FOURTEENTH KERALA LEGISLATIVE ASSEMBLY

COMMITTEE
ON
PUBLIC UNDERTAKINGS
(2016-2019)

THIRTY NINTH REPORT

(Presented on 18-5-2017)

SECRETARIAT OF THE KERALA LEGISLATURE
THIRUVANANTHAPURAM
2017

FOURTEENTH KERALA LEGISLATIVE ASSEMBLY

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On

KERALA STATE ELECTRICITY BOARD

(Based on the Report of the Comptroller and Auditor General of India for the years ended 31 March 2003, 2005, 2006, 2008, 2010 and 2012)

994/2017.

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INTRODUCTION

I, the Chairman, Committee on Public Undertakings (2016-2019) having been authorised by the Committee to present the report on its behalf, present this Thirty Ninth Report on Kerala State Electricity Board, based on the reports of the Comptroller and Auditor General of India for the year ended 31 March 2003, 2005, 2006, 2008, 2010 and 2012 relating to the Public Sector Undertakings of the State of Kerala.

The aforesaid reports of the Comptroller and Auditor General of India were laid on the Table of the House on 28-6-2004, 13-2-2006, 28-3-2007, 23-6-2009, 28-6-2011 and 18-2-2013 . The consideration of the audit paragraphs included in this report and the examination of the departmental witness in connection thereto was made by the Committee on Public Undertakings constituted for the years 2014-16 at its meeting held on 13-1-2016.

This report was considered and approved by the Committee (2016-2019) at its meeting held on 26-4-2017.

The Committee place on record its appreciation for the assistance rendered by the Accountant General (Audit), Kerala in the examination of the Audit Paragraphs included in this Report.

The Committee wishes to thank the officials of the Power Department of the Government Secretariat and the Kerala State Electricity Board for placing the materials and information solicited in connection with examination of the subject. The Committee also wishes to thank in particular the Secretaries to Government - Power and Finance Departments and the officials of the Kerala State Electricity Board who appeared for evidence and assisted the Committee by placing their views before it.

C. DIVAKARAN,
Chairman,
Committee on Public Undertakings.

Thiruvananthapuram,
26th April, 2017.

REPORT
ON
KERALA STATE ELECTRICITY BOARD
AUDIT PARAGRAPH 2.2 (2.2.1 to 2.2.2 of 2011-12)

2.2.1 Procurement of Pre-Stressed Concrete poles

Kerala State Electricity Board (KSEB) uses Pre-Stressed Concrete (PSC) Poles of various sizes (7m, 8m & 9m) for laying distribution lines.

Up to 2004, KSEB was awarding centralised short term (3 months to 3 years) contracts for the procurement of PSC poles in small quantities. With a view to attract new firms, KSEB decided (November 2004) to award centralised long term contracts for five years. Accordingly, the CE (TC&M)*1 assessed (November 2004/March/May 2005) the requirement (36.93 lakh) of PSC poles for the next five years. Three tenders*2 were invited (November/December 2004, April & May 2005) for 20 Electrical Circles (ECs) under the two bid system involving Pre-qualification (PQ) and Price bids. The Pre-qualification Committee (PQC) evaluated (January/June 2005) the PQ bids and qualified the bidders. The Purchase Committee (PC) opened (January/June/ August 2005) the Price bids of the qualified bidders and submitted the proposal to the Board of Members (Board) for placing the order with the lowest bidder of each EC. Though 22 firms participated in the tender, contracts, as approved by the Board, were awarded*3 to 17 firms for supply of 41 lakh poles, to be delivered during 2005-2013*4. Since the procurement of poles through long term contracts was a major policy decision, we scruitinised the system of procurement under the long term contract and our findings are discussed below:

Improper assessment of requirement

Assessment of actual requirement of poles considering the ongoing works, poles held with KSEB and the new works to be taken up in future is the primary step in the procurement process. CE (TC&M) assessed the requirement of poles for five years on an adhoc basis as five times the requirement for one year. This

*1 Chief Engineer (Technical, Contracts and Materials).
*2 Tender No 47/2004-05 dated 30-11-2014 was issued for 12 Ecs tender No. 11/2005-06 dt. 19-4-2005 was issued for 7ECs and tender No. 37/2005-06 dt. 2-6-2005 1 EC.
*3 In April 2005, August 2005, December 2005 and October 2006.
*4 Including the time period allotted for the delivery vide additional orders at 25/30 per cent.

assessment was unrealistic and unscientific as we noticed that one EC*5, out of 12 ECs test checked for which allocation of 2085 number of 9m poles per month was made, intimated (June 2007) that such huge quantity of poles was not required and in another EC*6, allocation of poles was not given citing sufficient stock of poles. KSEB subsequently reduced the monthly target of those contractors*7.

Further, we noticed that in respect of eight ECs, as against the assessed quantity of 11.80 lakh, the ordered quantity was 17.16 lakh and the quantity delivered was only 8.72 lakh poles. This resulted in diversion of poles from other Circles by paying additional transportation charges and procurement of poles at higher rates through subsequent tenders incurring extra expenditure as discussed subsequently.

Undue favour to few firms

Though, KSEB followed the General Conditions in tendering process, we noticed that KSEB favoured a few firms in awarding the contract as detailed below:

- The PQC disqualified (January 2005) one *8 firm during the scrutiny of the Prequalification bids due to poor past performance. Subsequently, the firm was qualified (April 2005), violating the tender condition, based on representation to the then Chairman of the Board.
- Similarly, another firm*9 was disqualified (2 June 2005) for not satisfying the PQ conditions. Subsequently, the firm was qualified (16 June 2005) stating that they were existing suppliers to a Karnataka State PSU, though this was not a PQ condition.

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*5 Pathanamthitta EC.
*6 Thodupuzha EC.
*7 433 nos of 8m and 867 nos of 9m poles for Pooja Industries and 1290 nos of 9m poles for Vellackamattathil.
*8 West Coast Concrete Products got order for Ernakulam (0.83 lakh) and Perumbavoor Ecs (0.70 lakh).
*9 Suman Concrete Product got order for Kannur EC (2.39 lakh).

- Even though these two firms were awarded contract for the supply of 3.92 lakh poles in three ECs, the firms failed to supply poles as per schedule and the contract had to be terminated.

- Contracts were awarded (April 2005 to August 2005) to four*10 firms for the supply of 10.17 lakh poles in four ECs. These were new firms promoted by a previously defaulted supplier*11. Contracts with three of these firms were terminated for non supply and the termination order initially issued (September 2010) in respect of the fourth firm*12 was subsequently (December 2010) kept in abeyance.

- Even after initiating (November 2009) procedures for termination of the contracts at the risk and cost of the above mentioned firms, KSEB purchased (from May 2010) 11187 poles from three*13 of the above mentioned firms at updated prices for ₹ 1.24 crore and released payments, though ₹1.99 crore was recoverable from these firms towards penalty for belated supplies.

- The tenders did not prescribe the maximum number of ECs for which a bidder can submit its bids. As such all the bidders submitted their quotation for many ECs and became lowest in more than one EC. We noticed that the manufacturing capacity of the bidders were not considered by the PQC as a criterion and hence the bidders were prequalified for up to seven ECs though, their manufacturing capacity was not sufficient to cater to the requirement of more than one or two ECs. As such, KSEB negotiated with other bidders and placed orders. Thus orders were placed even with fourth lowest bidder*14 as was noticed in Irinjalakkuda EC. Thus it was evident that the quoted price was not relevant for getting orders. This defeated the underlying principle of inviting competitive tenders.

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*10 Suman Concrete Products (Kannur EC), Suma Concrete Products (Kasaragod EC), Roopa Engineering Corporation (Kalpetta and Manjeri Ecs), Roopa Construction Company (Kozhikode EC).

*11 Shri Naveen Chandra D Suvarna.

*12 Suma Concrete Products (Kasaragod EC).

*13 Suman Concrete Products, Suma Concrete Products, Roopa Engineering Corporation.

*14 Raphel & Company.

KSEB stated (September 2012) that by placing orders with the above firms, they could save ₹ 19.30 lakh as their rates were the lowest. Further, on placing orders with the fourth lowest bidder, the underlying principle of inviting competitive tenders was also not defeated as the bidder accepted the lowest rates. The reply was not acceptable as the two firms *15 supplied only eight to twenty two *per cent* of the ordered quantity only and the risk and cost amount involved on termination of the contract was ₹ 5.02 crore. Further, the tenders lacked competitiveness as the bidders got a chance to get orders on accepting the lowest rates, irrespective of their quoted rate.

Non-compliance with contract conditions

The contract provided for the terms and conditions relating to delivery of poles, imposition of penalty, release of payment, etc. to be complied with strictly during the performance of the contract. KSEB, however, favoured the contractors by not invoking these provisions as discussed in succeeding paragraphs:

Payment of additional transportation charges due to non adherence to delivery schedule

As per Purchase Order (PO), the contractors had to complete the supply of poles on a monthly basis by delivering at least the quantity fixed as the monthly target. The contract stipulated (clause 12) that the monthly target should not be refixed on any account. KSEB, however, reduced the monthly target in five*16 ECs as requested by the contractors. To meet the shortage of poles due to above reduction, KSEB diverted poles from other circles incurring additional expenditure of ₹ 44.85 lakh *(Annexure 10)* towards transportation charges.

The contracts for Kottayam and Pala ECs were awarded to the same contractor. Though KSEB reduced (June 2008) the monthly scheduled quantity and though there was heavy backlog in supply by the contractor in both the circles, instead of restoring the reduced target/ insisting the contractor to supply

*15 West Coast Concrete Products & Suman Concrete Products.
*16 Pooja Industries in Kottayam, Pala and Todupuzha Circles, Venad Structurals in Alappuzha Circle and Imperial trading Company in Trivandrum Circle.

the backlog, KSEB asked the contractor to divert poles from Kottayam to Pala EC by paying additional transportation charges to the same contractor*17. The extra expenditure on these worked out to ₹ 2.39 lakh *(Annexure 11)*.

KSEB stated that the monthly targets were reduced only in genuine cases. It was further stated that agreement authority/Board had not taken any decision regarding payment of additional transportation charges to Pooja Industries. The reply is not acceptable as the contract did not permit reduction of monthly target on any account and on verification we found that KSEB had paid additional transportation charges to Pooja Industries for diversion of poles to Pala EC from Kottayam EC.

Advance payment contrary to terms of contract

The contract provided (clause 4) for payment of 95 *per cent* of the invoice value within 45 days of presentation of bills along with way bills duly signed by the Engineer concerned for having received the materials in good condition at the designated location. KSEB, however, favoured one contractor*18 by releasing ₹ 4.21 crore being 50 *per cent* of the invoice value (excluding the taxes and duties) immediately after testing the poles. The contractor supplied the poles only after periods ranging from one month to four months from the date of payment.

KSEB stated that advance payment was made on the request of the contractor and as per the orders of the Hon'ble Minister to consider the request. It was also stipulated that the poles be delivered within 15 days. The fact remains that advance payment was contrary to the terms of contract and also the stipulation regarding delivery of poles within 15 days was also not adhered to.

Failure to collect security deposit as per contract

As per the Purchase Order (clause 5), the contractor had to furnish security deposit for an amount equal to five *per cent* of the total value of the contract by way of cash/DD/bank guarantee. This was the security available with KSEB towards satisfactory performance of the contract and would be released only after

*17 Pooja Industries.
*18 Pinarayi Industrial Co-operative Society at Kannur EC and Vadakara EC.

expiry of the period of guarantee of all poles supplied and after fixing liability, if any, of the contractor. In the 12 ECs test checked all contractors furnished the security deposit equal to only one *per cent* of the contract value. Instead of recouping the shortfall from subsequent payments to the contractors, KSEB reduced the security deposit to one *per cent.* As such there was no sufficient amount with KSEB to recover the risk and cost amount from the defaulted suppliers. This made the operation of risk purchase clause ineffective. As a result, the liability of ₹ 1.26 crore *(Annexure 12)*[*19] assessed in respect of three contracts[*20] terminated due to non-performance became irrecoverable. KSEB stated that the Security Deposit was reduced based on the request of the contractors.

Non levy of penalty for belated supplies as per the terms of contract

The contract fixed (clause 6) monthly schedule which was the minimum quantity of poles to be supplied by the contractor. If the contractor fails to achieve the quarterly target as per the above schedule, penalty (clause 12) was to be imposed quarterly at the rate of five *per cent* of the value (including transportation charges) of the poles short supplied. The penalty once levied would not be refunded on any account. KSEB, however, invoked the penalty clause so as to cause minimum loss to the contractor as below:

- KSEB, considered belated supplies of the previous quarter as supplies against the target for the current quarter while computing the penalty. This resulted in short recovery of penalty.

- While computing the penalty instead of reckoning the escalated price (including escalated transportation charges) as the value of poles, KSEB reckoned only the basic rate.

- KSEB waived ₹ 14.65 lakh being the penalty to be recovered from one contractor [*21] in violation of the contract clauses.

- Imposition of penalty on one contractor [*22] for three ECs was deferred till

*19 Since the liability in respect of other contractors is not yet determined.
*20 Suman Concrete Products in Kannur Circle, Roopa Construction Company at Kozhikode EC and West Coast Concrete Products at Ernakulam and Perumbavoor ECs.
*21 Suman Concrete Products in Kannur EC.
*22 Mr. D. Ajayakumar, Pooja Industries for Kottayam pala and Thodupuzha ECs.

the completion of supplies. Though the contractor supplied only 29, 33 and 74 *per cent* of the ordered quantity respectively in these three ECs, the penalty of ₹ 47.05 lakh worked out by KSEB was not recovered.

▯ The short recovery of penalty due to the above and consequent undue favour to the contractors worked out to ₹ 8.90 crore in fourteen ECs.

KSEB stated that as per the agreement, the contractor was not supposed to make up the shortfall in a quarter and if poles were supplied in excess of the quarterly target, it was not to be adjusted against the previous quarter. As such, the penalty should be calculated only for the short supplies in the quarter and not for the accumulated short supplies. It was further stated that at the time of recovery of penalty, the escalated price was not known and hence penalty was calculated only on basic price. The reply was not acceptable as the contractor was bound to supply the ordered quantity in accordance with the monthly schedule fixed. Recovery of penalty did not relieve the contractor from supply of the ordered quantity by adjusting belated supplies, which was an adjustment of the quantity supplied in a month against the shortfall in previous month. As regards the calculation of penalty, it was to be calculated on the value of poles.

Refund of penalty in violation of terms of contract

Though there was express provision (clause 12) in the contract for non refund of penalty once levied, KSEB favoured five contractors by refunding penalty of ₹ 62.74 lakh recovered in six ECs.

KSEB stated that the provision of penalty was to deter the contractors from making shortfall and to ensure adequate supply of poles. The fact, however, remains that the ordered quantity was not supplied by the contractors in full and KSEB had to resort to procurement at higher rate, besides violating the provisions of clause 12.

Non initiation of action under risk purchase clause

The contract provided (clause G-20) that in case of failure of the contractor to supply and deliver materials or in case of breach of any of the covenants,

stipulations, etc by the contractor, the contract would be terminated and the non delivered materials would be procured from elsewhere at the risk and cost of the contractor. Though six contracts were terminated due to non delivery of poles as per the contract, KSEB did not initiate action to recover the extra expenditure of ₹ 20.61 crore incurred for procurement of poles from other sources. Further, the contract with one supplier *23 was not terminated and even though the contractor had stopped supply in 2007, the Purchase Committee decided (March 2010) to defer the matter.

KSEB stated that necessary steps including RR action would be initiated after assessing the liability of the firms. The fact, however, remains that no action had been taken even after five years of termination of contracts (March 2012).

Post contract modification of the terms and conditions

Post contract modification of the terms and conditions to the advantage of the contractor is against the spirit of competitive bidding and should be avoided. After award of the contract, KSEB authorised amendments/modifications to the terms and conditions having financial implications giving undue financial advantage to the contractors as follows:

Dilution of Price Variation Clause

The Contract clause (clause 14) regarding price variation stipulated that the benefit of price increase would be given only for the poles supplied as per delivery schedule, i.e. the benefit of price increase would not be given for poles that were supplied late. Subsequently, based on the request of one of the contractors,*24 the Purchase Committee decided (January 2009) to give the benefit of price escalation for belated supplies also. This resulted in undue financial advantage to the contractors to the extent of ₹ 16.89 crore *(Annexure 13)* in 12 ECs (March 2012).

KSEB replied that poles delivered late means that the poles were supplied beyond the contract period. This interpretation of KSEB, however, did not go in

*23 Vallikattu Construction.
*24 Pooja Industries.

line with the spirit of clause 14 of the contract. Further, KSEB's subsequent communications had also reiterated that the benefit of price escalation would be allowed only for poles supplied as per delivery schedule under clause 14.

Amendment of Price variation formula in favour of the contractors

▯ The Price Variation clause (clause 14) and the formula there under stipulated that the prices would be re-fixed in case of variation in the average cost of cement, steel etc., in excess of 10 *per cent* from their value on the due date of tender. KSEB, however, removed the 10 *per cent* ceiling amending (September 2008) the formula to the advantage of the contractors by allowing the benefit of full price variation once the increase in the cost exceeded 10 *per cent.* It was interpreted that the 10 *per cent* ceiling was to ensure that small changes in the input prices would not lead to constant revision in the cost of output. This resulted in extension of unintended benefit of ₹ 1.59 crore to the contractors in four ECs.

▯ Contrary to clause 14(i) KSEB amended (September 2008) the formula to the advantage of the contractors by including the changes in the price of sand and coarse aggregate also, thereby extending benefit to the contractors to the extent of ₹ 68.31 lakh in three ECs.

KSEB stated that the PSC pole manufacturers represented to the Chairman requesting to allow some concessions as the contract allowed price escalation only on cement, HTS wire and labour charges. Accordingly, the Board decided to remove the 10 *per cent* ceiling in the formula and to allow escalation on river sand and coarse aggregate also. The fact, however, remained that these amendments resulted in financial advantage to the contractors not contemplated in the tender/contract.

Payment of transportation charges in violation of the terms of contract

As per the terms of the contract (clause 1) transportation charges would be paid at lump sum rates for delivery of poles anywhere within the EC concerned. In case of necessity the contractor was bound to supply poles to other Circles also for which transportation charges would be paid at separate rates (per pole per kilometer basis).

KSEB, however, paid transportation charges at the lump sum rates applicable for supply within the Circle in addition to the transportation charges at separate rates for poles supplied outside the Circle. This resulted in extension of unintended benefit to the extent of ₹ 63.56 lakh to two contractors*[25] only.

KSEB stated that no decision was taken by the competent authority to allow transportation charges at inside circle rate plus per km rate for delivery outside circle boundary. We, however, observed that KSEB decided (January 2011) and paid transportation charges at rates within the Circle in addition to per pole/km rate for delivery of poles outside the Circle. Similarly, we also noticed unauthorised payment of excess transportation charges to Pooja Industries in respect of poles delivered outside Kottayam EC.

Role of Chief Engineer (TC & M)

CE (TC &M) was submitting proposals relating to procurement of poles to the PC as well as the Board. All decisions regarding post contract modifications to the advantage of the contractors were taken by the PC/Board on the basis of the detailed note/proposals submitted by CE (TC&M). Instead of exercising due diligence, the CE (TC&M) forwarded the request of the contractors with a favourable note to the Board/PC without analysing the financial implication. On the strength of the recommendation of the CE (TC&M), PC/Board authorised amendments/ modifications to the terms and conditions of the contract which ultimately resulted in undue financial benefit to the contractors.

KSEB stated that recommendations on the request of the contractors were given only in very genuine cases and decision in violation of agreement conditions were taken only to ensure the continuance of the contract. As the contractors were bound to supply the poles at the agreed rate and as per the terms of the contract, the relaxation/concessions allowed through post contract modifications lacked justification.

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*25 Pooja Industries and Vellackamattathil Industries.

Storage and Accounting

Poles are delivered at the Electrical Sections (ESs) and Goods Received Notes (GRNs) are prepared at Sub Regional Stores.

We observed that the present system of accounting of poles was defective as the stores ledger kept at Sub Regional Stores always showed a nil balance. This resulted from the system of accounting where the poles received were immediately shown as issued. Hence we were not in a position to assess the total quantity supplied, balance to be supplied, poles utilised, poles held as stock, etc.

The actual utilisation and stock position of the poles were monitored only through Material At Site Account (MASA) maintained in ES concerned. The poles supplied at ES were stacked on the way side at different locations and many poles got damaged and even got buried under soil while widening the road.

On physical verification of the stock of poles at the instance of audit in two Electrical Section offices (Thodupuzha I & II), shortage of 168 nos (7m and 8m) poles worth ₹ 1.96 lakh (calculated @ ₹ 1091.81 for 7 m and ₹ 1302.31 for 8 m poles) and unaccounted 73 nos poles (9m) worth ₹ 1.51 lakh (calculated @ ₹ 2069.14 per pole) were detected.

The payments are made at the ECs. We, however, found that different ECs book the expenditure on procurement of all types of poles (Iron poles, 'A' poles, PSC poles) under the same head (22-226). Hence, we could not assess the total payment made, payment outstanding, price escalation paid, penalty recovered, price escalation payable etc., in respect of PSC poles procured. Further, no consolidated data was available with KSEB too.

KSEB, while admitting the observation stated that report from the Dy.CE called for was awaited.

Award of contract before expiry of the existing contract

During the currency of the long term contract, Board decided (October 2009) to decentralise pole purchase and delegated the power to the three CE (Ds).

Accordingly, the CE (Ds) invited (January 2010) tenders and placed orders for 13.44 lakh poles (7m, 8m and 9m) with 10 firms, of which nine firms were existing suppliers under long term contract. The rates obtained were higher than that of the current long term contract. Consequent upon receipt of new orders at higher rates, nine contractors stopped supply of the balance quantity of 821811 poles (7m/8m/9m) against previous contracts. KSEB failed to insist supply of the backlog as well as balance quantity. Calling for tenders before expiry of the current contract was unwarranted. This gave a chance to the contractors to escape responsibility of supplying the balance quantity against previous contract. As a result, 500205 poles had to be procured from the same contractors at higher rates obtained in the new tenders. The liability towards extra expenditure on account of this worked out to ₹ 15.12 crore.

KSEB stated that as the contract was for five years, delivery of poles was for five years and the contracts were to be short closed with the supplied quantity on the specified date of completion. Therefore no condition in the agreement could be invoked to insist on supply of balance quantity. The reply was not true to facts as the contractor was bound to perform the contract in full and in case of non supply, the contract provided for termination and procurement of the non supplied material at the risk and cost of the defaulted contractor. Further, KSEB in addition to the original quantity ordered, placed additional orders as per the contract extending the period of contract beyond the stipulated period of five years, which the contractors were bound to supply. This contradicts the reply of KSEB. The matter was reported to Government in July 2012; their reply was awaited (November 2012).

2.2.2 Litigation Management

The Kerala State Electricity Board (KSEB), Thiruvananthapuram in the course of carrying out its objects, operation and maintenance activities, confronts with large number of litigations under various categories of issues like, land acquisition, line drawing (tree cutting and diminution in land value), contracts, billing and tariff disputes, theft of energy, revenue recovery, tax matters, employee benefits, etc.

KSEB has a Legal Cell at the Corporate office headed by Legal Advisor and Disciplinary Enquiry Officer (LA&DEO) to conduct the cases through its standing counsels. The LA&DEO is the prime advisor of KSEB in all legal matters and his functions include *inter alia* vetting of tender documents and agreements executed between KSEB and contractors. KSEB also settles cases through Adalats conducted at various courts. We conducted an audit to assess the efficiency and effectiveness in handling of legal cases by KSEB.

As on 31 March 2012, KSEB had 22741 cases and 1326 appeals pending in various courts *(Annexure 14)*. The position of legal cases dealt with for the last four years was as shown below:

Particulars	2008-09	2009-10	2010-11	2011-12
Number of cases at the beginning of the year	19101	19218	21516	23058
New cases	5286	6079	5619	5520
Total	24387	25297	27135	28578
Number of cases disposed during the year	5169	3781	4077	5837
Number of cases pending at the end of the year	**19218**	**21516**	**23058**	**22741**

We selected 517 case files (169 lower Court and 348 High Court cases) for scrutiny based on random selection. These included pending cases, new cases filed and disposed of during the years 2008-09 to 2011-12. Out of the 409 disposed cases test checked, there were 53 favourable, 82 partially favourable and 274 unfavourable cases. We noticed deficiencies/shortcomings in management of litigation as discussed below:

Avoidable Litigation

KSEB, as a public sector statutory body, should be a model in following rules and regulations in the conduct of its business. We, however, found that

KSEB violated the provisions of its own manual/ Supply Code *26 other rules etc. leading to a spate of avoidable litigations. Sometimes Government interference also led to litigation.

Out of the 517 case files test checked, 257 cases were filed against KSEB due to avoidable reasons. These aspects have been discussed below:

Sl. No.	Type of case	No. of cases	Reason for litigation	Impact
1.	Tree cutting compensation	193	Payment of lower compensation than prescribed in the manual of KSEB.	Constituted 23 *per cent* of the total cases.
2.	Contract Matters	1	Irregular cancellation of work order by Government of Kerala (GoK)	Delay of 19 months
3.	Arrears of electricity charges	7	(a) Violation of Clause 12 of the Supply Code.	Unnecessary litigation which was finally decided against KSEB.
		2	(b) Violation of Clause 23 of the Supply Code.	
		3	(c) Violation of Clause 34 (d) of the Conditions of Supply of Electrical Energy, 1990.	
4.	Employee benefits	51	Non-deposit/payment of gratuity	Led to huge financial commitment of ₹250 crore (approx).
	Total	257		

Tree cutting compensation

KSEB paid to the claimants only half of the tree cutting compensation that was prescribed in the Manual on the ground to avoid huge payments. We found that this reduction did not lead to any saving as the Court allowed compensation in full, at the rate prescribed in the Manual (in 123 out 193 cases test checked).

*26 Kerala State Electricity Supply Code 2005.

Government stated (October 2012) that though five *per cent* annuity was mentioned in the Manual, finding it excessive, KSEB contested the rate in the Court. KSEB also stated that it can move against the provisions in the Manual of Instructions if it feels detrimental or impractical as it has no statutory force. The fact remains that non-compliance with the provisions of the Manual led to avoidable litigation and KSEB had to pay compensation at five *per cent* in 123 cases. Further, KSEB is bound to follow the Manual as it is a prevailing Board order to be followed with regard to land acquisition and tree cutting compensation.

Contract Matters

Korean Electric Power Data Networking Company (KDN) was awarded (September 2010) the work of implementation of the Information Technology system under Part A of the Restructured Accelerated Power Development and Reforms Programme Scheme for ₹ 239.97 crore. Subsequently, GoK directed (December 2010) KSEB to cancel the contract based on their reservation over tender process. KDN challenged (December 2010) the cancellation of the work order in the High Court of Kerala. The Hon'ble Court, in its judgement held (May 2012), that the Government had no authority to interfere in the matter and quashed the Government Order. Later KSEB issued (September 2012) Letter of Award to KDN. The project was delayed for more than 20 months*[27] due to Government interference. Cost escalation due to time overrun cannot be ruled out. Besides, this delay has postponed the social benefit of loss reduction in the transmission and distribution of electricity.

Government stated that the Hon'ble High Court has since directed the Government of India/Power Finance Corporation to enlarge the time frame for implementation of the project. The reply was, however, silent about the postponement of social benefits due to delay in implementation. Further cost escalation due to time overrun cannot be ruled out as KDN is yet to accept the re-awarded work as per the original terms and conditions.

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*27 Delay from Date of Cancellation of work order (December 2010) to date of re-awarding the work (September 2012).

Arrears of electricity charges

(a) According to Clause 12 of the Supply Code 'If a purchaser of a premise requires to have a new connection, as the earlier connection has already dismantled after disconnection, the arrear, if any, shall be realised from the previous owner/occupier of the premises and not from the purchaser'. KSEB denied electric connection to the petitioners on the ground of pending dues from previous owners of the property. The Court directed KSEB to give electricity connection upon the petitioner complying with the requirements for the grant of a new connection other than payment of energy charges due from the former occupier.

Government stated that the Kerala State Electricity Regulatory Commission has amended (30 May 2012) clause 12 by inclusion of sub clause (2) as

'Notwithstanding anything contained in sub-clause (1), the purchaser referred to therein shall deposit an amount equivalent to such arrears excluding interest with the licensee, which shall be reimbursed as and when realised from the previous owner/occupier'. The cases pointed out arose in the absence of such empowering clause earlier.

(b) According to Clause 23 of the Supply Code 'In case of belated payments penal interest at twice the bank rate *[28] based on actual number of days of delay from due date may be charged by the Licensee'. KSEB charged interest at the rate of 24 *per cent* per annum for the defaulted payments from consumers, while the bank rate was 6 *per cent* (from April 2003 to February 2012.) The Hon'ble Court directed KSEB to rework the liability of the consumers as per the provisions of Supply Code, 2005.

While accepting the facts, KSEB stated that strict instructions have been given for applying clause 23 of the Supply Code 2005.

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*28 Bank Rate means the rate at which the Reserve Bank of India is prepared to buy or rediscount bills of exchange or other commercial paper eligible for purchase under the RBI Act, 1934 (Section 1(f) of the Supply code 2005.

(c) Conditions of Supply of Electrical Energy, 1990 (Clause 34 (d) provides that 'No service shall remain disconnected continuously for a period exceeding six months for non-payment of amount due to the Board. If the dues are not paid within the six months period of disconnection, the service shall be dismantled and the amount due to the Board shall be realised through revenue recovery action'. KSEB did not dismantle the connections even after 6 months from the date of disconnection and later demanded current charges for the period beyond 6 months. The Hon'ble Court observed that KSEB was bound to dismantle an electric connection within 6 months of disconnection, if dues are not paid and directed KSEB to refund the current charges collected beyond the period of 6 months.

Government stated that it has included (27 July 2012) a clause in One Time Settlement Scheme to limit the minimum charge payable to a period of six months after disconnection if the connection is dismantled. The reply does not explain the above case of levying minimum charges beyond six months where the connection is not dismantled.

Employee Benefits

The District Labour Officer (DLO), based on petition filed by the retired employees, directed KSEB to pay or deposit the gratuity and interest thereon under Payment of Gratuity Act, 1972. KSEB, however, did not comply with the direction whereby, the retired employees approached the Court. The Court disposed of all writ petitions with a direction to KSEB to deposit gratuity along with interest, up to the dates of deposit, at the applicable rate.

All the above cases could have been avoided had KSEB formulated its orders/procedures in conformity with the Acts, rules and regulations applicable to it. Government stated that the Board took a policy decision to implement the Payment of Gratuity Act 1972 on 24 May 2011 only and this caused filing of umpteen WPs. The reply does not explain the reason for non-deposit of the gratuity amount as directed by the Controlling Authority which led to litigation.

Defective handling of cases

KSEB should efficiently handle the cases during investigation/presentation so as to get favourable orders to the maximum extent. We observed that the failure of KSEB to efficiently handle the cases helped the petitioners in winning the cases as discussed below:

Sl. No.	Type of case	No. of cases	Name of the petitioner/respondent and date of decision	Reason for losing the case	Loss of revenue (₹ in lakh)
1.	Theft of energy	2	(a) Shri K Nandakumar (April 2011)	• Failure in raising timely demand • Defective presentation • Failure to establish theft of energy.	8.13
			(b) Shri AR Narayanan (August 2009)		5.44
2.	Tree cutting compensation	29	Various claimants	Delay in filing the case	-
	Total	31			13.57

Theft of energy

(a) The APTS on inspection (15 December 2003) detected unauthorised use of electricity and raised (December 2003) demand for ₹ 8.13 lakh towards penalty. This was challenged by the consumer. Kerala State Consumer Dispute Redressal Commission, in its judgement set aside the bill citing that KSEB did not adduce evidence in support of the site mahazer.

(b) The APTS on inspection (5 January 2005) detected theft of energy and raised (January 2005) demand for ₹ 5.44 lakh. KSEB initiated action against the consumer but the Court acquitted the consumer of the charges finding that there was no proof for theft of energy.

Government while admitting the defective handling of the above cases stated that necessary in-service training would be imparted to the field officers for successful conduct of cases.

Tree cutting Compensation

There was delay in filing Civil Revision Petitions (CRP) by KSEB at the Hon'ble High Court against the compensation allowed by lower courts and as a result the court dismissed these petitions. We found that out of 175 CRP cases reviewed, 29 were dismissed due to delay upto 1315 days in filing.

Government while admitting the delay stated that it has ordered action against the delinquents and more attention would be given in avoiding such instances in future.

Lack of follow up action

Once a case is decided in favour of KSEB, it has to take suitable action to implement the decision. We observed that KSEB did not initiate timely/effective follow up action on cases decided in its favour which resulted in blocking up of revenue and limited the scope of recovery as discussed below:

Sl. No	Type of case	No. of cases	Name of the petitioner/respondent	Remarks	Amount involved (₹ in lakh)
1.	Revenue Recovery	1	Hitech Electrothermic and Hydro Power Ltd, Palakkad	Delay of more than two years in resuming Revenue Recovery action	8687.56
2.	Billing and Tariff Dispute	2	(a) Grammax Paper & Boards (P) Ltd	Settling of arrear claims for a meagre amount, despite favourable judgement	65.32
			(b) Hotel Indraprastha, Palakkad	More than two years delay in forwarding the copy of judgement to the field office and consequent delay in raising of bills on the consumer	90.35
3.	Land encroach-ment	1	Smt.Kochikkan Lakshmi, Edamon	Delay in eviction, though favourable Court orders were obtained	--
	Total				8843.23

Revenue Recovery

Though the case filed by the consumer against the Revenue Recovery (RR) initiated by the Special Officer (Revenue) of KSEB (SOR) was disposed of in November 2005, the SOR resumed RR action only in March 2008 after two years. Meanwhile, the movable assets of the consumer were sold (March 2007) by another creditor for ₹ 4.60 crore. Thus the delay of more than two years in resuming the revenue recovery action limited the scope of recovery by KSEB. No responsibility was fixed on the SOR for the delay in initiating RR action.

Government stated that as per the judgement, it had to consider the claims of the petitioner and to pass orders after hearing. Even though KSEB invited (April & May 2006) the consumer, he never turned up for hearing and the matter was disposed of (March 2008) without hearing. The reply is not acceptable in view of the fact that KSEB took almost two years to dispose of the matter and resume RR action.

Billing and Tariff Dispute

(a) The Court held that the consumer (Grammax Paper & Boards (P) Ltd) was entitled to get the benefit of Pre-92 tariff concession for the allocated power of 700 KVA, instead of 1000 KVA demanded by the consumer. The Hon'ble Supreme Court upheld (November 2008) the judgement of the Hon'ble High Court. The amount payable by the consumer including surcharge for the belated payment worked out to ₹ 95.16 lakh.

The SOR, however, unwarrantedly settled (December 2010) the claim under One Time Settlement Scheme for ₹ 29.85 lakh forgoing revenue to the tune of ₹ 65.32 lakh.

Government stated that huge arrears were pending from the consumer on account of disputes over pre-92 tariff and KSEB had included the case under One Time Settlement Package (OTS) evolved for realising long pending arrears from all kinds of consumers. The reply is not acceptable as there was no dispute in the instant case for collecting arrear amount up to a demand of 700KVA as per the

order of the Hon'ble Supreme Court. Further, KSEB did not protect its financial interest by including the case under OTS.

(b) As per the Hon'ble Supreme Court's judgement the consumer, Hotel Indraprastha, Palakkad was to be billed under commercial tariff (LT VII A) from 26 September 2000 to October 2003 instead of industrial tariff (LT IV). The copy of Hon'ble Supreme Court's judgement (May 2008) was forwarded to field office only in October 2011 after a delay of more than two years. The demand for the differential amount of ₹ 66.23 lakh was yet (May 2012) to be raised, resulting in loss of interest of ₹ 24.12 lakh (@ 9.50 *per cent*) from July 2008 to May 2012.

Government while admitting the delay explained that the present system was inadequate for the proper and efficient conduct of cases.

Land encroachment

The Court authorised (September 2003) KSEB to take over the land. Though the appeal for stay was denied (December 2009) by the Hon'ble High Court the eviction did not materialise so far. The encroached land admeasuring 24 cents was attached to the 220 kV Substation, Edamon where the Intelligence Bureau of Government of India had warned for securing the Substation premises by building security fencing.

Government stated that eviction and acquisition were sovereign functions of the State and KSEB as a requisitioning authority had acted in time. The reply indicates the need for urgent intervention of the State Government in the matter.

In addition to the deficiencies mentioned above; we also noticed lack of qualified personnel in legal wing and absence of special wings at field offices (SOR, Circles etc.) for attending to legal cases resulting in poor performance of the wing.

Government assured to take steps to make the system effective.

It is recommended that KSEB should analyse the reasons for mounting number of cases and take appropriate remedial measures to save time and money.

The reasons for losing the cases may also be analysed and lacunae noticed be circulated to field offices to avoid their recurrence in future. KSEB should develop a suitable mechanism to monitor the cases decided in its favour for its effective implementation and strengthen the Legal Wing.

AUDIT PARAGRAPH 2.3 (2.3.1 TO 2.3.2 OF 2011-12)

2.3.1 Loss of revenue

Non-charging of separate rates in case of non segregation of light/power loads and unauthorised use of electricity in respect of HT/ EHT consumers led to loss of revenue amounting to ₹7.52 crore.

As per Kerala State Electricity Board Terms and Conditions of Supply, 2005 (TCS), an agreement has to be entered into between Kerala State Electricity Board (KSEB) and the consumer. Terms of the agreement with High Tension (HT)/ Extra High Tension (EHT) consumers *inter alia* provided for charging of separate rates in case of non-segregation of light and power load, unauthorised use of electricity etc. Invoking these provisions had the benefit of additional revenue accruing to KSEB. KSEB, however, did not carry out inspection of the consumers' premises to identify such unauthorised use/non-segregation of load which led to loss of revenue as detailed below:

(a) As per tariff notifications for HT and EHT consumers issued by KSEB from time to time and as incorporated in the agreement for supply of energy, when the connected lighting load of the factory is more than five *per cent* of the connected load for power, the whole lighting load is to be segregated and metered by a sub-meter and lighting consumption in excess over 10 *per cent* of the bulk supply consumption for power is to be charged at 7 paise extra per kWh for EHT and 25 paise extra per kWh for HT consumers. If segregation and sub-metering was not made as specified above, the bill amount of the consumers is to be increased for demand and energy charges by 10 *per cent* and 20 *per cent* for EHT and HT consumers respectively.

