	4	1	22
Completed during the year	3	6	3	7	2	21
Projects Dropped/ deferred	0	5	3	1	0	9
On going projects at the end of the year	35	31	28	24	23*	-

*Including 3 projects kept on hold

From the above table it may be seen that there were 31 projects at the beginning of 2006-07 and 22 projects were sanctioned during the five year period 2006-11. Out of 53 projects, 21 projects were completed during 2006-11, nine projects were dropped/ deferred and 23 projects were under implementation at the end of March 2011, out of which six projects were lagging behind schedule, while the remaining 14 projects were scheduled for completion beyond 2010-11 (out of which one project i.e. Shanthi Khani LW is lagging behind). Project-wise details viz., date of sanction; scheduled and actual dates of completion; estimated and actual cost of project; time and cost overrun and reasons thereof, etc., in respect of both completed and ongoing projects are given in **Annexure -21** and **22** respectively.

It could be seen from the **Annexure-21** that out of 21 completed projects, 10 projects* were completed within scheduled time, in respect of remaining 11 projects there was time overrun of one to five years. The delay occurred mainly due to land acquisition (4 projects) and delay in procurement of equipment (3 projects). We observed that there was cost overrun of ₹ 39.75 crore in respect of four projects due to time overrun, carrying additional works not envisaged in FR, change of location, increase in compensation paid for non-forest land, etc. We further observed that due to time overrun there was loss of production of 7.34 million tonnes of coal valued ₹ 858.20 crore.

2.2.8.1 As on 31 March 2011, there were seven projects lagging behind the schedule date of completion resulting in not only time overrun but also non achievement of anticipated coal production. The details of original schedule of completion, revised schedule of completion, targeted production and shortfall

In respect of completed projects there was loss of production of ₹ 858.20 crore due to time overrun and also there was cost overrun of ₹ 39.75 crore.

* Delays are insignificant (three months).

in respect of these mines to the end of March 2011 were as given in the following table.

(Quantity in lakh tonnes and ₹ in crore)

Sl. No.	Name of the Project	Cost of the Project (₹.)		Scheduled Date of completion		Capacity per annum (Qty.)	Anticipated production to the end of 3/11 (Qty.)	Actual production to the end of 3/11 (Qty.)	Shortfall (Qty.)
		As per FR/ RFR	Actual as on 31.3.11	Original	Revised				
1	SRP OC II	49.08/88.47	13.06	March 08	March 10	15.00	45.00	17.36	27.64
2	Continuous miner at VK 7	49.66/74.73	79.14	March 04	March 08	4.00	28.00	6.13	21.87
3	Dorli OCP II	47.67	8.02	March 08	NA	7.00	21.00	0	21.00
4	Abbapur OCP	39.48	1.23	March 09	Yet to be finalized	6.00	12.00	0	12.00
5	Continuous Miner at GDK 11A	70.80	58.71	March 09	NA	4.00	8.00	7.59	0.41
6	KTK OC Sector -I	91.50	86.31	March 11	NA	12.5	--	--	--
7	ShanthiKhani Longwall	249.03	38.43	March 12	Under Preparation	11.67	11.92	1.06	10.86
	Total								93.78

Delay in implementation of projects resulted in cost overrun of ₹ 64.46 crore and loss of production of ₹ 1247.43 crore.

Due to delay in implementation of SRP OC-II and VK-7 Continuous miner projects, the FRs were revised from ₹ 98.74 crore to ₹ 163.20 crore resulting in cost overrun of ₹ 64.46 crore. Due to delay in completion of above projects as per schedule, the shortfall of production was 93.78 lakh tonnes valued ₹1,247.43 crore. The reasons for delay in completion of these projects were mainly due to

- delay in land acquisition (2 projects – Dorli OC-II & SRP OC-II);
- delay in finalization of tenders and procurement of equipment (2 Continuous Miner projects – VK-7 & GDK-11A);
- delay in getting clearance from Forest Department for acquisition of Forest Land (1 project – Abbapur OC);
- constraints in coal dispatch to APGENCO on cost plus arrangements (1 project - KTK OC Sector-I); and
- insufficient exploration (1 Project-Shanthi Khani Longwall)

Some of the above cases are discussed below:

i) Dorli OC-II: Though the project was sanctioned in March 2004 with date of completion as March 2008, the Company grounded the project only in June 2011 due to delay in acquisition of land identified for external dump yard. Even after acquisition of land in September 2009, the project was delayed as the Company proposed (February 2010) to utilize the adjacent OC-I project land for dumping OB, which was later dropped (February 2011) as it was found to be uneconomical due to increased lead distance. Accordingly Company decided to start the mine as standalone project. Thus the Company's inaction in deciding on the dump area and its failure to assess the economics of the alternative resulted in delay in completion of the project thereby resulting in forgoing of coal production of 21 lakh tonnes.

Delay in deciding the dump area resulted in loss of production of 21 lakh tones.

Internal delay in processing the application and delay in identifying land for Compensatory Afforestation resulted in delay in completion of the project.

ii) Abbapur OC: As per Forest (Conservation) Act 1980, it is mandatory to identify equivalent extent of non-forest land for Compensatory Afforestation for considering diversion of forest land for mining purposes. Though the project was sanctioned in October 2004, due to internal delay in processing the application and delay in identifying Compensatory Afforestation land, the Company applied for diversion of 165.92 ha of forest land required for this project only in October 2008. Thus, due to delay on the part of the Company, the project scheduled for completion in March 2009, was still under implementation.

The Management replied that pursuance of the case with various District Collectors and forest officials, identification of Government lands and to get it inspected by the Forest Department took lot of time to ascertain its suitability. The reply is not acceptable as the Company took abnormal time in processing the application and identifying Compensatory Afforestation land, which resulted in non-grounding of the project.

Exploration with less number of boreholes resulted in non detection of fault in the mine and non achievement of the production target.

iii) Shanthi Khani: The Company was operating “Long wall Projects” in Adriyal, Jallaram and Kakathiya Projects. While conducting exploration of coal for the above three projects, the Company adopted density of bore holes of 16.40, 20.30 and 22.60 per sq. kilometer. However, while implementing the Longwall Technology in the existing Shanthikhani mine, the Company carried out (1999-2002) exploration with a bore hole density of 12.50 per sq. kilometer only. While preparing road ways in the mine, a fault was encountered (January 2008) consequent to which, the Company had to conduct re-exploration by drilling 43 additional boreholes resulting in delay in completion of the project. Thus, inadequate exploration with less number of boreholes resulted in non detection of fault in the mine. The Project was proposed to commence production in 2008-09 and to achieve the targeted production in 2011-12. However, we observed that the Company could achieve 1.06 lakh tonnes against 11.92 lakh tonnes during the years 2008-09 to 2010-11 as envisaged in the FR. As the Project is lagging behind, the Company proposed (May 2011) to revise the FR.

The Management stated that due to lack of experience of handling large scale underground mining projects with new generation longwall, services of Commonwealth Scientific and Industrial Research Organization, Australia (CSIRO) was sought, which recommended digging additional boreholes to interpret geological structure correctly. The reply is not acceptable as the Company used Longwall technology in their other projects.

Some of other cases of irregularities in Project Planning and Execution are discussed below:

Disallowance of Financial Assistance by CCDAC

2.2.8.2 Government of India was providing financial assistance to coal companies for protection of important surface structures and public utilities during extraction of coal. All coal companies are required to apply to the member secretary, Coal Conservation and Development Advisory Committee (CCDAC) giving details of protective works that would be carried out. As per

the guidelines of CCDAC, protection works such as construction of water dams are eligible for financial assistance, provided the works are not included in Project Report. Even though the Company was aware of the CCDAC guidelines, the Company approved (July 2005) Feasibility Report (FR) for expansion of OC mine (RG OCP-I) for extraction of balance coal reserves of existing UG mine (GDK 9 incline) including certain protection works i.e., construction of 32 water dams (involving an expenditure of ₹ 12.80 crore) at an estimated cost of ₹ 88.10 crore through internal sources. The OCP-I Extension Project was completed (January 2009) at a capital cost of ₹ 79.41 crore and the Company submitted (March 2009) a claim for subsidy of ₹ 11.88 crore towards the cost of construction of water dams. The claim was rejected by the CCDAC, on the ground that the works were already provided in project report. Thus, the failure of the Company to adhere to the guidelines of CCDAC resulted in its foregoing subsidy of ₹ 11.88 crore.

The Management replied that while preparing FR, all the activities that are required for completion of the project will be incorporated and for receiving the subsidy / assistance from CCDAC the important activities for completing the project can not be overlooked in the Project Report. The reply is not acceptable as despite knowing that they would not get reimbursement of protection works from CCDAC in case it includes such work in FR, including it in the FR deprived of receiving the subsidy.