We observed (May 2012) that out of the total 1304 HT consumers, information pertaining to light and power loads was available only in respect of 400 consumers. Of these 400 consumers, 56 consumers had not installed separate sub-meters despite their light load exceeding five *per cent* of the total load. KSEB, however, did not charge rates applicable for non- installation of separate meter @ 20 *per cent* of the bill amount on demand and energy charges. The loss of revenue to KSEB for the limited period of September 2010 to March 2012 alone worked out to ₹ 4.78 crore. In the absence of information in respect of the balance 904 consumers, the shortfall, if any, in revenue collection could not be assessed by audit. The matter was reported (August 2012) to Government/Management; their replies were awaited (November 2012).

(b) As per the agreement for supply of HT/ EHT energy, the consumer shall not make any alteration, without prior approval of KSEB so as to increase the obligation of KSEB to supply electrical energy in excess of agreed Contract Demand (CD)/Connected Load (CL). If the consumer fails to obtain prior approval from KSEB to increase the CD, KSEB shall charge penalty as per TCS, after giving notice (clause 14(a) / (b) of the agreement). The consumer as per clause 15 of the agreement shall be liable to pay excess demand charges at 50 *per cent* of demand charges as per tariff notification, if agreement for revised.

CD is not executed but prior approval is obtained. As per clause 50 (1) / (2) of TCS, if a consumer is found to be indulging in unauthorised use of electricity, the electricity charges payable on such usage shall be charged as per Section 126 of the Electricity Act, 2003, i.e at twice the rate applicable for relevant category of services for the entire period during which such unauthorised use of electricity has taken place, after giving notice.

We observed (July 2012) that the Recorded Maximum Demand (RMD) in respect of 78 consumers *[29] was in excess of CD for a period ranging from six to eighteen consecutive months indicating misuse/theft of energy. In such cases, the

*29 One EHT II Category consumer and seventy seven HT category consumers.

Assessing Officer*30 (AO) of the sections along with Anti Power Theft Squad (APTS) of the region was to conduct inspection of premises of these consumers with a view to ascertain the unauthorised use of energy and to provisionally bill for misuse of energy. AO/APTS, however, did not carry out such an inspection. Further, Executive Engineers / Deputy Chief Engineers concerned also did not monitor the consumption by the consumer and direct AO/APTS squads to conduct inspection of premises. As such, only 150 *per cent* (normal demand charges 100 *per cent* plus excess demand charges 50 *per cent*) was charged for such RMD in excess of CD.

KSEB while explaining (October 2012) the reasons for lapses assured to take steps to review the tariff order and that direction would be given to field offices to inspect the premises of such consumers.

Failure to conduct inspection of premises resulted in non billing of penal charges for the misuse of energy at twice the rate of demand charges as provided in the TCS and consequent loss of revenue of ₹ 2.74 crore (reckoned at 200 *per cent* of tariff rates less already billed 150 *per cent*) to KSEB in respect of 78 consumers during September 2010 to February 2012.

The matter was reported (August 2012) to Government; their reply was awaited (November 2012).

2.3.2 IRREGULAR PAYMENT

Irregular payment of Isolated Area Allowance resulted in an extra expenditure of ₹ 0.44 crore

As per the Pay revision orders of Kerala State Electricity Board (KSEB) for the period from July 2003 to June 2008, as approved (September 2007) by the Government of Kerala, Isolated Area Allowance (IAA) @ 10 *per cent* of the Basic Pay, subject to a maximum of ₹1300 per month was payable to those officers of

*30 Officer not below the rank of Assistant Engineer of Electrical Sections in case of HT Consumers and Transmission Sections in case of EHT consumers assigned with the duty of monthly meter reading.

the Board who were physically present at the notified isolated areas*31. It further stipulated that IAA would not be payable to officers drawing Hydel Allowance (HA)/Investigation Allowance (IA).

Subsequently, based on a request from the Association of Officers in KSEB and recommendation of the Chief Engineer (Generation), KSEB withdrew the restriction imposed on claiming IAA and HA together and ordered (May 2008) that the officers working in the notified isolated area would be entitled to IAA @ ₹ 1300 per month in addition to HA w.e.f June 2008. The Committee of Public Undertakings (COPU), quoting the Government Order of 1979, had directed (July 2008) KSEB that all decisions regarding pay revision were to be taken only after prior approval of Government. The concurrent payment of IAA and HA during the period from June 2008 to March 2011 lacked Government approval and hence was ultra vires.

We noticed that an amount of ₹ 43.80 lakh was paid as IAA to 291 officers stationed in the five isolated areas during the period from June 2008 to February 2011 as detailed below:

*31 Isolated areas as notified by the Board as on 31-3-2007 were Sholayar, Peringalkuthu, Moozhiyar, Kochupampa, Edamalayar, Kakkayam and Thriveni Pampa.

Sl.No	Account Rendering Unit (ARU)	Isolated Area	No of cases of payment of LAA along with HA	Amount (₹ in lakh)
1.	Generation Circle, Thrissur	Peringalkuthu	77	17.42
2.	Investigation Circle, Thrissur	Kakkayam	16	0.26
3.	Generation, Civil Circles, Kothamangalam	Edamalayar Meencut	40	9.43
4.	Generation Circle, Moozhiyar	Moozhiyar	153	15.75
5.	Transmission Circle, Pathanamthitta	Kochupampa	05	0.94
	Total			**43.80**

KSEB while admitting our observation stated (November 2012) that the matter has since been taken up with the Government for ratification. The fact, however, remained that payment of Isolated Area Allowance was without approval of the Government and resulted in extra expenditure of ₹ 43.80 lakh. The matter was reported to Government (July 2012); their reply was awaited (November 2012).

[Audit paragraphs 2.3 (2.3.1 and 2.3.2) contained in the Report of C&AG for the year ended on 31 March 2012.]

Notes furnished by the Government on the audit paragraphs is given in Appendix II.

AUDIT PARAGRAPH 3 (3.1 TO 3.77-2009-10)

Introduction

3.1 Power is an essential requirement for all facets of life and has been recognised as a basic human need. The availability of reliable and quality power at

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

3.2 At the beginning of 2005-06, electricity requirement in the State of Kerala was assessed as 12698 Million Units (MU) of which only 6629.06 MU were available leaving a shortfall of 6068.94 MU, which works out to 47.79 *per cent* of the requirement. The total installed power generation capacity in the State of Kerala was 2618.74 Mega Watt (MW) (Kerala State Electricity Board (KSEB)-2047.23 MW, Others-571.51 MW) and effective available capacity was 2438.95 MW (KSEB-2047.23 MW, Others-391.72 MW) against the peak demand of 2452 MW leaving deficit of 13.05 MW. As on 31 March 2010 the comparative figures of requirement and available capacity were 2998 MW[1] and 2563.25 MW (KSEB-2126.48 MW, Others-436.77 MW) with deficit of 434.75 MW. Thus there was a growth in demand of 546 MW[2] during review period, whereas the capacity addition was only 124.30 MW (KSEB-79.25 MW, Others-45.05 MW).

3.3 In Kerala, generation of power is carried out by Kerala State Electricity Board (Board), a statutory body constituted on 01-04-1957 under Section 5 of the Electricity Supply (Act), 1948 for the coordinated development of Generation, Transmission and Distribution of electricity in the State of Kerala under the

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1 Requirement in terms of MU- 17200 MU.

2 Growth in demand in terms of MU - 4502 MU.

administrative control of the Power Department of the Government of Kerala. As per Section 172 (a) of the Electricity Act 2003 and as mutually decided by the Government of India and the State Government, Board has continued as Transmission utility and Distribution licensee till 24-9-2008. In exercise of powers conferred under Section 131 of the Electricity Act, 2003, State Government has vested (September 2008) all functions, properties, interests, rights, obligations and liabilities of Board with it till it is re-vested in a corporate entity. Accordingly, Board has been continuing all the functions as a Generation utility, State Transmission Utility and a Distribution Licensee in the State.

3.4 The Management of the Board is vested with a Board of Directors comprising of Chairman, Technical Members for Generation, Transmission and Distribution, Member (Finance), two ex-officio members and one non-official member, all appointed by the State Government. The day-to-day operations are carried out by the Chairman, who is the Chief Executive with the assistance of Members, Chief Engineers and Financial Adviser. As on 31 March 2010 the Board had 24 hydro generation stations, two thermal generation stations and one renewable energy station with the installed capacities of 1889.85 MW, 234.60 MW and 2.03 MW respectively.

3.5 The turnover of the Board was ₹ 5349.82 crore in 2008-2009 equal to 48.13 *per cent* and 2.97 *per cent* of the State PSUs' turn over and State Gross Domestic Product, respectively. Out of total turnover of ₹ 5349.82 crore, the Board's turnover from generation activities was to the tune of ₹ 722.43 crore. It employed 28043 employees as on 31 March 2010 of which 1038 employees were deployed in generating activities of the Board.

Scope and Methodology of Audit

3.6 The present review conducted during February 2010 to May 2010 covers the performance of the Board in respect of generation activities only during the period from 2005-06 to 2009-10. The review mainly deals with Planning, Project Management, Financial Management, Operational Performance, Environmental Issues and Monitoring by Top Management. The audit examination involved

scrutiny of records at the Head Office and 17 out of 27 generating stations. All major hydel generating stations, except for Kakkad and both thermal stations, with gross installed capacity of 2035.85 MW (95.74 per cent of total installed capacity) were reviewed.

3.7 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

3.8 The objectives of the performance audit were:

Planning and Project Management

- To assess whether capacity addition programme taken up / to be taken up to meet the shortage of power in the State is in line with the National Policy of Power for All by 2012;
- To assess whether a plan of action is in place for optimisation of generation from the existing capacity;
- To ascertain whether the contracts were awarded with due regard to economy and in transparent manner;
- To ascertain whether the execution of projects were managed economically, effectively and efficiently;
- To ascertain whether hydro projects were planned and formulated after taking into consideration the optimum design to get the maximum power, dam design and safety aspects; and
- To ascertain whether the Board had taken up the projects under nonconventional sources such as wind, solar, biomass etc., and tap generation from captive power sources.

Financial Management

- To ascertain whether the projections for funding the new projects and upgradation of existing generating units were realistic including the identification and optimal utilisation for intended purpose;

- To assess whether all claims including energy bills and subsidy claims were properly raised and recovered in an efficient manner; and

- To assess the soundness of financial health of the Board.

Operational Performance

- To assess whether the power plants were operated efficiently and preventive maintenance as prescribed was carried out minimising the forced outages;

- To assess whether requirements of each category of fuel worked out realistically, procured economically and utilised efficiently;

- To assess whether the manpower requirement was realistic and its utilisation optimal;

- To assess whether the life extension (renovation and modernisation) programme were ascertained and carried out in an economic, effective and efficient manner; and

- To assess the impact of R&M / LE[3] activity on the operational performance of the Unit.

Environmental Issues

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

- To assess the adequacy of waste management system and its implementation.

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3 Repairs Maintenance/Life Extension.

Monitoring and Evaluation

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

- To ascertain whether a documented and proper disaster management system was in place in all generating units.

Audit Criteria

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

- National Electricity Plan, norms / guidelines of Central Electricity Authority (CEA) regarding planning and implementation of the projects;

- standard procedures for award of contract with reference to principles of economy, efficiency and effectiveness;

- targets fixed for generation of power ;

- parameters fixed for plant availability, Plant Load Factor (PLF) etc;

- comparison with best performers in the regions / all India averages;

- prescribed norms for planned outages; and

- Acts relating to Environmental laws.

Financial Position and Working Results

3.10 The financial position of the Board for the four years ending 31 March 2009 was as given below.

(₹ in crore)

Particulars	2005-06	2006-07	2007-08	2008-09
A. Liabilities				
Paid up Capital	1553.00	1553.00	1553.00	1553.00
Reserves and Surplus (including capital grants but excluding depreciation reserve)	3091.41	3536.11	4055.27	4683.59
Borrowings (Loan Funds)				
Secured	3713.62	2498.52	1856.72	1100.36
Unsecured	...	...	...	...
Current Liabilities & Provisions	5018.79	3422.82	3812.35	4472.61
Total	**13376.82**	**11010.45**	**11277.34**	**11809.56**
B. Assets				
Gross Block	7711.62	8216.85	8684.56	9249.12
Less: Depreciation	2664.28	3070.27	3489.36	3924.10
Net Fixed Assets	5047.34	5146.58	5195.20	5325.02
Capital works in progress	1152.26	1184.48	1090.49	1171.12
Investments	16.52	16.48	16.48	25.80
Current Assets Loans and Advances*	7160.70	3060.61	3772.87	4085.32
Accumulated Losses				
Miscellaneous Expenditure	...	1602.30	1202.30	1202.30
Total	**13376.82**	**11010.45**	**11277.34**	**11809.56**

**Includes regulatory asset during the four years 2005-09 and intangible asset (₹ 0.69 crore) in 2008-09.*

The Board's financial position during 2005-2009 showed improving trend due to:

(i) Reduction in system losses, improvement in revenue assessment and collection consequent to replacement of faulty meters / static meters with electronic meters, effective anti theft activities and partial revision in tariff during 2007-08;

(ii) Swapping of high cost loans; and

(iii) Good storage of water in the hydel reservoirs except during 2008-09. Consequent increase in cash flow also enabled reduction in long term borrowings with higher interest burden.

The 'reserves and surplus' position shown in the balance sheet was, after adjusting subsidy / regulatory asset representing revenue gap (for the purpose of meeting Central Electricity Regulatory Commission's (CERC) stipulation of 14 *per cent* return on equity). The revenue gap so adjusted, however, got reduced from ₹ 144.56 crore in 2005-06 to ₹ 91.28 crore in 2007-08, but increased to ₹ 749.17 crore during 2008-09 due to increased power purchase necessitated by failure of monsoon.

The debt equity ratio of the Board varied from 2.39:1 during 2005-06 to 0.71:1 during 2008-09 as a result of repayment of high cost loans, equity remaining constant.

3.11 The Board did not keep activity-wise accounts of income and expenditure and therefore, the statement below has been prepared adopting expenditure figures apportioned to 'Generation activity' (ie., whole expenses of Generation Wing plus allocated finance charges[4]) and, in the same way apportioning gross revenue in the ratio of expenditure allocated to each activity. The details of working results like cost of generation of electricity, revenue realisation, net surplus / loss and earnings and cost per unit of operation are given below:

4 Basis of allocation not on record.

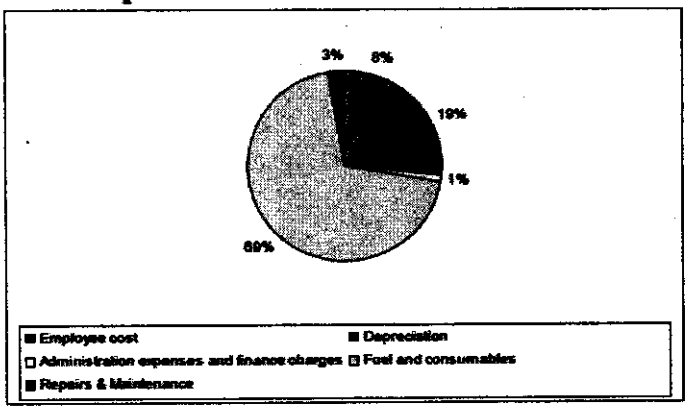
Sl No	Description	2005-06	2006-07	2007-08	2008-09
		(₹ in crore)			
1	Income				
	Revenue	626.96	447.34	627.31	718.54
	Other income including interest/subsidy	0.92	1.18	0.66	3.89
	Total Income	627.88	448.52	627.97	722.43
2	Generation				
	Total Generation (in MUs)	7600.78	7745.78	8703.55	6494.50
	Less: Auxiliary Consumption (in MUs)	46.42	50.67	55.86	54.06
	Total generation available for Transmission and Distribution (in MUs)	7554.36	7695.11	8647.69	6440.44
3	Expenditure				
(a)	Fixed Cost				
(i)	Employees Cost (less expenditure capitalised)	35.41	32.22	31.49	48.89
(ii)	Administrative and General Expenses	3.77	4.98	5.29	5.28
(iii)	Depreciation	139.02	145.64	110.08	110.48
(iv)	Interest and Finance charges (net)[5]	196.09	0.02	0.01	0.03
	Total fixed cost	374.29	182.86	146.87	164.68
(b)	Variable cost				
(i)	Fuel consumption				
	(a) Coal				
	(b) Oil	51.09	111.53	195.73	414.59
	(c) Gas				
	(d) Naphtha				
	(e) Other fuel related cost including shortages / surplus				
(ii)	Cost of water (hydel/thermal/gas/others)				
(iii)	Lubricants and consumables	0.21	0.30	0.24	0.37
(iv)	Repairs and maintenance	9.31	5.12	7.02	14.92
	Total variable cost	60.61	116.95	202.99	429.88
(c)	Total cost 3(a)+3(b)	434.90	299.81	349.86	594.56
4	Realisation (per unit) ₹	0.831	0.583	0.726	1.122
5	Fixed Cost (per unit) ₹	0.495	0.238	0.170	0.256
6	Variable cost (per unit) ₹	0.080	0.152	0.235	0.667
7	Total cost per unit (5+6) ₹	0.575	0.390	0.405	0.923
8	Contribution (4-6) per unit ₹	0.751	0.431	0.491	0.455
9	Profit /Loss(-) per unit (4-7) ₹	0.256	0.193	0.321	0.199

The generation activity was marginally profitable during the review period since own generation at normal level could be maintained during most of these years. The reduction in interest and finance charges also significantly contributed to the positive working results.

Elements of Cost

3.12 Fuel for thermal stations and depreciation constituted the major elements of cost for the Generation profit centre. The percentage break up of allocated costs of Generation Profit Centre for 2008-09 is given below in the pie chart.

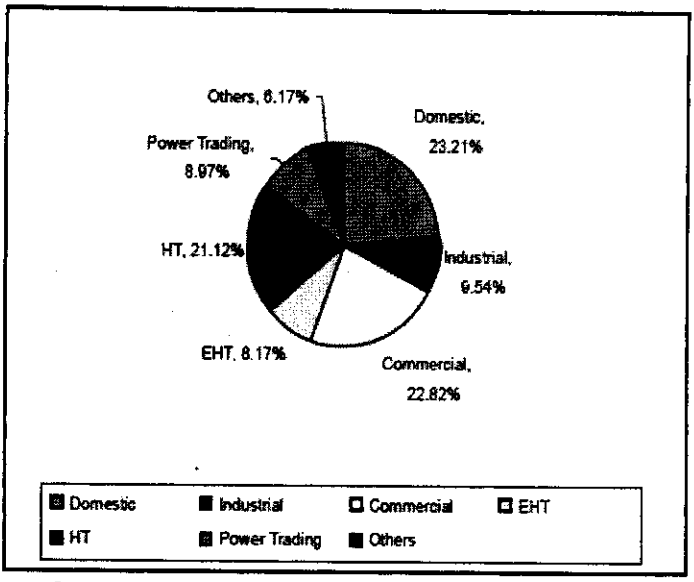
Components of various elements of cost



For the Board as a whole, purchase of power was the major element of cost accounting for 55.69 per cent followed by employee cost (20.46 *per cent*), depreciation (7.08 *per cent*), cost of own generation (6.76 *per cent*) interest and finance charges (5.54 *per cent*) and other operational expenses (4.47 *per cent).*

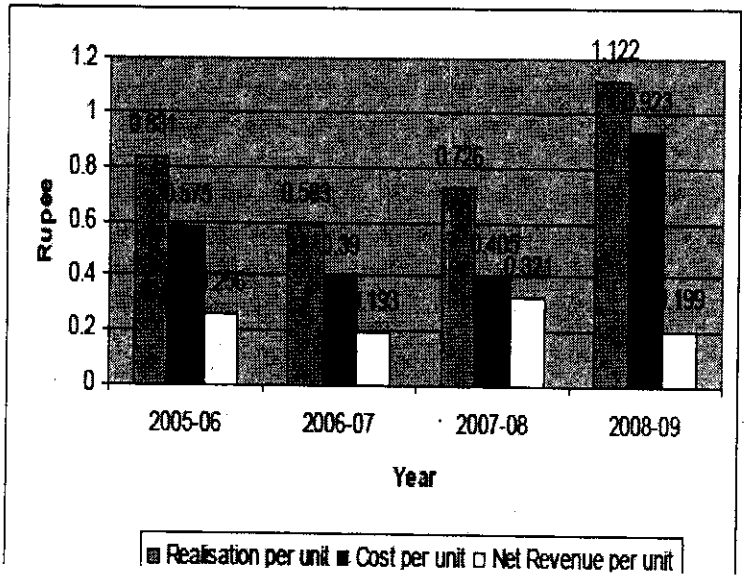
Elements of revenue

3.13 Sale of Power constitutes almost 100 *per cent* of Board's revenue. Segment-wise distribution of revenue was as indicated below:



Recovery of cost of operations

3.14 The revenue realisation covered up the cost during the four years 2005-2009. The trends of recovery of cost of operations are shown in the graph given below:-



Audit Findings

3.15 We explained the audit objectives to the Board / Government during an 'entry conference' (March 2010). Subsequently, we reported the findings to the Board and the State Government in July 2010 and discussed in an 'exit conference' (August 2010) which was attended by Principal Secretary to Government of Kerala, Power Department and Special Officer, Kerala State Electricity Board. The Board / Government replied to audit findings in August 2010. The views expressed by them have been considered while finalising this review. The audit findings are discussed below.

Operational Performance

3.16 The operational performance of the Board for the five years ending 2009-10 is given in the ***Annexure 14***. The performance was evaluated on various operational parameters as described below. It was also seen whether the Board was able to maintain pace in terms of capacity addition with the growing demand for power in the State. Audit findings in this regard are discussed in the subsequent paragraphs. These audit findings show that the generation losses were controllable and there was scope for improvement in performance.

Planning

3.17 NEP aims for availability of over 1,000 Units of electricity per capita by 2012, for which it was estimated that need based capacity addition of more than 1,00,000 MW would be required during 2002-2012 in the country. The Government has laid emphasis on the full development of hydro potential being cheaper source of energy as compared to thermal. The Central Government would support the State Government for expeditious development of hydro power projects by offering the services of Central Public Sector Undertakings likeNHPC[5] NTPC[6] and NEEPCO[7]. In order to fully meet both energy and peak demand by 2012, there is need to create adequate reserve capacity margin. In addition to enhancing the overall availability of installed capacity to 85 *per cent*, a spinning

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5 National Hydro Power Corporation Limited.

6 National Thermal Power Corporation Limited.

7 North Eastern Electric Power Corporation Limited.

reserve of at least five *per cent* would need to be created. Besides, environmental concerns would have to be suitably addressed through appropriate advance actions. The power availability in the State indicating own generation, purchase of power, peak demand and net deficit was as under.

3.18 During the period 2005-2010, the actual generation in the State was substantially less than the peak as well as average demand as given below:

Year	Generation within the State (MW)	Peak demand (MW)	Average demand (MW)	Percentage of actual generation to average demand	Percentage of actual generation to peak demand
2005-06	1804	2624	2406	74.98	68.75
2006-07	2143	2880	2627	81.58	74.41
2007-08	1864	3020	2666	69.92	61.72
2008-09	1953	2931	2499	78.15	66.63
2009-10	2305	2998	2854	80.76	76.88

As may be seen from the above, the actual generation was only 69.92 to 81.58 *per cent* of the average demand and 61.72 to 76.88 *per cent* of the peak demand. However, the total supply even after import was not sufficient to meet the peak demand, as given below:

Year	Peak demand (MW)	Peak demand met (MW)	Sources of meeting peak demand		Peak deficit (Percentage of peak demand)
			Own (MW)	Import (MW)	
2005-06	2624	2578	1804	774	1.75
2006-07	2880	2742	2143	599	4.79
2007-08	3020	2745	1864	881	9.11
2008-09	2931	2765	1953	812	5.66
2009-10	2998	2998	2305	693	-

3.19 There remained a shortfall of 46 to 275 MW (about 1.75 *per cent* to 9.11 *per cent* of the peak demand) even after import except in 2009-10. Consequently rotational (cyclic) load shedding was forced on the populace for 14 days in 2007-08, 278 days in 2008-09 and 17 days in 2009-10. Station-wise shortfall in generation is discussed in paragraphs 3.55 and 3.56 *infra*.

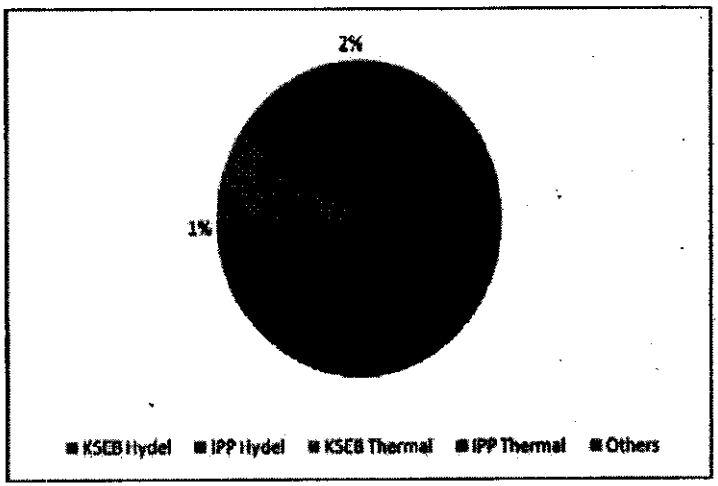
Management stated (August 2010) that all efforts to meet consumer demand were taken and any restrictions imposed were on account of transmission constraints, low inflow, forced outages of machines and maintenance needs of major stations.

The fact, however, remains that the main reason for load shedding was the capacity constraints of the State to meet the growing electricity demand from own generation.

3.20 This section deals with capacity additions and optimal utilisation of existing facilities.

Capacity Additions

3.21 The State had total effective capacity of 2438.95 MW at the beginning of 2005-06 and increased to 2563.25 MW at the end of 2009-10. The break up of generation capacity as on 31 March 2010, under thermal, hydro, Central, IPP and others is shown in the pie chart below:



3.22 To meet the energy generation requirement of 17200 MUs in the State during 2009-10, a capacity addition of about 2627.37 MW was required during 2005-06 to 2009-10, at the existing plant load factor (PLF).

3.23 The projects categorised as 'Projects under Construction' (PUC) and 'Committed Projects[8] (CP) earmarked for capacity addition during Plan period according to NE Plan are detailed below:

(In MW)

Sector	Thermal	Hydro	Non-conventional Energy	Total (for Plan period)	Additions planned for review period
PUC	...	263[10]	...	263	100
CP	...	140[11]	...	140	...
Total		**403**		**403**	**100**

3.24 The NE Plan had incorporated only major Hydro Electric Projects (HEPs) as state specific projects and indicated overall national target of 14000 MW for Small Hydro Electric Projects (SHEPs[9]) without identifying them state wise. The Board, in its 11th Plan approach paper, targeted overall capacity addition of 610.15 MW during Plan period which included 20 SHEPs with a total generation potential of 149.15 MW. The Achencoil (30 MW) and Chinnar (28 MW) HEPs, did not form part of 11th Plan targets in the NEP; but were identified as projects earmarked for commissioning during 12th Plan. These projects were however included by Board in 11th Plan itself envisaging capacity addition during 2011-12. Thus, Board's capacity addition plans, to the extent of 403 MW [610.15 - (149.15+58)] only were specifically recognised in NE Plan. The particulars of capacity additions envisaged by KSEB, actual additions and peak demand vis-a-vis energy supplied during review period are given below:

8 National Electricity Plan defines Committed Projects as projects for which the formal approval to take up the same has been granted by CEA.

9 Hydel projects with capacity of less than 25 MW.

Sl.No	Description	2005-06	2006-07	2007-08	2008-09	2009-10 (Provisional)
1.	Capacity at the beginning of the year (MW)	2047.23	2068.23	2085.73	2090.73	2123.23
2.	Additions Planned for the year as per NE Plan (MW) (11th Plan)				100.00[13]	
3.	Additions planned by the Board (MW)	185.00	200.00	132.50	10.80	41.00
4.	Actual Additions (MW)	21.00	17.50	5.00	32.50	3.25
5.	Capacity at the end of the year (MW) (1 + 4)	2068.23	2085.73	2090.73	2123.23	2126.48
6.	Shortfall in capacity addition (MW) (3-4)	164.00	182.50	127.50	Nil	37.75
7.	Energy requirement (MUs)	13760.00	14549.00	15384.00	16266.00	17200.00
8.	Energy supplied (MUs)	13618.96	14798.06	15375.55	15606.09	17335.58
	a) Energy produced (MUs)	7554.36	7695.11	8647.69	6440.44	7189.52
	b) Energy Purchased (MUs) (net of sale)	6064.60	7102.95	6727.86	9165.65	10146.06
9.	**Surplus(+)/ Shortfall(-) in meeting demand (MUs)**	**(-)141.04**	**(+)249.06**	**(-)8.45**	**(-)659.91**	**(+)135.58**

3.25 The actual capacity addition by KSEB during 2005-2010 was 79.25 MW (13.92 *per cent*) (***Annexure 15***) as against 569.30 MW planned, leaving shortfall of 490.05 MW. The State was not in a position to meet the demand as the power generated by Board as well as power purchased fell short to the extent of 8.45 MUs to 659.91 MUs during review period, except for 2006-07 and 2009-10.

We observed that:-

- The capacity addition plans of the Board were unrealistic. These were made without adequate preparedness for implementation and before obtaining forest / environmental clearances wherever required, as discussed in paragraphs 3.38 to 3.43. The Ministry of Environment and Forests, GOI had not yet cleared (October 2010) Athirappally HE Project (163 MW) which was the single largest project planned for implementation during 11th Plan period.

The execution of other three projects included under NE Plan viz., Pallivasal, Mankulam and Thottiyar HEPs also were behind schedule as the Board failed in completing land acquisition process within the projected time frame. Pallivasal Project also encountered material changes in design parameters of water conductor system, due to discrepancies in project investigation. These three projects were bound to spillover to 12th Plan. Out of five projects identified by CEA for capacity addition during 11th Plan, only one Project viz., Kuttiadi Additional Extension - 100 MW (slipped over from 10th Plan) could be commissioned during the plan period, recording only 24.81 *per cent* achievement of specific target (403 MW) fixed for the State in the NE Plan.

- Generation potential of five projects included under the plan proposals was incorrect. The capacity projected was 87 MW as against actual of 67.75 MW.

- Out of 27 projects planned by KSEB for commissioning during 11th Plan, envisaging capacity addition of 610.15 MW, 18 projects with proposed capacity of 367.35 MW (60.21 *per cent*) have not yet been taken up (October 2010) for execution though the Plan period ends by 2012. Based on status of 11th Plan projects (October 2010), actual achievement of capacity addition was only 28.75 MW as against 184.30 MW targeted (only 15.60 *per cent*) for the first three years of the plan period (2007-2010). Further, about 60 *per cent* of the projects planned for implementation were run of the river schemes. Generation potential of these schemes is confined to monsoon months, during which power availability position was comfortable and cheaper. Therefore, the effective capacity addition achieved on implementation of these schemes would be very marginal.

- The slow pace of project implementation was attributable to lack of importance given to investigation work. Test check of projects forming part of 11th Plan proposals indicated that their investigation and surveys were commenced during 1980s and 1990s and the time taken for finalisation of DPRs was more than five years on an average as against a normal period of two years envisaged in the NE Plan.

Development of energy from non-conventional (renewable) sources

3.26 The NE Plan emphasised the need for development of maximum energy from renewable sources. The State Planning Board had estimated (2006) the power generation potential from non-conventional / renewable sources in Kerala at 1715 MW. However, the State could tap power generation potential of only 173.925 MW (Small Hydel-133.85 MW, Wind-30.075 MW and Cogeneration- 10 MW) up to 31st March, 2010 of which Board's share was 95.88 MW (Small Hyde-93.85 MW, Wind-2.03 MW). The State Government had also established (January 1986) Agency for Non Conventional Energy and Rural Technology (ANERT) for development of non-conventional energy sources. ANERT approached the Board for setting up a 3.5 - 5 MW demonstration wind farm at Ramakkalmedu on cost sharing basis but Board failed to find out a suitable agency for establishing the project and in the absence of internal know-how also, the proposal was shelved (January 2009).

Optimum utilisation of existing facilities

3.27 In order to cope with the rising demand for power, not only the additional capacity needs to be created, the plan needs to be in place for optimal utilisation of existing facilities and also undertaking life extension programme / replacement of the existing facilities which are near completion of their age besides timely repair / maintenance. The details of the power generating units, which have completed the age of 30-35 years and therefore, fell due for Renovation and Modernisation / Life extension programmes (as per CEA norms) during the five years ending 2009-2010 vis actually taken up are indicated in the Table below:

Sl. No.	Name of Station	Unit No	Installed Capacity (MW)	Year of installation	Year of RMU as per CEA norms	Status of RMU works
1	Peringalkuthu	1	8	1957	1992	The RMU works planned in 1992 (cost of ₹ 9.54 crore) and again in 1996 (cost ₹ 40 crore) was postponed due to financial constraints. DPR has since been finalised (June 2010) involving investment of ₹ 68.20 crore for implementation during 11th Plan period (2007-12) as against 2007-08 indicated in the NE Plan. An RMU Division was formed (July 2010) at Poringal to oversee the project works. However, the work is yet to be commenced (August 2010).
		2	8	1958	1993	
		3	8	1959	1994	
		4	8	1960	1995	
2	Sholayar	1	18	1966	2001	The RMU was scheduled for completion in 11th Plan (2007-12) but DPR was under preparation (August 2010).
		2	18	1968	2003	
		3	18	1968	2003	
3	Kuttiady	1	25	1972	2007	A feasibility study was already made and RMU was programmed for 11th plan, so that the work could be taken up after commissioning Kuttiady Additional Extension Scheme (KAES) nearing completion (September 2010).
		2	25	1972	2007	
		3	25	1972	2007	
4	Idukki	1	130	1976	2011	The Board assessed the machines to be giving satisfactory performance and hence RMU works were proposed for commencement during 12th Plan after conducting Residual Life Assessment (RLA) studies.
		2	130	1976	2011	
		3	130	1976	2011	
5	Idamalayar	1	37.5	1987	2022	RMU works were advanced since both machines developed critical operational problems prematurely during 1990s. Orders were placed (November 2008) with BHEL, scheduling completion by November 2010, at a cost of ₹ 11.70 crore. Equipment supplies were in progress (August 2010).
		2	37.5	1987	2022	

From the above, it may be seen that none of the 10 units due for Renovation and Modernisation/ Life extension programmes (Sl. Nos. 1, 2 and 3), were actually taken up as planned.

Management attributed the delay in arranging RMU works to system constraints and delay in selecting the agency for conducting Residual Life Assessment (RLA) study. While system constraint should not be a valid reason for

carrying the risk of postponement of RMU works, delay in selection of agency was avoidable through advance planning and action.

The detailed audit observations relating to repair, maintenance and life extension programmes are discussed in succeeding paragraphs.

3.28 We observed that the postponement of RMU works had adverse effects on the performance of the machines. In respect of Peringalkuthu, except for a marginal increase in 2009-10, the hours of operation gradually decreased since 2006-07 and the extent of outages for repairs and maintenance went on increasing from 17.5 *per cent* of scheduled hours in 2005-06 to 28.45 *per cent* in 2008-09 and 23.12 *per cent* in 2009-10.

One or the other machine of the station was under prolonged shutdown for periods exceeding three months during the monsoon months[10] of 2007-08 and 2008-09, when the Peringalkuthu reservoir was spilling. We calculate, the consequential generation loss at 14.98 MU with revenue potential worth ₹ 5.26 crore.

3.29 The outages of Sholayar machines were 16.49 to 29.99 *per cent* during 2005-06 to 2008-09 and as a result the operated hours decreased from 16990.87 in 2005-06 to 13536.05 in 2008-09. Machine #3 of the HEP was under forced shut down for six months during 2005-06 due to thrust bearing pad damage. The spillage from the reservoir during this period was 47.2984 Million Cubic Meter (MCM) resulting in generation loss of 20.38 MU with potential revenue worth ₹ 6.30 crore. The same machine was again under forced shut down for another 62 days during 2006-07 due to the same problem. In November 2009, the machine again encountered stator core blow off and was out of service up to 2nd June, 2010.

3.30 Kuttiady machines were also out of service for 2247.08 hours to 6251.13 hours (11.35 to 31.34 *per cent* of scheduled hours) during the four years 2005-2009. Machines no. 2 and 3 were under shut down for a period of 36 days (between June 2007 and July 2008) and 29 days (between June 2005 and March 2009) respectively, due to runner damages. Out of 36 days (864 hours) of shut

10 June – December.

down of machine no. 2, for 119 hours during July- August 2007 (spill period) due to runner damages resulted in generation loss of 2.98 MU worth ₹ 1.04 crore. Machine # 3 was under maintenance shutdown from 11-1-2006 to 27-5-2006 and the repairs of this machine required total shut down of the Station from 11-4-2006 to 22-5-2006.

Repeated occurrence of major break downs indicated the need for urgent renovation and modernisation of these stations, to guard against generation loss of considerable extent.

3.31 The five diesel generating machines of Brahmapuram Diesel Power Plant (BDPP) required repairs and maintenance operations on completion of every 12000 hours of running and the maintenance works needed on completion of every 24000 hours of running was equivalent to complete overhauling costing around ₹ 3 - 4 crore. In the absence of indigenous know-how, the maintenance/ repair works were being entrusted with the OEM.

While the engines were designed for continuous operation the Diesel Plant was operated only as a peak-load station. Any cold start[11] of the engine was as good as 30 hours of running and therefore, it enhanced the maintenance needs of the machine besides, causing abnormal break down. Hence, scheduled maintenance based on stipulated operational parameters was inevitable and unavoidable for the healthy operation of the plant.

The Table below contains particulars of 24000 hours maintenance works undertaken/ to be undertaken for the machines of BDPP:

Machine No.	Date of commissioning	Hours operated at the time of shut down for overhauling	Date of shutdown for overhauling	Date of starting of overhauling works	Date of re-commissioning after overhauling	Cost of overhauling (₹ crore)
1	6/5/1997	24722.82	18/10/2007	1/1/2008	21/4/2008	3.23
2	8/8/1997	24748.89	6/2/2004	2/8/2004	18/12/2004	2.28
3	07/10/1997	23937.72	29/5/2009	10/8/2010	Work in progress	4.57 (Estimated)
4	17/12/1997	24751.35	2/2/2009	2/5/2009	1/8/2009	3.21
5	24/11/1998	26113.67	26/8/2010	Not taken up		

11 Starting the engine when the jacket water temperature and lube oil temperature are equal to atmospheric temperature is called 'cold start'.

In the case of overhauling of four machines (1 to 4), the work of overhauling was started after keeping the machine idle for long durations of three to 14 months due to delay in arranging the work.

Management stated (August 2010) that the delay was because of the longer lead time required for arranging supply of imported spares. We are of the opinion that the need for repairs was already known and hence sufficient advance action should have been taken to avoid unnecessary shutdown.