De-rating of Production Capacity

2.2.8.3 The FR for KTK 6 incline, Bhoopalpally area was approved (April 1990) for a rated capacity of 2.55 lakh tonnes per annum with a capital outlay of ₹ 14.15 crore. Subsequently, the FR was revised (June 2002) for a rated capacity of 3.12 lakh tonnes per annum with an enhanced capital outlay of ₹ 29.90 crore to be completed by 2004-05. Due to adverse Geo-mining conditions and heavy seepage of water since inception, the targeted production envisaged in the revised FR could not be achieved. Hence, the Company de-rated (March 2009) the capacity from 3.12 to 1.80 lakh tonnes per annum and the project was declared as completed on 31 March 2009 with a delay of five years with actual expenditure of ₹ 26.62 crore. The capacity of the mine was reduced to 70.59 *per cent* of the originally rated capacity, rendering the mine non-remunerative. The mine had achieved the production of 9.58 lakh tonnes against the target of 21.21 lakh tonnes during the years 2004-05 to 2010-11 resulting in shortfall of 11.63 lakh tonnes. Non-achievement of targeted production had resulted in increase in cost of production and thereby loss to the extent of ₹ 68.92 crore for the years 2005-06 to 2010-11.

De-rating of the production capacity rendered the mine non remunerative and resulted in loss of ₹ 68.92 crore.

The Management replied that the adverse geo-mining conditions, disturbed law and order situation were the causes for loss of production. Hence, the project was de-rated. The reply is not acceptable as the Company did not conduct the exploration activities properly as it is evident from the fact that the rated capacity was fixed at 2.55 lakh tonnes in 1990, was revised to 3.12 lakh tonnes in 2002, was again revised to 1.8 lakh tonnes in 2009. This adversely rendered the mine as unremunerative.

Production of Coal

Under utilisation of manpower and machinery resulted in shortfall in production of coal valued ₹ 1,084.75 crore.

2.2.9 The Company operates underground (UG) and opencast (OC) mines for extraction of coal. The details of targets and actual production achieved during the period of audit in respect of these mines are given in **Annexure-23**.

We observed that the overall production achieved by UG & OC mines ranged between 100.06 (2010-11) and 113.32 (2009-10) *per cent* during the five years period 2006-11. The extraction of coal in excess of targets in the OC mines has offset the extraction of lesser quantity of coal in the UG mines which ranged between 72.80 and 93.50 *per cent* (except during 2007-08 with 101.72 *per cent*). Further under utilisation of manpower and machinery as discussed in paragraph Nos. 2.2.9.1 and 2.2.11.1, resulted in shortfall in production of 78.01 lakh tonnes of coal valued ₹ 1,084.75 crore during 2006-11 (worked out at average sales realisation per tonne in each year).

We further observed that though the Company had achieved the overall targeted production during the five years ended 31 March 2011 and earned profit in all five years, the UG mines of the Company could not achieve the targets and incurred losses of ₹ 3,483.39 crore, whereas OC mines earned profit of ₹ 5,835.83 crore. On analysis of profitability of the UG mines, we observed that the average sales realisation did not cover even operating cost for large number of mines and continued to incur cash losses year to year. We observed that in the year 2010-11, out of 34 mines, 29 mines failed to recover operating cost.

As the Company had not prepared the Break Even Production (BEP) for each mine the Company could not concentrate on monitoring heavy loss making underground mines either for improving the production performance or to take suitable remedial action which resulted in losses in operation of UG mines.

In reply, the Company stated that because of various constraints both controllable and non-controllable, targets were not getting materialized in UG mines. The reply is not acceptable as the production in UG mines was not commensurate with the men, material and resources employed in UG mines

Manpower Deployment in underground mines

2.2.9.1 Deployment of manpower is an important input for production of coal. Total manpower deployed by the Company decreased from 82,224 in 2006-07 to 67,615 in 2010-11 due to retirements, control on fresh recruitment, Voluntary Retirement Scheme and mechanisation of operations in UG mines.

The Industrial Engineering Department (IED) of the Company assesses the man-power requirement of each mine in advance for ensuing financial year, considering production schedules, type of technology deployed, coal evacuation system and statutory requirement. We observed that the manpower

deployed was in excess of requirement in some areas and there was shortage in some other areas during 2006-11 as given in the table below:

Year	Total areas [†]	Surplus		Shortage	
		Areas	Manpower	Areas	Manpower
2006-07	10	7	3004	3	387
2007-08	10	6	1160	4	1281
2008-09	10	7	1955	3	333
2009-10	10	6	3131	4	939
2010-11	10	10	3708	0	0

Non-utilisation of surplus manpower effectively resulted in payment of wages of ₹ 438.92 crore.

The surplus manpower ranged between 1,160 and 3,708 and shortage ranged between 0 and 1,281 during the years 2006-07 to 2010-11. Due to non-deployment of surplus manpower to needy areas and excess deployment in some areas, the Company failed to achieve effective utilisation of manpower besides incurring an expenditure of ₹ 438.92 crore towards wages to surplus manpower for the years 2006-07 to 2010-11, which had negative contribution on the economics of the mine operation leading to operating losses. We further observed that despite deploying surplus manpower the Company could not achieve the targeted production in UG mines, except in 2007-08.

The Management replied that the surplus is only 130 in 2006-07 and 338 in 2008-09 which is due to company's policy of providing employment on compassionate grounds to female dependants of workmen involved in fatal accidents or unfit due to ill-health. The reply is not relevant, since the audit comment was on the surplus manpower deployed in UG mines, and not on the Company as a whole.

Outsourcing of maintenance works despite availability of unskilled workers resulted in extra expenditure of ₹ 19.92 crore.

2.2.9.2 We further observed that the Company, instead of utilising the surplus unskilled manpower for certain works viz., civic maintenance, house keeping in townships, maintenance of Railway sidings, filter beds, water supply, STP, swimming pools, miscellaneous works, etc., outsourced the above works and incurred ₹ 24.21 crore during 2010-11. We observed that by effective utilization of surplus unskilled manpower for the above works, the Company could have saved ₹ 19.92 crore on outsourcing the works during 2010-11.

Delay in redeployment of manpower from closed UG mines

Delay in redeployment of surplus manpower available in closed mines, resulted in payment of idle wages of ₹ 2.23 crore.

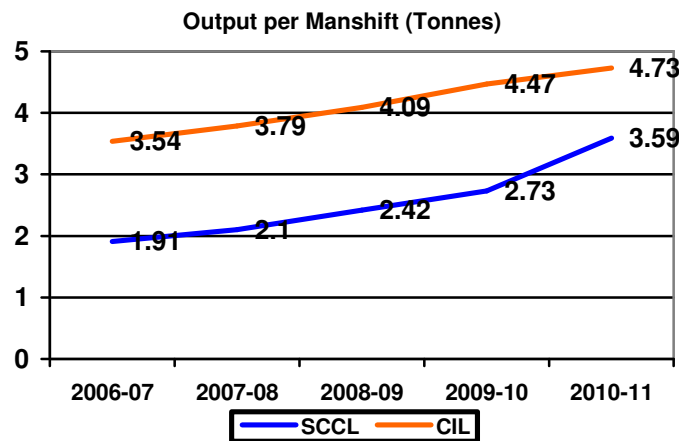
2.2.9.3 We observed that though the Company closed two mines (Somagudem (SGM) -1 and Mothilalkhani (MK) - 4) in March 2008 and August 2009 respectively, the redeployment of workmen (SGM-1: 11 to 86 workmen; MK-4: 31 to 120 workmen) was done only in August 2008 and March 2010 respectively, i.e., after a lapse of five and seven months after closure of the mines, with consequent payment of idle wages of ₹ 2.23 crore (SGM-1: ₹ 33.68 lakh; MK-4: ₹ 189.11 lakh). Had the Company properly planned for redeployment of surplus manpower prior to the date of abandonment of mines, the payment of idle wages to the tune of ₹ 2.23 crore could have been avoided.

[†] Area is a place comprising group of mines controlled by one General Manager.

The Management replied that after stoppage of production, several protective and statutory jobs have to be undertaken and information has to be furnished to the statutory agencies, for which some manpower has to be deployed from the last date of production till the final closure / abandonment of a mine.

The reply is not acceptable as the delays pointed out by us were after considering the above operations and beyond the date of abandonment of mines.

2.2.9.4 Output per Man shift (OMS) indicates the productivity of mining company. The chart below indicates comparative picture of the OMS of the Company and Coal India Limited (CIL) for the period 2006-11.



It could be seen from the above chart that the Company achieved 88 per cent increase in OMS from 1.91 tonnes in 2006-07 to 3.59 tonnes in 2010-11. However, OMS of the Company had always been lower than the CIL. Though the Management attributed the low OMS to high stripping ratio[‡] in OC mines, we observed that apart from high stripping ratio the ineffective and under utilisation of available manpower and equipment also contributed for the low OMS.

While accepting the fact that OMS of the Company was lesser than that of CIL the Company stated that productivity of UG/ OC mines in the Company was more than that of CIL. The reply is not relevant as we compared output per manshift and not the production alone.

Mining Activity

2.2.10 Coal is mined mainly through two methods viz., Open Cast (OC) and Under Ground (UG) mining depending upon the geological nature of coal deposits. For extraction of coal in open cast mines, the overburden (OB) existing over the coal seams was removed by engaging Heavy Earth Moving Machinery (HEMM). For extraction of coal in underground mines, tunnels were excavated until the coal seams are touched.

[‡] Stripping ratio indicates the quantum of earth to be removed to extract one tonne of coal.