3.32 Maintenance needs of the machines of KDPP were also not attended as per requirement after 12000 hours of operation. Maintenance of machines # 1 to 3 was carried out after operating them for extra hours in the range of 3257 to 5192. Likewise, the 24000 hours maintenance of machine # 5 and 8 was undertaken after running them for extra hours of 7262 and 8787 respectively. The station had effectively operated only seven out of eight machines at a time, keeping one of the machines idle for want of spares. The spares of idling machine were being used in the machines under operation. We observed that the cost of generation at KDPP was always lesser than the price of power imported from NTPC's Kayamkulam Combined Cycle Plant during 2005-2009. The extra cost incurred due to non-operation of one of the machines during the period April 2005 to September 2008 (when Kayamkulam power was costlier) amounted to ` 11.72 crore.

The Board maintained (August 2010) that its commitment for availing of bulk supply on round the clock basis from Kayamkulam prevented it from taking advantage of the partial availability from Kozhikode at lesser cost.

We observed that there was no contractual obligation that disabled the Board in limiting drawal of Kayamkulam power to the required level. Further, the Board as a policy scheduled the generation from own power plants based on merit order[12] and resorted to power purchases only when internal generation was costlier.

12 Merit Order: System of prioritising generation / purchase of power, based on cost of generation/ cost of import.

We are of the opinion that the Board could not achieve the optimum utilisation of available capacity of its hydro as well as thermal projects and lost out on making use of commercial opportunities by delaying decision of undertaking RMU works.

PROJECT MANAGEMENT

Project Formulation

3.33 Preparation of accurate and realistic Draft Project Reports (DPR) is a critical activity in planning stage of the project. Feasibility studies of potential Hydro Electric Projects were made, projects having scope for further investigation were identified and Preliminary Investigation Reports (PIR) were prepared. On its approval by Deputy Chief Engineer, sanction for conducting detailed investigation was given by Chief Engineer, based on which the DPR was prepared.

3.34 We observed that the Board had not standardised any policy guidelines and methodology for selection of projects. Because of this, projects cleared for detailed investigation were abandoned during the course of investigation due to the changes in the ideas of top management. During the period of review, 23 projects under investigation were dropped due to lack of foresight on the part of the Management as the projects involved contentious inter-state issues and acquisition of forest land and only 13 projects were taken up. The wasteful expenditure incurred on the survey and investigation of these abandoned projects **amounted to ₹ 3.58 crore.**

3.35 Budgetary controls were not being exercised over investigation activity. Further, no time bound milestones were fixed for completion of each activity of project investigation except in the case of prioritised projects. Due to lack of effective control and monitoring by top management, project investigation was often inordinately delayed. For instance-

- Three projects (Achancoil, Vakkalar and Chilikkalar) in Achancoil river basin were proposed during 1999. It took seven years for completion of investigation of the Project and to finalise (August 2006) the DPR of Achancoil. The DPR of Vakkalar was finalised in December 2007 and of Chilikkalar was yet to be finalised (October 2010).

- Marmala SHEP (4.5 MW) was proposed (September 1997) for implementation with Chinese assistance. Due to conflicting views about the viability of different proposals decision was delayed. Fresh surveys were undertaken and Detailed Investigation Report was finalised only in April 2010 with delay of nearly 10 years.
- The Anakkampoil (7.5 MW), Kandappanchal (3.75 MW) and Pathamkayam (4 MW) projects were separately investigated in the Chaliar river basin (1994 onwards) and project reports prepared in December 2007, February 2008 and June 2008 respectively. All the three schemes were planned for implementation during 11th Plan Period. Later, it was decided (December 2008) that Projects in the same river basin could be developed together for optimum utilisation of head and resources. Investigation of the cluster project has not been completed (August 2010) even after the lapse of 19 months.
- Feasibility studies of Koodam HE Project were conducted during 1999. However, no further action was taken until February 2007 when it was included in the list of schemes to be commissioned before 2011. But the DPR was approved only in December 2009.
- The Vadakkepuzha Diversion Scheme implemented (July 2003) at a cost of ₹ 2.66 crore contributed additional revenue of ₹ 13.77 crore by pumping 46.86 MCM of water into Idukki reservoir from Vadakkepuzha reservoir. As second part of Vadakkepuzha Diversion Scheme, a diversion channel from Pothumattom stream was constructed (July 2006) through which additional inflow was obtained in Vadakkepuzha reservoir during monsoon season. The low storage capacity of Vadakkepuzha reservoir and intermittent failure of pumping operations, however, caused heavy spillages through the overflow path of the temporary bund of the reservoir during every monsoon. Thus the benefit of the scheme was not fully derived. In order to prevent the spillage, a proposal to construct a pipeline from outlet of Pothumattom channel to Idukki reservoir was made (December 2007) based on which a feasibility report was finalised (June 2008) envisaging construction cost of ₹ 48 lakh with which additional power generation worth ₹ 51 lakh was achievable every year. Detailed investigation was ordered in June 2009.

We observed that the pipeline scheme was conceivable at the time of construction (July 2006) of diversion channel itself and the avoidable delay of three years (July 2006- June 2009) in finalising the proposal thereto had caused potential revenue loss of ₹ 1.53 crore (₹ 51 lakh x 3) already.

- The Pallivasal Extension Scheme (PES) and Sengulam Augmentation Scheme (SAS) targeted for commissioning during 11th Plan were investigated and taken up for implementation prior to 2000-01. With the commissioning of PES (December 2012) and SAS (January 2013) as targeted, the inflow of water would increase by 33.91 M^3/sec[13] into downstream Sengulam Reservoir. As the maximum requirement of water for existing Sengulam Station is only 17.92 M^3/ sec and its reservoir was having storage capacity of only 0.7 MCM, the excess inflow into Sengulam Reservoir would result in spillage of water. However, the requirement of capacity enhancement for Sengulam station, along with the PES and SAS was realised by Board only in June 2008. Consequently action was initiated (September 2008) to complete the investigation and implement the Scheme. As per management's projections, time gap between the commissioning of the existing projects and the newly proposed project will be a minimum of two years resulting in generation loss of 348.984 MU of potential value ₹ 132.61 crore as reckoned on the basis of projected annual generation of the proposed projects.

We observed that the project investigation was not planned at the appropriate time with a view to exploit the maximum potential and optimum utilisation of resources. Further, merits and demerits of different alternatives of project proposals were not collectively examined at the formulation stage and the most feasible option and substantive value addition often emerged during the advanced stages of project.

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13 PES-13.95 M3/sec and SAS 19.96 M3/sec.

Management contended (August 2010) that the Board's investigation systems evolved over the last five decades were foolproof and sufficient. We are of the opinion that there exists scope for review and refinement of the system as evidenced by the lapses in investigation detected and reported by Board's own expert committees, in the different cases.

Project Implementation

3.36 Project management includes timely acquisition of land, effective actions to resolve bottlenecks, obtain necessary clearances from authorities, proper scheduling of various activities etc. Time and cost overruns were noticed due to absence of co-ordinating mechanism throughout the implementation of the projects during review period as discussed in succeeding paragraphs.

3.37 The following table indicates the scheduled and actual dates of completion of the power stations, date of commissioning of power stations and the time over run.

Time over run

	Malankara	Lower Meenmutty	Neriamangalam Extension Scheme	Kuttiady Tail Race	Kuttiady Additional Extension Scheme
Time of completion as per DPR	2 years	2 years	2 years	2 years & 9 months	3 years
Date of commencement	December 1999	February 2003	July 2003	February 1990	November 2003
Date of completion	October 2005	March 2006	May 2008	October 2009	Work in progress
Date of commissioning	October 2005	March 2006	May 2008	-do-	Work in progress
Time overrun	47 months	14 months	35 months	17 years	Work in progress

It would be seen from the above that none of the five projects implemented during 2005-2010 was completed in time and slippages at various stages of implementation were due to delay in land acquisition, geological surprises, delay on the part of contract agencies in work execution.

The estimated cost of power projects completed during review period, actual expenditure, cost escalation and percentage increase in cost are tabulated below:

	Malankara	Lower Meenmutty	Neriamangalam Extension Scheme	Kuttiady Tail Race
Cost as per DPR (₹ crore)	41.13	11.26	47.76	17.71
Cost as per contract (₹ crore)	27.44	12.38	35.06	12.48
Actual cost (Booked till 31.3.09) (Provisional)	33.67	21.33	38.37	14.88
Cost overrun (₹ crore)	6.23	8.95	3.31	2.40
Percentage increase as compared to contract cost	22.70	72.29	9.44	19.23

There was cost overrun ranging from 9.44 *per cent* to 72.29 *per cent* in respect of completed projects and reasons as analysed in audit were as under:

- Delay in organising the project works.
- Lack of effective controls over work execution.
- Extra cost due to excess inputs.
- Execution of additional items of work.

Delays in land acquisition

3.38 Before tendering of any project construction works, it is imperative that land acquisition should be completed. The Board formulated policy guidelines in this regard only in June 2007. The new policy was also not followed for any of the projects executed thereafter. Consequently, schedule of implementation of

projects that involved land acquisition was adversely affected due to delay in acquisition proceedings. The main reasons for the delay were lack of policy guidelines from Government for fixing compensation and the procedural delay on the part of State Revenue / Forest Departments in facilitating the acquisition. Because of this, compensation payable for revenue / forest land under encroachment by private parties could not be decided which delayed the works. Major deficiencies noticed in land acquisition for projects are discussed below.

3.39 The Draft Investigation Report of Kuttiadi Additional Extension Scheme (KAES) had indicated the option of tunneling along the penstock route to avoid land acquisition for surface penstock. Yet, the DPR was prepared (1998) incorporating provision for surface penstock, on the ground that steel lined pressure shafts were expensive. The Environmental Management Cell (EMC) of the Board, however, refuted (April / May 1999) this view and supported tunnel option due to reduction in land requirement, minimum energy loss and overall reduction in project cost by ₹ 17.60 crore. The proposal in project report prevailed upon that in DIR and EMC report and land acquisition process was commenced with, in 1999 which was completed only by October 2006, following disputes over acquisition of 1.65 ha of forest land under encroachment. The dispute had to be resolved by the Board, paying land value of ₹ 31.16 lakh to Forest Department as well as compensation of ₹ 10.70 lakh to encroachers. The time overrun in the project work on this account was 34 months. The consequential cost escalation claim (₹ 12 crore) of project contractors, recommended by Project Manager for settlement at ₹ 8 crore was under scrutiny of Legal Cell of the Board (May 2010).

The Chairman, KSEB had also observed (January 2008) that the Scheme suffered from improper design of water conductor system, as the adoption of exposed penstock instead of tunnel resulted in considerable delay in land acquisition in most critical section of penstock route causing slippage of schedules.

We observed that the decision to act upon the proposal to construct surface penstock was taken without fully investigating into hurdles and obstacles involved in land acquisition.

3.40 The project works of Pallivasal Extenstion Scheme were awarded (January 2007) and the work commenced (March 2007) but the land (9.19 ha) acquisition proceedings were commenced only in April 2007.

The land acquired included 2.4559 ha of Government land encroached by private parties. As the existing rules in Government did not permit payment of compensation for acquisition of non-patta land, the Board had to pay ex- gratia for the same. Thus, the land acquisition cost of the project actually incurred amounted to ₹ 7.10 crore against ₹ 75 lakh provided for in the project report. The inordinate delay in the land acquisition caused prolonged interruptions in civil works of the project also.

3.41 When the issue of payment of compensation for non-patta land at Pallivasal became controversial the Board requested Government for approval of similar compensation payments for other ongoing projects in the same or nearby areas viz., Thottiyar, Mankualm, Sengulam Augmentation Scheme, Sengulam Tail Race SHEP and Perumthenaruvi SHEP. Government sanctioned (November 2009) payment of compensation in the form of ex-gratia to unauthorised occupants of Government revenue land and forest land*14.

3.42 In respect of Thottiyar project, acquisition proceedings for 26.33 ha of land were commenced in July 2007 but land acquisition was not completed by January 2009 when the project work was commenced. As of March 2010, 4.67 ha of land only could be acquired. Though the forest clearance was received for 3.8 ha of forest land, the same is pending for 1 ha till May 2010. The progress of project (March 2010) was only 0.88 *per cent* during the first 14 months as against the target period of completion of 40 months.

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*14

Project	Government Land	Forest Land
Thottiyar HEP	7.753 ha	1.1726 ha
Mankulam HEP	23.96 ha	5.00 ha
SengulamAugumentation Scheme	3.4876 ha	------
Sengulam Tail Race SHEP	1.4605 ha	------
Perumthenaruvi SHEP	0.417 ha	1.00 ha

In Mankulam Project, the Board had to face public agitation on the issue of settlement of compensation claims and due to this no progress could be achieved in the execution of the project. In respect of Perumthenaruvi Project, Board could not find out and acquire the required extent of private land for surrender to the Forest Department for compensatory afforestation even after two years' time (August 2008-August 2010) resulting in slippage of equal extent of time in implementation of the project.

For Chathankottunada HE project, the Board granted financial assistance (₹ 28.97 lakh) in lieu of rehabilitation package to 11 beneficiaries at rates envisaged in the draft Rehabilitation and Resettlement Bill.

Thus, the absence of policy guidelines from State Government or its own common policy framework, the Board had to resort to different terms of settlement for different projects in resolving land acquisition proceedings.

Delay in obtaining Forest/ Environmental Clearance

3.43 The procedural delays and uncertainty involved in obtaining Forest/ Environmental Clearances have also upset the project implementation schedules of the Board. As submission of approved DPRs and Environmental Impact Assessment Reports, as the case may be, was a prerequisite for applying for these clearances, lot of manpower costs and other expenses were also borne by the Board without any assurance of getting clearance. The status of 11th Plan projects that required forest / environmental clearances is given in ***(Annexure 16.)***

As could be seen in the Annexure, non-receipt of forest/ environmental clearance was the major reason for slippage of Athirappally Project from both 10th Plan and 11th Plan and the delay in receipt of forest / environmental clearances had substantially altered the implementation schedules of other projects as well. Apart from the delay in receiving clearances, further delay involved in removal of trees from the transferred areas also contributed to overall time overrun in completion of projects.

Cost/Time over run due to inadequacies in investigation and designs

3.44 As envisaged in DPR, the tail race channel of Kuttiady Additional Extension Scheme (KAES) with a maximum flow of 21.38 m^3/sec was to discharge into Kakkayam thodu, a stream that flowed from the upper reaches and it required deepening of the stream (discharge capacity 10 m^3/sec) to accommodate the tail water flow. During execution, the diversion of the stream from the upstream level was found necessary due to inverse slope of the tail race pit, great velocity of the flow in the stream, and possibility of accumulation of debris at tail race which may also enter the machine pits of KAES during monsoon.

The Board agreed (August 2010) that decision to divert the stream was taken as a very essential item of work and it was also treated as an extra item of work as per the terms of the agreement necessitating payment (September 2008) of ₹ 80.54 lakh against the estimated value of work of ₹ 32.27 lakh, resulting in extra expenditure of ₹ 48.27 lakh due to omission to incorporate an easily foreseeable item.

3.45 The Kuttiar Diversion Scheme taken up (1991) for implementation envisaged diversion of water from Kuttiar stream to Idukki reservoir for additional power generation. The work involving construction of a concrete weir and unlined diversion tunnel awarded (June 1991) with date of completion by March 1994 at an estimated cost of ₹ 2.52 crore (based on 1989 Schedule of rates) was terminated (March 2001) due to very slow progress in execution. The contractor sued (2002) the Board against the termination order and rearrangement of work got delayed upto April 2003. A new contractor was awarded the work at a revised estimated cost of ₹ 8.79 crore (based on 1999 schedule of rates). The works came to a standstill (March 2006) following allegations against sanctioning of several extra items / excess quantities and agitation of local people demanding construction of a motorable bridge across Kuttiar stream. The enquiry conducted by Vigilance Wing of Board brought out lapses in project investigation which did not foresee all the components of project works. This necessitated execution of several extra items of work, costing ₹ 1.72 crore and excess quantities of work

amounting to ₹ 1.50 crore. The Technical Committee of the Board, which looked into the facts of the case also observed (February 2008) that proper geological exploration was not conducted at detailed investigation stage and the lapses led to revision in designs.

The time overrun of four years and cost overrun of ₹ 3.22 crore was mainly attributable to deficiencies in project investigation.

Discrepancies in DPR

3.46 The Draft Project Reports are the essential plan documents to visualize and foresee all the fundamental features and requirements of project execution and should contain accurate design parameters of generators, water conveyance systems and power house, failing which the Project was bound to confront unforeseen obstacles during the course of execution. Deficiencies in DPR resulted in substantial time and cost overruns in the case of following projects under execution, as part of the 11th Plan projects.

3.47 A DPR made in October 1994 for setting up a SHEP with installed capacity of 5 MW at Ranni- Perinad (cost ₹ 8.47 crore) was revised (cost ₹ 19.94 crore) in September 2004 due to lapse of time and setting up of a SHEP upstream of project location. The project works tendered (September 2005) could not be finalised as only one bidder was prequalified. The work was retendered (January 2008) and finally awarded (October 2008) at contract cost of ₹ 30.84 crore with a completion period of 24 months.

After execution (February 2009) of agreement, the contractor intimated (February 2009) the difference between the 'net head' [15] actually available and that indicated in DPR. Re-examination of data (March 2009) led to refixation (November 2009) of net head and the Board had to agree with the design changes proposed by the contractors. To attain the same, the depth of excavation and size of power house was materially altered. The additional cost on account of excess quantities of work necessitated due to the alteration was estimated (August 2010) at ₹ 4.99 crore.

15 Difference in elevation between head water level and tail water level.

The Board replied (August 2010) that no projects can be completed without modification during execution. Moreover, the Board recorded (March 2009) that while considering the rated head, the increase in tail water level during machine operation was not considered.

3.48 The Adyanpara SHEP (3.75 MW) envisaged utilisation of yield of Kanjirampuzha river in Chaliyar basin for power generation. The work was awarded (May 2007) for an estimated cost of ₹ 21.33 crore which included civil works of ₹ 11.17 crore stipulating completion date as September 2009.

During execution, several items of extra works were found necessary for successful completion which were left out in the DPR. Following disputes over admissibility of extra items, the contractor discontinued the work in January 2008. The DPR was re-examined by the Board and revised contract amount was estimated at ₹ 26.18 crore. Further an option for incorporating a tunnel was examined and it was decided (September 2008) to invite separate tenders for tunnel work and to allow existing contractors to complete the rest of the works. Moreover, due to dispute with the contractor over the rates, the Board terminated (August 2009) the work and retendered it at the risk and cost of the contractor. The contractors, approached (August 2009) the Hon'ble High Court of Kerala against the termination order and thereby the project works were held up. Legal proceedings were in progress (August 2010).

Thus, the project planned for completion by October 2009, was still pending due to apparent deficiencies in investigation and design for which responsibility was being fixed by the Board.

Management stated (August 2010) that an enquiry was held (July-December 2008) by Vigilance Wing of the Board to find out the deficiencies in investigation and design of Adyanpara SHEP. Based on the findings in the preliminary report detailed enquiry was ordered (August 2009) to be conducted.

Contract Management

3.49 Contract Management is the process of managing various stages of the contract in an effective, efficient and economic manner. Board had not laid down policy guidelines on benchmark project cost for inviting global tenders / turnkey contracts and on having separate or combined contracts for civil and electromechanical works of hydro electric projects. The projects tendered between 2005-10 were mainly for joint execution of civil and electromechanical parts by consortiums of contractors. The KAES and Athirappally HEP were, however, tendered on 'turnkey basis'.

The Board concluded (August 2009) that the consortium route was less competitive due to the fact that only few parties were interested in consortium formation and the Board may go for separate bidding for civil and electromechanical works. Four project works were tendered using the new route during subsequent period.

We observed ***(Annexure 17)*** that the tender evaluation and finalisation of work order had been a time consuming process in the Board. Test check of 10 projects [16] executed/ planned for execution during the 11th plan disclosed that the time gap between date of tender and date of award of work ranged upto 28 months, the average being 13 months mainly due to procedural delay in evaluation of bids and their finalisation at the Board's level.

This delayed award of work is bound to affect the pricing structure of the bids and Board will be always at a disadvantage in getting the price clauses enforced as the cost of construction material is dynamic in present business environment.

3.50 Some of the major observations in respect of contracts test checked in Audit are discussed below:

A compensation claim of ₹ 6.06 crore was preferred by the Board on Steel Industrials Kerala Limited (SILK) for the generation loss sustained due to delay in attending to the repairs of Malankara machines. Considering the fact that generation loss could not be recovered legally and in the absence of provisions in

16 Lower Meenmutty, Pallivasal Extension Scheme, Neriamangalam Extension Scheme, Ranni-Perinad, Thottiyar, Chathankottunada, Adyanpara, Poozhithode, Vilangad and Peechi.

the agreement besides precarious financial position of SILK, the Government of Kerala directed (November 2009) the Board to drop the demand to which the Board acceded (December 2009).

We observed that SILK had only acted as an intermediary agency and almost all the items of work were arranged on sub contract basis. However, SILK was allowed to arrange repairs by providing unreasonably longer period of time. Despite the poor performance of contract by SILK in Malankara and Peppara HE Project, the Board had since awarded (April 2010) the work of Peechi SHEP to SILK as a consortium leader. The concessions given to SILK by virtue of being a PSU only indirectly aided the private agencies to whom the works were entrusted by SILK.

Non-achievement of Guaranteed Performance

3.51 The Neriamangalam Extension Scheme, envisaged utilisation of excess inflow into Kallarkutty reservoir, that used to spill out causing loss of potential generation. The DPR projected (January 2000) a completion time of two years but the project was awarded (April 2003) allowing completion time of 36 months. The contractors delayed the work execution and therefore, the Board formally extended the completion time initially upto May 2007 and again upto September 2007 subject to levy of penalty. The completion of work was delayed further and therefore, the machine could be synchronised only by July 2008 after a lapse of two years from original scheduled completion as per award of work. The machine developed frequent technical problems that resulted in prolonged outages (July 2008-December 2009) of 7747.40 hours against total available hours of 13176.67 (58.80 *per cent*). This also included 326.35 hours of outage during 2008 monsoon season when there was spillage of water from the dam reservoir. The outages caused generation loss of 164.66 MU (at 85 *per cent* PLF) during monsoon period resulting in irrecoverable loss of ₹ 3.10 crore.

We observed that the contractors could establish continuous test run of 72 hours and got (September 2008) a provisional acceptance certificate from the Board on condition that all the problems in the machine would be sorted out

within 30 days. The contractors, however, did not turn up to rectify the defects and to furnish a performance guarantee. But for the bank guarantee against retention money of ₹ 5.80 crore, no security was available with the Board to enforce the performance guarantee.

Thus, from above cases, it can be seen that the Board failed to enforce effective action to recover the consequential losses due to delay in completion of work or to obtain the performance guarantee to guard against generation losses which is a normal precondition.

Input Efficiency

Efficiency of fuel procurement systems and fuel efficiency of machines of the two Diesel Generating stations were reviewed in audit and deficiencies noticed in fuel management at these stations are discussed below:

Loss of Generation due to inadequate fuel stock

3.52 Fuel supplies for the thermal stations were obtained from Indian Oil Corporation (BDPP) and Bharat Petroleum Corporation Limited (KDPP) against long term contracts. No stock levels were fixed for fuel stock and procurement was made on the basis of monthly generation plans. Due to unsteady nature of generation plans on account of fluctuations in power prices in open market, the stock levels held, were disproportionately high and low, on different occasions. The depleted stock position of fuel had often adversely affected the power generation by both the stations. For instance, Machine # 2 of BDPP was under shut down for want of fuel from 31-3-2007 to 17-5-2007. The estimated short generation of power on account of the shut down was 2.75 MU. Similarly, the average generation at KDPP was only 0.2408 MU per day during the period 22-6-2009 to 30-6-2009 and the monthly average was 0.752 MU/day against the anticipated generation at the rate of 1.5 MU/day.

During the year 2009-10 when fuel prices had decreased considerably the cost of BDPP power was cheaper than the purchase price of power by the Board. The station, however, faced acute shortage of fuel due to insufficient supplies

from Indian Oil Corporation ie, the average supply was only 3000 MT/month against 8000 MT/month required. As worked out by Board, loss of generation was to the tune of 20 MU /month due to short availability of fuel; equivalent to loss of ₹ 10 crore per month.

Board stated (August 2010) that the short supplies on above occasions were due to logistical problems of oil companies which had since been overcome.

Consumption of fuel in excess of norms

3.53 The BDPP utilises HSD and LSHS as fuel. HSD was used as start-up fuel and switch over to LSHS was made when the machines attained 35 *per cent* of rated load. The specific fuel consumption norms for LSHS and HSD were 190.03 gm/KWH and 211.99 ml/KWH respectively. Fuel consumption during the five years 2005-2010 was in excess of norms for both LSHS and HSD resulting in extra expenditure of ₹ 20.65 crore ***(Annexure 18).***

Consumption of LSHS at KDPP was also higher than the norms (194.40 gm/ kwh). Moreover, it showed an increasing trend since 2007-08. As against the consumption rate of 204.27 gm/KWH and 204.01 gm/KWH recorded for the years 2005-06 and 2006-07 respectively, the consumption for the three years from 2007-08 to 2009-10 was in the order of 205.59 gm, 205.83 gm and 206.29 gm respectively per KWH of power generated. The cost of fuel consumed in excess of norms amounted to ₹ 39.71 crore ***(Annexure 18)***. The management noted (May 2009) the excess consumption and the Member (Generation) had directed (May 2009) Deputy Chief Engineer, KDPP to examine reasons for low output.

Management stated (August 2010) that fuel consumption standards guaranteed by machine manufacturers was based on theoretical/ laboratory conditions with fuel having specific calorific values. As the fuel available in India was not having the stipulated calorific values, the fuel efficiency tends to decrease. Frequent stops and starts, wear and tear of machines, variations in grid frequency and loss of fuel while filtering were stated as other contributory causes.

Manpower management

3.54 Deployment of staff in the generation wing was made by the Board as per sanctioned strength fixed on conventional basis without reference to actual field requirements on any scientific basis. When compared with sanctioned strength, there was shortage of 366 employees. A need based assessment of staff strength was also made during this period. We, however, noticed that, in certain cadres, there was excess staff strength available in some of the field offices, while shortages in very same cadres were reported from certain other offices indicating avoidable imbalances in staff strength.

The position of actual manpower and man power required as per CEA recommendation, for the four years upto 2009-10 is given below:

Sl. No	Particulars		2006-07	2007-08	2008-09	2009-10
Manpower as per CEA norms (in numbers)						
1	(a)Technical	(i)Thermal	84	84	84	84
		(ii)Hydro	2829	2837	2886	2891
		(iii)Total	2913	2921	2970	2975
	(b)Non-technical	(i)Thermal	40	40	40	40
		(ii)Hydro	481	482	491	491
		(iii)Total	521	522	531	531
	Actual manpower					
2	(a)Technical	(i)Thermal	104	101	105	125
		(ii)Hydro	602	596	668	744
		(iii)Total	706	697	773	869
	(b)Non-technical	(i)Thermal	41	31	26	24
		(ii)Hydro	174	165	166	145
		(iii)Total	215	196	192	169
	Excess(+)/deficit(-)					
3	(a)Technical	(i)Thermal	20	17	21	41
		(ii)Hydro	-2227	-2241	-2218	-2147
	(b)Non-technical	(i)Thermal	1	-9	-14	-16
		(ii)Hydro	-307	-317	-325	-346
4	Expenditure on salaries in Generation activity (₹ crore)		32.65	31.72	49.1	Not available
5	Excess expenditure on excess manpower in thermal stations (₹ crore)		0.69	0.59	1.05	Not applicable

Above table shows that men in position was more than the normal strength assessed as per CEA norms in thermal stations and the resultant excess expenditure for the three years up to 2008-09 worked out to ₹ 2.33 crore.

Rational assessment of man power in hydel stations with reference to norms, was not possible, in view of the fact that the hours of operation varied substantially from station to station in accordance with generation potential and system requirements. Management stated (August 2010) that reorganised staff pattern of Generation Wing was under implementation stage.

Manpower requirements of Civil Wing for project works were not assessed/reassessed on the basis of works on hand. As number of projects suffered long delay during implementation, the services of officials posted at the project site were underutilised. One such instance noticed in Audit was that of Division III of the Pallivasal project which was assigned with the supervision of the civil work of power house and incurred establishment expense of ₹ 45.09 lakh (2008-09) accounting for 34.40 *per cent* of the value of works (₹ 1.31 crore) carried out. Similarly, a full fledged project office was in existence since 1999 for 10 years for the Athirappally Project which is yet to be started (August 2010) for want of final clearance from Ministry of Environment. The average establishment cost incurred at the Division was ₹ 89 lakh per annum.

Management stated (August 2010) that the staff strength was also deployed for managing the litigation related jobs and also for investigation of Anakkayam HEP. Our findings from cost benefit angle indicated that the need of a full fledged office at project site for all these years was not there for the above jobs which were of relatively recent origin.

OUTPUT EFFICIENCY

Shortfall in generation

3.55 The targets for generation of power for hydel stations for each year were fixed by the Board and approved by the CEA. The targets were fixed based on the estimated power potential from the average inflow for the previous ten-year

period. As the actual generation potential solely depended upon the inflow received during the year, variations were expected to occur due to vagaries of monsoon. Thus, favourable variations were recorded during 2005-2008 and shortfall from targets during 2008-2010 when targets were fixed at a higher level as given below:

Year	Target (MU)	Actual (MU)	Variation (MU)
2005-06	5444	7413.30	(+)1969.30
2006-07	6292	7496.60	(+)1204.60
2007-08	6749	8327.28	(+)1578.28
2008-09	7008	5839.26	(-)1168.74
2009-10	6769	6646.27	(-)122.73

3.56 The year-wise details of energy to be generated as per design, actual generation, plant load factor (PLF) as per design and actual plant load factor in respect of 23 power projects commissioned up to March 2010 are as given in ***(Annexure 19.)***

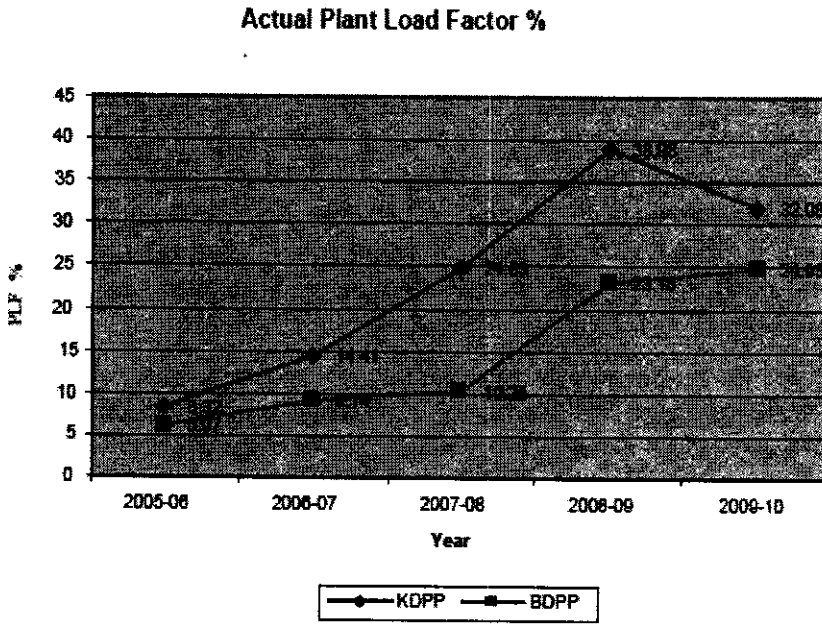
It could be seen from the Annexure that the actual generation and actual PLF achieved were higher than the targets as per design only in respect of Kuttiyadi and Neriamangalam stations during the entire period of 2005-2010.

- The designed output of Kakkad was 50 MW and the actual maximum delivery was only 41 MW because of high pressure or head loss occurred in the pressure shaft and tunnel, due to design deficiencies of the water conducting system.
- The Malankara station also could not achieve the designed output on combined operation of its machines as there was capacity limitation for the water intake pipe to the turbine unit laid by Irrigation Department, due to design deficiency.

The Board is on record pointing to design deficiencies in above projects. Reasons for short generation at Pallivasal HEP are discussed in paragraph 3.67.

Low Plant Load Factor (PLF)

3.57 Plant Load Factor (PLF) refers to the ratio between the actual generation and the maximum possible generation at installed capacity. According to norms fixed by Central Electricity Regulatory Commission (CERC), the PLF for thermal power generating stations (TS) should be 80 *per cent*, against which the national average ranged from 73.70 to 78.60 *per cent* during the review period. The PLF of the two thermal power stations of the Board was as depicted in the following line graph:



The PLF of these stations was relatively very low since they were being operated as peak load stations for reasons of economy.

3.58 The details of maximum possible generation at installed capacity, actual generation and corresponding Plant Load Factor achieved in respect of each

of the hydel generating units for the five years 2005-2010 are given in (***Annexure 19.***) The reasons for the low PLF, as observed in audit were:

- Low plant availability.
- Low capacity utilisation.
- Major shut downs and delays in repairs and maintenance.

These are discussed in the following paragraphs:

Management also attributed (August 2010) the low PLF to substantial variations in demand during peak and off peak hours due to peculiar nature of system load in Kerala Power Grid, which necessitated installation of high capacity machines without having round the clock requirement of full capacity utilisation.

Low plant availability

3.59 Plant availability means the ratio of actual hours operated to maximum possible hours available during certain period. As against the CERC norm of 80 *per cent* plant availability during 2004-2009 and 85 *per cent* during 2010-2014, the average plant availability of power stations of the Board was 76.36 *per cent* for 13 major HEPs, 37.16 *per cent* for 11 SHEPs and 46.47 *per cent* for two TS during the five years 2005-2010 as given below:

Table I – Major HEPs

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10	Period Total
Total Hours Available	327014.25	333888.58	331314.83	309756.28	313049.81	1615023.75
Operated Hours	258682.53	263152.95	261010.30	205418.79	244932.73	1233197.30
Planned S/d (in hrs)	55858.47	60247.99	54677.60	61483.42	50604.74	282872.22
Forced S/d (in hrs)	12473.25	10487.64	15626.93	42854.07	17512.34	98954.23
Availability Factor	79.10	78.81	78.78	66.32	78.24	76.36

Table II – SHEPs

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10	Period Total
Total Hours Available	139043.73	167595.00	169884.35	211738.72	217667.19	905928.99
Operated Hours	57452.60	73217.57	70505.97	70824.80	64635.11	336636.05
Planned S/d (in hrs)	1787.68	9146.57	39190.55	32445.92	47309.50	129880.22
Forced S/d (in hrs)	79803.45	85230.86	60187.83	108468.00	105722.58	439412.72
Availability Factor	41.32	43.69	41.50	33.45	29.69	37.16

Table III – Thermal Stations

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10	Period Total
Total Hours Available	39245.57	40133.54	61695.95	81177.87	74938.23	297191.16
Operated Hours	9827.07	16371.57	25644.22	45397.08	40878.10	138118.04
Planned S/d (in hrs)	19934.07	17270.00	18633.25	20035.42	19706.73	95579.47
Forced S/d (in hrs)	9484.43	6491.97	17418.48	15745.37	14353.40	63493.65
Availability Factor	25.04	40.79	41.57	55.92	54.55	46.47

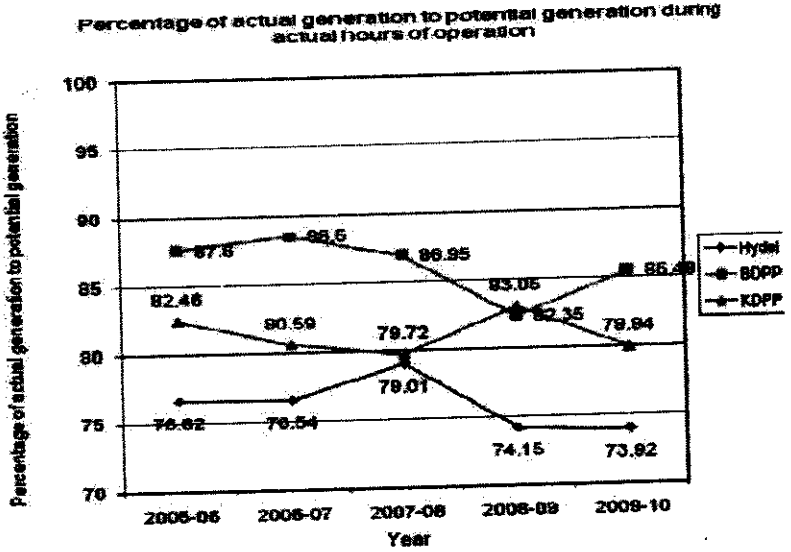
We observed that:

- Low plant availability at major HEPs was due to longer durations of outages caused by penstock accident at Panniar, explosion of machine #4 at Moozhiyar and prolonged spells of repairs and maintenance (including RMU at Neriamangalam and Moozhiyar) due to age factor.
- Lower machine availability at SHEPs was due to technical snags of machines as well as water conductor systems.
- Plant availability of thermal stations was very low due to postponement of repairs and maintenance due to cost considerations.
- The Board stated (August 2010) that generation from thermal stations is decided based on requirements after considering all other sources.

Low Capacity Utilisation

3.60 Capacity utilisation means the ratio of actual generation to possible generation during actual hours of operation. Based on national average PLF of 76.50 *per cent* and plant availability at 80 to 85 *per cent*, the standard capacity

utilisation factor works out to 90.30 *per cent* for thermal and 85.97 *per cent* for hydel. We observed that 11.50 to 20.28 *per cent* of the installed capacity of Thermal Stations and 20.99 to 26.08 *per cent* of the installed capacity of Hydel Stations remained unutilised. The percentage of actual generation to potential generation during actual hours of operation is given in the following line graph:



We observed that the following were the main reasons for the low utilisation of available capacity during 2005-10:-

- Running of units with partial load.
- Reduction in output at Pallivasal, Kakkad and Malankara HEPs due to limitations in water conductor system.
- Capacity limitations of hydel reservoirs, and low storage position in years of poor monsoons.
- Operation of Idukki HEP machines at reduced loads to maintain flexibility in the system.
- Decline in efficiency of BDPP machines.

Outages

3.61 Outages refer to the period for which the plant remained closed for attending planned/ forced maintenance. We observed:

- In respect of major HEPs, the total number of hours lost due to planned outages varied between 50604.74 hours and 61483.42 hours per annum during the review period i.e., between 16.17 *per cent* and 19.85 *per cent* of total available hours. Planned outages of SHEPs widely varied between 1.29 *per cent* and 23.07 *per cent* of available hours. The relatively higher levels of outages were attributable to age factor necessitating increased maintenance requirements for major HEPs and teething troubles of newly commissioned SHEPs.
- The forced outages of major HEPs during 2005-2010 were in the range of 12473.25 hours (2005-06) to 42854.07 hours (2008-09) and varied between 3.81 *per cent* and 13.83 *per cent* of available hours. In the case of SHEPs, forced outages were in the range of 35.43 *per cent* (2007-08) to 57.39 *per cent* (2005-06) of available hours. These outages were mainly because of accidents at Panniar and Moozhiyar HEPs and deficiency of water for small HEPs most of which were run of the river projects.