Overburden removal

2.2.10.1 Coal production from OC mines contributes 77.85 per cent of the total coal production of the Company. There were 16 working OC mines as on 31 March 2011. In the Feasibility Reports (FRs) of OC mines quantum of OB to be removed and mineable coal to be extracted are indicated by the Stripping Ratio. Initially the Company carried out the removal of OB with its HEMM and subsequently outsourced the work (1991). Removal of OB was outsourced 100 per cent in four mines; the Company carried out mining by using its men and machinery in one mine; and mining was carried out by both the Company and outsourcing agency in eleven mines as on 31 March 2011.

In the table below the stripping ratios of various units of CIL and SCCL for 2010-11 are given.

Production	CIL units								SCCL
	MCL	CCL	SECL	ECL	NCL	BCCL	WCL	Total	
Coal (million tonnes)	98.11	46.25	95.90	23.43	66.25	25.31	34.95	391.30	397.26
OB (million cubic meters)	88.70	62.52	137.57	56.25	182.21	83.23	115.82	732.11	2164.82
Stripping ratio	0.90	1.35	1.43	2.40	2.75	3.29	3.31	1.87	5.45

It could be seen from the above table that during 2010-11 the stripping ratio of various units of CIL spread throughout the country are much lower, which ranged between 1:0.90 and 1:3.31 whereas the stripping ratio of the Company was much higher at 1:5.45. The reasons for high stripping ratio in SCCL, as attributed by the Management, were deeper, steeper, more faulted, scattered and dispersed coal reserves in comparison to other coal belts.

Analysis of cost of OB removal by the Company vis-à-vis outsourcing

2.2.10.2. The details of cost incurred by the Company and outsourcing from 2006-07 to 2010-11 is indicated in **Annexure-24**. We observed that the Company did not carry out any cost benefit analysis for outsourcing so far (May 2011). We further observed that the Company's cost of OB removal per bank cubic meter (bcm) was higher (ranged between ₹ 35.75 and ₹ 52.02 per bcm) than the OB removal through outsourcing between 2006-07 and 2010-11. Even after excluding the cost of wages, which was a fixed cost element, the cost incurred by the Company in OB removal on their own was higher than the outsourcing cost per bcm (ranged between 8.14 and 13.03 per cent) during 2006-10. This excess cost was mainly due to high costs incurred by the Company for explosives, power and other stores and spares including diesel as detailed in **Annexure-24**.

Company's cost of OB removal is higher than outsourcing contractors even after excluding the cost of wages.

The Management replied that over the years, the cost of OB removal by outsourcing has been proved to be cheaper when compared to the departmental HEMM. The Company did not offer any comments on the high cost of explosives, power etc.

Targets and Achievement

2.2.10.3 The Company fixes targets for removal of OB based on the capacity of equipment available with it in advance for the subsequent year. After deciding the quantity of coal to be extracted and allocating the available excavation capacity of the equipment to coal extraction, the quantity of OB to be removed by the Company is decided. The balance quantity of OB to be removed is offered to contractors by calling open tenders. The quantity of OB removed by the Company *vis-à-vis* the outsourced Contractors during the last five years ending 31 March 2011 is given below:

Year	OB removed through (in lakh bank cubic meters (lbcm))			Percentage of total OB removed through	
	Internal resources	Outsourcing	Total	Internal resources	Outsourcing
2006-07	532.26	866.32	1398.58	38.06	61.94
2007-08	429.52	977.73	1407.25	30.52	69.48
2008-09	490.06	1356.30	1846.36	26.54	73.46
2009-10	533.33	1943.96	2477.29	21.53	78.47
2010-11	648.54	1534.56	2183.10	29.71	70.29
Total	2633.71	6678.87	9312.58	28.28	71.72

The share of Company in total OB removed in five years ranged between 21.53 (2009-10) to 38.06 *per cent* (2006-07), which gradually decreased from 38.06 to 21.53 *per cent* between 2006-10 but increased to 29.71 *per cent* in 2010-11.

2.2.10.4 A reference is invited to Performance Audit Report on 'Removal of Overburden in opencast mines of the Singareni Collieries Company Limited' included in the Report of the Comptroller and Auditor General of India (Commercial), Government of Andhra Pradesh for the year ended 31 March 2006, wherein matters relating to removal of OB were discussed. We noted persistence of certain omissions despite pointing out the same with suitable recommendation. Details are given at **Annexure-25**.

Further, we noticed the following shortcomings in removal of OB during 2006-11.

Outsourcing Contracts for OB removal

2.2.10.5 The Company had awarded 32 contracts for removal of OB in the OC projects operated during the five years ending 31 March 2011, the details such as name of the project, quantity awarded, name of the excavation agency, period of contract, rate at which work was awarded and status of the contract are given in the **Annexure-26**. We observed that the Company was outsourcing OB removal on adhoc basis. Five Contractors secured 24 contracts constituting 75 *per cent* of the 32 contracts. Though the Company was preparing the estimates and negotiating with Contractors, the awarded rates were higher than the estimates in nine out of 12 contracts where estimates were reviewed.

Further, we observed that 32 contracts were awarded by outsourcing the removal of 9,426.38 lakh bank cubic meters (lbcm) of OB during the five

years ending 31 March 2011. The period of contracts ranged between six months and 75 months. It can also be noticed that though the minimum rates of awarded contracts steadily increased over the years, the maximum rates of the contracts were fluctuating during the period. The weighted average rates were high in Ramagundam Area (I&II) as compared to the other areas as indicated in **Annexure-27**, which ranged between ₹ 78.19 and ₹ 96.14 per bcm as against ₹ 54.86 and ₹ 79.94 per bcm, respectively.

Management replied that in Ramagundam Area the rates were high due to higher leads when compared to other areas. The reply is not acceptable because weighted average lead vis-à-vis awarded weighted average rate as worked out by the Company also had wide variation in respect of Ramagundam Area III and was not comparable.

Deficient evaluation of tenders by Technical Evaluation Committee

2.2.10.6 The Company invited tenders (November 2005) for removal of 223.20 lbcm of OB at Block-C of Manuguru Opencast Project-IV. After technical evaluation (December 2005/ January 2006) of the bids by Technical Evaluation Committee an order was placed (April 2006) on ABC Engineering Works, Vijayawada, being the lowest bidder. A scrutiny of the Evaluation Report revealed that the past performance of the tenderers was not evaluated as required under Clause 7.21 of Chapter-7 of Purchase Manual. Further, we observed that as against an earlier order placed (October 2004) on this Contractor for OB removal at GK OCP, Kothagudem, the contractor deployed insufficient equipment, defaulted in performance and stopped the work (June 2007), which compelled the Company to incur additional cost of ₹ 40.51 crore for completion of the balance works.

Though the Company was aware of the firm's bad performance before placing (April 2006) order, these facts were not brought to the notice of the Tender Evaluation Committee which resulted in awarding the contract to same defaulted firm. The contractor again defaulted and had not achieved the monthly targets from January 2008 up to the end of contract (November 2009) due to non deployment of adequate machinery as per terms and conditions of the order. The total quantity of work executed by the contractor up to 17 November 2009 was 111.057 lbcm only as against the total awarded quantity of 202.310 lbcm i.e., about 54.89 *per cent*. The Company did not (August 2011) initiate action for recovery of ₹ 5.39 crore towards penalties.

Deficient evaluation of tender resulted in awarding of contract to defaulted firm.

Management stated that offers are being evaluated by considering the past performance of the firm as per terms and conditions of the order. The reply is not acceptable as the company had not taken into the account the performance of the contractor in the ongoing contract viz., deployment of HEMM, achievement of monthly schedules as on the date of evaluation of tenders. The performance of the contractor was only 60, 68 and 60 *per cent*, during October, November and December 2005 respectively against the monthly schedules and the Company also issued notices (November 2005/January 2006) to the contractor about deployment of only 5-6 shovels and 35-40 tippers against the requirement of seven shovels and 45 tippers stipulated in

the order which was causing short fall in OB removal. These facts were not reported in the Tender Evaluation Report.

Bonus and Penalty Clauses

2.2.10.7 A review of work orders issued for removal of OB in the OC mines during the period from 2006-07 to 2010-11 revealed that in respect of consumption of explosives and diesel, the Company was incorporating clauses in the order that (i) if the contractor consumes explosives & accessories and diesel over and above the agreed quantity per bcm of OB removed, a penalty equivalent to the value of excess consumed explosives & accessories and diesel would be levied and (ii) in case the quantity of explosives & accessories and diesel consumed by the contractor was less than the agreed quantity per bcm of OB removed, a bonus amount equivalent to the value of explosives & accessories and diesel saved would be paid to the contractor. In this regard we observed that due to deviation from the terms of the order and inclusion of defective clause the Company paid excess bonus as discussed below:

(a) Excess payment of bonus in deviation of terms of the order

The Company supplied explosives and diesel to excavation contractors for OB removal. The contractors were to use only the quantity of diesel and explosives as stipulated in the work order on per bank cubic meter basis. For regulation of excess/less consumption of diesel and explosives besides above clauses another clause was included in three orders (YOC-23, MOC-135 and MOC-136) stipulating that “All the taxes and duties, if any, applicable on the bonus amount shall be to the account of the contractor only”. However, we observed that in respect of the three orders (September/ October 2006), the bonus for less consumption of diesel and explosives were paid at invoice price which was inclusive of taxes and duties in deviation of the specific terms of the orders. The excess amount of component of taxes, duties and freight (at the rate of 47.92 *per cent* for diesel and 28.72 *per cent* for explosives) worked out to ₹ 4.58 crore.