3.62 None of the ten independent SHEPs have given satisfactory performance, due to non-stabilisation of operation of the machines as well as water conductor systems. The output of these stations was substantially lower than the potential output envisaged in the Project Report, for all the five years (2005-2010), resulting in overall shortfall of 195.42 MU.

3.63 The planned and forced outages of the two Thermal Stations ranged from 24.68 *per cent* to 50.79 *per cent* and 16.18 *per cent* to 28.23 *per cent* respectively during 2005-2010 as shown below. The reason for the outages was non-availability of spares, as and when needed:

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10
Total machine hours available	39245.57	40133.54	61695.95	81177.87	74938.23
Planned Outages (in hours)	19934.07 (50.79)	17270.00 (43.03)	18633.25 (30.20)	20035.42 (24.68)	19706.73 (26.30)
Forced Outages (in hours)	9484.43 (24.17)	6491.97 (16.18)	17418.48 (28.23)	15745.37 (19.40)	14353.40 (19.15)

Management stated (August 2010) that spares for the machines were not being stocked in consideration of the high cost involved. Considering the generation loss consequent to non-availability of critical spares in time, the reply furnished was not adequately convincing. The Board may consider undertaking a periodical exercise to replenish stock of spares considering cost benefit effects.

Auxiliary consumption of power

3.64 Energy consumed by power stations themselves for running their equipments and common services is called auxiliary consumption. CEA has fixed an auxiliary consumption norm of 0.50 *per cent* of generation for hydel stations and 3 *per cent* for thermal stations (combined cycle type) against which the auxiliary consumption of the Board for the five years 2005-2010 was as given below:-

	2005-06	2006-07	2007-08	2008-09	2009-10
Hydel Stations	0.41	0.44	0.42	0.46	0.32
Thermal Stations	4.35	3.43	2.89	2.63	2.93

Auxiliary consumption at Madupetty, Panniar and Sholayar stations was not metered for the last few years and was, therefore, accounted on estimated basis. The auxiliary consumption at TS was higher than norms during 2005-2007 since the levels of generation operation was very low during that period.

Repairs & Maintenance

3.65 To ensure long term sustainable levels of performance, it is important to adhere to periodic maintenance schedules. The efficiency and availability of

equipment is dependent on the strict adherence to annual maintenance (A/M) and equipment overhauling schedules. Non-adherence to schedule carries a risk of the equipment consuming more fuel oil and a higher risk of forced outages which necessitate undertaking R&M works. These factors lead to increase in the cost of power generation due to reduced availability of equipments which affect the total power generated.

Schedules of A/M of power stations were fixed by the Board and each of the machines was shutdown for maintenance after obtaining prior permission. The schedules were drawn in line with the specific generation policy for each station. Accordingly, preventive maintenance of machines of Stations having storage reservoir was undertaken during monsoon months and the maintenance of run of the river projects planned for summer months. The normally permitted time for A/M was 15 days to one month for different machines. However, deviations from set schedules were noticed on account of unexpected outages of other machines at same or other stations, breakdowns during unscheduled periods and other system constraints. We noticed:

- The average time taken for annual maintenance of renovated machines (6 Nos) of Pallivasal Station ranged up to 36 days against the stipulated time of 15 days. Similarly, the duration of annual maintenance of Sengulam machines was 34 to 52 days against normal time of 30 days. The time taken was higher in view of the fact that all the machines had undergone RMU works during the year 2000-2002.
- The A/M of machines of Neriamangalam and Sabarigiri Stations, recommissioned during 2005-2009, was not properly carried out after recommissioning. Time gap of 15 to 23 months was observed in arranging the A/M of these machines after completion of RMU works (***Annexure 20***). No reasons were on record for the long time gap in A/M efforts.
- A/M of Idamalayar machines was also carried out inconsistently. The time gap between two maintenances of machine# 1 ranged between five months to 14 months and for machine #2 between eight months to 17 months during 2005-2010. The changes in schedules were mostly on account of forced shut down necessitated due to technical snags before the due dates of A/M.

- The A/M of Sholayar machines was also undertaken at irregular intervals. The A/M of machine # 1 was not carried out from August 2006 to January 2008. The actual duration of A/M of unit #3 was 45 days on an average for the three years upto 2009-10.
- The average duration of A/M of Peringalkuthu machines was also in the range of 33 to 43 days due to high rate of maintenance needs.

Post Renovation &Modernisation Status

3.66 Renovation, Modernisation and Uprating (RMU) works of hydel stations were to be planned when the life of the existing units crossed 30 to 35 years, as per CEA Guidelines. The RMU works involved identification of the problems of units, preparation of techno economic viability reports, preparation of detailed project reports (DPR) to lay down benefits to be achieved from these works.

***3.67** We observed :—*

- The renovation and modernisation work of the Pallivasal station carried out (2000-2002) envisaged replacement and upgradation of existing plant for increase in the station output. On renovation (June 2002) the machines, however, were giving an output of only 32.50 MW on combined operation as against the rated output of 37.50 MW, although the units were giving rated output when operated individually. The Board attributed the short performance to the fact that the water conductor systems (60 years old) that carry water from storage reservoir to power station were not renovated along with the machines. Loss of generation (2005-2009) on account of this was 58.925 MU of potential revenue worth ₹ 18.21 crore at 85 *per cent* rated capacity. Further, the runner buckets of Units 4, 5 and 6 replaced by the RMU contractors had been frequently developing pits and cracks, ever since recommissioning (2002). Apart from getting the runners repaired at the cost of RMU contractors during guarantee period (2002 to 2005), no effective action

to evolve a lasting solution to the problem, was insisted by Board before settling their accounts. The Board suffered a loss of ₹ 3.86 crore on account of generation loss due to machine outages for want of serviceable runner during the review period. Action for procurement of a spare runner costing ₹ 94 lakh was initiated (August 2010) by Management to overcome the problem.

- When machine availability is critical during the monsoon period, RMU works of Neriamangalam Machine 2 and 3 were undertaken in 2005-06 and 2006-07 respectively. The loss of generation was 82.18 MU of potential worth ₹ 25.83 crore. Though the time required for RMU works was 6-8 months, the works could not be carried out during non monsoon period due to delay in commencement of work and consequent non-completion of works within the stipulated time.

- RMU works of all the 6 machines of Sabarigiri station were carried out by M/s VA Tech Austria between the period July 2003 to December 2009. There was time overrun ranging between 126 days and 616 days for six machines which adversely affected the generation plan of the Board. The quality of works carried out was also unsatisfactory. Machine #5, recommissioned (May 2006) after RMU had to be shut down (July 2006) for 127 days following an accident. Machine No.4 recommissioned in February 2007 exploded in May 2008, resulting in total loss of the unit, major repairs to Unit #3 and partial damages to other Units. Investigation conducted by CEA attributed the cause to manufacturing defects. Board estimated and initiated legal action for recovery of loss of ₹ 51.10 crore from M/s VA Tech.

Financial Management

3.68 Efficient fund management is a tool for decision making for optimum utilisation of available resources and borrowings at favourable terms at appropriate time. The power sector companies should, therefore, streamline their systems and procedures to ensure that:

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

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

Details of sources and utilisation of resources on actual basis for the years 2005- 06 to 2009-10 are given below:

S.No.	Particulars	2005-06	2006-07	2007-08	2008-09
Sources					
1.	Net Profit/(loss)	101.26	217.42	217.42	217.42
2.	Add: adjustments	498.29	879.89	914.27	108.14
3.	Funds from operations (1+2)	599.55	1097.31	1131.69	325.56
4.	Decrease in working capital	593.43	0.00	0.00	1096.29
5.	Cash deficit (10-(3+4))	0.00	0.00	0.00	0.00
6.	**Total (3+4+5)**	**1192.98**	**1097.31**	**1131.69**	**1421.85**
Utilisation					
7.	Capital expenditure	463.59	514.48	364.88	644.50
8.	Increase in working capital	0.00	56.60	240.29	0.00
9.	Cash surplus (3+4)-(7+8)	729.39	526.23	526.52	777.35
10.	**Total**	**1192.98**	**1097.31**	**1131.69**	**1421.85**

The surplus cash position was mainly on account of reduced levels of capital expenditure as a result of slow progress of targeted project works and absence of new project works.

The Board had been meeting the project fund requirements mainly from internal generations and short term borrowings except in case of term loan (₹ 158.40 crore) taken for KAES from REC.

Delay in decision making over financial tie-up

3.69 In case of KAES, the lowest offer of M/s. BHEL – L&T Consortium was found (June 2001) acceptable provided the party withdrew their demand for deviations from payment terms of the Board. Even though the withdrawal was communicated (June 2001) by the Consortium, the Board finally decided (August 2003) that the financial package offered carried very high interest rates when compared with the prevailing market rates and interest subsidy under Accelerated Generation and Supply Programme. The contract was finally awarded to BHEL L&T Consortium in August 2003 at the cost of ₹ 168.28 crore. As a result of the delay of over two years in decision making without valid reason the Board had to allow BHEL-L&T Consortium escalation of 7.5 *per cent* amounting to ₹ 11.94 crore with consequential delay of two years in completion of the project.

Drawal of high interest bearing loan funds without requirement

3.70 A term loan of ₹ 176 crore from Rural Electrification Corporation (REC) was got sanctioned (March 2005) by Board for KAES, which carried interest at the rate of 8 per annum. with reset option at the end of every three years. The loan was to be availed of on reimbursement basis. REC recovered upfront fee of ₹ 17.60 lakh from the initial instalment. In September 2008, when an amount of ₹ 31.07 crore (net of upfront fee) was already drawn, and the rate of interest stood enhanced to 12.75 *per cent* as per reset option, the Board availed of fresh instalment of ₹ 85.45 crore, when its fund position was quite comfortable to meet the project commitments and the Financial Adviser objected to the drawal on the ground that the rate of interest was quite high. The Board was also keeping its surplus funds in short term deposit bearing interest of only 9.02 to 9.29 *per cent*, all along the period of drawal and utilisation of loan funds. Further instalments of ₹ 4.30 crore and ₹ 6.92 crore were also drawn during September 2009 and March 2010 respectively when the internal fund position was still better, and the

Financial Adviser did not endorse the proposal for additional drawal. REC turned down (December 2009) request of the Board (November 2009) to short close the loan without prepayment premium in the absence of enabling provisions in contract agreement. Drawal of high interest bearing loan funds without genuine requirement thus resulted in avoidable extra expenditure of ₹ 2.88 crore for the project implementation.

We also observed that the funding proposals for projects were originated by Planning Wing and the Finance Wing had exercised only limited control or no control at all in the matter of drawal of loan funds for project finance.

Drawal of payments by contractor in excess of due amounts

3.71 The agreements executed with the contract agency that executed RMU works of Sabarigiri Station and the Neriamangalam Extension Project, provided for payments for supplies and services through irrevocable letters of credit(LC). The terms of LC were such that payments were to be released by Bankers against certificates of receipts of materials at site, to be issued by the Board within 21 days and in case the certificates were not issued within the said period the Bankers were at liberty to pay the entire invoice amount as claimed by the contractors.

Majority of the invoices issued by the contractors did not reach the project offices of the Board within the stipulated time of 21 days as a result of which the contractors could obtain full payments against their claims, on expiry of stipulated time. These claims were made by the contractors without making all applicable deductions including statutory deductions and hence there was excess drawal of ₹ 1.48 crore against 22 passed invoices in the case of Sabarigiri Project and ₹ 63.84 lakh against 13 invoices for the Neriamangalam Project between the period October 2004 to December 2008.

Adoption of liberal payment terms without safeguarding the financial interests of the Board coupled with inadequacy of internal systems to ensure timely compliance with payment terms in contract agreement resulted in the over payments.

Non-closure of Project Accounts

3.72 Information on actual cost of completion was not forthcoming for any of the projects commissioned during 10th Plan/ 11th Plan. The Account Closing Units functioning at different sites in respect of five[17] projects which were commissioned between April 1987 and October 1999 were not able to finalise and close the project accounts so far (May 2010).

Management stated (August 2010) that closing of accounts was often delayed due to litigation and vigilance enquiries. The reasons attributed were not valid since it was possible to finalise the accounts making adequate provisions and disclosures for issues under litigation / vigilance enquiries.

Higher cost of construction of Small HE Projects

3.73 In accordance with the KSERC (Power Procurement from Renewable Sources) Regulations 2006, a uniform capital cost of ₹ 4.88 crore per MW could be treated as reasonable for SHEPs. Test check of DPRs of nine[18] SHEPs included in the 11th Plan showed that the cost per MW was more than the prescribed limit by ₹ 0.11 crore to ₹ 4.35 crore (***Annexure 21***).The causes of variations were not analysed and the Board has no inbuilt system for analysing such issues of the project management.

Thus Board could not effectively monitor the physical progress of the work through financial controls. Though the financial management of the Board improved during the review period, the internal control systems were not adequately effective.

Tariff Fixation

3.74 In accordance with KSERC (Tariff) Regulations, 2003, the Board was to file before the Commission its Annual Revenue Requirement (ARR) and the Expected Revenue from Charges (ERC) for each financial year not later than four

17 Idamalayar , Madupetty, Peringalkuthu Left Bank Extension Scheme, Kakkad and Lower Periyar.
18 Adyanpara, Sengulam Tail Race, Anakkampoil, Kandappanchal, Chathankottunada II, Perunthenaruvi, Poozhithode, Ranni- Perinad and Barapole.

months before commencement of financial year unless revenue gap could be met by any other means. KSERC was to allow tariff revision to bridge the gap in accordance with KSERC (Terms and Conditions of Tariff for Retail Sale of Electricity Regulations, 2004). The status of filing of ARR & ERCs by the Board and their disposal by KSERC for the period under review were as given below:

3.75 KSERC allowed to recover revenue gap of ₹ 904.89 crore out of ₹ 3079.11 crore claimed by the SEB in five ARR applications filed during review period. The reasons for disallowing expenses to be claimed through tariff fixation from customers were as follows:

(a) higher employee cost including terminal benefits should be justified on the basis of production norms;

(b) consumers deposit should be utilised for meeting working capital requirement to control interest on borrowings, depreciation, etc.;

(c) Electricity duty was to be borne by Licensee.

Revenue shortfall of ₹ 239 crore for the period from January 2006 to November 2007 in pursuance of direction of State Government and order of KSERC (January 2006) allowing a rebate of ₹ 0.20 per unit from tariff applicable to domestic and commercial consumers remained unrecovered as State Government declined to release subsidy in monthly instalments to compensate the shortfall as directed by KSERC.

Dam Safety Aspects

3.76 A separate wing named 'Research and Dam Safety Organisation' (RDSO) was in existence in the Board to look after the security and safety of Dams and Power Houses, and to protect the landed properties of Board in Project areas. Scrutiny in audit disclosed the following shortcomings in the functioning of the organisation:

- The Wing had not undertaken research oriented dam safety activities during the period of review for want of adequate manpower.

- Although Dam Break Analysis was a prerequisite to the formation of Emergency Action Plan which was a mandatory exercise for facing any eventuality of a dam failure, it was not systematically carried out for any of the Dams of the Board. In its absence, documented disaster management systems have not also been put in place. As a result, duties and responsibilities were not properly assigned with field personnel so as to ensure that there was adequate preparedness to take necessary relief/ remedial measures in the event of any calamity/ disaster.
- Safety concerns expressed by Central/State Intelligence/Vigilance Organisations were also not being addressed properly. Adequate security was not provided for Dams and other vital installations and armed security was not provided except for few of the major stations.
- The average value of Dam Safety works executed by the RDSO during 2005-2009 was only ₹ 1.05 crore per annum. Test check disclosed that its employee cost for 2008-09 was ₹ 3.38 crore which was 320 *per cent* of the annual average value of works executed.

Monitoring by Top Management

3.77 Board had evolved regular monitoring systems through which the top management kept itself informed of the operational and financial performances in broad parameters. State's power position was reviewed in power position meetings held every month at Chief Engineer level, also attended by Board's technical members for generation and transmission. The generation strategy for each month was evolved in these meetings with reference to storage position in Hydel reservoirs. Similar monitoring systems were also existing for monitoring of other operational and financial issues which were also systematically reviewed at the level of Board members through quarterly meetings. Important issues related to project execution were also discussed upon at Board level and collective decisions were taken in consideration of recommendations of field officers.

[Audit paragraphs 3.1-3.77 contained in the Report of C&AG for the year ended on 31 March 2010]

[AUDIT PARAGRAPH 3 (3.1 TO 3.31) OF 2007-08]

3.1 Hydro electric power constitutes 98 per cent of the total energy generated by the Kerala State Electricity Board (Board). As there was delay in getting clearances for major hydro electric projects from the Government of India and other statutory bodies, the Board took up (1998) implementation of small and mini schemes which had the advantage of low investment, low generation cost, minimum gestation period and least environmental problems. As per the guidelines of the Ministry of Non-conventional Energy Sources (MNES), hydel projects having capacity above one MW and upto 25 MW are to be classified as Small Hydro Electric Projects (SHEPs).

At the beginning of the ninth plan, the Board had two* SHEPs having an aggregate capacity of 18 MW. During the ninth plan period (1997-2002), the Board took up implementation of nine# SHEPs with total installed capacity of 39.50 MW and potential generation of 137.07 MU. As against the target of commissioning of nine SHEPs, the Board could commission only Madupetty SHEP during the ninth plan period.

During the tenth Plan period (2002-2007), the Board targeted commissioning of 10 SHEPs with an installed capacity of 40.85 MW to generate 150.62 million units (MU) of power annually. As against this, the Board commissioned seven SHEPs (total capacity of 29.10 MW) with annual generation capacity of 112.62 MUs of electricity at a cost of Rs. 104.39 crore. While the works of two projects (Sengulam Tail Race and Landrun) were not taken up, one project (Kuttiyadi Tail Race) was under implementation (August 2008).

Organisational Set-up:

3.2 The Board is governed by a seven member Body headed by the Chairman. The Chief Engineer, Generation is in charge for implementation and operation of hydro electric projects in the State. The Chief Engineers (Civil Construction) North and South are in charge of construction activities.

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* Kallada-15MW and Peppara-3MW.

\# Madupetty (2.00 MW, 6.40 MU) Malampuzha (2.50 MW, 5.60 MU) Chembukadavu IChembukadavu II (9 MW, 16.40 MU) Urumi I (2.00 MW, 5.00 MU) Urumi II (4.00 MW, 9.53 MU) Kuttiyadi Tail Race (3.75 MW, 15.00 MU) Malankara (10.50 MW, 65.00 MU) Lower Meenmutty(3.50 MW, 10.14 MU).

Scope of Audit :

3.3 The present performance review conducted during November 2007 to March 2008 covers the implementation and performance of eight SHEPs (seven commissioned and one ongoing) of the Board during 2002-03 to 2006-07.

Audit Objectives :

3.4 The objectives of the performance review with reference to the envisaged advantage of low investment, low generation cost, minimum gestation period and least environmental problems were to ascertain whether:

- The SHEPs were implemented in an economic, efficient and effective manner;
- Detailed feasibility studies were conducted before undertaking the projects;
- The finance obtained for the project was cost effective and utilised efficiently for the intended purpose;
- The various subsidies receivable from the Central/State Governments were actually received;
- The commissioned units were performing at the envisaged capacity and the cost of generation was optimum; and
- Periodical maintenance was conducted and the defects noticed during guarantee period were promptly rectified by the contractor.

Audit Criteria:

3.5 The following criteria were adopted:

- Policies formulated by the Board/ Government, guidelines and directions issued by the Central/State Governments and the Board with regard to implementation of SHEPs;

- Detailed Project Reports (DPR)/ Feasibility Study Reports, Board minutes and agenda papers of meetings of the Board;
- Tender documents, MoU/ Agreements signed with contractors; and
- Standards fixed by the CEA as regard to cost of the project, capacity utilisation and cost of generation.

Audit Methodology:

3.6 The audit adopted the following mix of methodologies:

- Review of policies, guidelines and directions issued by the Central/State Government and the Board;
- Scrutiny of feasibility study Reports/DPRs, Board minutes and agenda papers of meetings of the Board;
- Adherence to prescribed procedure for invitation of tender and award of contracts as well as review of execution of works and payments to contractors;
- Scrutiny of progress report, performance appraisal reports and generation details;
- Scrutiny of operation and maintenance cost of commissioned project; and
- Issue of audit enquiries and interaction with the Management of the Board.

Audit findings:

3.7 Audit findings as a result of performance review were reported (June 2008) to the Board/ Government and discussed in the meeting (7 August 2008) of the Audit Review Committee for State Public Sector Enterprises (ARCPSE),

which was attended by the Additional Secretary, Power Department, Government of Kerala and Chairman of the Board. The views expressed by the Board/ Government have been taken into consideration while finalising the review.

The audit findings are discussed in the succeeding paragraphs:

Status of projects :

3.8 The Board fixed a target of commissioning of eight* ongoing SHEPs at an estimated cost of Rs. 118.52 crore. Out of these eight projects, the Board decided to implement four projects under Chinese assistance and the balance on its own. As against this, the Board commissioned seven SHEPs (four with Chinese assistance and three by the Board) and one project is still in progress.

The status of the projects was as given below:

Name of projects	Capacity		Due date of Commi-ssioning	Actual date of Commissioning	Time over run	Estimated Cost	Actual Cost
	MW	MU				Rs. in crore	
Chinese assisted projects							
Chembukadavu- I	2.70	6.24	September 2001	January 2004	28 months	11.38	12.74
Chembukadavu-II	3.75	9.66	October 2002	January 2004	15 months	12.72	13.86
Unit-I	3.75	9.53	October 2002	January 2004	15 months	13.20	12.38
Unit-II	2.40	6.10	May 2003	January 2004	8 months	10.95	12.45

* Out of ten projects proposed, two projects (Sengulam Tail Race and Landrun) were not taken up for implementation.

KSEB Schemes							
Lower Meenmutty	3.50	10.14	February 2005	April 2006	14 months	11.26	16.01
Malankara	10.50	65.35	Decembe r 2003	October 2005	22 months	41.13	33.67
Malampuzha	2.50	5.60	February 1992	November 2002	10 years 9 months	2.94	3.28
Kuttiyadi Tail Race	3.75	15.00	April 2003	In progress	..	14.94	13.04*
Sengulam Tail Race	4.50	12.50	Not taken up for implementation			..	..
Landrum	3.50	10.50				..	..
Total	**40.85**	**150.62**				**118.58**	**117.43**

Project financing:

3.9 The Board initially planned the financing of the four Chinese Projects by availing export credit from China and the implementation of the remaining four projects using institutional borrowings/ own funds. Since export credit assistance was not forthcoming as discussed in paragraph 3.12, the financing of five∞ projects was made through loan (Rs. 74.48 crore) from Rural Electrification Corporation Limited (REC) at interest rates varying from 9.50 per cent to 11.75 per cent per annum. The remaining three∂ projects were financed from own funds (Rs. 42.95 crore). As against the total estimated cost of Rs. 118.52 crore, the actual cost amounted to Rs. 117.43 crore. The subsidy available for SHEPs from MNES was not considered for project financing and was also not obtained subsequently as discussed below:

∗ Expenditure incurred upto August 2008.

∞ Chembukadavu I, Chembukadavu II, Urumi I, Urumi II and Malankara.

∂ Lower Meenmutty, Malampuzha and Kuttiyadi Tail Race.

Failure to obtain capital subsidy

3.10 As per the subsidy scheme announced (July 2003) by the GoI (MNES), the new SHEPs and the ongoing projects were eligible for subsidy at the rate of 40 per cent of the project cost limited to Rs. 1.5 crore plus Rs. 25 lakh per MW and at the rate of 75 per cent of the balance project cost limited to Rs. 75 lakh plus Rs. 12.50 lakh per MW respectively.

Audit noticed that the Board obtained the benefit of subsidy of Rs. 2.13 crore in respect of Lower Meenmutty project only and was yet to obtain the benefit of Rs. 15.50 crore in respect of other projects due to laxity in pursuing the claim.

The Board stated (July 2008) that MNES was addressed to release subsidy amount in respect of all the projects. The fact remains that the Board failed to effectively follow up the matter with MNES for release of subsidy as no correspondence was made with MNES since July 2006.

SHEPs implemented with Chinese assistance

Project formulation and MoU implementation:

3.11 A Memorandum of Understanding (MoU) was signed (4 May 1998) between Government of Kerala and HIC/IN-SHP♣ for implementing 18 small/ mini schemes (Annexure 16) in Kerala with a capacity of 107 MW to generate 296.36 MU per annum. Another MoU was also signed on the same day with HIC/IN-SHP for implementing four projects® as pilot projects. To formulate the MoU for development of SHEPs in the State, the Energy Management Centre (EMC) Kerala, an autonomous body, acted as a liaison agency between the Board and HIC/ IN-SHP. Accordingly, agreements were executed (October 1998/April 2002) between KSEB and HIC/IN-SHP for engineering, design and on-site consultation for implementation of the four pilot projects at a price of USD

♣HIC/IN-SHP is an international non-profit making organisation under the joint ownership of UNDP, UNIDO, Chinese Government and several other international, regional and national energy organisations and institutions.

® Chembukadavu stage I & stage II and Urumi stage I and stage II.

3,96,800 and for supply and erection of equipments at a contract price of USD 42,63,000 (Rs. 19.18 crore) CIF Kochi.

Audit noticed the following discrepancies in the MoU/ agreement executed with HIC/IN-SHP which affected the financial interests of the Board:

- The capacity of the four pilot projects as ascertained by the Board in their preliminary studies was lowered from 17.25 MW to 12.60 MW (from 34.93 MU to 31.53 MU) at the instance of HIC/IN-SHP based on their engineering design and machinery available. Since the potential generation of power was compromised to suit the design of Chinese equipments, the Board could not tap additional energy from the available water to the extent of 3.40 MU per annum.

  The Board stated (July 2008) that the capacity assessed at the time of preparing the report cannot be taken as the capacity of the project. The Board, however, lowered the capacity to suit the Chinese design and proposed to undertake another down stream scheme, Chembukadavu - III (6 MW) for utilising the remaining head available which should have been included in the original Chembukadavu-II scheme itself.

- As per MoU, HIC/IN-SHP was to arrange export credit with financing agencies in China for equipment supplied for the four pilot projects. The Board, however, deviated from the MoU, and executed (3 October 1998) the agreement with HIC/IN-SHP linking export credit to the equipment supply for 18 SHP projects. Due to this deviation, the export credit eligible for the four pilot projects could not be availed as the remaining 14 projects were not taken up for implementation. Consequently, KSEB had to finance the four pilot SHEPs by obtaining loan from Rural Electrification Corporation at higher

interest rates involving additional financing cost as discussed in paragraph 3.12.

The Board stated (July 2008) that they would have incurred exchange variation loss due to depreciation of Indian Rupee against US Dollar. However, the rupee on an annual average had appreciated against US Dollar during the period (2002 to 2008).

- To avail export credit facility from HIC/IN-SHP, the Board had foregone the benefit of international bidding for the supply of equipment and the tender was limited to Chinese equipment suppliers. With the subsequent amendment to MoU delinking the export credit from the four projects, the Board had to accept Chinese technology at the rates specified by them. This resulted in non availability of competitive rates for the equipment of the project besides lack of transparency in the contracts executed.

- As per the General Conditions of agreement, one turbine for the first station (Chembukadavu I) of the four pilot projects was to be supplied free of cost by HIC/IN-SHP.
But the Board had not ensured that the generator was delivered free of cost by HIC/IN-SHP resulting in loss of Rs. 1.45 crore (USD 3,15,557 x Rs. 46) towards cost of generator not supplied.

- The Board stated (July 2008) that an amount of USD 65,969 was deducted towards cost of one free turbine from the amount payable to HIC/IN-SHP at the time of concluding the contract price. The reply is not acceptable as an ineligible amount of USD 63,354.45 was paid to HIC/IN SHP as service charge for export credit and USD 43,834 was also added on the ground of mistake in calculation of total price before deducting the cost of the generator from the total price, offsetting the intended benefit of free supply.

- The Director of EMC and Ex-officio Secretary to Government, who played a key role in identification of small hydro projects in Kerala during the period of selection of HIC/IN-SHP as consultant cum supplier and held negotiations with HIC/IN-SHP on behalf of KSEB and Government, later on became the Managing Director of HIC/IN-SHP. The same Director as MD of HIC later (August and October 2004) conducted negotiations for settling the claim with the Board.

There was conflict of interest in the Director of EMC subsequently becoming MD of the consultant supplier.

The Board stated (July 2008) that the appointment of former Director of EMC as Managing Director of HIC/IN-SHP did not have any financial impact on the contract with HIC/IN SHP and he was not a member in the evaluation panel for finalisation of equipment price. The fact remains that the former Director of EMC had been a member of the Steering Committee for finalising of MoU and had subsequently participated as MD of HIC/IN-SHP in the steering committee meeting to settle disputed claims of HIC/IN-SHP.

Non-availing of suppliers export credit:

3.12 As per agreement with HIC/IN-SHP, the Board was to get supplier's export credit facility for 18 projects as a single package covering 85 per cent of the value of equipment in China, cost of installation (15 per cent of total equipment ex-factory price) and 1.5 per cent incidental expenses. The period of credit was to be seven years including one year as grace period with interest rate of 7.5 per cent per annum plus 1.5 per cent for insurance warranty.

Audit noticed (January 2008) that as per MoU with HIC/IN-SHP, export credit was available for equipment supplied for the four pilot projects valued at Rs. 17.01 crore. Contravening this provision in the MoU, agreement was executed

with HIC/IN-SHP linking export credit to the equipment supply for all the 18 projects as a single package. As a result, the Board did not get the supplier's export credit facility. Due to non availability of Chinese supplier's export credit the Board had to avail loan from Rural Electrification Corporation (REC) Limited at interest rate of 11.25 per cent per annum resulting in excess financing cost to the tune of Rs. 38.29 lakh per annum.

At the time of entering into MoU the export credit facility was considered as attractive part of the contract and for this purpose the Board had foregone the benefit of invitation of global tenders. Due to non-availing of export credit, the Board's interests were not protected while concluding the supply contract.

The Board stated (July 2008) that they would have incurred a loss of around Rs. 1.95 crore due to depreciation of Indian Rupee against USD during the period 1995 to 2005 had Chinese export credit been availed. The reply is not acceptable as Indian Rupee had appreciated from Rs. 45 per USD in 1995 to Rs. 40 per USD in 2007-08 during the pay back period (2002 to 2008) and hence the export credit would have been more beneficial. Besides, the benefit of availability of export credit at reduced rates of interest as projected by the Board while signing of MoU with HIC/IN-SHP had also been foregone.

Execution of projects:

3.13 The Board targeted commissioning of the four Chinese projects during the period September 2001 to May 2003. The details of capacity of each of the projects, target date of commissioning, time overrun, estimated cost and actual cost were as given below:

Name of projects	Capacity		Due date of Commi-ssioning	Actual date of Commission ing	Time over run	Estimated Cost	Actual Cost
	MW	MU				Rs. in crore	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Chinese assisted projects							
Chembukadavu- I	2.70	6.24	September 2001	January 2004	28 months	11.38	12.74

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Chembukadavu- II	3.75	9.66	October 2002	January 2004	15 months	12.72	13.86
Unit-I	3.75	9.53	October 2002	January 2004	15 months	13.20	12.38
Unit-II	2.40	6.10	May 2003	January 2004	8 months	10.95	12.45
Total	**12.60**	**31.53**				**48.25**	**51.43**
Average cost per KW (in Rs.)						38,300	40,800
Average cost per KW of Board's projects (in Rs.)						37,421	35,050
Average cost per KW as per MoU (at the rate of 800 USD per KW)						36,000	

It would be seen from the above that:

- The Board estimated average cost of Rs. 38,300 per KW for the Chinese projects as against the cost per KW of Rs. 36,000 projected as per the MoU indicating that the projections given at the time of concluding the contract were not realistic. The actual average cost per KW on execution of the projects was Rs. 40,800 involving additional capital cost of Rs. 6.05* crore.

- While the actual average cost per KW of SHEPs implemented by the Board was Rs. 35,050, the cost of Chinese projects was Rs. 40,800 indicating that Chinese technology did not bring in cost effectiveness.

- There was delay in commissioning of the projects ranging between eight months and 28 months mainly due to delay in execution of associated civil works by the Board resulting from non-compliance with tendering formalities,

* (Rs. 40,800-Rs. 36,000) x 12,6000 KW.

failure to plan and design civil works in consonance with project requirement, avoidable rectification works arising from design defects and poor quality of construction, etc., as discussed in succeeding paragraphs.

Delay in execution of civil works:

3.14 While the on-site consultation, equipment supply and erection of equipments of the four pilot projects were executed by HIC/IN-SHP, civil works of these projects were undertaken by the Board. The details of execution of the civil works are indicated below:

Sl. No.	*Particulars*	*Chembukadavu I*	*Chembukadavu II*	*Urumi I*	*Urumi II*
1	Name of Contractor	Dr. Sasi Elloor	Paulose, George & Co.	Aarti Engineering Company	Paulose, George & Co.
2	Tendered Cost (Rs. in crore)	3.72	4.70	5.48	4.55
3	Actual Cost (Rs. in crore)	3.39	4.87	4.36	5.30
4	Scheduled date of completion	4-9-2001	24-10-2002	26-10-2002	6-5-2003
5	Actual date of completion	19-8-2003	4-9-2003	22-7-2009	31-12-2003 (extended date)
6	Delay in months	23	10	21	Nil
7	Date of commi-ssioning	25-1-2004	25-1-2004	25-1-2004	25-1-2004

Details in the table indicate that there was delay ranging from 10 months to 23 months in completing the civil works of the three SHEPs due to non-provision of surplus channel, design deficiency and delay in acquisition of land. Since the completion of civil works and the equipment supply and erection works by HIC/IN-SHP required proper synchronisation, delay in completion of civil works in turn resulted in delayed commissioning of the four pilot projects with consequent generation loss as discussed in paragraphs 3.16, 3.17 and 3.20.

Failure to provide Diversion Canal:

3.15 After commissioning (January 2004) of Chembukadavu Stage II, a landslide occurred (July 2007) near the Chembukadavu Stage II canal due to which water to stage II power house was blocked by the earth and the overflow of water led to stoppage of generation of power from Stage II.

Since there was no alternate arrangement of concrete lined contour channel, when stage II was not working, the generation of power could resume only in July 2007, after fixing stop log gates at Chembukadavu stage-II canal at a cost of Rs. 6.30 lakh. The generation in Stage-II resumed on 11 August 2007.

In the absence of alternate channel for discharge of water the power generation from Chembukadavu I had to be stopped for 52 hours (19 July 2007 to 21 July 2007) and the generation loss worked out to Rs. 5.39 lakh.*1 Thus the failure of Board in providing diversion canal for the tail water from Chembukadavu-I to the mother stream, resulted in wasteful expenditure of Rs. 11.69 lakh*2

The Board stated (July 2008) that the diversion of tail water of Chembukadavu-I to main stream was not envisaged earlier to exploit maximum energy with minimum structure. However, the Board had admitted the fact that power canal is situated in landslide prone area, and hence diversion canal should have been envisaged.

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*1 2700 kw x 52 hrs at the rate of Rs.3.84/unit.

*2 Rs. 6.30 lakh plus Rs. 5.39 lakh.

Failure in planning and construction of Surplus Channel

3.16 The Board decided in May 2003 to construct a surplus channel which was critical for the commissioning of both Chembukadavu Stage I & II. The final proposal at an estimated amount of Rs. 10.54 lakh with copies of the drawings was forwarded (July 2003) to the contractor and after completion of the work, the generation commenced (September 2003) at Chembukadavu stage II.

Due to lack of proper synchronisation of the construction work of surplus channel with the other civil works there was no generation for 92 days from July to September 2003 involving a loss of Rs. 3.18 crore.*3

The Board accepted (July 2008) the audit observation.

Deficiencies in planning and design:

3.17 After completion of the civil and erection works of the Chembukadavu Stage II in September 2003, the Board, could not commission the project till January 2004 as there was delay in load testing on account of overflow of the canal berm and sliding (August 2003) of the left side of the berm during the load rejection test of Chembukadavu Stage I.

Audit noticed (December 2007) that the overflow structures constructed according to the drawing provided by the HIC/IN-SHP were not sufficient for the maximum discharge of water from three machines in Chembukadavu-I at maximum load and opening of valve to the full extent. The consultants had not taken into account the probable outflow from Chembukadavu I, during operation at full capacity. Due to the delay in commencement (January 2004) of generation arising from above design deficiency, there was loss of generation for 57 days from 4 September 2003 to 31 October 2003, involving loss of Rs. 1.97 crore.*4

Avoidable rectification work

3.18 As per the Chinese design, the power canal of the Chembukkadavu Stage-I project was constructed with pre-cast concrete slabs at the sides and 'cast insitu' concrete at the bottom of the canal to reduce cost. Since the side portion of the R.R. masonry parapet was not cement plastered as recommended in the Chinese design there was excessive seepage of water.

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*3 92 days x 3,750 x 24 hours x Rs. 3.84/ unit.

*4 3750 x 24 hrs x 57 days at the rate of Rs. 3.84/unit.

The contractor also refused to rectify the defect citing the reason that seepage of water was on account of design defect and not due to deficiency in construction. The proposal to strengthen the canal construction at a cost of Rs. 17.50 lakh (July 2008) was yet to be implemented.

The Board stated (July 2008) that it was not a design defect as pointed out in the audit paragraph. The reply is contrary to the fact that the Board had proposed (February 2004) to arrange canal lining as a separate work indicating that there was initial design defect in the power canal.

Non-recovery for unreturned rubble

3.19 As per terms of the agreement with the contractor for civil works of Chembukadavu Stage II, the balance of rubble issued to the contractor was to be returned to the Board on completion of the work and recovery at three times the standard rate of Rs. 170/ m^3 was to be effected for unreturned rubble.

Audit observed (November 2007) that the contractor had retained 4,062.715 m^3 quantity of rubble out of 6,128.410 m^3 recorded as receipt, and recovery was made only at the standard rate of Rs. 170 m^3 for 1,550 m^3 instead of thrice the standard rate applicable and no recovery was made for 2,512 m^3 of rubble resulting in undue favour to the contractor on account of non-recovery of cost at penal rates amounting to Rs. 18.08 lakh.

The Board stated (July 2008) that out of 4,174.53 m^3 of rubble to be returned, 2,624.53 m^3 of rubble was used by the contractor for different works of the project and recovery was proposed for balance 1,550 m^3 of rubble and hence no favour was extended to the contractor. However, as per the agreement penal recovery at three times the market price of material issued had to be effected for non-return of unused balance of materials. As per records the contractor had not used the rubble for any other work. No recovery has been made even though the civil works were completed (September 2003) and the project commissioned (January 2004).