Payment of bonus on saved diesel and explosives at invoice price without excluding taxes and duties resulted in excess payment of ₹ 21.52 crore.

(b) Excess payment of bonus due to defective clause

The Company did not include a suitable clause as to the exclusion of taxes for payment of bonus amount. In the absence of this, the Company while making payments towards bonus for savings in consumption of explosives and diesel had calculated the value of saved quantities at the gross price of the materials including Cenvat, Education cess and Value Added Tax (VAT), which were not actually incurred, resulting in extending undue benefit to the contractor to the tune of ₹ 16.94 crore in respect of four contracts (December 2005 to April 2006).

Management replied that the NIT was modified suitably for subsequent tenders.

Excess payment of ₹22.08 crore due to lead variation

2.2.10.8 The Company awarded (January 2009) a contract to Nagarjuna Construction Company Ltd., (NCCL), Hyderabad for removal of 720 lbcm of OB at Medapalli Opencast Project, Ramagundam-I at weighted average rate of

₹ 49.99 per bcm amounting to ₹ 359.98 crore including service tax for a period of 6 years. The terms and conditions of the work order, *inter alia*, provided for lead variation clause whenever there was change in the specified unloading/ dumping location resulting in variance in lead distance, upon which the revised bench-wise rates and quantity of diesel will be calculated as per the formulae given. Since the contract was for a period of 6 years, the lead calculation would be made at the end of every year progressively and payments would be adjusted accordingly.

The dump yards were changed in December 2009 and May 2010 due to development of abnormal cracks and height restrictions imposed resulting in lead variations. Further, we observed that (i) at the time of preparation of outsourcing proposals, while assessing the bench wise and year wise leads, the fixed lead distance between the different horizons had been considered twice erroneously which resulted in excess lead, (ii) about 70 lakh bcm of OB was transported by a different route which was less by three KMs than the projected haul road and (iii) there was abnormal delay in finalization of the revised lead variations as per clause No.4 of the Work Order due to protracted correspondence and delay in approval for revised dump locations by the Company.

Non-review of lead distance in the quarry as per contractual agreement resulted in excess payment of ₹ 22.08 crore to the contractor.

Thus, failure of the Company to assess the projected lead correctly and include it in NIT/ Work order and timely review of the leads as contemplated in the work order had resulted in excess payment to the contractor to the tune of ₹ 22.08 crore till March 2011.

Management replied that an amount of ₹ 8.01 crore was recovered till date (August 2011) and a note for considering bench-wise rates with revised leads is under process for giving necessary amendment to the work order. However, the fact remains that the bench-wise rates with revised leads to be finalized at the end of each year were abnormally delayed, which resulted in excess payment to the contractor.

Underground Mining

Production Performance

2.2.11 In UG Mines, coal is extracted mostly by hand section mining i.e., manual coal filling. With a view to reduce the cost of production and also to improve production, the Company introduced machine mining in all UG mines besides hand section mining. The production performance and capacity utilisation of various techniques used in UG mines during the period of audit are given in **Annexure-28**.

Under-utilisation of machines in UG mines resulted in loss of production valued ₹ 1092.61 crore

We observed that the targets were not achieved during the last five years (except in the year 2007-08) inspite of mechanisation. The loss of production for the years 2006-07, 2008-09, 2009-10 and 2010-11 worked out to 78.86 lakh tonnes valued ₹ 1,092.61 crore due to under-utilization of machines in UG mines.

The Management replied that due to difficult geo-mining conditions and increased depth of workings, targeted production from UG Mines could not be achieved. The reply is not acceptable as the targets are fixed considering all these aspects.

Utilisation of Machinery

2.2.11.1 The details of Scheduled Standard Hours, Machine Available Hours, actual utilization, idle hours, etc., are given in **Annexure-29**. We observed that as against 54,38,046 Machine Available hours, 19,86,867 hours were actually utilised during the review period and the percentage of actual utilization ranged between 32.56 (2006-07) and 38.21 (2010-11) indicating under-utilisation of machine available hours. The utilization of machine hours in Longwall ranged between 29.20 and 48.02 *per cent*, in Continuous Miner between 22.54 and 36.06 *per cent*, in Road Headers between 12.96 and 24.48 *per cent*, in Blasting Gallery between 33.33 and 39.71 *per cent*, in Load Haul Dumpers between 32.45 and 59.41 *per cent* and in Side Dump Loaders between 34.52 and 39.53 *per cent*.

We observed that the main reasons for under utilization of machine available hours were shifting of machinery, shift change, preparation for roof supports, etc., which are controllable with proper planning.

The Management replied that action was being taken on controllable factors for increasing the utilization of under ground machines.

Operational Performance

2.2.11.2 Longwall, Continuous Miner and Blasting Gallery are the major output yielding methods of mining. Their operational performance has been reviewed and following observations are made:

i) Blasting Gallery

On a test check of performance of this technology in two mines (GDK 11A & GDK 10 incline) we observed that the Company pre-closed (during the years 2006-11) 7 panels due to spontaneous heating, thereby losing the opportunity of prospecting 4.33 lakh tonnes of coal reserves. Further, monitoring of spontaneous heating was not effective as the Company did not establish proper preventive mechanism such as Magnehelic type pressure measuring instrument and Industrial Scientific handheld multi gas detectors to avoid occurrence of spontaneous heating.

The Management replied that in spite of compliance of recommendations made by CSIRO and other reputed Indian Government Scientific Institutions for improving the performance in the BG panels, SCCL could not fully utilize the BG technology in some of the panels.

ii) Continuous Miners

The Company introduced Continuous Miner Technology in VK-7 mine. The contract placed on Joy Mining Machinery Limited (JMML), England, *inter alia* include site investigation; supply, installation and commissioning of

Non- monitoring of spontaneous heating resulted in loss of 4.33 lakh tonnes of coal reserves.

equipment; operate and maintain the equipment ensuring the availability of critical spares at site and imparting training to the Company staff during the first five years, at total landed cost of ₹ 162.09 crore. Further, the firm was to indemnify the Company against losses and claims for death of the personnel due to its negligence. The machine was commissioned in August 2006. On 12 November 2006 a fatal accident occurred due to roof collapse causing death of four employees/ officers besides loss of mine equipment valuing ₹ 19.01 crore. Enquiries and investigations made (December 2006) by two agencies (Rock Mechanics Technology and Firth Consulting Services Pvt. Ltd.) proved that the roof monitoring system provided by the firm failed and could not give warning signal of roof fall, which was a part of contractual obligation of the supplier. However, we observed that the Company had not proceeded against the firm for breach of contract but accepted the proposal of the supplier to share 50 *per cent* of cost of equipment replaced, which was not in the financial interest of the Company and amounted to extending undue benefit to the firm. Apart from damage of equipment (net loss: ₹ 10.69 crore), the Company suffered loss of production of 8.41 lakh tonnes valued ₹ 98.78 crore (between November 2006 and June 2009).

The Management replied that the roof fall occurrence was above the monitoring horizons of the equipment. The failure of roof is due to the geological disturbances. It cannot be predicted by the Monitoring system as the fall height is more than 12 metres. As the accident took place due to a combination of reasons, the firm JMML alone cannot be held accountable for the accident and cannot be penalized for the whole loss.

The reply of the management is factually incorrect. As per the Frith Consulting Services Private Limited the height of the fall was 6 meters and not 12 metres and above.

Performance of HEMM

2.2.12 Draglines, Shovels, Dumpers, Dozers and Drills are the Heavy Earth Moving Machinery (HEMM) used in OC mines for removal of OB and also production of coal. Equipment capacity is the annual material handling capacity expressed in million cubic metres (M.cum) for OB or lakh tonnes for Coal. As on 31 March 2011, the Company was operating two Draglines, 86 shovels, 452 Dumpers, 79 Dozers and 50 Drills.

Utilization of HEMM

2.2.12.1 The Company adopted CMPDIL[§] methodology of assessment of performance and utilization of HEMM. Availability percentage of equipment was worked out considering idle hours and working hours to standard shift hours (SSH) and utilization percentage was based on working hours to SSH. While the availability of HEMM generally conformed to the norms prescribed by the CMPDIL, the utilization was far below the norms in respect of all the

[§] Central Mine Planning & Design Institute Limited.

categories of equipment as indicated below:

(in percentage)

Equipment	Utilization norm of CMPDIL	Percentage of Utilization to SSH				
		2006-07	2007-08	2008-09	2009-10	2010-11
Draglines	73	49	28	53	50	55
Shovels	60	48	48	52	54	52
Dumpers	50	35	35	36	36	34
Dozers	45	34	31	31	31	29
Drills	40	20	21	24	29	26

The percentage of utilization of the Dumpers ranged between 34 and 36 during the period 2006-11 against the norm of 50. Their utilisation was almost static during the period indicating management's inaction to take remedial measures to improve the performance. On the contrary the Company was outsourcing the OB removal.

Further, the Committee on Public Undertakings (COPU) while reviewing the Audit Report of CAG of India for the year ended 31 March 1997 (Commercial) Government of Andhra Pradesh, recommended segregation of controllable and non-controllable factors in breakdowns of HEMM but the Company had not taken any action in this regard.

Further, a comparison of the utilisation of HEMM during the last five years with certain other companies dealing with coal production in the country revealed that the utilisation of HEMM in SCCL was on lower side ranking at 5th position for draglines and drills and at 4th position for shovels, dumpers and dozers as given below.

Company	Utilisation Percentage*				
	Dragline	Shovel	Dumper	Dozer	Drills
SCCL	43.00	50.80	35.20	31.20	24.40
BCCL**	67.19	83.30	60.24	52.43	66.54
MCL††	58.40	45.80	30.20	30.80	39.40
NCL‡‡	103.40	64.60	72.40	45.00	59.20
WCL§§	83.60	52.60	40.20	31.40	28.80

*Average for five years compiled from the Annual Reports of the respective Companies

The Management replied that the utilization of HEMM was showing an improving trend and that the Company was taking action like preventive maintenance, planned repairs and introduction of OC Mine Management System (OCMMS) to improve utilization of equipment. The reply is not acceptable as the utilization of dumpers and dozers steadily decreased during the period and the utilization of draglines was erratic. Similarly, the idle hours also increased in respect of dumpers and dozers. Since norms are fixed taking all factors into consideration, the underutilization of the equipment against the norms is not justified and needs to be improved.

** Bharat Coking Coal Limited (BCCL);

†† Mahanadi Coalfields Limited (MCL);

‡‡ Northern Coalfields Limited (NCL); and

§§ Western Coalfields Limited (WCL) – all are subsidiaries of Coal India Limited

Consumption of HSD oil in excess of norms resulted in extra expenditure of ₹ 24.46 crore.

Excess consumption of HSD oil

2.2.12.2 The Company had fixed norms for consumption of High Speed Diesel (HSD) oil as litres per cubic metre of OB/ Coal excavated for Dumpers (area-wise based on the lead) and litres per hour worked for Shovels, Dozers, Grader, and water sprinklers long back. The norms in respect of Dumpers for lead distances from 0.10 to 3.5 KMs were fixed between 0.08 and 1.76 litres per cubic metre of OB/Coal excavated. Similarly, the norms for other HEMM were fixed between 10.20 and 125 litres per hour based on the capacities of the equipment. Scrutiny of mine-wise consumption of HSD oil revealed that there was excess consumption of HSD oil than the norm in four to six mines, valued ₹ 24.46 crore as given in **Annexure-30**. The summarized details of excess consumption of HSD oil is given below:

(Quantity in kilolitres)

Year	No of mines where excess consumption was noticed	HSD oil as per norm	Actual consumption	Excess consumption	Percentage of excess consumption
2006-07	4	28712.22	29394.29	682.07	2.38
2007-08	6	30190.61	33598.47	3407.86	11.29
2008-09	6	38776.33	40668.07	1891.74	4.88
2009-10	4	14843.96	15241.00	397.04	2.67
2010-11	4	7703.96	8344.56	640.60	8.32

A further analysis of the consumption pattern in the projects revealed that the consumption was more in respect of two mines which was more than 10 per cent (RG OC I: 16.51 per cent in 2007-08 and RG OC II: 21.45 per cent in 2007-08 and 11.28 per cent in 2008-09). Though the Company was reviewing the consumption of HSD oil in respect of the equipment on yearly basis, the reasons for the excess consumption of oil was not reviewed so as to take remedial measures and reduce the consumption.

The Management replied that the overall consumption of HSD oil was less than the norm during the period 2006-11 and that in projects where consumption is more than the norm the details are reviewed and analysed.

The fact remains that four to six mines are still consuming more than the norm during 2006-11.

Recovery of burnt oil

2.2.12.3 We observed that in seven out of 16 mines, recovery of burnt oil was very low as per details in **Annexure-31**. The percentage recovery was erratic and not consistent, which ranged between 18 and 69 during review period. The main reasons attributed to low recovery were drainage of oil due to failure of hose assembly and “O” rings of running vehicles, wastage during change of failed components and inadequate storage facilities. We also observed that there was no equipment like wheel mounted trolleys, underground storage tanks; portable oil trolleys for collection and storage of burnt oil. Further, spillage, mis-handling and negligence etc., also could have contributed to low recovery of burnt oil.

The Management replied that the Company was taking preventive action to avoid leakages of lubricants. We observed that the burnt oil has a realisable value and classified as hazardous waste and hence proper studies have to be conducted by the Company and norms for recovery should be fixed.

Coal Washeries

2.2.13 With a view to improve the quality of coal and to earn additional revenue the Company concluded (February 2008/ November 2009) two agreements with Global Coal & Mining Private Limited, who is the owner of coal washeries at Manuguru and Ramagundam areas, with installed capacity of 15 lakh tonnes each per annum, to be operated on Build Own and Operate (BOO) basis. As per the terms of the agreement the Company had to offer 10 lakh tonnes of washable coal per year. However, the Company could not offer agreed quantity in 2010-11 due to failure of transport Contractor to supply the agreed quantity to Washery and no alternate arrangement for supply of coal was made by the Company which resulted in loss of potential profit of ₹ 48.08 crore.

The Company failed to supply agreed quantity of coal to Washeries which resulted in loss of potential profit of ₹ 48.08 crore.

The Management replied that the action against Contractor is being initiated. Further progress is awaited.

Sales Activity

2.2.14 The Company meets the linkage requirements of major Power Companies (72.60 per cent), Cement Companies (13.5 per cent) and Other customers (13.9 per cent) through Fuel Supply Agreements (FSA). During the five years period 2006-07 to 2010-11, out of 2,235.16 lakh tonnes of coal sold 2,047.75 lakh tonnes were sold through FSAs and the percentage of FSA sales to total sales increased from 87 (2006-07) to 97 (2010-11).

Pricing Policy

2.2.14.1 The pricing of coal was fully deregulated by the GoI with effect from 1 January 2000. We observed that the Company did not have any declared pricing policy or mechanism, in the absence of which the revision of coal prices was erratic and without any relevance to the cost of production. The average cost of production and average sale price during 2006-11 are as given below:

(In ₹ per tonne)			
Year	Average Cost of Production	Average Sale price	Surplus/ Deficit
2006-07	1024.81	1002.31	-22.50
2007-08	1092.78	1097.75	4.97
2008-09	1284.24	1260.68	-23.56
2009-10	1384.70	1380.29	-4.41
2010-11	1541.26	1561.42	20.16

We observed that except in 2007-08 and 2010-11, the average sale price fixed was less than the corresponding average cost of production, and the deficit ranged between ₹ 4.41 (2009-10) and ₹ 23.56 (2008-09) per tonne. We further

Non-revision of the prices of F & G grades of coal since September 2004 resulted loss of revenue ₹ 3,411.96 crore.

observed that the prices of F and G grade coal of ₹ 681 and ₹ 503 per tonne respectively were not revised after September 2004 though the cost of production of coal increased from year to year, which was ₹ 1,541.26 per tonne in 2010-11. Non-revision of the prices of F & G grades of coal since September 2004 resulted in loss of revenue of ₹ 3,411.96 crore for the years 2007-08 to 2010-11.

The Management replied that at any point of time Company price for F & G grades are higher than the Mahanadhi Coal Fields Limited (MCL) price (*other sources of APGENCO in F & G grades*). Besides, the Company is heavily depending on APGENCO for sale of F&G grades of coal produced in Kothagudem region. Increase in prices of F and G grades beyond the prices of Coal India Limited (CIL) will have adverse impact on marketability of F & G grades of coal in case APGENCO opts to buy from CIL and other sources.

The reply is not acceptable as marketability of coal would not be a problem in view of huge demand for coal and ever increasing gap between demand and supply. Further, though the basic price of the coal of the Company was less than that of MCL, the landed cost per tonne of coal procured from MCL by APGENCO is more by ₹ 239 per tonne and ₹ 287 per tonne for F and G grades, respectively.

Short collection of additional Price

2.2.14.2 The Company entered (1-7-2006) into FSA with Andhra Pradesh Power Generation Corporation Limited (APGENCO) for supply of 100.80 lakh tonnes coal per annum. We observed that during the years 2008-11 the Company supplied 113.20 lakh tonnes of coal in excess of the linked quantity. The Company requested (April 2009) the APGENCO for payment of additional price of ₹ 444 per tonne for the quantity supplied in excess of linkage quantity. In response to the request made by the Company, APGENCO agreed (27 July 2009) to pay additional price of ₹ 444 per tonne for 19 lakh tonnes of coal supplied during the year 2009-10, out of which payment was made for 15.78 lakh tonnes only. Considering total excess quantity of 113.20 lakh tonnes of coal supplied during 2008-11, the loss of revenue due to non-payment of additional price by APGENCO works out to ₹ 432.54 crore $\{(113.20 - 15.78) \times ₹ 444\}$.

Non-payment of additional price by APGENCO resulted in loss of revenue of ₹ 432.54 crore.