Non-imposition of Liquidated damages for delay

3.20 The civil work of Urumi-I SHEP was awarded (July 2001) to Aarti Engineering Company, Nagpur (AEC), at Rs. 5.48 crore for completion before October 2002. The contractor commenced the works in August 2001. However, the work could not be completed as scheduled due to the following reasons:

- The excavation of power channel could not be started in August 2001 as the land acquisition for the project was not completed. The land was handed over to the contractor only in October 2001, after two and a half months from the date of award (June 2001) of work. The contractor intimated (February 2002) the Board about the readiness of power house excavation for geological inspection. The geological mapping of the power house area, however, could be carried out only in April 2002, after a delay of 21/2 months.

- As per the agreement, the Board was to supply the steel required (130 MT) for fabrication of penstock by October 2001. The Board, however, supplied the entire quantity by October 2002. The delay in issue of steel plates for 5 months resulted in consequent delay in the fabrication and erection of penstock and connected accessories.

As per general conditions of contract, the contractor was liable to pay damages for delay after the scheduled date of completion at the rate of one per cent on the estimated value of the contract per day, not exceeding five days. Despite consequential loss to the tune of Rs. 5.50 crore on loss of generation, the Board, had not imposed liquidated damages of Rs. 27.40 lakh (Rs. 5.48 crore x 5 per cent) on the contractor for no reasons on record.

The Board accepted (July 2008) the audit observation.

Failure to ensure quality of construction:

3.21 The electro mechanical equipments in the power house of Urumi I project were damaged (July 2004) due to floods. These equipments had to be repaired by the Board at a cost of Rs. 58.45 lakh.

Audit noticed (November 2007) that the flood waters entered the power house due to weakness in the masonry of the protection wall of the powerhouse. The Board did not undertake replacement of the masonry wall with RCC structure even though the matter was pointed out by the Executive Engineer of the Board as early as in March 2002. The proposal for strengthening the original masonry wall with concrete lining was also not undertaken on the ground of savings in cost. Subsequently the electro-mechanical equipments of Urumi I project were damaged due to floods and these equipments were repaired at a cost of Rs. 58.45 lakh.

Thus, the failure of the Board in ensuring the quality of construction resulted in avoidable expenditure of Rs. 58.45 lakh on repairs to the power house.

The Board stated (July 2008) that the damage to the power house was due to flash flood and not due to inferior quality of construction. The reply is contrary to the fact that a proposal from the field engineer to strengthen the masonry wall with RCC structure was rejected by the Board on the ground of savings in cost.

Avoidable extra expenditure on Chinese consultation and erection

3.22 As per agreement with HIC/IN-SHP, on-site consultation for civil work of all the four Chinese projects was to be provided for a total 2,160 mandays at a consultation fee of USD 80 per manday. The civil works of Chembukadavu-I commenced on 4 July 2000 whereas works relating to the other three Chinese projects commenced after delays ranging from 12 months (Chembukadavu II) to 16 months (Urumi II) which resulted in additional expenditure as detailed below:

- Failure in commencing the civil works on all the projects concurrently and completing the same as scheduled resulted in payment of Rs. 10.51 lakh* as excess consultation fee for 292 mandays.

* 292 x USD 80/manday x 45 per dollar.

- Non-deployment of Chinese team during October 2002 to April 2003 for erection work necessitated payment of Rs. 2.80 lakh towards idleness fee to the erection team.

The Board accepted (July 2008) the audit observation.

Payment to contractors in violation of agreement

3.23 Audit noticed that the following payments were made to the civil construction contractors in violation of the contractual provision:

- As per general conditions of agreement with civil contractors, materials retrieved from foundation excavation, blasting, etc., which were suitable for construction purposes should be segregated separately from other materials and suitably stack piled for use as and when required. The stacking charges payable for useful blasted rubble was stipulated at Rs. 219.75 per 10 m^3. The Board, however, paid aggregate stacking charges of Rs. 27.35 lakh for Chembukadavu Stage I & II and Urumi Stage I & II for 1,24,450 m^3 of non-stacked rubbles.
- Board had released the security deposit (except Urumi I) of Rs. 64.89 lakh even before passing the final bill.

The Board stated (July 2008) that final bills of the contractor have not been settled and the final decision in the matter would be taken in the interest of the Board. The fact remained that the Board had released the security deposits even when the recovery was pending and the final bill amount would not be sufficient for the recovery.

SHEPs implemented by the Board:

3.24 The Board targeted implementation of four SHEPs during the period 2002-2007 using its own expertise and personnel, at a total estimated cost of

Rs. 70.27 crore. The details of capacity of each of the projects, target date of commissioning, time overrun, estimated cost and actual cost were as given below:

Name of the project	Capacity		Due date of commi-ssioning	Actual date of commi-ssioning	Time over run	Estimated cost	Actual Cost
	MW	MU				Rs. in crore	
Lower Meenmutty	3.50	10.14	February 2005	April 2006	14 months	11.26	16.01
Malankara	10.50	65.30	December 2003	October 2005	22 months	41.13	33.67
Malampuzha	2.50	5.60	February 1992	November 2002	10 years 9 months	2.94	3.28
Kuttiyadi Tail Race	3.75	15.00	April 2003	In progress	..	14.94	13.04*
Total	**20.25**	**96.09**				**70.27**	**66.00**

It would be seen from the above details that out of four projects targeted, the Board could commission three projects during the review period. Out of these, the work of Malampuzha project was completed as early as 1999 but the formal commissioning was done only in November 2002 due to disputes arising from technical defects in execution. After incurring an expenditure of Rs. 13.04 crore, the Kuttiyadi Tail Race Scheme remained to be completed (August 2008).

Details of work executed by the Board are given in **Annexure 17.**

Deficiencies noticed in the implementation and post-commissioning performance of these projects are discussed in succeeding paragraphs.

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* Expenditure incurred upto August 2008.

Malankara SHEP

3.25 Malankara SHEP, having an installed capacity of 10.5 MW, envisaged diversion and utilisation of 2,745.94 mm^3 of water from Malankara Dam for power generation. The project was commissioned in October 2005/August 2006 after a delay of 16 years due to absence of proper co-ordination between various works relating to the project and slackness on the part of the contractor as discussed below:

- As per the contract, the contractor (WCP) was to complete the civil works of the project in 24 months. Even after allowing extension of time twice for completion of work, the work was completed only in June 2005 at a cost of Rs. 4.51 crore. The main reason for delay in completion of work was non-compliance of commitments on acquisition of land by the Board and slackness on the part of contractor in executing the works in time.

- As a result of the delay of 20 months from December 2003 to August 2005 in completing the allied works for evacuation of power, the Board had incurred revenue loss of Rs. 37.55 crore (7,000 Units x 24 x 582 days at the rate of Rs. 3.84/unit).

- Due to forced shutdowns of Unit-II from September 2005 to August 2006 and Unit-III from February 2007 to April 2008, on account of the damage of its high speed gear wheel and problem with Programmable Logical Control (PLC) respectively, there was loss of generation of 19.189 MU. The Board decided (September 2007) to recover Rs. 6.06 crore from the contractor, towards energy loss. The loss was yet to be recovered (July 2008).

The Board stated (July 2008) that the delay in completion of civil works was due to presence of large volumes of rock at the site and restriction in blasting of rock at the dam toe. The Board admitted that the site for 66 KV substation was handed over to the contractor in October 2003 when the substation was to be completed in September 2003. The matter was pending before the high power committee constituted by the Board.

Lower Meenmutty Project

3.26 The Lower Meenmutty Project, a run of the river scheme with an installed capacity of 3.5 MW, envisaged generation of 7.63 MU of energy per annum by utilising the water from Vamanapuram Irrigation Project. The scheme was sanctioned (October 1994) by the Government of Kerala and Board (September 1995) respectively. Administrative Sanction was accorded (May 2000) by the Board specifying the period of completion as two years.

The contract for execution of the work was awarded (January 2003) to Asian Techs - VA Tech Joint Venture (Asian Tech) at an estimated cost of Rs. 8.51 crore and agreement executed (July 2003).

The work commenced in February 2003 could not be completed even after extension of time upto November 2005. The estimate was revised to Rs. 11.26 crore. The project was finally commissioned in March 2006 at a cost of Rs. 16.01 crore. The main reasons for delay of 10 years and six months in commissioning the scheme after its approval were:

Nature of delay	Duration
Aquisition of land	3 years 6 months
Administrative sanction	1 year 2 months
Issuance of work order	2 years 8 months
Construction	1 year

The reasons for delay as analysed in audit were delay in purchase of land, fixing incorrect compensation for lands purchased and related disputes, arranging funds, giving approvals for various stages of work, revision of estimates, inept decision on disputes and matters of Court cases and delay in making payment to contractors. Though these were time consuming projects, the Board could have properly planned and monitored effectively to reduce the delay. The Board, however, failed to arrest the delay caused due to the above reasons.

The irregularities noticed in the implementation of the project were as discussed below:

- Utilisation of plates of 12mm, 14mm and 16mm thickness instead of 10mm plates and resultant increase in the weight of the plates required for fabrication of Penstock from 61 tonne to 110.296 tonne (including normal wastage of 3.21 tonnes allowed at the rate of three per cent on the finished penstock weight of 107.086 tonnes) involving additional expenditure of Rs. 29.24 lakh.
- Due to delay in completion of the project from February 2005 to March 2006 there was generation loss of 16.80 MU valued at Rs. 3.87 crore*.

Malampuzha Project:

3.27 Mention was made in the Report of the Comptroller and Auditor General of India for the year ended 31 March 1999 about the non-commissioning of Malampuzha project after incurring an expenditure of Rs. 4.73 crore upto March 1999. In August 1999 oil leakage problems developed and even after further repairs the anticipated generation could not be achieved.

Due to failure (November 2000) of the machine and delay on the part of the contractor to procure and install a new bearing, there was no generation of power

* 3,500 units x 24 hours x 120 days at the rate of Rs. 3.84 /unit.

during the remaining period of the irrigation season. The machine was put to continuous operation from October 2001 and generated 8,27,125 Kwh of energy up to December 2001 when the machine was stopped due to pressure oil leakage.

As per the report (July 2002) by a committee constituted (August 2000) to study the problems, failure of the machine was due to poor installation and inferior design. Eventually power could not be generated for 179 days out of 214 days for which water was available due to which there was energy loss of 10.74 MU valued at Rs. 4.12 crore (at the rate of Rs. 3.84/ unit for 10.74 MU). Subsequently, the project restarted in September 2005 failed in December 2006. Since then, there was no generation of power (August 2008).

Due to technical defects, inferior design coupled with other failures, the project had come to a halt. The Board may initiate measures to revamp/refurbish the projects to make it viable for operation on a continuous basis.

ONGOING SCHEMES

Kuttiyadi Tail Race Project:

3.28 The Kuttiyadi Tail Race Project (KTR), with an installed capacity of 2.5 MW envisaged the utilisation of tail race discharge water of Kuttiyadi Power Station for generating 14.05 MUs of power per annum. Administrative sanction for the project was received in June 1989.

The work of design, supply, erection and commissioning of generating equipments was entrusted (April 1993) to Boving Fouress Limited (BFL), Bangalore at a total cost of Rs. 3.01 crore with stipulation of completion by 1995. The Board subsequently enhanced (May 1993) the capacity of the scheme to 3.75 MW (17.10 MU) and decided (1995) to install Tubular Kaplan turbine instead of Francis turbine by incurring an additional expenditure of Rs. 2.19 crore. Due to this, the tenders invited (1994) for civil work had to be cancelled. The civil work was entrusted to SILK only in October 2000 at a PAC* of Rs. 4.61 crore. As per the agreement, SILK was to commence the work before 5 October 2000 and complete by 4 April 2003. The work was completed within the extended period of 30 June 2008.

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* Probable Amount of Contract.

BFL completed (26 June 2008) the erection work of Unit I & II. The unit III has not been supplied so far (July 2008) and the Board had incurred a total expenditure of Rs. 13.04 crore. The project was yet to be commissioned (August 2008).

Audit noticed the following:

- Due to delay in erection of equipments consequent to delayed completion of civil work, the equipments supplied (December 2000) by BFL for Unit I & II at a cost of Rs. 3.07 crore remained idle for 90 months (up to June 2008). The interest loss on the blocked up capital worked out to Rs. 2.42 crore[Ñ]
- Due to delay in commissioning of the scheme the Board lost generation of 17.10 MU of electricity during May 2003 to July 2008.
- Rs. 1.48 crore paid (1999) as advance to BFL for supply of Unit III remained blocked up for 90 months (upto June 2008). The interest loss on the blocked up capital worked out to Rs. 1.18 crore.
- As a result of the delay in completion of the project the equipments supplied (December 2000) by BFL were rendered unusable and the Board had to incur (June 2007) avoidable expenditure of Rs. 1.75 crore in refurbishing of the equipments.

Post commissioning performance of projects:

3.29 The year-wise details of energy to be generated as per design, actual generation, plant load factor (PLF) as per design and actual plant load factor in respect of the seven SHEPs commissioned during the five years up to March 2007, cost per KW of installed capacity for six projects were as given **in Annexures 18 and 19.**

Ñ At the average interest rate of 10.50 per cent applicable on REC loan.

The details in the ***Annexures*** indicate that:

- The actual generation and actual PLF achieved was far below the energy to be generated and PLF as per design during the five years upto 2005-06.
- In the case of Malampuzha SHEP, the annual generation of energy ranged between 0.176 MU and 2.951 MU only when compared to the optimum level of 5.60 MU.
- During 2006-07, when all the projects were in operation, total actual energy generated was 66.98 MU (59.43 per cent of capacity) as against the total Design Energy Capacity of 112.71 MU, involving a shortfall in generation of 45.73 MU.
- As against the total designed generation of 408.03 MU of energy during the six years ended 2007-08 the actual generation was 197.25 MU involving an aggregate shortfall of 210.78 MU.
- As the PLF had been designed considering the availability of water the loss of generation (total 210.78 MU) during the period 2002-03 to 2007-08 indicated that water resources and capacity were not being utilised to the optimum level due to design deficiencies, frequent breakdown of units and delay in timely rectification of defects as discussed below:

Frequent breakdown of generator

3.30 During 2005-06, the generating machine of Malampuzha project started in September 2005 but the turbine failed due to crack in the runner shaft and after repair at a cost of Rs. 4.87 lakh the machine commenced operation (August 2006) but failed again in December 2006.

Due to frequent failure of equipments, there was no generation of power for 180 days resulting in loss of 6.288 MU valued at Rs. 2.41 crore.

Non-recovery of penalty from the contractor:

3.31 The generating Units No. III (1.5 MW) and No. I (0.5 MW) of Lower Meenmutty project were reported faulty from March 2007 and May 2007 respectively. As against the time of four months and 10 days respectively required for repairing Units No. III and I, Unit No. I was repaired and put into operation in November 2007 and Unit No III was not repaired (January 2008). The generation loss on account of undue delay of 110 days in repair of the above worked out to 5.28 MU valued at Rs. 2.03 crore. The penalty recoverable as per Guarantee Clause of the agreement amounting to Rs. 82 lakh has not yet been recovered from the contractor.

The Board replied (July 2008) that a letter was issued (February 2008) to the contractor for recovery of Rs. 99.40 lakh and for withholding pending claims of the contractor. The fact, however, remained that the amount was yet to be recovered.

(Audit Paragraph 3.1 - 3.31 contained in the Report of C&AG for the year ended on 31 March 2008).

Audit Paragraph 4.11, 4.12, 4.13, 4.15 & 4.16 (2007-08)

Loss of capital subsidy

4.11 The decision of the Board to include departmentally executed rural electrification works under RGGVY scheme in violation of the REC guidelines and conditions of tripartite agreement rendered it ineligible for capital subsidy of Rs. 10.57 crore.

Government of India (GoI) introduced (March 2005) Rajiv Gandhi Grameen Vidyutikaran Yojna (RGGVY) for providing electricity to all households in five years. The scheme to be implemented through Rural Electrification Corporation Limited (REC) envisaged 90 per cent capital subsidy on overall cost of the project and 10 per cent loan by REC. The conditions associated with the project as prescribed in the REC guidelines and the tripartite agreement entered (July 2005) into between GoI, REC and the Board, stipulated execution of the project on turnkey basis only for the Board to be eligible for subsidy.

Under RGGVY, GoI sanctioned (April 2005) electrification of 3,578 hamlets in 930 villages with an outlay of Rs. 343 crore for VEI¥ scheme and Rs. 94.57 crore for REDBÖ package for construction of seven 66/11KV substations and eighteen 33/11KV substations. REC thereupon sanctioned (June 2005/June 2007) the works for execution through the Board. Audit noticed (May 2007) that though the Board was eligible for subsidy only for works executed under turnkey contracts, departmentally executed works valuing Rs. 11.74 crore were included under the scheme when there were sufficient other works which qualified for assistance to be proposed under the scheme. Due to this, ultimately the Board had to treat (December 2006) the above works under normal development plan thereby rendering it ineligible for 90 per cent subsidy.

Thus the decision of the Board to include departmentally executed rural electrification works under the scheme circumventing the REC guidelines and conditions of tripartite agreement rendered it ineligible for capital subsidy of Rs. 10.57 crore.

Government stated (June 2008) that due to social obligation as well as certain other reasons such as to provide power supply to certain classes of prospective consumers the Board was forced to execute the work proposed under the scheme without waiting indefinitely for favouring the turnkey contractor. It was further stated that there arises no question of lapse of fund since the funds were being utilised for executing other works under RGGVY. The reply is not relevant to the point since the Board included departmentally executed works under the scheme for which subsidy was not available when other eligible works for subsidy were available for inclusion. The departmental works were also delayed till January to April 2007 and some of the works were not even completed indicating that no social purpose was served by foregoing the 90 per cent subsidy and soft loan of 10 per cent.

4.12 Loss of interest income

The omission on the part of the Board in prescribing compounded rate of interest in the quotations invited for short terms deposits from banks resulted in interest loss of Rs. 30.68 lakh.

¥ Village Electrification Infrastructure.
Ö Rural Electricity Distributor Backbone.

During the second half of 2005-06 the financial position of the Board improved due to sale of power outside the State and adjustment of unscheduled interchange in transfer of inter-state power. Consequently the Board started (January 2006) parking temporary surplus funds in short term deposits with nationalised and scheduled banks. During the period April 2006 to January 2007 there were surplus funds ranging between Rs. 10 crore and Rs. 145 crore with the Board and these were deposited with 15 nationalised/scheduled banks for periods of 7 days to 327 days fetching interest at rates ranging between 5.01 and 9.51 per cent per annum. The Board had been investing the surplus funds at the interest rates fixed after inviting quotations from nationalised/ scheduled banks from time to time. The banks allowed compounded rate of interest in respect of deposits for periods of two quarters or more when the quotations invited by the Board specifically mentioned that the interest rate should be on compounded basis.

Audit noticed that out of 33 instances of short term deposits for which quotations were invited, the Board, however, insisted on offers at compounded rates only in seven instances even though there were 13 more instances of deposits where the periods exceeded two quarters and involved 202 to 326 days. Thus, due to the failure in inviting offers from the Banks on compounded rates of interest, the banks allowed only simple rate of interest.

The differential loss of interest in the above 13 instances relating to the period May to November 2006 worked out to Rs. 30.68 lakh.

Government stated (June 2008) that all the nationalised banks were quoting rates at simple interest which would invariably be more than the quarterly compounding rates and as such there was no loss to the Board. The reply is not correct since the simple interest rates quoted by banks were either the same or marginally lower than the compounded rates.

4.13 Loss due to undue favour

The decision of the Electricity Board to waive annual increase in pole rentals without justifiable grounds resulted in undue benefit to Asianet to the extent of Rs. 7.79 crore.

Asianet Satellite Communications Limited (Asianet) entered into (November 1992) an agreement with the Board for distribution of cable television network using Board's electric poles for a period of 10 years. The annual pole rental was fixed at rupee one per pole as a promotional offer. Clause 19 of the agreement provided for revision of terms and conditions including rate of pole rentals every three years, if necessary. Accordingly, the Board revised the pole rental to Rs. 17 per pole in December 1999. Following the request of new cable operators to allow them also to use electric poles, the Board further revised (October 2002) the pole rental to Rs. 54 (rural areas) and Rs. 108 (urban areas) per pole per annum. As per the revised orders, contract for use of LT poles was to be for a period of ten years with a condition for increase of pole rental rates by 12.5 per cent every year. The revised orders were to be effective from the date of expiry (November 2002) of the then existing agreement. A new agreement was to be executed with Asianet for a period which may extend up to a maximum of 10 years.

The revision was challenged (November 2002) by Asianet in the Hon'ble High Court of Kerala and the Court dismissed (June 2005) the petition and allowed the Board discretion to decide on the request of Asianet. Thereupon, the Board rejected (December 2005) the request (September 2005) of Asianet for reduction in rates and issued (December 2005) demand notice to Asianet for Rs. 22.99 crore towards pole rental dues at revised rates together with interest at 24 per cent per annum. Asianet filed a writ petition before the High Court and obtained stay order against the demand notice after payment (January/February 2006) of Rs. 9 crore. The Board, however, did not initiate any action to get the stay vacated even though two years have elapsed. Without getting the stay vacated, based on the representation (February 2006) of Asianet, the Board waived (March 2006) annual increase of 12.5 per cent in pole rentals upto March 2006 and allowed a nominal increase of five per cent thereafter, thereby extending undue benefit to Asianet to the extent of Rs. 7.79 crore.

Audit noticed (June 2007) that Board had taken the decision to revise the earlier demand and waive annual increase in pole rentals already effected merely

on the basis of a representation from Asianet without adequate justification that too before vacating the stay pending before the Court. Thus the decision of the Board to waive annual increase in pole rentals without justifiable grounds resulted in undue benefit to Asianet to the extent of Rs. 7.79 crore.

The matter was reported to Government/Management in May 2008; their reply was awaited (May 2008).

4.15 Avoidable liability due to violation of statutory provision

The Board's failure to deduct tax at source on interest payment in conformity with provisions of Income Tax Act, 1961 may result in liability to the extent of Rs. 1.59 crore.

As per Kerala Electricity Supply Code 2005, consumers of the Board had to maintain as security deposit an amount equivalent to three months electricity bills (two months' bill in the case of consumers having bi-monthly billing) for availing power. Consumers were eligible for interest on such security deposit with effect from 1 April 2005 at bank rate or at rates fixed by Kerala State Electricity Regulatory Commission (KSERC). In conformity with the direction of KSERC, the Board had been crediting interest at the rate of 6 per cent per annum to the consumers' account during the first quarter of the subsequent financial year for adjustment against electricity bill.

As per provisions of the Income Tax Act, 1961 (Section 194 A) the Board was responsible for deduction of tax at source on interest exceeding Rs. 5,000 at the rate of 10 per cent (individuals) and 20 per cent (companies). Failure to deduct tax at source attracted penalty equivalent to a sum equal to the amount of tax deductible at source. Interest at the rate of 12 per cent per annum was also payable on the defaulted tax payment.

During the first quarter of 2006-07, the Board credited Rs. 37.44 crore to the consumers' account as interest on security deposit for the financial year 2005-06. Out of this, income tax of Rs. 1.28 crore was deductible at source on interest amounts credited to 1,524 High Tension and Extra High Tension

consumers since the interest payment exceeded Rs. 5,000. The Board, however, did not deduct the tax at source. As per provisions of the Act the Board was liable to pay penalty of Rs. 1.28 crore and interest of Rs. 31 lakh (upto May 2008) on the amount of tax not deducted at source. Thus the Board's failure to deduct tax at source on interest payment may result in additional liability to the extent of Rs. 1.59 crore.

The matter was reported to Government/ Board in June 2008; their reply was awaited (June 2008).

4.16 Idle investment of borrowed Funds and interest payments

Decision of the Board to purchase CMRI without connected accessories (RF module) resulted in blocking up of funds amounting to Rs. 75.53 lakh and avoidable interest liability of Rs. 10.66 lakh.

For downloading of data from static meters, the Board assessed the requirement of common meter reading instrument (CMRI#) at one CMRI for every 40 distribution transformers. Accordingly, the Board issued (January 2005/ 2006) two purchase orders to Signals and Systems Private Limited (SSPL), Chennai, the lowest bidder, for procurement of an aggregate quantity of 258 CMRIs under the Accelerated Power Development and Reforms Programme (APDRP) at a total price of Rs. 75.53 lakh. As per terms of the purchase order, supply was to commence within 45 days from the date of order and completed within 60 days. In order to transfer data between the meter and the CMRI, the Board was to purchase the Radio Frequency (RF) modules separately from the meter manufacturers. SSPL supplied all the CMRIs during the period February 2005 to October 2006. These CMRIs were subsequently issued to various electrical sections of the Board.

CMRI is a two way communication interface between various static energy meters and a base computer station for the purpose of exchange of data.

Audit noticed (June 2008) that the CMRIs issued to electrical sections had been lying unutilised as of June 2008 since the RF module had not been procured by the Board from the meter manufacturer. As a result, Rs. 75.53 lakh had been blocked up since October 2006. Since 75 per cent of the cost of the APDRP scheme was funded through loan from Rural Electrification Corporation Limited/GoI at interest rates varying between 9 to 12.50 per cent per annum, the Board would pay avoidable interest of Rs. 10.66 lakh* on the idle investment. Thus, the decision of the Board to purchase CMRI without connected accessories (RF module) resulted in blocking up of funds amounting to Rs. 75.53 lakh and avoidable interest liability of Rs. 10.66 lakh.

The matter was reported to Government/ Board in June 2008; their reply was awaited (August 2008). [Audit Paragraphs 4.11, 4.12, 4.13, 4.15, 4.16 contained in the Report of C&AG for the year ended on 31 March, 2008].

Audit Paragraph 3.1 (3.1.1 to 3.1.41 - 2005-06)

3.1.1 Kerala State Electricity Board (Board) was constituted in 1957 under Section 5 of the erstwhile Electricity (Supply) Act, 1948 (Act). The Board is responsible for generation, transmission and supply of Electricity to all classes of consumers in the State of Kerala. The Act was subsequently repealed by the Electricity Act, 2003 (New Act) effective from 10th June, 2003. As per the second proviso to Section 172 (a) of the New Act, the Government of India and Government of Kerala mutually decided to continue the KSE Board as a State Transmission Utility (STU) and a Distribution Licensee. Government of India, Ministry of Power has allowed (June 2006) the same arrangement to continue up to 9th December, 2006. As per Section 185 (2) (d) of the Electricity Act 2003 read with Section 69(2) of the erstwhile Electricity (Supply) Act, 1948, the audit of accounts of the Board is entrusted to the Comptroller and Auditor General of India.

A seven member Board comprising the Chairman and six members look after all the activities of KSEB. The Finance Wing of the Board is headed by Member (Finance) who is assisted by Financial Adviser. Fund management is centralised and looked after by the Financial Adviser under the supervision of Member (Finance).

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* Calculated at 10.75 per cent per annum, being the average rate of interest charged by REC/GoI on loans given under APDRP Scheme.

Scope of Audit

3.1.2 The present performance review conducted during the period from January to March 2006 covers cash management, collection and remittances of revenue, borrowings from financial institutions and management of receivables during the period from 2001-02 to 2005-06.

The records available in the Corporate Finance Wing, Special Officer (Revenue) and Law Department in the Board office and Brahmapuram Diesel Power Plant, Regional Stores, Aluva, Buildings & Stores Division and Transmission Central Stores, Angamally were examined.

Audit objectives

3.1.3 The performance review of fund management was conducted with a view to ascertain whether the overall management of funds in the Board was efficient and effective by analysing whether:

- there was a well defined financial management policy;
- financial planning was adequate and took care of the funds requirement with reference to the physical targets envisaged;
- the allocation of funds was realistic and whether funds were utilised for the intended purposes;
- the funds raised were cost effective; and
- the internal resources were gainfully utilised.

Audit criteria

3.1.4 The criteria used for assessment of performance were:

- Government guidelines and statutory provisions;
- annual financial budgets and the variance between the budgets and actuals;
- periodical fund forecast statements;

- allocation of funds between revenue and non-revenue categories;
- agreements with lending agencies;
- financial ratios and effectiveness in management of receivables; and
- agreements with HT/EHT consumers.

Audit Methodology

3.1.5 Audit adopted the following methodology for attaining the audit objectives:

- Review of Government orders, guidelines and financial delegations;
- Analysis of annual and periodical budgets;
- Scrutiny of agenda notes, Board minutes, files relating to resource mobilisation from financial institutions and market borrowings;
- Review of files relating to selected HT/EHT consumers and records relating to banking transactions; and
- Stores records relating to four stores maintained at unit level.

Audit findings

3.1.6 Audit findings as a result of test check were reported to the Management/Government in May 2006 and discussed in the meeting of the Audit Review Committee on Public Sector Enterprises (ARCPSE) held on 4th August, 2006, which was attended by the Principal Secretary to the Government of Kerala, Power Department and the Chairman of the Board. The views expressed by the members have been taken into consideration while finalising the review.

Audit findings are discussed in the succeeding paragraphs.

Budget and Actuals

3.1.7 In accordance with the provisions of the erstwhile Electricity (Supply) Act, 1948, the Board has been preparing the Annual Financial Statement (Budget)

every year for submission to the State Legislature. It was noticed in audit that the budgets were being prepared by consolidating the unit level budgets and there was no system in vogue to verify the correctness of estimates submitted by the units. In the case of capital budgets the estimates were not prepared on a scientific basis with reference to the schemes/projects to be executed during the ensuing year.

Revenue Budget

3.1.8 A review of the Budget estimates for the five years ending 2005-06 *vis-a-vis* the actuals revealed that the budgets did not portray a realistic estimate of the revenue and expenditure of the Board as detailed in Annexure 10. It would be seen from the Annexure that in the case of sale, purchase, generation of power, subsidy, other non-tariff income and administrative and general expenses etc., there were wide variations in the estimates from year to year. The percentage of actuals to estimates varied between 29 and 182 in the case of subsidy, 78 and 120 in sale of power, 74 and 115 in purchase of power, 28 and 92 in generation of power and 87 and 285 in administration and general expenses. During the year 2003-04, the actual expenditure on interest and finance charges was Rs.648.21 crore against the estimated amount of Rs.480.64 crore leading to deviation of more than 34 per cent of the budget. This was mainly due to payment of premium amounting to Rs.31.90 crore for swapping of loans and higher borrowings during the year. It was noticed in audit that the management failed to analyse the reasons for wide variations between budgets and actuals.

Capital Budget

3.1.9 A review of the capital budget for the five years ended 31 March 2006, revealed that during the entire period, the actual expenditure was much lower than the estimate and the percentage of actuals to estimates was 69, 52, 39, 74 and 58 during the five years ended 31st March, 2006 as shown in Annexure 11. The main reason for lower utilisation of funds as compared to budget estimates was non-implementation of several schemes [projects like Kuttiadi Tail Race, Athirappally, Malankara, Sengulam Augmentation, Arippara (generation projects], Master Plan for Cities, Capacitor Installation (System Improvement Works), etc.] for which budget provision had been made.

The Board/Government stated (March/August 2006) that on most items, the variance was within the tolerable limits and with the revised budget, the variation was within 10 per cent in respect of total income and expenditure. It was also stated that the Board was able to estimate the requirements accurately and borrowings were planned and sourced accordingly. The reply is not tenable as the Board approves the revised budgets for a financial year at the fag end of that particular year in the months of February/March and the revisions are based on actual expenditure. Since the fund management of the Board is based on the estimates projected in the Budget, it is essential that the projections should be realistic as far as possible.

Sources and Utilisation of funds

3.1.10 The sources of funds were receipts from sale of power, subsidy from the State Government, loans from the State Government, Banks and other Financial Institutions and market borrowings (by issue of bonds). These funds were mainly utilised for payment of power purchase bills, fuel, debt servicing, administrative costs and system improvement works of capital and revenue nature.

Capital Receipts and Expenditure

3.1.11 The following table shows the details of capital receipts and expenditure for the five years ending 2005-06:

Particulars	2001-02		2002-03		2003-04		2004-05		2005-06	
	Budget estimates	Actual	Budget estimates	Actual	Budget estimates	Actual	Budget estimates	Actual	Budget estimates	Actual
Loan from State Government including assistance from APDRP*, PMGY** etc.	190.00	14.84	150.00	53.16	290.00	15.65	100.00	42.71	100.00	66.28

* APDRP: Accelerated Power Development and Reforms Programme.
** PMGY: Pradhan Manthri Gramodaya Yojana.

Loans from financial institutions	1384.34	675.47	1640.00	1327.09	1277.32	1997.75	700.00	539.45	900.00	364.00
Receipts under OYEC† Scheme/ Service Connection Charges	100.00	130.07	100.00	155.88	100.00	185.26	120.00	201.23	212.00	265.85
Debts and deposits	200.00	168.58	200.00	632.13	350.00	529.97	249.64	990.63	847.96	776.37
I. Total Capital receipts	1874.34	988.96	2090.00	2168.26	2017.32	2728.63	1169.64	1774.02	2059.96	1472.50
Subvention from Government	(-) 801	...	(-) 557	(-) 815.57	(-) 429.49	(-) 450.97	..	(-) 342.77	(-) 492.25	(-) 144.58
Other Internal resources	(-) 424.34	(-) 375.83	(-) 864	(-) 873.77	(-) 822.83	(-) 1491.92	(-)471.37	(-) 998.04	(-) 614.40	(-)864.33
Total as per budget document	649.00	613.13	669.00	478.92	765.00	785.74	698.27	433.21	953.31	463.59
II. Capital Expenditure††	649.00	450.70	669.00	348.56	765.00	297.88	698.27	515.84	953.31	443.10
Percentage of Utilization		45.57		16.08		10.92		29.08		30.09

It was noticed in audit that the actual capital receipts were more than the budget estimates except in 2001-02 and 2005-06 and the overall percentage of utilisation for capital purposes was only 26. During all these years the actual utilisation was only between 11 and 30 per cent except in 2001-02 when it was 46 per cent which showed that funds mobilised for creation of capital assets such as generating stations, transmission lines, sub-stations, voltage improvement schemes, etc., were diverted for debt servicing and for meeting revenue

† OYEC: Own Your Electric Connection.

†† Source - Scheme-Wise Progress report furnished to Government.

expenditure. This practice is in violation of Section 62 (1) of the Electricity (Supply) Act, 1948 (since repealed by Electricity Act, 2003 introduced with effect from June 2003) which provides that no sum exceeding Rs.75,000 in the case of recurring expenditure or Rs. Three Lakh in the case of non-recurring expenditure shall be expended unless it is included in the budgets submitted to the State Legislature. It was also noticed that in the budget document presented to the State Legislature during 2001-02 to 2005-06 borrowings for capital purposes were inflated (by way of negative figures under other internal resources against capital expenditure in the above table) to the extent of Rs.5476.68 crore to accommodate the revenue deficits and repayment of principal and interest on loans.

During the five year period ended 31st March, 2006, a total amount of Rs.3040.29 crore raised for capital purposes was utilised for repayment of loan. In the ARCPSE meeting, the Board agreed that in the capital budget negative figures such as subvention and internal resources were included and this was to tide over the revenue deficit especially the subsidy receivable. It was also stated that there were diversion of funds mobilised for capital purposes for revenue expenditure.

Financial Ratios

3.1.12 Financial stability of any organisation is assessed by analyzing various financial ratios. Some important ratios are:

- Current Ratio which shows the ability of the organisation to cover its current liabilities with its current assets.

- Debt Equity Ratio for measuring the relative proportion of external funds and shareholders' funds invested and indicates the soundness of long-term financial stability of the entity.

- Debt Service Coverage Ratio which measures the fund available for servicing debt obligations.

As per the Asian Development Bank (ADB) covenant the standard for current ratio is two and that of debt equity ratio and debt service coverage ratio are one.

An analysis of the above three ratios revealed that the current ratio and debt service coverage ratio were low during the entire period indicating poor short-term liquidity and the debt equity ratio was high during the period up to 2004-05 with improvement in 2005-06 as shown below:

Particulars	2001-02	2002-03	2003-04	2004-05	2005-06
Current Ratio*	0.55	0.73	0.72	0.56	0.50
Debt Equity Ratio@	1.75	1.72	1.60	1.23	0.92
Debt Service Coverage Ratio#	0.68	0.52	0.41	0.49	0.54

The Government stated (August 2006) that current ratio was around two all these years. The reply is not tenable as the Board/Government have taken subsidy receivable and inter-unit debit balances as Current Assets and excluded security deposits from consumers from Current Liabilities.

Audit scrutiny revealed that poor liquidity led to the following:

- Debt servicing was made through further borrowings adding to the overall financing cost and poor performance.
- There was diversion of funds from capital to revenue affecting implementation of schemes/projects and resorting to high cost short term finance for projects.

Since the funds raised were pooled in one bank account, the individual cases of diversion for debt servicing and revenue purposes were not identifiable.

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* Current Ratio = Current Assets./. Current liabilities.

@ Debt Equity Ratio = Debt ./ Equity.

\# Debt Service Coverage Ratio= Profit before interest and depreciation./ Interest and principal. repayment on capital liabilities.

Management of receivables

Subsidy receivable

3.1.13 The Board has been preparing its Revenue Accounts showing 3 per cent Rate of Return on Capital Base as surplus and the revenue gap to make up the return was being shown as Subsidy Receivable from the Government. The summarised position of the amount accounted as subsidy during the five years ended 31st March, 2006 was as follows:

(Rs. In crore)

Particulars	2001-02	2002-03	2003-04	2004-05	2005-06
Sale of Power	1994.33	2645.69	2969.22	3158.89	3590.11
Other income	47.52	61.27	91.52	98.13	102.62
Total income	2041.85	2706.96	3060.74	3257.02	3692.73
Total expenditure	3295.46	3641.75	3976.35	3496.28	3736.06
Revenue defecit	1253.61	934.79	915.61	239.26	43.33
3 *per cent* of capital base shown as surplus	62.83	80.78	91.83	103.49	101.26
Amount credited to revenue account as subsidy receivable from the Government	1316.44	1015.57	1007.43	342.75	144.59
Subsidy as percentage to income from sale of power	66	38	34	11	4
Subsidy as percentage to expenditure	40	28	25	10	4

It would be seen from the above that with reference to the Board's regular income from sale of power, subsidy constituted 4 to 66 *per cent* and it represented 4 to 40 *per cent* of the total expenditure during the five years ended 31st March, 2006.

3.1.14 The Government issued (August 1995) orders to subsidise the shortfall in income of the Board to maintain three per cent rate of return. The order was issued mainly to facilitate the Board to avail of a loan of Rs.100 crore from Power Finance Corporation (PFC). There was, however, no firm commitment from the Government for reimbursement of deficit to make up three per cent return on capital base in the form of subsidy. Taking advantage of this provision the Board accounted for a total amount of Rs.6400.06 crore as income by way of subsidy till 31st March, 2006 against which Rs.1914.71 crore only had been adjusted by the Government so far. The accounting of huge amounts as subsidy receivable over the years without actual cash inflow had affected the liquidity position of the Board. This only helped the Board to show better results of its working by covering up huge expenditure. It was noticed that the Board keeps on booking the revenue gap as receivable from the Government to show three per cent return on capital base despite no actual cash inflow for the last 10-11 years.

In the ARCPSE meeting, the Management stated (August 2006) that in view of the magnitude of the amount, the Board could not write-off the amount shown as subsidy receivable. The Principal Secretary, Power Department assured to look into the matter.

Revenue Realisation

3.1.15 The income of the Board for the five years ending 2005-06 was as indicated below:

(₹ in crore)

Particulars	2001-02	2002-03	2003-04	2004-05	2005-06
Revenue from sale of power	1994.33	2645.69	2969.22	3158.88	3590.11
Subsidies and grants	1316.43	1015.57	1007.43	342.77	144.58
Other income	47.52	61.27	91.52	98.13	102.62
Total	**3358.29**	**3722.53**	**4068.17**	**3599.78**	**3837.37**
Percentage of revenue from sale of power to total income	59	71	73	88	94

The main source of revenue of the Board was from sale of power. The revenue from sale of power represented 59 to 94 per cent of the Board's total revenue during the five years ending 2005-06.

The position of receivables against sale of power, its realisation and arrears of revenue during the above period was as given below:

(₹ in crore)

Year	Receivables at the beginning	Revenue from sale of power	Total	Collection	Receivables closing balance	Percentage of realisation to total receivables
2001-02	806.71	1994.33	2801.04	1994.32	806.72	71.19
2002-03	806.72	2645.69	3452.41	2414.21	1038.20	69.93
2003-04	1038.20	2969.22	4007.42	2782.15	1225.27	69.42
2004-05	1225.27	3158.87	4384.14	2893.10	1491.04	65.99
2005-06	1491.04	3590.11	5081.15	3475.21	1605.94	68.39

It would be seen from the above that the amount pending collection as at the end of each year was showing an increasing trend and the percentage of realisation to total receivables decreased from 71 in 2001-02 to 66 in 2004-05 and marginally increased to 68 in 2005-06. The decline in revenue realisation was mainly due to non-receipt of energy charges from the Government Departments, Local Bodies and Public Sector Undertakings and amount was blocked up under pending court cases in respect of HT/EHT consumers (Paragraphs 3.1.18 and 3.1.22 infra). As a result the Board had to depend heavily on borrowings at high cost.

Category- wise analysis of receivables

3.1.16 The following table shows year-wise dues recoverable from various categories of consumers during 2001-02 to 2005-06

(₹ in crore)

Category	2001-02	2002-03	2003-04	2004-05	2005-06	Increase in 2005-06 as compared to 2001-02 (percentage)
Domestic	17.22	14.40	2.44	4.90	4.33	(-) 74.85
Commercial	75.76	84.43	75.06	82.09	74.09	(-) 2.20
Public lighting	4.31	6.14	6.89	7.41	6.84	58.70
Irrigation & Dewatering	45.85	57.49	54.94	61.12	34.47	(-) 24.82
Public Water works	68.30	130.00	171.85	269.97	352.15	415.59
Industrial LT	18.93	25.76	29.28	37.30	41.62	119.86
Bulk Supply	9.62	14.34	25.74	31.42	17.75	84.51
Misc. C.C.	1.43	2.32	3.07	4.44	4.20	193.70
High Tension	97.56	136.41	148.43	163.24	137.97	41.42
Extra High Tension	284.27	344.25	408.73	450.76	481.34	69.32
Inter State	....	....	....	....	17.61	69.32
Total	623.25	815.54	926.43	1112.65	1172.37	88.10

It would be seen that in respect of Public Water Works, Industrial LT, Bulk Supply, HT and EHT consumers, the percentage increase in dues was 416, 120, 85, 41 and 69 respectively.

Age-wise analysis of receivables

3.1.17 The details of category-wise, age-wise analysis of receivables as on 31st March, 2006 were as given in the following table :

(₹ in crore)

Category	Above 5 years	Between 3 and 5 years	Between 1 and 3 years	Between 6 months and 1 years	Less than 6 months	Total outstanding	Percentage of total outstanding
Domestic	0.80	0.62	0.59	1.21	1.10	4.33	0.37
Commercial	6.28	12.07	15.51	15.64	24.59	74.09	6.32
Public lighting	0.48	1.41	2.38	1.03	1.55	6.84	0.58
Irrigation & De-watering	3.79	8.98	11.62	5.41	4.67	34.47	2.94
Public water works	33.35	92.82	127.66	61.03	37.29	352.15	30.04
Industrial LT	4.90	5.34	13.14	9.21	9.03	41.62	3.55
Bulk Supply	...	...	7.17	5.04	5.53	17.75	1.52
Misc.C.C	0.05	0.38	1.22	1.18	1.37	4.20	0.35
HT	33.24	50.87	26.83	12.79	14.24	137.97	11.77
EHT	242.47	101.78	106.51	19.26	11.32	481.34	41.06
Inter State					17.61	17.61	1.50
Total	**325.36**	**274.27**	**312.63**	**131.81**	**128.30**	**1172.37**	
Percentage to total outstanding	27.75	23.39	26.67	11.24	10.95		

Out of the total receivables, 51 per cent were pending collection for more than three years. It would also be seen that a significant portion of total dues to the extent of 83 per cent were recoverable from HT/EHT consumers (53 per cent) and Public Water Works (30 per cent). Receivables to the extent of 69 per cent against the HT/EHT consumers were pending realisation for more than three years.

The Government stated (August 2006) that the Board had been making earnest efforts for achieving maximum efficiency in revenue collection and further improvement in collection efficiency was difficult on account of protracted litigations by private consumers and non-payment of electricity charges by the Government Departments and State PSUs. The fact remains that despite the efforts stated to have been made by the Board, the arrears in collection of revenue increased year after year.

Blocking up of funds due to pending Court cases

3.1.18 As assessed by the Task Force constituted by the Board, as on 30th September, 2004, Board's revenue to the tune of Rs. 332.76 crore was blocked up in 312 cases relating to 170 HT/EHT consumers due to litigation arising from denial of pre-1992 tariff (a concession granted by the Government of Kerala for newly formed industrial units), non-payment of consumer deposit, non-installation of Time of Day meters (TOD)*, claims for duty exemption, imposition of penalty, etc. The Board had incurred Rs.16.90 crore towards legal charges during the five years ending 2005-06.

It was noticed that in a number of cases, consumers evaded payment by getting interim stay orders against disconnection notice issued by the Board. In spite of the fact that the Board had eight Standing Counsels (one Senior Standing Counsel and seven Additional Standing Counsels) at the Hon. High Court and eighty seven Standing Counsels at the subordinate Courts, inordinate delay was noticed in getting even interim stay orders vacated and also bringing up the cases before the Hon. Court for disposal. A few cases of inordinate delay in taking legal action came to notice during audit are discussed in Annexure 12.

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* Meters used to record the consumption of HT/EHT consumers during normal hours, peak hours and off-peak hours.

It was further noticed in audit that follow-up action of Court cases were centralized in the Board Office and that there was absence of proper control and monitoring. Though 361 cases in respect of HT/EHT consumers were pending as on 31st March, 2005, there was no system of short listing or prioritizing the cases for further follow-up. The system needs to be restructured by deploying more competent manpower and also by decentralising petty cases involving small amounts. There was lack of co-ordination between the finance and legal wings in pursuing the cases and monitoring recovery to augment the funds position. Due to delay, in many cases private HT/EHT consumers were benefited.

The Government stated (August 2006) that proper follow-up action were being taken from the Board's side and written statement and counter affidavits prepared and transmitted to the standing counsels at the earliest to get early disposals in favour of the Board. In the ARCPSE meeting, the Management stated (August 2006) that despite the Board's efforts there were delays in the disposal of Court cases. The reply is not tenable in view of the fact that in respect of seven cases test checked, it was noticed that the cases dating back to 1997 were still pending disposal mainly due to lack of proper follow-up. As a huge amount is blocked up due to Court cases, the Board should look into the fact as to whether consumers were taking advantage of deficiencies, if any, in the enabling rules framed by the Board.

Non-realisation of energy charges due to concession granted by Government in violation of statutes

3.1.19 Prior to formation of State Electricity Regulatory Commission (SERC) in November 2002 the electricity tariff was being fixed by the Board with the approval of the State Government. After the constitution of SERC, electricity tariff was being fixed with the approval of SERC. It was noticed in audit that even after formation of SERC, Government intervened and allowed concessions to the consumers resulting in revenue loss to the Board. A few such instances are discussed below:

3.1.20 As part of the revival proposal of Travancore Cochin Chemicals Limited (TCCL) the Government issued orders (January 2003) giving concession to the Company according to which power tariff was to be frozen at August 2001 level i.e., Rs.2.42/KWH of energy till the implementation of Barapole Hydel Project by the company in July 2004 and the interest on all arrears of electricity charges payable by the company had to be waived. The Government Order was silent on the manner in which the concession was to be compensated to the Board. TCCL was billed at the normal tariff on the ground that the full time members of the Board did not agree to the Government decision. However, in view of Government orders, TCCL paid the power bills as per concessional tariff during the period from November 2002 to March 2005 which resulted in accumulation of arrears receivable from TCCL. Kerala State Electricity Regulatory Commission pronounced (30th April, 2004) the Government Order giving concessions to TCCL as null and void since these orders violated the authority of the Tariff Regulatory Commission. The allotment of Barapole Hydel Project had been cancelled (April 2004) by the Government. Total arrears as on 31st March, 2006 amounted to Rs.77.41 crore excluding interest by way of undue concession extended to TCCL.

Thus, the decision of the Government to grant concession to TCCL without proper authority resulted in locking up of revenue which affected the ways and means position of the Board.

3.1.21 Indian Aluminium Company Limited (INDAL) another EHT consumer had been remitting current charges under protest on the ground that KSEB was not empowered to order revision of tariff in the context of enactment of the Electricity Regulatory Commission Act, 1998. In Kerala, the SERC was formed in November 2002 while the Board revised the tariff effective from October 2002 i.e., before the establishment of SERC. However, following the revision of tariff effective from 1st October, 2002, the consumer paid the demanded amount up to November 2002 under protest and from December 2002, they were remitting current charges only at the August 2001 rates. Due to this short remittance, arrears payable by the consumer had accumulated.

Based on a representation from the consumer, the Government issued orders (April 2003) allowing relief of Rs. one crore per month for a period of three months. The financial commitment of this was to be shared by the Government and the Board equally. The consumer had unilaterally deducted the entire concession amount of Rs.three crore from the arrears due to the Board and the Government share of Rs. 1.50 crore had not been received. In this case also, SERC had declared the relief given to INDAL by the State Government as null and void. In view of the SERC order, the concession of Rs. Three crore granted by the Government as a relief to INDAL became unauthorized and the amount remained to be realised from the consumer.

Thus, due to grant of concessions by the Government in violation of Section 65 of the Electricity Act, 2003 and failure of the Government to make good the loss, the Board could not realise Rs.80.41 crore being the value of energy sold to the above two consumers, even after a lapse of two years since issue of orders by SERC.

In the ARCPSE meeting the Principal Secretary, Power Department, agreed to look into the matter.

Dues from Government Departments/State Public Sector Undertakings and Local Bodies

3.1.22 As on 31st March, 2006 funds of the Board amounting to Rs.797.48 crore were locked up with Government Departments, Local Bodies and State Public Sector Undertakings by way of pending dues. The outstanding against the Government Departments and State PSUs increased from Rs. 356.64 crore in March 2003 to Rs.797.48 crore as on March 2006 indicating an increase of 124 per cent. The matter was discussed (May 2004) in a meeting convened by the Chief Secretary and it was decided that Finance Department would provide necessary budget provision to liquidate the arrears of electricity charges of Government departments. The Secretaries concerned were instructed (May 2004) to issue directions to PSUs for payment of electricity charges including arrears. It was, however, noticed that no appreciable improvement in realisation of arrears had been made.

The Government stated (August 2006) that the Principal Secretaries, Power and Finance convened meetings of the Government Secretaries and other officials and as a result Rs. 32.50 crore could be collected by the Board from Kerala Water Authority and Agriculture Department and follow-up actions were being vigorously taken. It was, however, noticed in audit that compared to the arrears pending collection, the realisation was marginal and therefore Government's intervention in the matter was necessary.

Interest loss on excess payments

3.1.23 The Board had been paying monthly fixed transmission charges to Power Grid Corporation of India Ltd., (PGCIL) for two transmission systems (220 KV DC Kayamkulam-Edamon and Kayamkulam-Pallom lines) constructed (November 1998/December 1999) and maintained by PGCIL. Initially the charges were paid on provisional basis as fixed by the Central Electricity Regulatory Commission (CERC) and thereafter as per the final orders issued (3rd June, 2002 and 30th June, 2003) by CERC in this regard. When the final orders of CERC were issued, it was found that the fixed charges paid as per the provisional tariff order were in excess. The excess amount paid to PGCIL during the period between November 1998 and June 2003 amounted to Rs. 42.45 crore and this was refunded by PGCIL (July 2002/August 2003). The excess amount was actually paid by the Board out of borrowed funds bearing average interest at 11.75 to 12.25 per cent per annum. The Board, however, failed to submit the claim to CERC in respect of interest amounting to Rs.7.26 crore pertaining to the period from November 1998 to July 2003.

The Government stated (August 2006) that as ordered by CERC, the Board had made payments (Rs.47 crore) due to PGCIL during 2005-06 without interest and had interest payment been adopted, the Board would have suffered major financial loss. The reply is not tenable since the excess provisional payment was made based on inflated claim submitted by PGCIL to CERC and the Board also failed to submit the claim to CERC even though they actually suffered interest losses. The contention that the Board may have to pay interest on reciprocal basis

to PGCIL on short claims in other cases is not tenable since in such cases the excess claims were made by PGCIL only at the time of submission of demand before CERC. In the present case the Board failed to take up the matter with CERC at the appropriate time.

Interest loss on avoidable payment of Advance tax

3.1.24 The Kayamkulam Combined Cycle Power Plant (KCCPP) of National Thermal Power Corporation Limited (NTPC) was eligible for Avoidable payment of 100 per cent tax holiday as per section 80-IA of the Income Tax Act, advance Income Tax to 1961, available for enterprises engaged in infrastructure development. As per clause 7.3.4 of CERC Tariff Order dated 21st December, 2000 also, the beneficiaries of new stations should get full benefit of the tax holiday loss and therefore the station wise/region wise profit before tax as estimated shall constitute the basis for distributing the tax liability of all stations/regions. Though no income tax was to be paid in respect of the Kayamkulam unit, the Board has been paying the tax along with the power purchase bills in proportion to the capacity of Kayamkulam unit to the total generating capacity of NTPC. The amount so paid by the Board for the period from April 2001 to March 2004 aggregated to Rs.36.80 crore and the same was refunded to the Board by NTPC in May 2003 and February/May 2004. Though the refund of this amount was received in May 2003 and February/May 2004, yet the funds were blocked up for a period ranging from seven to 32 months.

While the Board made payments to NTPC towards advance tax out of funds borrowed at the average rate of 10.58 per cent per annum involving actual interest liability of Rs.7.25 crore, NTPC had not paid interest on the refunded amount except a refund of Rs.23.38 crore against Rs.22.98 crore paid in 2001-02 towards Income tax. The interest loss due to avoidable payment of advance income tax to NTPC worked out to Rs.6.85 crore.

The Government stated (August 2006) that the interest on excess tax paid would be passed on to the Board only if the interest was allowed by the

IT Department on such payments. The reply is not acceptable since KCCPP enjoyed tax holiday benefit, NTPC was not required to collect and pay any tax to IT Department. As such, question of passing on the interest received from IT Department on excess tax paid to the Board does not arise.

Non-rationalisation of security deposit of licensees

3.1.25 The licensees of the Board for distribution of power comprised of EHT and HT licensees. As per the Board order (August 1997) the licensees had to deposit towards security, an amount equivalent to two months' electricity charges. While the mode of payment in respect of EHT licensees was 50 per cent by cash and the balance by way of bank guarantee (BG) the same prescribed for HT licensees was up to Rs. five lakh by cash and the balance as BG.

It was noticed in audit that due to the above differential treatment given to HT licensees in respect of mode of payment, the Board could not collect additional interest free amount of Rs. 1.33 crore (up to 2003-04) from two HT licensees and utilise the amount for its working capital requirements. (One month's electricity charges: Rs. 1.43 crore minus Rs. 0.10 crore collected). Special status allowed to HT licensees on mode of payment of SD deprived the Board of funds amounting to Rs. 1.33 crore besides benefit of reduction in financing cost of Rs. 31.88 lakh.

The Board stated (March 2006) that the quantum and mode of remittance of each category of consumers were fixed after careful study and as per new State Electricity Regulatory Commission (SERC) regulations, interest on such deposits was payable. The reply is not acceptable as the Board has not given specific reasons for accepting BG in excess of Rs. five lakh from HT licensees alone and even after paying interest at six per cent (from April 2004) fixed by SERC on the Security Deposits, the cost of funds would have been beneficial.

Borrowings

3.1.26 The details of borrowings as at the end of the five years up to 2005-06 and receivables outstanding at the end of the year were as follows: □

Year	Govt. Loans	Institutional loans	Total	Borrowings during the year	Receivables outstanding	Percentage of receivables to borrowings
2001-02	199.90	4572.01	4771.91	690.31	806.72	116.86
2002-03	253.06	4841.10	5094.16	1380.24	1038.20	75.22
2003-04	268.70	5086.96	5355.66	2013.38	1225.27	60.86
2004-05	311.41	4229.92	4541.33	582.16	1491.04	256.12
2005-06	377.69	3335.93	3713.62	430.28	1605.94	373.23

The borrowings were intended mainly to repay past loans, meet capital expenditure and to bridge the revenue gap. The borrowing of Rs.1380.24 crore in 2002-03 was primarily for repayment of loan amounting to Rs.1058 crore. The Board could bring down its outstanding borrowings from Rs.5355.66 crore in 2003-04 to Rs.3713.62 crore in 2005-06 by swapping of high cost loans and on account of increased revenue from sale of power.

The percentage of receivables outstanding to borrowings stood at 373 in 2005-06 against 117 during 2001-02. This was mainly on account of delay in realisation of energy charges from consumers. The heavy outstanding of uncollected amount indicate that the borrowings could have been reduced considerably through effective recovery measures in respect of receivables.

In the ARCPSE meeting, the Chairman, KSEB, agreed to the audit observation and stated that major portion of the receivables was due from the Government Departments/PSUs.

Loss due to non-incorporation of put/call option on issue of KSEB Bonds

3.1.27 The Board issued five series of Bonds (VI, VII, VII A, IX & X) aggregating Rs.1103.44 crore at interest rates varying from 15.25 per cent to 11.40 per cent per annum during the period between March 1999 and September 2002. The interest rates on institutional finance recorded a declining trend since 1999-2000. The Board, however, issued only the VI series and X series with put/call option and Series Numbers VII, VIIA and IX were issued without this option. The Bond series VII, VII A and IX were redeemable to the extent of 50 per cent at the end of the sixth year and balance 50 per cent at the end of the seventh year of issue. The same, however, could have been redeemed at the end of the fifth year under the put/call option. The VI series bond (15.25 per cent) was pre-closed at the end of five years in March 2004 by availing short-term loan from commercial bank at the interest rate of 8 per cent per annum.

It was observed by Audit that though the declining trend in interest rates was noticed by the Board as evidenced by incorporation of such a clause for Series VI issue, this clause was not incorporated in the issue of Series Nos. VII, VIIA and IX (13.25 per cent to 13.75 per cent). If the Board had included the options in the Bonds issued in July 1999, March 2000, and February 2001 it could have avoided interest loss of Rs.28.33 crore up to 31st March, 2006 and future liability of Rs.19.51 crore, by exercising the call option for foreclosing the high cost bonds after the expiry of the five year lock-in-period.

The Government stated (August 2006) that in view of risk factors linked with such options, it would be prudent to have a combination of bonds with dissimilar features so as to even out the detrimental effects against the beneficial results. The reply is not tenable since the Board had not considered any uncertainty in borrowing rates and resultant risks at the time of issue of VII, VII A & IX series Bond and in fact there was an omission in considering the advantages of the option.

Delay in swapping high cost loans

3.1.28 There was a general declining trend in the interest rates on the loans since 1999-2000. Banks and other Financial Institutions reduced rates of interest on the then existing loans and evolved schemes to restructure the high cost loans into low cost loans subject to certain conditions. It was, therefore, advantageous for the Board to go for swapping/restructuring of the existing high cost loans so that there would be substantial saving in interest. It was noticed by Audit that the Board delayed the swapping of loans leading to avoidable payment of interest charges as discussed in the succeeding paragraphs.

3.1.29 As of March 2002 the Board had outstanding loans of Rs.1219.14 crore from Rural Electrification Corporation (REC) bearing interest rates ranging between 11.5 and 16 per cent per annum. The REC, in its Circular letter addressed to all the State Electricity Boards and other State Power Utilities, announced (January 2003) their policy for swapping of loans with retrospective effect from 16th December, 2002, thereby extending the benefit of current lower cost of funds to old projects/schemes also. Further, REC also finalised the guidelines on swapping of loans and intimated to all the State power utilities in March 2003.

The Board, despite being aware of the swapping scheme in December 2002 itself and even after receipt of detailed guidelines from REC, failed to effect swapping from March 2003. The swapping was done only on 20th June, 2003 due to procedural delays. The outstanding balance of Rs.649.43 crore as on 20th June, 2003 was swapped reducing the interest rate from 11.5 to 10.5 per cent. The additional interest burden arising from this on 504 loans from REC aggregating to Rs. 649.43 crore for the period March 2003 to 20th June, 2003 worked out to Rs.2.42 crore.

The Government stated (August 2006) that the guidelines on swapping of loans were finalised by REC only on 13th March, 2003 and intimation was sent by REC on 27th March, 2003 with cut-off date on 20th June, 2003 and also the ways and means position of the Board at that time was acute; therefore swapping could not be effected earlier to 20th June, 2003. The reply is not acceptable since

the Board was aware of swapping scheme of REC in December 2002 itself and model calculation was also forwarded by REC in January 2003 for availing of swapping. The Board, however, did not insist for swapping with retrospective effect on receiving the communication from REC indicating the cut-off date as 20th June, 2003. The question of ways and means for payment of premium also did not arise since the premium on swapping was being adjusted against future loan disbursements.

3.1.30 PFC had formulated a policy for swapping of high cost loans in January 2002 according to which the premium payable for swapping of loans was the discounted value of the interest loss during the balance period of loan maturity. The Board had outstanding loans of Rs.126.44 crore as on 31st August, 2002 from PFC bearing interest rates ranging from 10.50 to 16.50 per cent per annum. PFC introduced a new debt restructuring scheme in August 2002 whereby loans would be restructured at the then existing lending rate on payment of 50 per cent of the premium. The premium would be the present discounted value of loss of interest during the balance period of loan maturity. The new scheme allowed part restructuring of loans and the quantum of restructuring in the financial year would be Rs.100 crore or 20 per cent of the outstanding loans whichever was less. The limit was further revised (November 2002) as Rs.100 crore or 20 per cent whichever was higher. Restructuring to current interest rate of 10 per cent (after rebate) was effected only in December 2002 (Rs.100 crore involving three loans in full and one in part) reckoning 31st December, 2002 as the cut-off date, paying a premium of Rs.8.55 crore. It was noticed by Audit that though the Board contemplated restructuring from November 2001 it did not take advantage of the new scheme immediately after its announcement by PFC in August 2002. Since PFC had intimated the new scheme to the Board in August 2002, the swapping of 20 per cent of outstanding loans (Rs.25.29 crore) could have been effected at least from 1st October, 2002 (after allowing a reasonable period of 45 days for complying with procedural formalities) and the balance Rs.74.71 crore from 1st December, 2002. It was also observed that even after considering the extra premium payable and interest thereon, there would have been a saving of interest amounting to Rs.28.18 lakh if the loan was swapped on two occasions i.e., in October 2002 (Rs.25.29 crore) and in December 2002 (Rs.74.71 crore).

The Government stated (August 2006) that the request from the Board for restructuring the loan under the new scheme (August 2002) was confirmed by PFC only in December 2002 and swapping of loans earlier to December 2002 was not possible. The reply is not acceptable since the Board made its request only on 29th October, 2002 and restructuring with revised limit intimated vide PFC circular dated 18th November, 2002 could be effected in December 2002 indicated that a reasonable time of 45 days was enough for complying with procedural formalities.

Excess payment of interest

3.1.31 The Board had been obtaining loans under the Bills Rediscounting Scheme of Industrial Development Bank of India (IDBI) for payment of supply bills. The value of materials paid to suppliers by IDBI was to be repaid in a period of five and a half years. The principal amount would be split into 20 usance bills of equal amount and paid along with interest in quarterly instalments. The rate of interest during the period of drawals was 13.5 per cent. The Board represented (February 2003) to IDBI to reduce the rate of interest in view of the general decline in interest rates. Reduced rates effective from 6th January, 2004 were intimated by IDBI as 9.35, 9.40, 9.45, 9.50 and 10 per cent for usance periods of three, four, five, five and half, and seven years respectively. As the attempts of the Board to swap or preclose the loans were not fruitful; further re-discounting of supply bills was discontinued (2005-06).

It was noticed by Audit that even after receiving intimation (January 2004) regarding reduced interest rates, the Board continued to opt for a higher usance period of five and a half years involving higher interest rate. During the period between January 2004 and March 2005, the Board had availed of credit of Rs.8.17 crore. By opting for the shorter usance period of three years with interest rate of 9.35 per cent for usance bills after January 2004 the Board could have avoided interest liability amounting to Rs.1.39 crore during the period January 2004 to March 2010 on the above credit amount.

The Government stated (August 2006) that the usance and applicable rate of interest were not the only parameter and liquidity factor had to be considered while choosing the period of usance bills. It was, however, noticed in audit that the Board did not choose the right usance period despite its favourable liquidity position.

Non-closure of high cost loans

3.1.32 During 2002-03, the Board obtained three loans of Rs.5.06 crore, Rs.8.32 crore and Rs.15 crore at the rate of 11.5 per cent per annum from Kerala Power Finance Corporation Limited (KPFC) for installation of capacitors and settlement of power purchase bills. Out of this, the loan of Rs.15 crore was closed on the due date of 1st July, 2005 and the other loans of Rs.8.32 crore and Rs.5.06 crore, as per schedule of repayment, are to be closed by 30th May, 2009 and 15 March 2009 respectively. Though the terms and conditions of these loans provided for premature settlement with three months advance notice without any extra charge the Board did not take any action for swapping/closure of these high cost loans.

It was observed in audit that during the month of December 2004, term loans were available from commercial banks at eight per cent per annum and the borrowing limits of the Board also permitted such borrowings. KPFC itself had sanctioned fresh loan at a rate of 6.35 per cent per annum during December 2004. Calculated at the differential rate of 3.5 per cent (11.5 per cent - 8 per cent) the interest loss on this account for the period up to March 2006 worked out to Rs.56.27 lakh on outstanding principal of Rs.17.66 crore against three loans as on December 2004.

The Government stated (August 2006) that the tenure of short-term loans was too small and the suggestion of Audit to fore close long-term debt by availing short-term loans was against management principles. The reply is not tenable as during December 2004, the low interest term loans from commercial banks were available for five years period and repayment of these loans would occur only after the scheduled date of repayment of KPFC loans. Since the loan outstanding

(December 2004) was only for an amount of Rs.17.66 crore, it could have been closed by availing low cost short-term/mid-term loans thereby avoiding the interest loss.

Payment of consultancy charges for un-availed portion of loan

3.1.33 Based on the project cost of Rs.33.33 crore estimated by the Board, the Rural Electrification Corporation Limited (REC) had sanctioned (1997-98) a loan of Rs.33.33 crore through the Overseas Economic Co-operation Fund, Japan (OECF), an International funding agency, to KSEB for its system improvement projects. As per clause 15 of the loan agreement with REC the consultancy charges would be levied at the rate of 3 per cent of the total scheme/sub-project cost. The first instalment of the loan was released on 20th March, 1998. While releasing the loan instalments, REC had deducted Rs.98.89 lakh towards consultancy fee. The Board, however, availed (March 1998 to January 2002) of a total loan amount of Rs.27 crore only including Rs.98.89 lakh charged as consultancy fee. Based on the actual cost of Rs.26.01 crore of the project, consultancy fee payable was only Rs.78.04 lakh i.e., 3 per cent on Rs.26.01 crore. Therefore, due to overestimation of project cost the Board had paid Rs.20.85 lakh towards consultancy fee on the unavailed portion of the loan as well.

The Board stated (February 2006) that as per clause 15 of the loan agreement consultancy charges at the rate of 3 per cent of the total scheme/project cost were payable and the request of the Board to waive the amount was denied by REC. The fact, however, remains that over estimation of project cost resulted in submission of application for excessive amount and avoidable payment of consultancy charges.

Payment of interest in advance outside the purview of the loan agreement

3.1.34 During the years 2002-03 and 2003-04, the Board availed of three loans of Rs.200 crore, 307.74 crore and 330 crore from KPFC at the interest rates of 11.75, 10.91 and 9.06 per cent respectively. KPFC mobilized the fund by issue

of Non-SLR Bonds redeemable after seven years and ten years. As per the terms and conditions of the loan agreement the Board had to pay the interest half-yearly on the specified due dates. On request from KPFC, the Board paid an amount of Rs.8.24 crore on 4th February, 2003, 1st September, 2003 and 2nd December, 2003 in advance for the purpose of payment of interest on Bond application money to its investors, though such payment was not envisaged in the agreement. This amount was adjusted by KPFC subsequently (March/December 2003 and February 2004) in the first half-yearly interest payment and the balance was paid on the due dates.

It was observed by Audit that by advancing the borrowed funds to the lending institution itself without charging any interest, the Board incurred avoidable interest loss on borrowed funds locked up for a period of 53 to 121 days. Calculated at the interest rate of the respective loans the loss worked out to Rs.20.07 lakh.

The Government stated (August 2006) that unless the Board advanced the amount KPFC would not be in a position to fund the interest due on application money.

The reply is not acceptable since the payment of interest on the application money to the subscribers of the bond was the liability of the KPFC and the Board, being the borrower, need not have advanced money for liquidating the lending institution's liability by incurring interest loss.

Acceptance of over subscription as long-term loan

3.1.35 The Board requested (April 2003) KPFC for a long-term loan of Rs.300 crore for meeting its various capital payments. For financing the Board, KPFC issued Non-SLR Bond Series No. III which was to be redeemed at the end of seven years. The issue was oversubscribed to the extent of Rs.7.74 crore and KPFC requested (July 2003) the Board to accept this amount also as a long-term loan on the same terms and conditions. Thereupon the Board accepted (August 2003) the oversubscribed amount of Rs.7.74 crore at the same interest rate of the

loan (10.91 per cent). The estimated capital liabilities of the Board was only for Rs.300 crore and there was no need for accepting Rs.7.74 crore as loan since short-term loan was available from banks at the interest rate of 8.5 per cent to 9.75 per cent, during the same period.

The Board thus incurred additional interest expenditure of Rs.23.56 lakh on Rs.7.74 crore from 16th August, 2003 to 31st March, 2006 calculated at the differential rate 1.16 per cent.

The Government stated (August 2006) that the terms and conditions for other loans involved Government guarantee as well as escrow cover making the task more difficult and hence the over subscription was accepted. The reply is not tenable since borrowing of the oversubscribed amount from KPFC was only a measure to help KPFC and in that process the Board had to pay avoidable interest since the average interest rate charged by commercial banks during the same period was around 9.15 per cent. The Board should have opted for funds bearing lower financing cost for short-term purposes.

Failure to avail interest subsidy benefit

3.1.36 A loan of Rs. nine crore was sanctioned (March 2001) to the Board by PFC for civil works of Lower Periyar Hydel Generation Project covered under the Accelerated Generation and Supply Programme (AG&SP) and was eligible for interest subsidy at 4 per cent from 1997 to 2002 and thereafter at 3 per cent. The loan amount was released in two instalments of Rs.5.82 crore and Rs.3.18 crore on 29th March, 2001 and 17th July, 2001 respectively. The first tranche of loan of Rs.5.82 crore was released (March 2001) at the rate of 14.5 per cent without reckoning interest subsidy and the subsidy was allowed only from July 2001. The second tranche of Rs.3.18 crore was released (July 2001) at the revised interest rate of 13.50 per cent, again without giving the benefit of interest subsidy. The subsidy was allowed only with prospective effect from January 2002.

The Government stated (August 2006) that an amount of Rs.6.91 lakh had been received and the matter already taken up with PFC for speedy release of the amount.

It was, however, noticed that Board had failed to avail the benefit of interest subsidy under the AG&SP Scheme from the date of release of loan itself by initiating prompt follow-up action and an amount of Rs.16.08 lakh was remaining to be collected (August 2006). Thus, the failure of the Board to claim the benefit of reduced rate of interest from July 2001 to October 2003 and eligible subsidy during the period March 2001 to January 2002 resulted in avoidable payment of Rs.16.08 lakh after netting of the recoveries of Rs.6.91 lakh effected by the Board.

Failure to avail waiver of processing charges

3.1.37 During 2003-04 the Board had paid Rs.15.63 lakh towards processing charges to Syndicate Bank, Union Bank of India and Indian Overseas Bank (IOB) for the short-term loans aggregating Rs.175 crore. During the same period, for a loan of Rs.10 crore taken from South Indian Bank (SIB) no processing charges were paid. The Board, however, did not raise the issue of waiver of processing charges with the Union Bank and the Syndicate Bank. IOB was also addressed only after release (December 2003) of the loan. Subsequently, IOB and Syndicate Bank waived the processing charges to the extent of 50 per cent and 100 per cent in January 2004 and July 2004 respectively on future loans availed of from them. Thus, the absence of proper negotiation with the banks resulted in avoidable payment of processing charges amounting to Rs.15.63 lakh.

The Government stated (August 2006) that due to continuous efforts only, SIB had waived the processing charges and that on receipt of terms and conditions of sanction itself, the Board took up the matter with other banks to remove/modify unfavourable conditions and also to reduce processing charges. The reply is not acceptable as nothing was available on records to substantiate the contention of the Government.

MANAGEMENT OF BANKING TRANSACTIONS

Delay in transfer of funds to Central Collection Account

3.1.38 The collections from consumers at the field offices of the Board were remitted to non-operative collection accounts and transferred to Central collection

accounts. The local accounts were maintained primarily with State Bank of Tranvancore (SBT) and where SBT branches were not available, accounts were maintained with Canara Bank, Union Bank of India and Syndicate Bank.

As per the Memorandum of Banking arrangements (July 1991) with State Bank of Travancore, the balances in various collection accounts as at the end of the day would be transferred to Central Collection Account (CCA) of the bank the next day. The banking arrangement had been reviewed in October 2000 and renewed up to September 2002 and no such arrangement existed thereafter.

On a review of the daily transfer of funds, it was noticed by Audit that during October 2002 to February 2005, there was delay ranging from one day to 1441 days (after allowing a grace period of three days) in 2359 cases for transfer of funds to CCA. As the balances in CCA are transferred to Cash Credit Account on daily basis any delay in fund transfer would attract interest in Cash Credit Account. At the average cash credit rate of 12.5 per cent per annum, the interest loss on this account worked out to Rs.23.44 lakh.

The Government stated (August 2006) that all cases of delay were promptly taken up with SBT along with claim towards interest. It was, however, noticed that Bank did not pay any interest for the delayed transfer of funds and as there was no valid agreement in force after September 2002, the Bank would not be liable to compensate for any delay.

Further it was also noticed that the Board continued payment of monthly service charges of Rs.12.50 lakh even after introduction of net working and core banking in SBT. In view of the fact that with the introduction of hi-tech electronic facilities in banks, services such as clearing of cheques, inter branch transfer of funds etc., are offered free of cost by many commercial banks, monthly payments amounting to Rs.12.50 lakh towards service charges lacked justification.

Delay in transferring loan funds to Overdraft (OD) accounts

3.1.39 The Board used to borrow funds for its capital and revenue requirements from financial institutions like Rural Electrification Corporation

Limited (REC), Kerala Power Finance Corporation Limited (KPFC), Life Insurance Corporation (LIC) etc. Since these institutions were charging interest on loans right from the date on which funds were transferred from their bank accounts, these funds should have been credited to the destination accounts on the same day.

The Board had been availing of OD/cash credit from commercial banks to manage its working capital requirements. On a review of the relevant records it was noticed that there was delay ranging from two to 15 days in transferring of loan funds received by banks from financial institutions to the overdraft account of the Board resulting in avoidable payment of interest of Rs.32.15 lakh at the OD interest rate ranging from 6.75 to 12 per cent per annum during the period from April 2001 to September 2005.

The Government stated (August 2006) that to avoid the delay alternative option given by REC was accepted and new account with HDFC was opened. It was, however, noticed by Audit that even after changing the bank (March 2002) for transfer of funds there was delay of two to five days which was mainly due to failure of the Board to identify and intimate the bank account to which transfers were to be made. By providing standing instructions for transfer, such delays and consequent interest loss could have been avoided.

Internal Control

Internal controls are essential pre-requisite for the efficient discharge of an organisation's functions and required for 'good governance'. These are procedures and safeguards that are put in place by the management of an organisation to ensure that its activities are proceeding as planned. Strict observance of these procedures/safeguards is vital in organisation dealing with substantial funds.

Misappropriation/Defalcation of cash

3.1.40 The Board has an internal control system wherein independent control over collection and disbursement exists. Collection and disbursement would remain independent of each other in all locations including the Head Office

and the locations have no access to the funds collected by them. The Internal Audit of the Board is primarily concerned with the validity of transactions and balances i.e., to detect possible errors and irregularities by evaluating the handling and custody of funds, preparation and maintenance of records through observation and checking. In spite of such laid down procedures, Audit scrutiny revealed that in 15 Electrical Divisions of the Board the internal control mechanism during 2001-02 to 2004-05 was not effective in preventing defalcation of Board's revenue by its own employees. The amount of defalcation as reported by Audit in the Inspection Reports aggregated to Rs.39.75 lakh. In addition to this, misappropriation cases noticed by the Board involving Rs.16.67 lakh were also pending final disposal.

The defalcation was facilitated as a result of non-verification of daily remittances as per cash challans and the amounts actually credited in bank. If the daily remittances and the amounts credited in bank were verified on daily basis, the misappropriation could have been detected. It was also observed that minor penalties on cash misappropriation cases were imposed and the employees concerned were being reinstated into service after remitting the amount involved. Hence, recurrence could not be controlled effectively.