The Management replied that they were constantly pursuing with APGENCO for payment of additional price for the quantity supplied in 2008-09, whereas APGENCO was not accepting for payment of such additional price. Still discussions are taking place with APGENCO and Government of Andhra Pradesh for releasing of payment.

The reply is not acceptable, as the Company failed to conclude the agreement with APGENCO for recovery of additional price for the quantity supplied over and above the linkage. Further, in similar situation, the Company is collecting ₹ 760 per tonne for supply of coal in excess of FSA quantity from NTPC for

which Company and NTPC entered into a mutual agreement. In the absence of the agreement, the Company could not realize the additional price.

Non-renewal of FSA

2.2.14.3 As per clause 20 of the FSA entered into (July 2006) with APGENCO, the FSA can be renewed on mutual consent from time to time but not exceeding six months, after which the seller/purchaser shall have the option to continue or withdraw from the FSA. We observed that though the FSA had expired by 31 March 2008, the Company neither renewed the FSA nor a new FSA was entered till date (September 2011). It was further, observed that due to non-renewal of FSA with APGENCO, the company could not claim any performance incentive, envisaged from April 2009 for supplies in excess of 90 per cent of Annual Contracted Quantity, on par with other power sector Companies, amounting to ₹ 41.08 crore for the years 2009-10 and 2010-11.

The Company could not claim performance incentive of ₹ 41.08 crore due to non-renewal of FSA with APGENCO.

The Management replied that the Company was making all attempts to conclude FSA with APGENCO and also requested APGENCO to release the performance incentive for the FY 2009-10 and 2010-11. Even though FSA is not concluded, the SCCL is continuing to supply coal to meet the requirements of APGENCO.

Non-Collection of Crushing Charges

2.2.14.4 The Company procured (June/August 2007) four “-100MM crushers” at a cost of ₹ 1.16 crore for installation at Ramagudam and Mandamarri with the objective of supplying crushed coal to customers and to earn an additional revenue of ₹ six per tonne towards the crushing charges. However, the Company installed three crushers leaving the other crusher uninstalled to date (March 2011). We observed that though the Company installed one crusher at Ramagundam (December 2010) and two crushers at Mandamarri (January/July 2009) the company did not collect the envisaged crushing charges till date (June 2011) in respect of crushed coal supplied at Ramagundam.

The Management replied that the crushing charges of ₹ six were not collected from the Customers as the coal was mixed with larger size coal due to non-availability of infrastructure for dispatching -100 MM size coal separately.

The reply is not acceptable as the Company failed to provide necessary infrastructure for separation of -100 MM and -150 MM and above crushed coal to earn the envisaged revenue.

Non levy of Mine Reclamation Cost

2.2.14.5 While issuing Environmental clearances, MoEF, stipulated that the depth of the final gap of an OC mine should be reduced to 30/35/45 metres from surface by re-handling/ dumping OB. The reduction of depth of the final void could be done either by re-handling the OB of the external/ internal dumps or by dumping the OB produced from the adjacent/ relay projects. Re-handling of OB of the external/ internal dumps incurs additional cost to be loaded on the project, while the cost of dumping of the OB of the relay project

Though the provision for mine reclamation cost was made in accounts, decision was not taken to include the MRC in sale prices of coal.

could be accounted to the relay project i.e., adjacent project. The Company was carrying out the back filling/ reclamation activities from relay projects wherever feasible. However, in other cases where back filling was required to be done, by re-handling the OB of the external/ internal dumps, cost of such activities was estimated and provided in the accounts. The Company provided ₹ 1,988 crore towards back filling charges till end of March 2011.

As the expenditure on back filling cannot be absorbed in the present coal price, the Company estimated (December 2009) additional price under “Mine Reclamation Cost (MRC)” at ₹ 71 per tonne to be included in sale price of coal, as the reclamation costs are not included in the FRs of respective projects. Though the Company is making provision for reclamation cost every year, it has not taken a decision to include the MRC in sale prices of coal to date (September 2011).

The Management replied that the Company is not in a position to load additional cost on account of mine reclamation and it will be reviewed at an appropriate time and decision will be taken in due course. However, the Company needs to take decision as early as possible in view of the huge accumulated reclamation cost to be absorbed.

Internal Control and Monitoring

Technical audit was not conducted and Periodical updating of manual was not done.

2.2.15 The Internal Audit (IA) is being carried out by Internal Audit Wing as per the Internal Audit Manual of the Company. We observed that though the Company prepared and adopted Internal Audit Manual (June 2005), which provided for conducting Technical Audit apart from normal internal audit, technical audit was not conducted so far. Periodical updating of the manual, to meet latest developments in the organisation, was not done. Though the Company had introduced (July 2008) the SAP, it has not prepared any manual/ procedure to be followed in conducting internal audit in EDP environment so far (September 2011). We further observed that the Company has not prepared Strategic plan covering the risk assessment for audit, for three years period, as envisaged in the IA manual, in the absence of which, the internal audit was restricted to routine checks based on the annual plan.

A review of Internal Audit Reports for the years 2006-11 revealed that internal audit of the Company was mainly limited to pre/ post audit of various claims/ payments, Physical Verification of inventory, etc., but did not cover major areas viz., tender procedures followed by the Company in finalization of tenders for removal of Overburden; comparison of the consumption of explosives, HSD oil, etc., by the Company and off loading contractors; land acquisition matters; deployment of man power at mines against the sanctioned strength; exploration activities; sufficiency of safety measures; yearly review of FSAs etc.

Management Information System

2.2.16 The Industrial Engineering Department (IED), based on the information received from the areas, prepares various Management Information Reports. We observed that though review meetings were stated to

Norms were not fixed for departmental consumption of explosives. Cost sheets are not analysed to identify the cost control areas.

have been conducted at area level, no minutes/ action taken notes were prepared. Further, it was observed that the IED neither fixed any norms for consumption of explosives for removal of OB and extraction of coal, nor compared the consumption of the same with that of contractors. Efforts were also not made to identify and analyse controllable and non-controllable reasons for under utilisation of HEMM, underground mining machines etc.

The Cost and Budget Department of the Company prepares the Mine wise/Technology wise Cost Sheets for every month. We observed that the Cost sheets are not analysed to identify the cost control areas to take corrective action to reduce the cost of production. The Company has not prescribed any periodical returns to be submitted to higher authority for scrutiny of the element wise cost of production. Thus, the utility of these Reports for cost reduction and better management is not effective.

Safety Management

2.2.17 The Fifth Conference on Safety in Mines held at New Delhi in December 1980 recommended various measures to be implemented in improving safety in mines. It was suggested to have a well defined safety policy to be implemented with the approval of Board of Directors of the Company. Pursuant to the Board decision (January 1983) the Company framed the safety policy, which *inter alia* provides for a) continuous review and improvement of all existing safety practices; b) imparting awareness of safe working methods to staff; c) supply of latest equipment to employees; and d) reduce the accident rate to the barest minimum. The Board also stressed on the need to give importance for maintenance of health and prevent fatigue.

The Company incurred ₹ 1,253.80 crore on various safety measures during the period from 2006-07 to 2009-10. The details of accidents occurred during the last five years ending 31 December 2010 as recorded in the 'accident register' are given below:

Year	Fatal accidents		Serious accidents		Reportable accidents		No. of Mandays lost
	No. of accidents	No. of fatalities	No. of accidents	No. of persons injured	No. of accidents	No. of persons injured	
2006	16	19	620	624	1474	1482	48749
2007	10	10	557	562	1256	1260	53604
2008	12	13	427	429	964	975	45847
2009	17	21	405	410	634	639	46740
2010	10	12	302	312	511	531	40834
Total	65	75	2311	2337	4839	4887	235774

It can be seen from the above table that there was gradual reduction in number of accidents during 2006-10. Cause-wise analysis, in audit, of the fatal accident cases for the year 2010 revealed that 50 per cent of the total fatal accidents were due to haulage and conveyors; 70 per cent of the accidents were in underground mines; 10 per cent in OC mines and the balance had occurred above the ground.

We observed that

- Though the serious and reportable accidents decreased during the period, the mandays lost did not decrease proportionately and was erratic which contributed to more production loss.
- Though the Disaster Management Plan contemplated conducting mock rehearsals once in six months, the Company conducted the rehearsals at irregular intervals but did not record the results of such rehearsals which were impeding the knowledge of readiness to disaster mitigation.

The Management stated that the efforts put in to reduce accidents have given fruitful results by reduction in fatalities, serious injuries and reportable injuries. However, the mandays lost due to serious injuries and reportable injuries had not reduced considerably though various measures are being implemented by the Company.

2.2.17.1 The following table enumerates the details of fatality rate/ serious injury rate in SCCL as compared to CIL for the period 2006 to 2009.