Cash flow analysis

3.1.41 As per the Commercial Accounting System Manual, the Board was required to maintain Daily Cash Fund Position , Daily Commitment Report, Daily Cash Flow Report and Monthly Cash Flow Reports. These statements were not prepared in the prescribed form. Ways and means projections were being made monthly and based on which financial planning was done. The Board had not prepared a Cash Book showing the daily balance of cash and balance available in various bank accounts. The Cash Book print out did not show daily balance of cash and only month-end balances were taken. In view of this cash balance at any point of time could not be ascertained. Due to non-preparation of cash flow statement as required in the Manual it would not be possible to ensure that financial management was being carried out properly.

The Government stated (August 2006) that the Board was maintaining various records as prescribed in the Commercial Accounting System Manual through which reports were generated for proper management and control of finance. The reply is not acceptable since fund management was not being carried out as prescribed in the manuals of the Board.

[Audit Paragraph 3.1.1. - 3.1.41 contained in the Report of C&AG for the year ended on 31 March, 2006].

AUDIT PARAGRAPH 3.2 (3.2.1 TO 3.2.31 - 2005-06)

Introduction

3.2.1 Kerala State Electricity Board (Board) is responsible for generating, transmitting and distributing electricity power in the State of Kerala. The Board has introduced computerisation in the areas of High Tension Billing, Low Tension Billing, Pay Roll, Accounting and Inventory Management.

In terms of an MoU signed (August 2001) between the Ministry of Power, Government of India and the Government of Kerala for Power Sector reforms, KSEB was to undertake computerisation of accounting and billing in towns by March 2002 for effective energy audit. An Indigenously Developed System (IDS) for Billing developed in Visual Foxpro platform was introduced during 2001 in eight Distribution Sections. In 2003 the Board decided to develop separate software using RDBMS* platform SQL Server with Windows 2000 Server as Operating System. The software for LT Billing, called "Jyothi" developed in association with Price waterhouse Coopers (PwC), was introduced in 177 out of 561 Distribution Sections during 2003-2005. The objective of computerisation of billing was to automate key revenue billing and collection activities in the section offices of the Board and to improve customer satisfaction. Between 2000 and 2006 (up to February), the Board spent Rs.8.69 crore on the purchase of servers, personal computers and connected accessories (Rs.7.62 crore), licensed software (Rs.1.07 crore) for the implementation of LT Billing System.

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* Relational Database Management System.

Sale of power (SOP) in respect of all LT consumers is done through the 561 Electrical Sections. Invoices relating to sale of power to LT consumers are issued from the Section and payment collected at the Electrical Sections. KSEB at present follows two types of billing system viz., Monthly Billing System and Bi-monthly Billing System. All industrial consumers and consumers with connected load exceeding 10KW are billed monthly and the rest bi-monthly. The scoping document for the development of LT Billing System proposed the installation of an application software in Sections along with Personal Digital Analyser (PDA) appropriately programmed to automate the key revenue billing and collection activities. The process from new consumer registration to billing, collection and reporting were to be covered by the system. Under the system, consumer data for area-wise spot billing was to be extracted to PDA and meter reading data based on which spot bills are printed, are uploaded to the system. It was proposed to enhance cash collection timings through double shift for better consumer satisfaction. Ten Data Centres were proposed to be set-up across the state to have database redundancy and to facilitate common collection centres.

Organisational set-up

3.2.2 The IT needs of the Board are overseen by the Management Information System (MIS) department, which functions under the Member (Accounts). MIS Department is headed by Director (MIS) and has two Regional offices one each at Kochi and Kozhikode.

Scope and Methodology of Audit

3.2.3 IT audit was conducted to evaluate the IT general controls and application controls specific to computerised LT Billing system. The data pertaining to the period April 2004 to May 2006 made available to Audit in MS Access format was analysed using Computer Assisted Audit Techniques (CAAT) for checking of data completeness, regularity and consistency. In addition to the MIS department, Thiruvananthapuram, seven# Electrical Sections where the software "Jyothi" is installed were covered in audit. As the same software is

Vellayambalam, Fort, Alappuzha North, Chottanikkara, Kaloor, Thiruvalla and West Hill.

installed at 177 locations, only seven sections, five urban and two rural located in the southern, central and northern region of the state were selected to assess the general controls and operational issues.

Audit objectives

3.2.4 The Information Technology Audit of LT Billing System in the Board was conducted to ascertain whether:

- the LT Billing System was generating monthly/bi-monthly demands as per the tariff rate appropriate to the tariff classifications;
- the collection of demands was accounted correctly and the personal ledgers updated automatically;
- the system was generating accurately the reports required for day to day function of the Sections; and
- access to the System was restricted to authorised users.

Audit criteria

3.2.5 The audit criteria were as follows:

- business rules of the Board relating to preparation of demands and notifications relating to tariff revision;
- registers prescribed by the Board for recording amendments in billing parameters; and
- electronic data through data extraction and queries to assess the data integrity, accuracy and completeness.

Audit findings

The findings of audit are discussed in the succeeding paragraphs.

Software development

Delay in executing agreement with Pricewaterhouse Coopers (PwC)

3.2.6 The Board decided (January 2003) to select SQL Server as the database and Windows 2000 server as the Operating System (OS). This was in consideration of the offer of Microsoft to develop the required software through PwC, free of cost. Though the Board accorded sanction (January 2003) for signing a tripartite agreement among the Board, Microsoft and Pricewaterhouse Coopers (PwC), the agreement was executed only on 25th February, 2004.

Preparation of System Requirement Specification (SRS), development and customization of program acceptance testing and training were the responsibility of PwC. There was, however, no indication of the involvement of PwC or Microsoft after signing the agreement in February 2004. As the LT Billing System was introduced in Vellayambalam Section during December 2003 and the software required for introduction of the System in 80 sections was procured as early as in March 2003, there was no justification for signing an agreement with PwC during February 2004. As the agreement was signed after the development of software and no time frame was prescribed, audit could not ascertain whether PwC delivered all the components of the software in time and provided system support during implementation.

The Management stated (August 2006) that the software development started immediately after the Board's decision and PwC had associated with the Board, IT team all through the System Development Life Cycle and the delay in actual signing of MoU was due to the delay in getting draft MoU vetted by the Law Department of the Board and the other two firms.

It was, however, observed in audit that many deficiencies in the software remained to be rectified leading to defective billing as described in the succeeding paragraphs. This was evidently due to the absence of involvement of PwC for enhancement/customization of program.

Absence of provisions in the LT Billing System

3.2.7 Though Jyothi 1.0 was introduced in December 2003 and was modified thrice thereafter, the following essential provisions were still lacking in the system:

- Provision to capture the parameters relating to Energy Audit.
- Provision to capture the data relating to installation of capacitors by Industrial consumers.
- Facility to generate reports of revenue such as Monthly Report of Revenue required to be forwarded to the Division.
- Provision to store Meter reading exception Report, Consumption comparison report, invoice comparison report in respect of spot bills etc. generated by the system for scrutiny during audit.
- Audit module to generate queries or reports for various audit purposes by the Internal Auditors and External Auditors.

The Management stated (August 2006) that Energy Audit Module would be included after Feeder Meter, Boundary Meter etc. are installed for the purpose; Sales Revenue Data Module would be operationalised shortly and most of the additional reports required would be included in the next version. It further stated that an Audit Module would be incorporated in the next version.

System implementation

Delay in computerisation of the distribution sections

3.2.8 A Memorandum of Understanding (MoU) was signed on the 20th August, 2001 between the Ministry of Power, Government of India and the Government of Kerala to reform the power sector in Kerala under the Accelerated Power Development Reforms Programme (APDRP). As per the MoU, the Government of Kerala had to undertake computerisation of accounting and billing in towns by March 2002. As per the Memorandum of Agreement (MoA) signed (October 2002) between the Secretary, Ministry of Power and the Chairman, KSEB, the process of setting up the computerised billing centers was to be completed by March 2004 in three phases.

Even though computerisation of 80 sections was scheduled to be completed by March 2003 in the first phase and supply order was placed on 24th March, 2003, the application software was ready only by December 2003. Against 200 Sections scheduled in the 2nd phase, supply order for purchase of hardware was placed only for 97 Sections during December 2003. Moreover, computerisation of the third phase of 280 sections scheduled to be completed by March, 2004, and the remaining 103 Sections in the second phase has not started (June 2006). As the implementation of computerisation had not been extended to the remaining Sections, one of the objectives of APDRP scheme viz., to enable the Board to conduct effective Energy Audit, could not be achieved so far (July 2006).

The Management stated (July 2006) that the delay in implementation of computerisation was due to time taken for various procedures connected with the procurement.

Delay in introduction of Personal Digital Analyzer for LT Billing

3.2.9 The Project Proposal submitted by Microsoft contemplated the use of Pocket PCs suitable for roaming user to help the meter reader to generate accurate bills at the door step of the consumer. The Scoping Document and User Manual also contemplated uploading of spot Bill data from Personal Digital Analyzer (PDA) a hand-held billing device to download data from the system, print demand and upload demand details into the system. The Board introduced two PDAs on trial basis at Vellayambalam Section to facilitate calculation of Energy charges and printing of invoices on the spot in order to reduce human intervention and avoid error due to data entry. The PDA was, however, not being used in the Section. There was no documented reason for discontinuing the use of PDA.

It was noticed that computer generated bills were served to only less than five per cent of the consumers who were billed monthly and who accounted for 45 per cent of LT revenue in each Section. In these cases, meter reading was fed into the computer and demands were generated by the system. In respect of 95 per cent of consumers, who were mostly domestic consumers covered by bi-monthly billing, the details of meter reading based on which manual bills were

prepared by the Meter Readers and the details of demand were subsequently fed into the system. This involved additional manpower for data entry, causing two to three days delay in data entry to facilitate cash collection, thereby reducing the seven days' time limit given to consumers for such remittance. Moreover manual input by the meter reader and subsequent data entry by the Senior Assistant increases the risk of data entry error and data manipulation.

While selecting the Microsoft product for LT Billing System, Government desired the device integration at Meter Reader level. However, in the absence of PDA, LT Billing System was reduced as a tool for compilation of collection. If the Board had taken steps to introduce PDA in all the computerized Sections, there would have been a saving in manpower to the tune of two Senior Assistants per Section. In cost terms the savings would have been Rs.2.40 lakh per Section per annum against the investment of Rs 2.50 lakh per Section towards PDA.

The Management stated (August 2006) that the Computer System was fully equipped to implement PDA billing and the field trial at Vellayambalam was successful. It was also stated that full implementation can be carried out once the Board takes a Policy decision in the matter. The reply is not tenable as a Policy decision in this respect should have been taken immediately after successful trial run for effective implementation of computerisation.

Application control

3.2.10 Any IT System should have Application controls to ensure the proper authorization, completeness, accuracy and validity of transaction. This comprises of Input and Process Controls. Analysis of data relating to six Sections using Computer Assisted Audit Technique revealed the lack of Input control and Process control as elucidated below:

Input control

Input controls are essential to ensure that the data received for processing are genuine, complete, accurate and properly authorized so as to prevent incorrect or fraudulent data entry. If input of consumer details, billing parameters such as

meter reading, tariff category are not proper, it would adversely affect the reliability of data. Deficiencies noticed in audit with reference to absence of input control are discussed below:

Reduction in demand through Invoice correction

3.2.11 The demands generated by the system are revised using the provision for Bill correction based on complaints or otherwise. A scrutiny of the data relating to bill correction revealed that there was substantial reduction in demand in all the Sections covered in audit. As the fields such as calculated amount, billed amount and payable amount are replaced by the corrected value in the database and the consumption or meter reading based on which such invoice amount was altered was not entered in the database, there was no audit trail to verify the corrections. Though the corrections made were to be written in " Invoice Correction Register" there was no documentary evidence in support of such invoice correction. In the absence of such documentary evidence the corrections made could not be vouchsafed in audit.

The reduction in demand was to the tune of Rs 70.71 crore in six Sections in two years. Annexure 13 indicates the magnitude of reduction in demand compared to the total collection which ranged from 17 per cent to 106 per cent.

Test check in audit of a few invoices revealed that the Bill corrections register from January 2006 onwards maintained in West Hill Section did not indicate whether the corrections had been authorized by Senior Superintendent or Assistant Engineer. Out of 4407 invoice corrections, energy charge was reduced to zero in 1097 cases without authority. For example in the case of a consumer, the meter was not readable and hence the system generated a bill for Rs. 1,96,659 based on average consumption. The bill was, however, reduced to Rs. 1,805 charging only fixed charge and meter rent. No amount was realised towards energy charge. There was also no report as to whether the Assistant Engineer had conducted field verification and confirmed that there was no consumption.

Generation of highly inflated demands based on abnormal consumption was one of the factors contributing to substantial reduction in demand. This was due to absence of proper control over recording of meter reading or calculation of consumption and as a result the consumption based on which energy charges were calculated exceeded the maximum possible consumption with reference to connected load. In West Hill Section such abnormal demands were noticed in 948 invoices relating to industrial/commercial consumers.

Repeated Invoice correction due to failure to rectify System data

3.2.12 It was observed in audit that invoice correction in the Distribution Section, West Hill, Kozhikode involved reduction in demand to the tune of Rs.20.73 crore. Scrutiny of the database revealed that invoices of the same consumers were repeatedly corrected. Out of 6141 invoice corrections in respect of 3429 consumers carried out during the last two years, invoices were corrected on five to 28 occasions in the case of 180 consumers. It was also noticed that repeated corrections (on 28 occasions) were made in respect of the invoices issued to one consumer.

An analysis of the causes of correction in respect of selected consumers revealed that the repeated correction became necessary due to the failure to modify master tables relating to Multiplication Factor, Meter Status and Meter Reading. This was evidently due to the absence of proper training to staff especially at Assistant Engineer/Senior Superintendent level, who were expected to analyse the cause of correction and ensure timely rectification of the defects so that such mistakes did not recur.

The Management stated (August 2006) that the errors should have been rectified in the first occasion itself. It was also stated that Human Resource Development wing had been requested to arrange further training to staff and a circular was being issued to impose more control.

Incorrect data capture in respect of Cash Deposit

3.2.13 The consumers seeking Electricity connections are required to remit Cash Deposit (CD). Test check of the details of CD amounts in respect of LT IV

(Industrial) consumers in the Electrical Sections of Kaloor, West Hill, Chottanikkara and Thiruvalla in the System with the manual CD register revealed that the amounts in the system did not tally with the corresponding entries in the Manual CD register in 292 out of 1217 cases checked involving excess accounting of Rs.7.66 lakh in two Sections and short accounting of Rs.2.52 lakh in the other two Sections.

As per the instructions governing back data entry issued by the Board, Senior Superintendent/Asst. Engineer(AE) was required to validate data entry and forward a Compact Disc containing back data along with a certificate to the effect that the data was verified and found to be correct. In view of the discrepancies noticed in large number of cases test checked it is evident that Supervising Officers failed to discharge their duties and hence the data in the system is not reliable for the purpose of additional CD collection or crediting of interest on the deposits to the Consumers account.

The Management stated (August 2006) that the responsibility for maintaining accuracy of data was with the Data Manager viz., AE of the Section.

Short collection of Cash Deposit

3.2.14 As per clause 13(4) of Kerala Electricity Supply Code, Cash Deposit should be not less than three times the monthly current charges for bi-monthly billed consumers and two times the monthly current charges for monthly billed consumers. Wherever there was shortfall in CD, the Sections were required to raise demands for Additional Cash Deposit (ACD). Analysis of data relating to CD/ACD collection in Vellayambalam, Fort, Alappuzha, Thiruvalla and West Hill Sections revealed that CD was zero in certain cases. It also included nominal entries like one rupee, 10 rupee much less the monthly minimum of Rs. 85 payable by LT I consumers. Though there exists provision in the package for Mass Additional Cash Deposit calculation based on 12 months moving average of invoice, none of the Sections covered in audit raised ACD demand using the facility. As a result there was a short recovery of CD to the tune of Rs. 13.37 crore in six Sections.

The Management stated (August 2006) that CD details of very old consumers and those migrated to other sections were not available and ACD demand would be issued as per rules.

Irregular marking of bills as disputed

3.2.15 As per the User Manual bills can become disputed vide Court Orders or as mutually accepted between the Board and the consumer. In case of dispute about metering equipment the meter should be replaced and the old meter sent for Technical Examination. On receipt of the Report the bills issued during the period of dispute would be examined and revised, if necessary. Audit scrutiny revealed that the report of litigation cases (Disputed Bills) under category LT VIIA generated through the system in Kaloor section contained 83 invoices involving Rs.9.07 lakh, but none of these related to 'court case' or ' awaiting technical examination report'. Moreover the bills marked as disputed were seldom followed up and released. It was also noticed that in West Hill Section 747 invoices were treated as disputed. No register of disputes was, however, maintained to watch the progress and to revoke the invoices intended for collection. In majority of the cases the reasons recorded in the system fell under the category " Wrong Bill". The practice followed by the Section in keeping invoices under disputes without proper authority was irregular and leads to delay in collection of dues. Due to irregular marking of demands as disputed and failure to revoke the demand, an amount of Rs.41.32 lakh was pending collection from Industrial consumers alone.

The Management stated (July 2006) that the procedure followed by the Sections was incorrect and such weaknesses in internal control would be addressed.

Lack of supervisory control over collection through manual receipts

3.2.16 As per User Guidelines, cash collection shall be done manually by issuing the manual receipts in the event of a system failure. As soon as the System is restored, all the collection taken manually should be entered in the system by the cashier and all corresponding reports taken. Audit scrutiny of the manual

receipts issued by the cashier revealed serious irregularities such as failure to account certain receipts, delay in accounting of receipts and use of manual receipts even on the dates on which there was no disruption due to System failure. The details are given in ***Annexure 14.***

It is evident that the Senior Superintendent responsible for checking daily cash collection and accounting for the same failed to discharge their duty leading to temporary misappropriation of collection.

Absence of validation controls in data entry relating to demands

3.2.17 Invoice date, Invoice due date and disconnection due date are important parameters which affect calculation of fine, interest, disconnection etc. Audit scrutiny revealed that disconnection due date was on future date like 2008 in 20 cases and on much earlier dates in 102 cases (12th October, 1900) in West Hill Section; Invoice date was found to be later than Invoice due date in 130 records in five sections. This indicated that the due dates were not taken from the Billing cycle table and the system permitted arbitrary input of due dates.

Process control

Incorrect generation of report on Sale of Power (SOP)

3.2.18 There is a provision in the system for generating tariff category-wise summary of demand, collection and balance Report (SOP 14) of all consumers in the Section. It was, however, noticed in audit that the report generation relating to balance was incorrect as the system failed to include previous months CB as arrears in the report of the next month. Hence the balance pending collection in Thiruvalla Section was displayed as negative. The DCB Statement for the month of April 2006 generated from the system in the West Hill Section did not contain the figures for the opening balance, total demand and the balance. The number of consumers (14000) in the report was also largely understated (550). The figures of consumption also included abnormal consumption ignored for computation of energy charges.

As against an amount of Rs.1.86 crore pending at the end of April 2006 in Alappuzha North Section as per SOP 14 report, the sum of outstanding invoices pending collection was Rs. 44.63 lakh. Thus, the reports generated by the System did not reflect the correct position of balance pending collection.

The Management stated (August 2006) that the tariff-wise break-up of arrears of non-domestic consumers could not be correctly worked out from manual records to include arrears. The reply is not tenable in view of the fact that all the pre-system bills pending collection as on the specified date for switchover to computerisation were required to be entered into the System, but the Sections failed to comply with the instructions.

Failure to demand tariff minimum charge from domestic consumers

3.2.19 Notification relating to tariff rate for LT consumers issued in October 2002 stipulated payment of minimum charge of Rs.30 for single phase domestic consumers and Rs.170 for three phase consumers. It was noticed in audit that the system failed to generate the minimum tariff charge of Rs.405 in respect of bi-monthly bills of several Phase 3 domestic consumers and Rs.85 of phase one domestic consumers leading to short demand of Rs.2.67 lakh in five Sections.

Failure to link tariff classification to purpose of use

3.2.20 Electricity Tariff rate applicable to individual consumers is based on their tariff categorization according to purpose of use. Consumer category table contains a field to indicate the purpose for which power supply is used and another field stores corresponding tariff category in which the particular consumer is included.

Audit scrutiny of the Consumer category table in West Hill Section revealed that the tariff category assigned and the purpose of usage had no proper linkage as shown below:

- Consumers categorized as domestic included consumers who had taken connection for industrial, agriculture and commercial purposes, Government Offices, educational institutions etc.
- Among 275 categorized under tariff for Industrial consumers, there were three consumers who had taken connection for commercial purpose and one for domestic purpose.
- Thirty four consumers categorized under tariff rate applicable for Agriculture connections included consumers who had taken connection for domestic and commercial purposes and Educational Institutions.
- Same type of Institutions has been grouped under different categories.

Similar misclassification of tariff was noticed in other Sections. Wrong categorization of consumers leads to loss of revenue to the Board/Government due to application of lower rate for energy charge, fixed charge and electricity duty. Notwithstanding the absence of a built-in provision to assign tariff code with reference to purpose type code and reassign tariff as and when purpose code is changed, the Assistant Engineers should have taken special care in assigning tariff code.

The Management stated (August 2006) that the consumers have been assigned appropriate tariff category but there was omission to update the purpose type code whenever there was change in purpose of use. It was also stated that the properties 'purpose', 'tariff', 'user' and 'consumer category' would be linked to prevent such mismatches in the database.

Non reckoning of unit of connected load for billing

3.2.21 Connected load is the basis of levy of Fixed charge from non-domestic and industrial consumers. The total connected load of the consumer is

stored in Customer Connected load table with the unit of connected load recorded in Watt or KW. Audit scrutiny revealed that in majority of the cases the load was shown according to the wattage of connection with the unit shown as KW. It was further noticed that if a consumer had a connected load of five KW, then in the system it would be shown as 5000 KW. As a result the total connected load of all consumers in a Section itself exceeded the total generating capacity of the Board, an obvious impossibility.

Lack of control over calculation of consumption

3.2.22 The system has provision to capture closing reading and opening reading, meter condition and bill cycle during monthly/bi-monthly billing. Closing reading of previous month becomes opening reading of next month and the opening reading is printed in the spot bill. In the case of Door Lock both opening and closing reading will be the same. In the case of Meter exchange initial reading of the new meter and final reading of the old meter are to be captured in Consumer Meter table. Audit scrutiny of the table in West Hill Section revealed the following:

- Calculation of consumption was not equal to previous reading minus present reading in 27682 records. These included 3777 door locked cases where both readings should be equal, and 18253 cases categorized as "Available and accepted". As the processing logic should be consistent for all cases, the exceptions indicate that authorized but invalid or unauthorized changes made into the system cannot be ruled out.
- Calculation logic was based on actual consumption in 2,10,507 records, based on average consumption in 7782 records and blank in 4973 records. Moreover out of the cases where consumption was recorded as based on average, meter condition was depicted as OK in 6954 records. Out of 4933 where calculation logic was blank, in 4903 cases meter condition was also shown as OK. Thus, clearly when the meter

was OK, the system generated bills on average consumption only and should be rectified.

Similar discrepancies were noticed in audit in all the Sections covered. This indicated that the system lacked control over calculation of consumption.

Incorrect generation of disconnections list:

3.2.23 The Disconnections list generated from the System at West Hill as on 15th May, 2006 showed that 196 consumers were due for disconnection for non payment of arrears. Audit scrutiny revealed that the list contained many duplications and that only 37 consumers were actually due for disconnection. These included eight consumers with arrears of Rs.3,14,136 who had defaulted for more than six months. As a result, the consumers appeared in both the 'Disconnection List' and the list of 'Consumers Defaulted for more than six month'.

The Management stated (August 2006) that the disconnection list generated by the system was not believable and hence the Section relied on manual Consumer Personal Ledger for disconnection.

Deficiencies in consumer data

Incomplete data relating to consumers

3.2.24 Customers' table contains the details of consumers in the Section. A scrutiny of the database revealed that some of the connected consumers were shown as not billable though as per user manual, all connected consumers would become billable automatically on first meter reading entry.

It was also noticed that some of the dismantled consumers and consumers who had closed their account were also shown as billable. Thus, the system did not have control to ensure that all connected consumers were billed without fail.

The database contained several records where the name of consumer was blank. Due to absence of input validation junk characters were also seen entered against the name. The database also included several records where consumer's

permanent/temporary address was blank. Section-wise position is indicated in **Annexure 15**

Due to improper maintenance of database, the number of consumers actually connected and their name and address could not be correctly ascertained from the system thus seriously limiting the data's usefulness as MIS.

Improper grouping of not-traced consumers as Dismantled consumers

3.2.25 As per instructions issued at the time of switch over to computerisation, all 'not traced connections' were to be included under dismantled category. Consumers are dismantled on specific request or if disconnected for six months due to failure to remit dues. As the date of the dismantling field was zero in most of the records, it is evident that proper verification was not conducted at the time of switch over to the computerised system or thereafter. As the list included known consumers like Government Offices, High Schools etc., the possibility of genuine consumers having escaped billing cannot be ruled out.

The Management stated (August 2006) that the dismantled consumers included those transferred to nearby Sections on forming new Sections. Such consumers should have been verified and excluded from the database at the initial stage of computerisation.

Lack of integrity of customer data

3.2.26 Customer ID is a unique field generated by the System to identify a consumer. These codes are to be protected against modification and deletion to ensure the integrity of the database. Audit scrutiny revealed that there were several gaps in the Customer ID in the Customers table and the customer related table as per details given in **Annexure 16.**

Invoice No is another unique number generated by the System to identify the invoice of a consumer. Scrutiny of the database relating to demands revealed that

there were several gaps in Invoice Number involving 7218 missing invoices in five Sections.

Continuity of invoice numbers and validation of due dates are important parameters for billing. Missing numbers indicate possible back end deletion of records of demand without authority compromising IT security and integrity of database.

The Management stated (August 2006) that there was provision for deletion of records at the early stages on cancellation of Reconnection Fee and Surcharge Bills, but the provision was removed later. The reply is not tenable as it was noticed that the facility still existed in the front-end in respect of ex-system bills and pre-system bills. Facility for deletion of records which obliterates the audit trail was not conducive to data security.

In view of the varying number of records and missing unique ID the information generated out of the System was not reliable. Deletion of records of receipt could be a result of misappropriation of collection. Though as per User manual, access to database is denied to users in the Section, the integrity of the system appears to have been compromised through unauthorised back end correction.

Discrepancies between manually prepared and system generated reports

3.2.27 The Section office is required to prepare a number of statements like Demand Collection Balance (DCB) statement, Monthly report of revenue collected, disconnection list, Government Building arrears, etc., for onward transmission to the Divisional office. Even though some of the reports could be generated from the System, the West Hill Section was relying only on manually prepared reports. A comparison of the manually prepared reports and the system-generated reports revealed the following discrepancies.

Government Building Consumer Arrears Statement:

- The total arrears as per the computer generated report in West Hill Section as on 15 May 2006 was Rs.4,63,861 (in respect of 17 consumers) but the manual report showed the arrears as Rs.2,95,059 (in respect of four consumers). Thus, 13 consumers included in the System did not find a place in the manually-prepared list.
- The Report generated in the Electrical Section, Alappuzha (North) on 2 May 2006 indicated that only Rs 1,578 was due from the Kerala Water Authority (KWA). It was noticed that as per the Statement 'Current charge arrears from Government Departments and Public Sector Undertakings' of March 2006 prepared by the Section for onward transmission to the Divisional Office, the dues from the KWA amounted to Rs.1,44,04,478. Audit scrutiny revealed that the consumers were wrongly categorized as " Ordinary Consumer" instead of KWA consumer and hence the arrears of these consumers did not reflect as arrears due from KWA.

DCB Statement

- Figures in respect of Demand for the month of April 2006 (Rs.85,32,400.21) and the Total Demand generated (Rs.83,43,048) from the System at West Hill Section also differed from the figures prepared manually. Similarly, against the total collection of Rs.79,04,801 for the month of April 2006 as per the manual DCB, the collection as per the System generated DCB was Rs.89,38,525.98.

Thus, the Board failed to ensure that the output generated, was complete and accurate.

General IT controls

Inadequate IT Security

3.2.28 The Board has an IT Security Policy for the security of IT Assets, including data. The following lapses were noticed in audit:

- Absence of a well defined and documented Password Policy leading to sharing of password of the Senior Superintendent (SS) by the Senior Assistants and Daily wage staff.
- Failure to disable the access right of the retired/transferred employee facilitating unauthorized access to the System.

Thus, inadequate access control rendered the system vulnerable to unauthorised access and data manipulation.

The Management stated (July 2006) that a comprehensive training programme covering all aspects of IT Security was scheduled to begin shortly and after training the security environment would improve. It was also stated that a comprehensive password Policy would be formulated and circulated shortly.

Absence of segregation of duties among IT staff

3.2.29 It was noticed in audit that no officers were separately entrusted with the duty of System Development Manager, Librarians, Security Administrator and Network Manager. Though no user in the Section Office has right to access database, several back end corrections in data were noticed during audit. The person responsible for back-end correction could not be identified as the role of Database Administrator (DBA) in respect of Sections has not been specifically assigned to any person.

Failure to adhere to stipulated backup procedure

3.2.30 Audit scrutiny revealed that no external backups were being taken during the last several months in the Alappuzha North Section, as the tape drive was defective and there was no CD drive. There was no Back up Register at the Vellayambalam Section.

The absence of regular back up enhances the risk of inability to provide continuous computing services and increase the risk of unauthorized changes to the backup database.

The Management stated (August 2006) that a circular was being issued to all Assistant Engineers reminding them on the importance of back up.

Ineffective Internal Audit

3.2.31 Regional Audit Offices under the Chief Internal Auditor are responsible for the audit of revenue collection in the Distribution Sections of the Board. Consequent upon the introduction of computerisation and the discontinuance of manual records, the Internal Audit wing could not conduct audit effectively as the staff were not trained in the use of LT Billing System and there was no audit module in the software. Though the Auditors Manual prescribed certain procedure/checks to be followed/conducted in computerized Sections, it was noticed in audit that such checks were not carried out.

As such the comments in Internal Audit Reports were confined to short recovery of FC due to failure to instal capacitors and non installation of separate light meter, etc., based on manual ledgers. Though short collection of energy charges due to wrong application of tariff etc. could have been detected by adopting Computer Assisted Audit Technique, no such step was taken. As the inaccuracies in the Billing parameter entries and tariff categorisation would result in repeated incorrect bill generation and the existing rules did not permit raising of additional demand in respect of past cases, the Board has lost substantial revenue due to delay in conducting internal audit in the computerized Sections. It was also noticed that there was also no machinery to monitor user logs to detect unauthorised modification of data, making the system vulnerable to misuse.

The Management stated (August 2006) that additional reports suitable for audit would be incorporated.

The above matters were reported to Government in August 2006; their replies are awaited (September 2006).

[Audit Paragraph 3.2.1 - 3.2.31 contained in the Report of C&AG for the year ended on 31st March 2006].

Audit Paragraph 4.14 to 4.16, 4.19 to 4.21 (2005-06)

4.14 *Undue benefit*

Granting of rebate in contravention of the provisions of the agreement and in violation of the formula prescribed for maximum demand relief resulted in extending undue benefit of Rs.1.12 crore to a private party.

As a part of the Government decision (December 1989) to allow private captive hydel generation of power, the Board entered into (December 1994) an agreement with Indsil Electrosmelts Limited (IEL), a private entrepreneur, for the generation of power at Kuthungal hydro Project in Idukki district. The project was commissioned by IEL in June 2001. The monthly energy generated from the project and fed into the Board's grid was to be metered and the Board had to deliver this energy less 12 per cent towards wheeling charges and transmission and distribution loss, free of cost to IEL and its nominated associate. By virtue of the contribution of the power into the Board's grid, the Board should grant relief in maximum demand to IEL as per the prescribed formula under clause 14(a) of the agreement.

As per the formula the relief had to be worked out by taking 30 days as base for all the months and the number of days to be reckoned for granting relief should not include the days on which generation of power could not be made by IEL due to unavoidable reasons. Further, if there was no generation continuously for a period exceeding 15 days, no relief in maximum demand should be granted.

It was noticed in audit that IEL had not generated power continuously for 27 days each in March and April 2005 and the actual production was for four days and three days respectively. The Special Officer (Revenue) of the Board, however, deviated from the above contractual provisions relating to continuous non-generation for a period exceeding 15 days and extended ineligible maximum demand relief for 5368 and 5355 KVA respectively during these months. The undue benefit extended to IEL on this account worked out to Rs.27.88 lakh.

It was further noticed that relief was extended to the generating Company on maximum demand of 0.32 lakh KVA due to reckoning the maximum number of days in the month as actual generating days instead of 30 days prescribed as base in the formula included under the agreement. The excessive relief granted on account of this for non-generating days at Rs.260 per KVA (as per latest tariff revision of October 2002) for the period from December 2002 to June 2005 worked out to Rs.83.90 lakh.

Thus, granting of rebate in contravention of the provisions of the agreement and in violation of the formula prescribed for maximum demand relief resulted in extending of undue benefit of Rs.1.12 crore to a private party.

The matter was reported to the Government/Board in May 2006; their reply is awaited (August 2006).

4.15 *Undue benefit*

The Board failed to invoke reduction in prices on belated supplies and also refunded the liquidated damages levied in terms of the contract which resulted in undue benefit of Rs.1.06 crore to the supplier.

In order to meet the urgent requirement of energy meters to be used in distribution of power, the Board placed (31 March 2003) four purchase orders for supply of five lakh single phase static energy meters on four suppliers including Omni Agate Systems (P) Limited (OAS), Chennai, who was to supply 1.5 lakh meters at the rate of Rs.342.41 (all inclusive) for Central Region of the Board. Fifty per cent quantity was to be supplied within 30 days (i.e., by 29 April 2003) and the balance within 60 days (29 May 2003) from the date of purchase order. All the firms except OAS completed the supply within the delivery period. OAS supplied 1.10 lakh meters in July 2003 and 40,000 meters in August 2003 after the expiry of the scheduled delivery period. The terms of purchase provided (Clause 28) that the price of materials supplied after the scheduled delivery period would be adjusted taking into account the market price on the date of actual supply or the order price, whichever was lower.

It was observed by Audit that in response to the subsequent tenders invited in July 2003, the offer received (1 August 2003) for the supply of meters to the Central Region was Rs.256 per meter (all inclusive). Hence 40,000 meters received during August 2003 should have been paid at the revised rate of Rs.256 per meter in terms of the contract. The Board, however, did not invoke the above provision to adjust Rs.34.56 lakh towards price variation (Rs.342.41 - Rs.256) for 40,000 meters thereby making avoidable payment to the contractor.

Further, as per clause 15 of the purchase order, non-adherence to delivery schedule attracted liquidated damages at the penal rate of five per cent on the value of meters supplied belatedly for every week of delay.

Despite two weeks' extension of delivery period granted by invoking the force majeure clause on account of a transporters' strike, the entire quantity of 1.5 lakh meters was supplied after delays ranging from 40 to 67 days. Consequently, the Board deducted (August to October 2003) an amount of Rs.1.10 crore from the supply bills towards liquidated damages.

It was noticed that one and a half years after the recovery of liquidated damages, the firm made a request (April 2005) to the Government to condone the delay on the ground that the transporters' strike had affected production even beyond the period of the strike. The Board considered the firm's request and decided (May 2005) to restrict the liquidated damages to a maximum of 10 per cent and refunded (July 2005) an amount of Rs.71.25 lakh out of Rs.1.10 crore already deducted.

The Board's decision lacked justification, since the other three firms on whom orders for supply of 3.50 lakh meters were placed on the same date with the same terms and conditions, had supplied the entire quantity within the delivery schedule, without any extension on account of the transporters' strike.

Thus, failure of the Board to invoke reduction in prices on belated supplies and refund of the liquidated damages levied in terms of the contract resulted in undue benefit of Rs.1.06* crore to the supplier.

The Government stated (June 2006) that the price in the subsequent fresh tender was known to the Board only after completion of the supply and therefore the meters supplied after delivery period were accepted at the ordered rate. As regards non-levy of liquidated damages without ceiling, it was stated that no loss had been noticed due to the delay in supply of meters and that there was sufficient stock of meters during the period March to August 2003.

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* Rs. 34.56 lakh + Rs. 71.25 lakh.

The reply is not acceptable since the rate applicable on the date of submission of the bid on 1 August 2003 was known to the Board before making final payment against invoices, yet the prices were not re-fixed as envisaged under the contract. In the case of liquidated damages the action of the Board in re-opening the case and accepting the request of the firm and releasing LD amount recovered after 1 ½ years of the supply contract, does not appear to be justifiable. If the Board had sufficient stock, the procurement at the higher rate of Rs.342 per meter itself could have been avoided since the subsequent rate was only Rs.256 per meter.

4.16 *Misutilisation of funds*

Incentive funds released by the Government of India for development of Power Sector was misutilised for payment of donation and gift resulting in non-productive expenditure of Rs.2.50 crore.

Accelerated Power Development and Reforms Programme (APDRP) of Government of India envisaged upgradation of sub-transmission and distribution system in densely electrified zones in the urban and industrial areas and improvement in commercial viability of State Electricity Boards. The guidelines issued (June 2003) by the Government of India (GOI), Ministry of Power, in this regard provided for incentive component to encourage/motivate utilities to reduce cash losses.

According to the 'Incentives Scheme', the State Government would be given incentive in the form of grant upto 50 per cent of the actual total loss reduction by State Electricity Boards (SEBs)/Utilities and the State Government would release the funds to the State Power utility within a week of the said amount being credited to the Government account. The year 2000-01 was stipulated to be taken as the base year for calculation of loss reduction. The grant released under incentive component was to be utilised for improvement of power sector only.

The Government of India sanctioned (2005-06) Rs.64.94 crore to the State Government under APDRP towards incentive grant for the period up to 2002-03 and the amount was received in October 2005 and March 2006.

Ignoring the specific directions contained in paragraph 7 of the guidelines for utilisation of incentive amount for improvement in power sector only, the Board accorded sanction (June 2005) to donate Rs.one crore to Malabar Cancer Society, Kannur and to give a gift of Rs.400 each to all the employees of the Board who were in service during 1 April 2002 to 30 June 2005. Payment of Rs.one crore to Malabar Cancer Society, Kannur was made (November 2005) and an aggregate amount of Rs.1.50 crore was disbursed, (September 2005) as 'gift to employees'. As per Paragraph 10 (v) of the guidelines, diverted funds would be adjusted with 10 per cent penal interest, against the next instalment of Central Plan assistance to be released to the State Government in that year or in the subsequent year. Based on this the diverted amount of Rs.2.50 crore was recoverable and interest payable thereon for the period from July 2005 to July 2006 worked out to Rs.27 lakh (at the rate of 10 per cent for 13 months on Rs.2.50 crore).