Particulars	Company	2006	2007	2008	2009
Fatality Rate per Million Tonne	CIL	0.30	0.15	0.16	0.14
	SCCL	0.50	0.24	0.30	0.39
Fatality Rate Per 3 lakh manshifts	CIL	0.32	0.18	0.20	0.19
	SCCL	0.32	0.18	0.26	0.39
Serious Injuries Rate Per Million Tonne	CIL	0.96	0.92	0.91	0.57
	SCCL	16.55	13.52	9.92	8.46
Serious injuries Rate Per 3 lakh manshifts	CIL	1.02	1.05	1.15	0.77
	SCCL	10.58	10.25	8.47	8.19

While the fatality rate per Million Tonne of coal produced in CIL ranged between 0.14 and 0.30, in SCCL the same was higher ranging between 0.24 and 0.50 during 2006-09. Similarly the fatality rate per three lakh man-shifts in CIL ranged between 0.18 and 0.32, whereas the same was higher in SCCL ranging between 0.18 and 0.39 during 2006-09.

Further, serious injuries per Million Tonne/ per three lakh man-shifts were abnormally high in SCCL ranging between 8.19 and 16.55 as compared to 0.57 and 1.15 in CIL.

The Management stated that the geo-mining conditions of SCCL were adverse as compared to CIL. However, though the Company was incurring huge expenditure on safety measures, the fatality rate and serious injury rate were high.

2.36 lakh mandays lost due to serious and reportable accidents.

2.2.17.2 Audit scrutiny revealed that the Company had lost 2.36 lakh mandays due to serious and reportable accidents with consequential loss of production of 5.56 lakh tonnes of coal valued ₹ 68.35 crore, besides payment of workmen compensation of ₹ 6.21 crore during the period 2006-11.

Environment Management

Mining Projects

2.2.18 We noted that the Company was conferred several awards during 2006-11 in recognition of their commitment towards the environment from various agencies. Scrutiny of various records maintained by the Company in compliance with various norms on the subject revealed the following:

Air Pollution

2.2.18.1 Most of the mining operations produce dust. The major operations producing dust are drilling, blasting, hauling, loading, transporting and crushing. The uncontrolled dust not only creates serious health hazard but also affects the productivity through poor visibility, breakdown of equipment, increased maintenance cost and ultimately deteriorates the ambient air quality in and around the mining site.

We observed that as per terms of the Special Conditions of Environmental Clearance (EC) issued by the MoE&F, each Coal Handling Plant/Coal Screen Plant (CHP/CSP) should be equipped with high efficiency bag filters, water sprinkling system to check emissions from crushing operations, haulage roads, transfer points etc., and drills should be wet operated or with dust extractors. We observed that out of nine CHP/ CSPs operated by the Company only five were provided with mist spraying arrangements for mitigating the dust and other four (Rudrampur, Yellandu -2 Nos. CHP/CSP, Bhoopalapalli) CHP/ CSPs were operated with only mobile water sprinklers.

Water Pollution

2.2.18.2 Waste water discharge from mines, effluent treatment plants and sewage treatment plants etc., are formed as acidic water. The acidic water results in severe water pollution problems. Environmental effects of Acid Mine Drainage (AMD) include contamination of drinking water and disrupted growth and reproduction of aquatic plants and animals. We observed that:

- As per clause (xv) of the Specific conditions of the EC, each Coal Handling Plant/ Coal Screening Plant (CHP/CSP), Area Workshop (AW)/ Base Workshop (BW) should be provided with Effluent Treatment Plants (ETPs) to segregate oil and grease from the waste water. However, it was observed that out of 31 CHP/AW/BW only 14 ETPs were arranged resulting in the waste water being discharged in to the environment without treatment causing water pollution to that extent. Further, Section 9 of Hazardous Waste (Management and Handling) Rules, 1989 requires maintenance of records for collection, receipt, treatment, transport, storage and disposal of hazardous waste. However, the Company was yet to comply with the stipulation of MoE&F notification.
- As per the EC each colony should be provided with Sewage Treatment Plant (STP) for treatment of sewage discharge. Out of 12 places where colonies were situated, STPs were arranged only at seven places resulting in discharging untreated sewage waste of the colonies in

remaining five places (Kothagudem, Ramagundam I & II, Bellampalli and Goleti) into the environment.

Extraction of coal without Consent Orders of APPCB and without EC

The Company extracted coal without the Consent Orders.

2.2.18.3 The Consent letter issued by APPCB specifies the actual quantity of coal to be produced per annum. This condition was not observed by the Company on several occasions. Due to extraction of coal in excess of the production envisaged in Consent Order, the APPCB had not issued the Consent Orders for year 2008 for the mines in Kothgudem Area and advised (24 October 2008) to obtain fresh EC from GoI. However, the Company extracted coal without the Consent Orders from the year 2008 onwards. We further observed that the Company had been operating 11 mines having balance life of one to twenty years without EC.

It was replied that the EC would be obtained for these mines at the time of renewal of mining lease.

Poor survival in plantations

Survival percentage of saplings was poor in some plantations.

2.2.18.4 The Company raises plantations in OB dumps, in vacant areas (block plantation) and on both sides of roads (avenue plantation) in and around mining areas. The Company incurred ₹ 13.73 crore on plantations during 2006-10. As per clause (xi) of Specific Conditions of the EC, the Company has to raise 2500 plants per hectare. As against this, actual number of plants raised for five years up to 2010 ranged between 1093 to 2688 (OB Plantation), 400 to 2,138 (Block plantation) and 92 to 1,500 (Avenue Plantation). However, the survival percentage of saplings was poor in respect of Block plantation and Avenue plantation, which ranged between 22 and 36 *per cent* only as against norm of 80 *per cent* survival (Ramagundam I & II Areas (in 2006), Kothagudem and Srirampur Areas respectively).

Management replied that the plantations would be revisited and given due care to see that the survivals are increased.

Pollution at Coal washery, Manuguru

2.2.18.5 Scrutiny of the records of Coal Washery, Manuguru pertaining to the environmental issues revealed the following:

- i) The firm had not constructed Rain Water Harvesting structure as required under clause 8 of the Schedule-A of the Consent Order of APPCB.
- ii) As per Special condition 5 of Consent Order of APPCB, the firm had to monitor ground water around the coal washery and submit half yearly monitoring reports to Regional Officer, APPCB, Kothagudem. However, no such monitoring has been done by the firm.
- iii) As per Special conditions 6 & 7 of Consent Order of APPCB, the firm should take measures to maintain the efficiency of the settling tank of waste water not less than 90 *per cent* and maintain zero effluent discharge. It was observed that due to frequent breakdowns to the thickener slurry settlement tank, the slurry was allowed to flow outside without processing.

The slurry was allowed to flow outside without processing causing environmental problems.

This was causing damage to the roads, compound wall apart from causing damages to environment around the washery.

It was replied that the Company had advised the coal washery authorities at Manuguru to improve the pollution abatement and monitoring facilities in order to comply with the statutory conditions of consent orders issued by APPCB.

Conclusions

- ❖ *The Company failed to complete the projects as planned during the five year period and projects were delayed due to delay in land acquisition, procurement of equipment, deficient exploration, etc., resulting in time overrun, and cost overrun and loss of anticipated production.*
- ❖ *Underground mines were incurring losses due to ineffective utilisation of equipment and manpower.*
- ❖ *Despite pointing out in earlier Audit Report, no action was taken by the Company to formulate clear policy for OB removal in OC mines; OB Manual was not prepared; vendor development was not done to avoid monopoly in OB contracts; norms for utilisation of explosives for departmental removal of OB were not fixed and there was no monitoring on number of HEMM deployed by OB contractors.*
- ❖ *While availability of HEMM was conforming to norms the utilisation was far below norms.*
- ❖ *The Company had not declared pricing policy for coal, due to which the revision of coal prices was erratic which had no relation to cost of production.*
- ❖ *Sale of coal to FSA customers was not managed effectively to optimise revenue.*
- ❖ *Internal audit was limited to routine pre-audit checks without conducting technical audit and audit of major issues viz., OB contracts, land acquisition matters, FSAs, etc. Controllable and non-controllable reasons for under utilisation of HEMM and other mining equipment were not analysed to take remedial action.*
- ❖ *Though the number of accidents had shown decreasing trend during the past five years ending 2010, the rate of serious injuries per MT/ per 3 lakh manshifts was abnormally high as compared to that of CIL.*
- ❖ *Effluent Treatment Plants were not provided at all CHP/ CSP and the survival percentage of plantations was poor.*

Recommendations

The Company Should

- ❖ *Effectively implement mining projects duly coordinating all related matters viz., land acquisition, procurement of equipment, etc., so as to ensure timely completion.*
- ❖ *Effectively utilise the available equipment and manpower to achieve optimum production.*

- ❖ *Streamline all issues relating to OB removal to achieve greater efficiency and economy.*
- ❖ *Formulate coal pricing policy and manage sales efficiently to optimise revenue.*
- ❖ *Conduct Technical audit and prepare strategic audit plans covering for three years based on the risk assessment. Study and analyse cost data for identification of controllable and non-controllable reasons in respect of loss of utilisation hours of HEMM, Underground mining machines, etc., for cost control and cost reduction purpose.*
- ❖ *Effectively advocate and implement safety measures, especially in underground mines, to achieve zero accidents rate.*
- ❖ *Strictly comply with all environment protection norms.*

Transmission Corporation of Andhra Pradesh Limited

2.3 IT Audit on Implementation of ERP

Executive Summary

Transmission Corporation of Andhra Pradesh Limited (Company) is engaged in transmission of electricity and Grid operations.

The Company decided (April 2003) to implement an Enterprise Resource Planning (ERP) with four modules viz., Finance and Controlling, Materials Management, Projects Management and Maintenance Management to provide management accurate, timely and reliable information for better decision making.

An IT Audit of the system revealed that

- There was no IT strategy and IT policy.
- Objectives of the system were partially achieved.
- Major business activities such as calculation of price variation, generation of bills for its consumers, loan administration and pension accounting were not included in the ERP.

- No documentation available defining roles for allocation of User ID based on job description.
- System exposed to greater risks by allowing the access to data from backend.
- Security of the system stands compromised by allowing the access to ERP application servers through LAN and existence of open ports on the computers connected to both ERP and LAN networks.
- Continuance of manual processing even after four years of ERP commissioning.
- Intended MIS reports are not generated.
- Migration of data from partially completed HR module into Payroll module resulted in serious errors in maintenance of service particulars of employees.
- Post Implementation Review of the system was not conducted for evaluating the System Effectiveness.

Introduction

2.3.1 The Transmission Corporation of Andhra Pradesh Limited (Company) is engaged in the business of transmission of electricity and grid operations. The activities of the Company include construction and maintenance of Extra High Tension (EHT) transmission network.

The Company implemented (August 2007) an Enterprise Resource Planning (ERP) through M/s Industrial and Financial Systems (IFS) with a total cost of ₹ 817.52 lakh with four modules viz., Finance and Controlling (FA), Materials Management, Projects Management (PM) and Maintenance Management (MM) under the project name “Resource Optimization Solution for Enterprise (ROSE)”. In addition, Payroll (PR) module was implemented from July 2010, while Human Resources (HR) module is still under implementation (August 2011).

Information Systems Setup

2.3.2 The system operates in a client server environment with HPPrx6600 server and HP EVA 4000 based SAN with Windows Server 2003 and HP UX 11.23 as Operating Systems. Oracle 9i is used as the backend database software. Optical Fiber Network through transmission lines were used for the network requirements of the ERP. Leased lines were used wherever it was not possible to utilize the Company’s own network.

Audit objectives

2.3.3 The audit was conducted with a view to assess whether built-in input, process and output controls were adequate and the data captured in the system were accurate, complete and reliable; adequate security exists to safeguard physical and virtual assets; and business rules were correctly mapped in ERP and it was serving the intended purpose.

Audit Findings

2.3.4 The audit findings were reported to the Company and the Government in October 2011. The Company replied to the audit findings in November 2011 and the replies were considered while finalising the report. The audit findings are discussed below.

2.3.4.1 Lack of IT strategy and IT policy

The Company did not have an approved and well documented IT strategy or IT policy to integrate all their activities into a co-ordinated IT environment.

2.3.4.2 Partial achievement of objectives

Despite implementing the system about four years ago, the envisaged objectives of implementing ERP could not be achieved due to lack of

proper planning, deficient system design and non-incorporation of important business activities.

2.3.4.3 System Acquisition, Development and Implementation

The following areas of work were not included in the Finance module:

- a. There is no option to process the price variation clauses of the purchase order in the ERP. The company accepted that it was due to technical constraints and they are processed manually.
- b. The process of calculation and approval of consumer bills is a manual process and entered into ERP for recording purpose only. The Company accepted the observation.
- c. Loan accounting has not been made a part of Finance module. Due date for repayment of loans and interest calculations are done manually. The Company accepted the observation.
- d. Pension accounting was functioning outside the Finance module.

2.3.4.4 Logical Access Controls

1. There was no effective password policy whereby essential parameters like number of invalid logon attempts until user is locked, maximum password length, use of alphanumeric and special characters, prohibition of dictionary words could be taken care of. The Company replied (November 2011) that they had prepared a standard operating procedure in this regard and added that action was being taken to implement the same.
2. There was no audit trail as no logs were maintained making the verification of the changes made in the system difficult. The Company explained (November 2011) their attempts made in the past to address the issue and added that they were planning to devise a new strategy to address the matter.
3. Absence of documents defining the roles for specification of job profiles and allocation of User ID made the system administration an arbitrary job. Company accepted their inability.
4. There was no segregation of responsibilities as both System Administrator and Database Administrator were accessing the administration tool using the same User ID with same password. As logs of the activities of these User IDs were not maintained, the integrity of the database could not be ensured. The functions of System Administrator and Database Administrator were allotted to the same person which is against the normal business rules. Management replied that any user with **SYSDBA** and **SYSOPER** privileges cannot access the application and any user assigned with **SYSOPER** privileges can

perform database operations. The reply is not correct and is self contradictory.

5. The entire system was exposed to greater risk as the Database Administrator could access the data from backend which is against the best practice. The Company replied (November 2011) that such technically not feasible issues were mailed by core team to ERP Administrator for necessary action at backend using “**IFSAPP**” User ID.

2.3.4.5 IT Security

1. The system is exposed to greater risk as officials at Corporate office were permitted to access the ERP directly and not through the Citrix Metaframe presentation server while other officials were permitted to access the presentation layer of the application only through Citrix. Company accepted the observation and stated that additional Citrix Licenses will be procured to route the ERP users in Corporate Office through Citrix Metaframe Presentation Server after consulting M/s IFS.
2. Scanning the ERP network and Local Area Network (LAN) for ports ranging from 1 to 1023 using the software “Free IP tools” revealed that vulnerable ports were open on the computers connected to both the networks, exposing the users of the system to risks apart from attack of viruses and worms in servers and personal computers and intrusion by hackers. The Company replied (November 2011) that action was being taken to close the vulnerable ports and to remove Administration account privileges on network computers.

2.3.4.6 Application controls

Even after four years of implementation of ERP system, manual records and manual processing are still in use resulting in duplication. Company accepted the observation.

Module-wise Deficiencies

2.3.4.7 Financial Accounting Module

1. Provision of extension of work order upto the period 31-12-9999 results in non-closure of work orders. Lack of option for restricting the reopening of a closed work order may facilitate unauthorised withdrawal of material in the name of closed work orders. Company accepted the observation.
2. Details of assets could not be obtained from ERP even after entering the data. Similarly, the ERP system does not provide the book value of the assets when they are scrapped. Company accepted the observation.

2.3.4.8 Project Management Module

3. Due to non-updating of data in ERP, all the MIS reports were not generated. Company accepted the observation.
4. Lack of timely updating the project module prevented the management from real time tracking of the progress of the projects. Company accepted the observation.

2.3.4.9 Maintenance Management Module

5. Failure to update the data in System results in non-availability of up-to-date information for monitoring the actual progress in maintenance. Company while accepting the observation stated that poor ERP connectivity was the reason for non-updating of data.

2.3.4.10 Human Resources Management and Payroll Modules

6. Despite extension for seven times, the HR module was not completed (November 2011). Separation of PR module and migration of data from partially completed HR module led to serious error in maintenance of leave account of employees where the EL accumulated was shown as more than the limit of 300 days in respect of 17 employees.
7. As the 'transaction month' field, which was meant to capture the year and month of the employee loan transaction defined as numeric with 8 digits instead of Date format with "YYYYMM" structure, incorrect data like zero, 2101008, and 20009 was entered into the database.
8. Lack of proper definition of PAN field led to acceptance of incorrect data in the system. Company accepted the observation.

2.3.4.11 Evaluation of System Effectiveness

Audit carried out the evaluation of system effectiveness through a questionnaire circulated among 533 users out of whom feedback was given by 285 users. Summary of feedback is as follows:

Sl No.	Parameter/Question	Response (%)	
		Yes	No
1	Usefulness of User manuals	66	34
2	Adequacy of Training	66	34
3	Timeliness of Service function	100	0
4	Stability of Network	64	36
5	Improvement in day to day working	59	41
6	Usefulness of Reports	89	11
7	Overall satisfaction	73	27

In view of the above, audit is of the opinion that a post-implementation review i.e. six months after the implementation of the system could have

helped the Company in evaluating the system and addressing various system inadequacies.

Conclusions

The Company implemented ERP to regulate the activities and processes, to provide an organization-wide view of the operations and to provide management with accurate, timely and reliable information for better management decision making.

Even after a lapse of four years of implementation of system, the Company had not formulated an IT strategy or mapped all its activities in the ERP and there was no documented plan either. Manual processing of critical activities was in vogue as major activities like loan administration, revenue recognition etc., were kept outside the ERP system. Most of the MIS reports were not being generated through the system and wherever they were generated, they were not reliable due to belated entry/ non-entry of data in the system. There was no integration between various modules resulting in duplication of work and giving scope to human errors. The system is vulnerable to internal as well as external attack due poor security.

Recommendations

The Company should

- *plan to include all the major activities of the Company in a time bound manner in the ERP as envisaged initially to reduce the dependence on manual processing and attendant errors creeping into the system;*
- *ensure timely data entry in ERP to make the reports reliable and complete;*
- *integrate all the modules to prevent duplication of work and scope for errors;*
- *formulate and implement a comprehensive security policy to safeguard IT assets and fix the existing vulnerabilities;*
- *formulate, regulate and document the allotment of different roles based on their job specification and delegation of powers;*
- *build an appropriate input controls for data integrity and reliability; and*
- *review the feedback given by various users of the system to address the same in a time bound manner.*