Thus, incentive funds released by the Government of India for development of power sector was misutilised for payment of donation and gift resulting in non-productive expenditure of Rs.2.50 crore.

The Government stated (May 2006) that there was no diversion of funds as the donation was to an organ under the control of the Department and the gift was given to the employees of the Board within the power sector only. The reply is not acceptable since as per the programme approved by the Government of India the grant under incentive component shall be utilised for improvement in power sector only. Neither the donation to a society nor the gift to Board employees could be considered as a utilisation for improvement of power sector.

4.19 *Avoidable expenditure*

Failure of the Board to terminate the order in time and recover the additional cost on alternate procurement of meters at the risk and cost of HPL resulted in avoidable expenditure of Rs.68.60 lakh.

The Board placed an order (11 March 2004) on HPL Socomec (P) Limited (HPL), New Delhi for the supply of 2000 numbers of LT, CT operated 3 phase 4 wire static watt hour meter at the rate of Rs.1874.02 per meter for a total cost of Rs.37.48 lakh. As per the terms of the Order (Clause 7), delivery of the meters was to be completed within 60 days (9 May 2004) from the date of purchase order. Clause 12 of the purchase order further provided for the Board's right to inspect and approve the meters before despatch. The Board waived (July 2004) the pre-despatch inspection and the meters supplied (10 July 2004) after two months from the stipulated date of delivery did not pass the acceptance test. There were no reason on record for waiver of the pre-despatch inspection.

It was noticed in audit that eventhough HPL did not make supply within the scheduled time, the Board did not cancel the contract for failure to supply materials in time. Further, the opportunity for procuring the meters at risk and cost from the 2nd lowest tenderer (Elektron Energy Equipments (P) Limited) at Rs.2692.36 per meter was also not availed of within the validity period (4 June 2004) of the tender. The Board finally rejected (September 2004) the entire lot. As the firm did not replace the rejected meters, the purchase order was terminated (October 2004) at the risk and cost of the firm as per clause 4 and 13 of the agreement.

The Board re-tendered (October 2004) for procurement of meters of same specification and order was placed (January 2005) on Larsen and Toubro Limited, Chennai for the supply of 3500 meters to the Distribution (Central) region at the lowest negotiated rate of Rs.5397.47 per meter for a total value of Rs.1.89 crore. The additional expenditure incurred by the Board on procurement of 2000 meters worked out to Rs.68.60 lakh after adjusting Rs.1.87 lakh recovered through bank guarantee.

The purchase order placed on HPL was cancelled on 4 October 2004 after a delay of three months from the date of supply. Only after this was pointed out (October 2005) by Audit, the claim for additional expenditure of Rs.70.47 lakh from HPL on account of the risk and cost clause was preferred (28 November 2005). HPL refused (January 2006) to bear the risk and cost on the ground that the meters rejected by the Board were perfectly alright when taken back and the Board had not intimated how the meters were defective. No legal action was initiated (April 2006) by the Board as per the terms and conditions of the contract.

Thus, the failure of the Board to terminate the order in time and recover the additional cost on alternate procurement of meters at the risk and cost of HPL resulted in avoidable expenditure of Rs.68.60 lakh.

The Government stated (August 2006) that the District Collector had been requested to initiate revenue recovery action against the firm to realise the amount of Rs.68.60 lakh.

4.20 *Undue benefit*

Improper decision of the Board to deviate from contractual provisions resulted in undue benefit of Rs.20.55 lakh to the supplier.

The Board placed orders (February 2004) on Capital Power Systems Limited, Noida (CPS) for supply of three lakh single phase static meters at an all inclusive rate of Rs.204 per meter. The meters were intended to meet the urgent requirement for the replacement of mechanical meters under Accelerated Power Development and Reforms Programme (APDRP). As per clause 3 of the purchase order, the price was firm and statutory variation in taxes and duties during the scheduled delivery period was to be borne by the supplier. The scheduled date of completion of delivery was 6 May 2004.

The Government of Kerala increased the entry tax from 8 per cent to 13.8 per cent with effect from 1 April 2004. Despite the contractual stipulation the Board decided (April 2004) to bear the statutory variations in taxes and levies in respect of tenders/purchase orders already issued by the Board. While issuing this

order, the Board ignored the fact that the tenderers had quoted for meters taking into account the future enhancement in taxes and levies. Based on the above orders CPS was allowed the benefit of enhanced rate of entry taxes in respect of quantities supplied in April/May 2004.

It was observed in audit that the Board rejected two offers at the time of tender evaluation on the ground that the quotes mentioned variations in taxes and duties to the Board's account. Further, in May 2004, orders were placed on two Delhi based firms at Rs.204 per meter all inclusive. Ignoring this, the Board, deviating from the contractual provisions, allowed the enhancement of 5.8 per cent in entry tax to CPS with effect from 6 April 2004. The actual additional payment so made for 187500 meters purchased during April/May 2004, worked out to Rs.20.55 lakh.

Thus, the injudicious decision of the Board to deviate from the contractual provisions and allow enhancement in taxes resulted in undue benefit of Rs.20.55 lakh to the supplier.

The Government stated (August 2006) that the clause regarding firm price with statutory variations to be borne by the supplier was included in the purchase order as a then existing common condition. Most of the suppliers had expressed their reluctance to accept the clause; the Board decided to amend the clause in April 2004. The payment of entry tax was stated to be made to CPS in accordance with the provision of this order. The reply is not acceptable since general provision of purchase amended in April 2004 was made applicable to the purchase order issued to CPS in February 2004 whereby the suppliers who had already loaded their quoted price for statutory variations were given undue benefit by way of re-imbursement of entry tax.

4.21 *Avoidable expenditure*

Failure of the Board to terminate the purchase order placed on NLE and negotiate with the second lowest tenderer within the validity period for procurement of the material at risk and cost resulted in avoidable expenditure of Rs.18.35 lakh.

The Board invited (November 2003) tenders for the purchase of 102.8 MT of Hot Dip Galvanised Hexagonal Heads Bolts and Nuts of various size. The validity of the offers received was four months (11 April 2004) from the date of opening (12 December 2003) of tender. Out of the six offers received the contract price of Rs.45.84 lakh offered by NL Engineers (P) Limited, Mohali (NLE) was accepted and orders were placed (17 March 2004) for 102.8 MT. The second lowest tender was that of India Steel Corporation, Kolkatta at Rs.50.01 lakh.

As per clause 12 of the general conditions of tender (March 2004) NLE had to furnish security deposit (SD) amounting to Rs.2.29 lakh and execute the agreement within 15 days from the date of receipt of purchase order. NLE neither executed the agreement nor paid the requisite deposit. Ignoring this the Board proceeded with the procurement. The materials were scheduled for supply within three months (16 June 2004) from the date of purchase order.

NLE supplied (May 2004) 36 MT of Bolt and Nuts which were rejected by the Board as the threaded portion of the Nuts was found rusted. Since the materials were neither replaced nor further supplies were made, the order was terminated (29 July 2004) at the risk and cost of NLE.

In order to supplement the requirement arising from non-supply of the material, the Board procured 37.5 MT of the material from Alsteel Industrials, Kollam for Rs.26.25 lakh in March 2005 and 65.3 MT from Spring Lock Industries, Vadodara at Rs.43.12 lakh in May 2006 at the risk and cost of NLE.

Thus, the total additional expenditure on procurement of material with reference to the price of NLE worked out to Rs.23.53 lakh. After adjusting the EMD of Rs.1.01 lakh given by NLE the actual loss worked out to Rs.22.52 lakh. As these purchases were at the risk and cost of NLE the Board lodged (December 2005) a claim for Rs.22.52 lakh on the firm. The firm refused to make payment and filed a legal suit against the Board advancing counter claim for Rs.4.77 lakh. The recovery of the claim of Rs.22.52 lakh is doubtful.

Since NLE failed to comply with the contractual provisions regarding SD and execution of agreement the procurement should have been made from the second lowest tenderer - India Steel Corporation, Kolkata, who quoted a total contract price of Rs.50.01 lakh and thereby saved Rs.19.36 lakh.

Thus, the failure of the Board to terminate the purchase order placed on NLE and procure the material from the second lowest tenderer within the validity period resulted in avoidable expenditure of Rs. 18.35 lakh (net of SD forfeited Rs.1.01 lakh)

The Government stated (August 2006) that as per orders issued (November 2001) by the Board no further negotiation with other tenderers to match with the price of the lowest tenderer should be made after opening of tenders. It was also stated that even though the firm had not executed the agreement they offered (April 2004) the first lot for inspection and hence there was no reason to believe that the firm would not execute the agreement before expiry of the firm period. The reply is not tenable since the audit observation is on the failure of the Board to procure the material from the second lowest tenderer at the quoted price of Rs.50.01 lakh invoking paragraph 23 (a) of the general conditions of tender as the NLE failed to execute the agreement; and not on negotiation and reduction in price in violation of existing orders of the Board. The offer stated to have been made by the lowest tenderer for inspection of first lot by April 2004 could not be considered as a substitute for formal agreement to be executed under the contract and furnishing of security deposit.

[Audit Paragraphs 4.14, 4.15, 4.16, 4.19, 4.20 and 4.21 contained in the Report of the C&AG for the year ended on 31st March 2006].

Audit Paragraph 3.1-3.36 (2004-05)

Introduction

3.1. The Hydro Electric Power Stations of the Board at Pallivasal (37.5 Mega Watt), Sengulam (48 Mega Watt) and Panniar (30 Mega Watt) were installed during the period 1940-1964. On the ground that the generators in the Power Stations had outlived their life, the Board signed (August 1995)

a Memorandum of Understanding (MoU) with SNC Lavalin, Canada for providing services and other resources to the Board for implementation of rehabilitation projects. This MoU was converted (February 1996) into consultancy agreements for renovation of Pallivasal, Sengulam and Panniar Power Stations and subsequently (February 1997) the supply of equipment and engineering services was also entrusted to SNC. The finally accepted (July 1998) cost of Rs.239.81 crore included foreign exchange component (Rs.149.15 crore), 85 per cent of which (Rs.126.78 crore) was to be funded by Export Development Corporation, Canada and the balance from the Board's own resources. On completion of the renovation (October 2001) all the Power Stations were expected to function at maximum efficiency level thereby avoiding losses due to major breakdowns, pre-arranged/emergency shutdowns of machines.

Scope of audit

3.2. The performance audit review conducted during the period January to May 2005 covers the conceptualisation, financing and implementation of the renovation work of Pallivasal, Sengulam and Panniar hydro electric Power Stations and their performance after completion of renovation.

Audit objectives

3.3. Performance audit of the project was conducted with a view to assess whether:

- the renovation was actually necessary;
- the financing by the external agency was beneficial to the Board;
- the procurement of machinery, equipment and services was carried out in a cost effective manner; and
- the performance of Power Stations after renovation was efficient.

Audit criteria

3.4. The basic audit criteria used for assessment was to evaluate whether:

- The project for renovation was undertaken after taking into account other new capacity addition programmes on the anvil.
- the opinion of the expert bodies on the necessity of renovation was obtained.
- proper and accepted procedures for identification of consultant and suppliers of plant and equipment were adopted and cost effective procurement was made.
- funding for the project was negotiated properly and cost of financing was optimum.
- cost of the project was comparable with that agreed/incurred for similar renovation/modernisation projects undertaken by the Board.
- the level of performance of renovated plant was more efficient when compared to pre-renovation performance.
- the renovated plant and machinery were of specified quality and efficiency.

Audit methodology

3.5. The methodology adopted for review of the various activities connected with planning of renovation projects, financing, implementation and performance after re-commissioning was:

- Review of minutes of the discussions held by the Ministerial delegation at Canada as well as that of the Board of Members.
- Scrutiny of consultancy agreements, Reports by the Central Electricity Authority, detailed project reports, agreements with suppliers and financing agencies, Cabinet notes and decision on foreign loan, generation data and technical information compiled by the Board.

Audit findings

3.6. Audit findings as a result of test check were reported to the Company/Government in June 2005 and discussed in the meeting of the Audit Review Committee on Public Sector Enterprises (ARCPSE) held on 27 July 2005,

which was attended by the Principal Secretary to the Government of Kerala, Power Department and the Chairman of the Board. The views expressed by the members have been taken into consideration while finalising the review.

Audit findings are discussed in the succeeding paragraphs.

Project description

3.7. Pallivasal, Sengulam and Panniar Hydro Power Stations are located in the Idukki District of the State of Kerala. Water from Kundala and Mattupetty reservoirs is utilised for power generation at Pallivasal. The Sengulam Power Station is dependent on Pallivasal since the tail water from Pallivasal is being pumped to the Sengulam balancing reservoir and used for generation of electricity. Panniar Power Station served by the Anayirankal and Ponmudi reservoirs, is located adjacent to the Sengulam power plant.

A flow chart showing the sources of water and locations of the three generating stations is given in **Annexure** 17.

Project formulation

3.8. The Board proposed (1990) to the Central Electricity Authority (CEA) the Pallivasal Rehabilitation Scheme for extension of the then existing facility with an under ground Power Station. CEA recommended (1992) that immediate replacement of the generating units of Pallivasal Power Station was not necessary, since the plant was in fairly good condition and suggested a new scheme of 60 MW as an augmentation of the existing scheme.

Panniar Augmentation scheme to improve the water inflow and increase the power generation by 29.43 MU, was also underway (1995). Similarly, Sengulam Augmentation Scheme for additional power generation of 85 MU was also under consideration of the Board. All the above augmentation schemes necessitated uprating of capacity of generators rather than renovation.

3.9. While the above schemes were under consideration/implementation, the Board, ignoring the recommendations of the CEA on the good conditions of the

Pallivasal Power Station, entered into (August 1995) a Memorandum of Understanding (MOU) with SNC Lavalin Inc, Canada (SNC) for establishing a joint venture association for carrying out rehabilitation of existing facilities, identifying the three Hydro Electric Projects at Pallivasal, Sengulam and Panniar for the first batch of renovation. As per the MOU, finance for the renovation was to be arranged by SNC from Export Development Corporation (EDC), Canada and Canadian International Development Agency (CIDA).

3.10. Feasibility of renovation of the three projects was studied (September 1995) by a retired Chief Engineer of the Board who was later identified by the Board itself as a consultant to SNC. Based on the consultant's report and further discussions, contracts were signed (February 1996) with SNC for providing technical services for management, engineering, procurement and construction supervision to ensure completion of the projects within three years. Based on subsequent discussions held (October 1996) by a delegation headed by the Minister for Electricity, Government of Kerala, the consultancy agreements were converted (February 1997) into fixed price contracts for supply of goods and services for the renovation at a cost of 67.94 million Canadian Dollars (CAD) (Rs.169.03 crore*). Arrangement of 85 per cent foreign financing by EDC was also included in the contracts. With the reduction in scope of supply of Panniar renovation work (7.52 million CAD) and consultancy charges (0.47 million CAD), the foreign exchange component finally agreed to be paid to SNC for supplies and services (July 1998) was 59.95 million CAD(Rs.149.15 crore), including total consultancy charges of 7.19 million CAD(Rs.17.89 crore).

3.11. The following were noticed in the project formulation and sanction:

- The renovation of the Pallivasal Power Station was taken up disregarding the opinion of CEA not to replace the generators and ignoring the improvement in performance factor of Pallivasal Power Station from 4.867 in 1981 to 5.466 in 1996-97 (The performance factor actually recorded during the post-renovation period of 2003-04 was only 4.588).

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* Conversion rate adopted as one Canadian Dollar equal to Rs. 24.88.

- Sengulam and Panniar Power Stations required enhancement in capacity. Instead the Board considered their renovation. The three schemes (Pallivasal, Sengulam and Panniar) proposed by the Board were sanctioned by the Government as a composite scheme.

- Prior to signing (August 1995) of the MoU the Board did not conduct a feasibility study justifying the necessity for undertaking the renovation. The proposal for renovation of Pallivasal, Sengulam and Panniar Power Stations was not prepared and submitted to the Central Electricity Authority for concurrence as required under Section 29(1) of the Electricity (Supply) Act, 1948.

Government replied (August 2005) that the Ministry of Power, Government of India had adjudged the fair life of hydro electric plant and machinery to be 35 years and the Board decided to renovate and modernise the Pallivasal, Panniar and Sengulam generating stations considering various factors such as life of old units, generation loss due to increased shut downs, etc. It was also stated that only those power schemes with capital expenditure of over Rs.100 crore were required to be submitted to CEA for concurrence and since the estimated cost of each of the projects, as per the detailed project reports prepared for the three projects, was below Rs.100 crore, concurrence of CEA was not obtained.

The reply is not tenable since the Board did not provide evidence of any study done before entering into the MoU with SNC and also ignored the opinion of CEA on the condition of the plant at Pallivasal. Since the three schemes were proposed by the Board and sanctioned by the Government as a composite project involving capital expenditure exceeding Rs.100 crore, splitting the project to avoid concurrence by the CEA appeared to be a post facto rationalisation.

- The feasibility study was conducted (September 1995) by the Board after signing (August 1995) the MOU, by engaging a retired Chief Engineer who became a consultant to the principal contractor (SNC) itself. Global tenders were also not invited either before entering into the contract for consultancy or final agreement with SNC for supply, erection and commissioning of the projects.

Government stated (August 2005) that there was no record to indicate that the retired Chief Engineer was a consultant to SNC in 1995 when he prepared the feasibility report. The reply is evasive as there is 'a conflict of interest' in the retired Chief Engineer becoming the consultant of SNC. The Board could also not provide any confirmation regarding independence of the consultant at the time of rendering the feasibility study.

- No action was taken by the Board to ensure the reasonableness of the prices quoted by SNC in October 1997 before signing of the contracts. Instead, eight months after signing of the contracts, the Board sought post facto justification of the contract price through the entrustment of a study to National Hydro Electric Power Corporation Limited (NHPC). It was seen from NHPC's report that the technical specifications of the equipment required for price comparison purposes were not made available to them. It was also seen that NHPC had not certified the reasonableness of the prices but had only stated that keeping in view of the soft loan with grant element, the purchase for Canadian equipment and accessories could be considered favourably. As the grant was not received (as discussed in paragraph 3.18 infra) there was hardly any justification as per NHPC's report.

- The Kerala State Electricity Board (Meetings) Regulations, 1957 prescribed that the Board shall meet at least once in a month and any urgent matter transacted in between meetings should be ratified in the immediate succeeding meeting. The full Board was, however, not aware of the necessity for renovation, the signing of MOU (August 1995), or the contract (February 1996) for technical services with SNC, till January 1997 even though 28 Board meetings were held during the period from January 1995 to December 1996. Final contracts (February 1997) for design, supply and installation of equipment with SNC was formally approved by the Board only in January 1998.

The Ministerial delegation which conducted (October 1996) deliberations on the contract with SNC and funding arrangements with EDC and CIDA at Canada did not even consider the fact that SNC was only a consultant intermediary and not the original equipment manufacturer (the supply of goods was actually made under the contracts by Alstom, Canada). The contracts were finally signed

(February 1997) with undue haste without ascertaining the reasonableness of prices.

Project consultancy

3.12 The contract signed (February 1996) by the Board with SNC for technical services for renovation of Pallivasal, Sengulam and Panniar Power Stations provided for payment of a total service charge amounting to 7.19 million CAD. The services to be provided were:

- Preliminary and Detailed engineering
- Preparation of drawings, specifications, bills of quantities and tender documents.
- Calling for and evaluation of tenders and award of contracts.
- Producing civil drawings
- Review and approval of contractor's design, drawings and other submissions
- Construction supervision and inspection
- Commissioning
- Technology transfer and technical training.

Subsequently, the contracts for detailed technical specification and design of equipment, manufacture, shop assembly and testing, painting and packing, delivery and supervision of installation was awarded (February 1997/July 1998) to the consultants themselves at a total fixed price of 59.95 million CAD (Rs.149.15 crore).

With the award of the above contracts the consultants (SNC) became contractors for supply of equipment and services as well as installation, and the technical services contemplated in the consultancy services viz., preliminary and detailed engineering, design, calling for and evaluation of tender, supervision of installation, etc., were rendered superfluous. The Board, however, awarded the

detailed design, supply, installation and supervision contract as an addendum to the earlier consultancy contracts without excluding 7.19 million CAD (Rs. 17.89 crore) provided for therein. The technology transfer and training of engineering personnel of the Board was also not undertaken by SNC, as discussed in paragraph 3.22 and 3.23 infra.

Thus, the failure of the Board to exclude the overlapping fee for technical services from the final fixed price contracts for renovation of the projects resulted in avoidable payment of Rs. 20.31 crore*.

Government stated (August 2005) that SNC played two different roles as consultant and supplier and hence there was no duplication or overlapping of payments to SNC. The reply is not acceptable since on the firming up of the consultancy contracts into supply contracts SNC no longer performed the role of a technical and financial intermediary. Due to this, there was no rationale for making payments for intermediary services.

Project Financing

3.13 As per the MOU (August 1995) the funds required for financing of the project were to be arranged by SNC from EDC and CIDA. In order to firm up the finance, a Ministerial delegation visited (October 1996) Canada and negotiated with EDC and CIDA a loan of 54.4 million CAD representing 85 per cent of the contract value of 60.4 million CAD and 3 million CAD towards exposure fee. The loan from EDC carried interest rate of 6.8 per cent per annum in addition to one time payment of above exposure fee and administration fee of 0.5 per cent. The loan was to be disbursed in instalments as advance to SNC, as per specific schedules prescribed in the commercial contracts and carried a commitment fee of 0.375 per cent per annum on the unavailed portion of the loan. After further negotiation, agreement for the final loan amount of 53.8 million CAD was executed (July 1998) and the loan was repayable in 17 semi-annual instalments from October 2001.

* Actual payment up to March 2005.

The absence of due professional care in negotiating the foreign loan proved to be detrimental to the financial interests of the Board as discussed in the succeeding paragraphs.

Payment of exposure fee

3.14 During negotiation (October 1996) of the foreign loan, EDC agreed to accept State Government guarantee to the extent of 57 per cent for the foreign loan component with an exposure fee# of 5.84 per cent. Subsequently, the Central Government denied (April 1998) permission for the State Government Guarantee for foreign loans and the Board provided (July 1998) Deferred Payment Guarantee (DPG) by bankers, involving a total liability of Rs. 30 crore towards commission and upfront fee. Notwithstanding the financial security provided by way of DPG, the Board finally incorporated a provision for payment of 4.76 per cent towards exposure fee and made payment of Rs. 9.48 crore (including interest) up to 31st March, 2005 and a future liability of Rs. 2.21 crore. Since the exposure fee was intended to secure against the risk of default in the payment of instalments of loan and interest, there was no need for including the exposure fee in the loan agreement when the security cover was provided in the form of DPG by bankers.

Thus, the failure to negotiate and exclude exposure fee from the loan agreement resulted in avoidable/committed payment of Rs. 11.69 crore (including future liability of Rs.2.21 crore).

Government stated (August 2005) that the exposure fee was never intended to secure against default in repayment of instalments of loan and interest but was demanded by an international agency to protect against what the agency perceived as country's risk. The reply is not acceptable in view of the fact that as per internationally accepted Policy and Procedure Manual the exposure fee is the 'anticipated cost of the lending Government to cover the potential default by the borrower of principal and interest on original contract terms'.

As a normal Course of business, EDC charges exposure fee as a part of its compensation for risk undertaken when providing medium – long term export credit.

Payment of commitment charges

3.15 As per the loan agreement (July 1998) the Board had to pay towards commitment fee to EDC on each interest payment date a sum equal to 0.375 per cent per annum on the portion of unavailed loan with effect from the date of agreement.

It was, however, noticed during audit that as per Article III of the agreement it was the responsibility of the exporter (SNC) to provide a schedule of dates of anticipated advances, and payments were to be made by EDC direct to SNC in US Dollars against the prescribed milestone dates based on the commercial contract. At the time of entering into the loan agreement, the Board was aware of the fact that the milestone payments were to be made in five instalments commencing from August 1998. The actual payment of 31.5 million CAD (Rs. 92.92 crore*) was also made as scheduled. Hence, the undrawn advances were committed by EDC for specific dates during the period up to November 2000 and payments could not have been made on any other date. The avoidable payment made towards commitment fee when there was no committed unavailed advance during the period up to November 2000 worked out to Rs.1.20 crore.

Deferred Payment Guarantee cover

3.16 Section 4.01 of the loan agreement provided for indemnification of repayment to EDC of the principal and interest on the indebtedness of the Board. The indebtedness as defined under Article I thereunder included principal, interest, administration fee, commitment fee, expenses and any additional amounts payable from time to time. In conformity with the agreement, the Board provided (July 1998) deferred payment guarantee (DPG) cover from bankers for a total amount of Rs.200 crore. The Board had to pay a commission of 1.6 per cent per annum along with one time payment of 0.8 per cent towards fronting charges# and 1.05 per cent upfront charges.

3.17. Audit noticed that the maximum indebtedness of the Board during the tenure of the loan was below Rs. 180 crore$. The Board, however, over-estimated

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* Conversion rate : One Canadian Dollar equal to Rs. 29.50.

\# Fee charged by the bank to insure the risk.

$ Cumulative principal amount released (Rs. 150.19 crore) as of October 2001 plus interest thereon (Rs. 17.22 crore) and Commitment fee (Rs. 1.39 crore) = Rs. 168.80 crore. Taken as Rs. 180 crore to accommodate further loan drawn, Rs. 7.56 crore.

the indebtedness as Rs. 200 crore and furnished DPG from bankers for an equivalent amount. The decision of the Board to create excessive (Rs.20 crore) DPG cover resulted in avoidable extra expenditure of Rs. 2.77 crore towards commission and other expenses as of December 2004 and a future liability of Rs.93 lakh for the period up to October 2009.

The Government stated (August 2005) that the actual liability amount exceeded Rs. 200 crore even at present and hence the argument that total liability was to be limited at Rs. 180 crore was not correct. The reply is not tenable in view of the fact that during the period from July 1998 to April 2005 the actual liability was only in the range of Rs. 22.57 crore to Rs. 168.80 crore and by fixing the DPG cover at a higher level the Board had to pay commission to the Bankers without actually having the liability to the extent of the DPG cover.

Grant for Cancer Hospital

3.18 During negotiation (October 1996) of the contract by the Ministerial delegation, SNC agreed to mobilize funds for construction of a Cancer Hospital in Malabar area of the State. This was followed (April 1998) with an MOU between SNC and Government to finance implementation of the hospital project. As per the project report prepared by SNC, the Malabar Cancer Centre (MCC) was to cost Rs. 103.30 crore; Rs.98.30 crore was to be mobilised by SNC and the balance (Rs. 5 crore) was to be State Government contribution. The actual contribution made (up to February 2001) by SNC towards this project was only Rs. 8.98 crore by way of direct payment to Technicaliya Consultants Private Limited, a Chennai based firm for works in connection with the hospital. There were no records available to show that further funding was made towards the project (April 2005). The MOU has also not been renewed after March 2002 for reasons not on record.

3.19 It was noticed during audit that as per the Board Minutes dated 13th January, 1998 the contribution to be made by SNC for setting up MCC was an important factor taken into consideration while finalising the contracts for renovation of Pallivasal, Sengulam and Panniar power projects even though the Board was not directly concerned with funding proposals in the social sector. The funds for setting up MCC were also agreed (December 1997) to be provided by SNC on satisfactory conclusion of agreement by the Board for renovation of

projects. NHPC recommendations (October 1997) on the reasonableness of prices under the contracts were also based on this grant element.

The Government stated (August 2005) that there was no enabling provision in the contracts for R&M of Pallivasal, Sengulam and Panniar projects to appropriate dues to SNC against financial assistance promised to be arranged by them for Malabar Cancer Centre Society. The fact, however, remained that the Board of Members of KSEB considered this assistance at the time of ratification of the contract and SNC had also stated (December 1997) that the Malabar Cancer Centre project was directly connected with the project for renovation and the grant element could be availed on satisfactory conclusion of the loan agreement. The Board, however, did not follow-up the matter.

Implementation of the projects

3.20 As per the contract, the supply of Canadian goods was to be completed within 27 months from the effective date (September 1998) of the contract i.e. by November 2000 and the project was to be commissioned by September 2001. It was noticed in audit that the implementation of the project was not planned properly. The work was originally proposed to be carried out by simultaneous shutdown of all the three Power Stations. Later, for utlilisation of water inflow during shutdown period, the work was carried out in two phases by keeping half the units of each Power Station in service. Due to technical problems, delays in completion of associated works and delay on the part of SNC to attend to pre-commissioning works, etc., the commissioning of the projects were delayed. The work was finally completed and the projects commissioned during the period October 2001 to February 2003 at a total cost of Rs. 259.40 crore (excluding financing charges of Rs. 63.83 crore). The details of projects, date of commissioning and generating capacity were as follows:

Name of Project	Targeted date of recommissioning	Date of re-commissioning	Generating capacity (MW)
1	2	3	4
Pallivasal: Units I-III	September 2001	October 2001	15.00

1	2	3	4
Units IV-VI	September 2001	August 2002	22.50
Sengulam: 4 units	September 2001	December 2001/ November 2002	48.00
Panniar: 2 units	September 2001	November 2001/ February 2003	30.00

3.21. Audit analysis disclosed that there was failure on the part of the Board in getting technology transfer and training of personnel as envisaged in the contract with SNC. The equipment supplied by the SNC also had various defects and certain equipment received could not be utilised. The delay in execution of the project also entailed consequential losses. Instances of extra expenditure or loss arising from the above deficiencies are discussed in the succeeding paragraphs.

Transfer of technology and training of Board's Engineers

3.22. The contracts for consultancy services provided for transfer of technology and technical training of Board's engineers. An amount of 1.48 lakh CAD (Rs. 37 lakh) was included for this purpose in the total agreed ceiling of 7.19 million CAD (Rs. 17.89 crore). The services were to be provided by SNC at their offices as well as utilities in Canada, construction sites, etc., as specified in the contracts. Since the state of the art technology equipment were supplied and erected by SNC, training of the Board's engineers was essential to ensure the quality and reliability of Canadian equipment at the design stage itself and for further operation and maintenance. The Board, however, failed to avail of the benefits of training of Board's engineers and technology transfer in terms of the contract.

In the absence of technology transfer and training programmes, and non-disclosure of technical specifications in Annexure I-D to the agreement, the Board's engineers were not adequately equipped to assess the suitability and reliability of the imported machinery either at the time of procurement or at the time of erection. As a result the Board could not identify and rectify defects in machinery, installed by SNC resulting in losses, as discussed in paragraphs 3.24 to 3.26 infra.

3.23. The reduction to be made in consultancy charges on account of the non-availment of the above services was 1.48 lakh CAD (Rs. 37 lakh) and ceiling for consultancy charges correspondingly came down to 7.04 million CAD. Ignoring this the Board released (March 2005) pending payments to SNC reckoning the overall ceiling as 7.19 million CAD. The avoidable payment so made amounted to Rs.37 lakh (1.48 lakh CAD).

The Government stated (August 2005) that technical training programme and technology transfer was achieved to a large extent in India itself and that there was no substantial loss to the Board. The reply is not acceptable in view of the fact that the training to be imparted at the manufacturer's works at Canada during the design stage and on an operational plant could not be imparted in India. Accordingly, the benefit of the training of the Board's engineers did not accrue to the Board.

Supply of Draft-Tube Gate (DTG)

3.24 The contract with SNC was for renovation of the existing facilities at Panniar. The site inspection and identification of equipment to be replaced was, however, not undertaken with proper care. Due to this the list of equipment to be renovated by SNC as per contract included two Draft Tube Gates intended for shutting down the flow of tail race water from one generator to draft tubes of the other generator even though no such gates were actually available at the Panniar Power Station. The cost of repair of these gates as included in the value of contract was 19,000 CAD. Subsequently SNC designed and supplied (November 2000) a new draft tube gate, the measurement of which did not suit the existing draft tube outlet. These defects were also not inspected and identified by the Board's engineers in the absence of sufficient knowledge or expertise in the technology transferred by SNC.

The expenditure of Rs.5.99 lakh (19,000 CAD) incurred on the DTG was a loss to the Board.

3.25. For erection of DTG and Electrical hoist with gantry cranes, the Panniar Power Station was shutdown from 10th April, 2002 to 19th June, 2002. The defects in the DTG were noticed only during erection and finally the installation was rendered abortive. The avoidable loss of generation due to spillage of water during the shutdown period required for rectification of the above defects worked out to 5.731 MU valued at Rs. 1.78 crore at the rate of Rs.3.10 per unit.

Supply of Generator Metering Equipment

3.26 The renovation contract included supply and installation of new computer based central control and supervision system with Nexus metering equipment. Even though the metering installation by the sub-contractor (Alstom) of SNC in other countries were having problems due to design defect of Nexus equipment, SNC suppressed this information from the Board. The central control and supervision system for all the three Power Stations were supplied (September 2000 to January 2001) by SNC at a total landed cost of Rs. 1.92 crore. On installation and commissioning of the control equipment, the Generator metering equipment was not functioning properly. Several attempts made by SNC could not rectify the defects (May 2004). Since the equipment with design defects were supplied by SNC suppressing material information, the Board's engineers also could not identify this prior to installation.

Government stated (August 2005) that the equipment manufacturer after testing in the laboratories, observed that the instruments were not functioning correctly and the defects have since been rectified. It was also stated that even if Nexus meters were not functioning the performance of the generators would not be affected. The reply is not acceptable in view of the fact that the SNC themselves had identified (25-7-2002) that 'Nexus being used by Alstom was a defective design, as it was reported that the problem was surfacing on other installations (in other countries) as well'. The failure of this equipment resulted in very serious problems leading to shutdown of generating units as reported by the Board's engineers.

Thus, the supply of equipment with design defect by the contractor and failure of the Board to recover the cost form SNC resulted in a loss of Rs. 1.92 crore.

Cost of projects

3.27 As per the norms fixed by the Central Board of Irrigation and Power (CBIP), the cost of capacity benefit in the case of renovation and modernisation of units of hydro Power Stations should be 25 to 30 per cent as compared to the cost of installing a new generating unit.

The total cost of the Kuttiady Additional Extension Scheme, a new hydro electric project with an installed capacity of 100 Mega Watt (MW) awarded to M/s BHEL/L&T on a turn key basis (August 2003) was Rs. 66.05 crore; the per megawatt cost being Rs. 0.66 crore. Based on the norms of CBIP, the per MW cost of the Pallivasal, Sengulam and Panniar, Renovation project should not have exceeded Rs. 0.50 crore (75 per cent of 0.66 crore) per MW. The total cost ceiling for the three projects worked out to Rs. 57.75 crore (115.5 MW @ Rs. 0.50 crore per MW). Based on the aggregate cost of Rs. 374.50 crore booked by the Board for the renovation of the three projects as of December 2004, the per MW cost worked out to Rs. 3.24 crore indicating a total excess cost of Rs. 316.75 crore with reference to norms.

3.28 It was further noticed in audit that the per MW cost of renovation, modernisation and life extension projects undertaken by various Electricity Boards in the country during the period from 1992 to 2003 ranged between Rs. 0.11 crore and Rs.2.34 crore only as detailed in ***Annexure 18***. Even with reference to the highest cost of Rs.2.34 crore per MW in respect of Umium Stage I Project (Meghalaya) completed during the year 2003, the additional cost incurred on the renovation and modernisation of the three projects in Kerala worked out to Rs.103.95 crore.

Government stated (August 2005) that the per MW cost of Kuttiyadi Additional Extension Scheme and the renovation projects could not be strictly

compared due to difference in the scope of works and source of machinery and equipments. The reply is not acceptable since the per MW cost of the three projects involving only renovation and modernisation was very much higher than the per MW cost of new Kuttiyadi Additional Extension Scheme, implemented by the Board. The cost of the renovation project has to be a maximum of 75 per cent of the cost of a new project as per CBIP norms and it can not be as high as 648 per cent as in the instant case.

PERFORMANCE

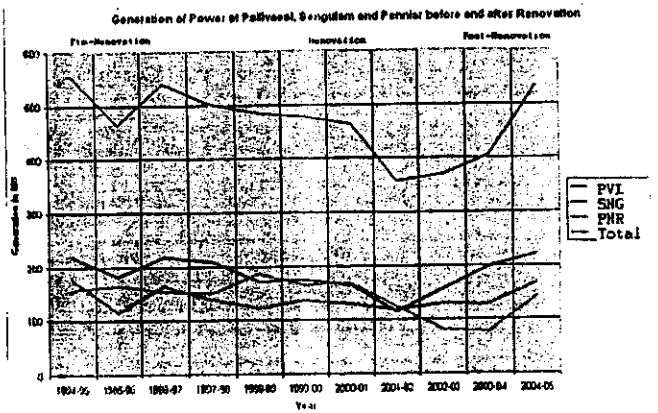
Generation of Power

3.29 The projects were renovated and re-commissioned during the period October 2000 to February 2003. The table below indicates the year-wise details of generation of power in each of the three Power Stations at Pallivasal, Sengulam and Panniar, and the rainfall obtained at the respective project areas during the pre-renovation (1994-95 to 1998-99) renovation (1999-2000 to 2002-03) and post renovation periods (2003-04 to 2004-05) of the project:

Year	Rainfall at Pallivasal (Kundala & Madupetty) (mm)	Generation at Pallivasal (MU)	Generation at Sengulam (MU)	Rainfall at Panniar (Anayirankal & Ponmudi) (mm)	Generation at Panniar (MU)	Total rainfall in Project areas (mm)	Total Generation (MU)
1	2	3	4	5	6	7	8
Pre-renovation period							
1994-95	1733.00	221.96	177.15	2544.00	156.06	4277.00	555.17
1995-96	1293.00	183.74	114.63	2285.00	164.18	3578.00	462.55
1996-97	1513.00	220.69	164.70	1986.00	153.54	3499.00	538.93
1997-98	NA	211.63	139.30	2194.00	149.33	NA	500.26
1998-99	1251.00	172.85	123.45	2336.00	187.70	3587.00	484.00

Renovation Period							
1999-2000	3986.00	175.60	136.66	2138.00	164.60	6124.00	476.86
2000-01	3243.50	165.35	129.70	2178.00	187.60	5421.50	482.65
2001-02	2841.10	118.00	117.00	2636.00	123.90	5477.10	358.90
2002-03	2015.99	157.00	129.66	1629.00	79.71	3644.99	366.37
Post-Renovation Period							
2003-04	2085.00	192.99	128.07	1984.00	75.61	4069.00	396.67
2004-05	2874.50	222.89	168.09	2733.00	142.52	5607.50	533.56

3.30 A graph showing the project-wise generation and total generation of power during the pre-renovation, renovation and post-renovation period is given below:



3.31 It would be seen from the above details that during the five year period of 1994-95 to 1998-99 (prior to renovation), the total rainfall at the concerned project areas ranged between 3499 mm and 4277 mm and the total power generated by the three Power Stations ranged between 462.55 and 555.17 MU. When compared to this the rainfall during the post renovation period ranged between 4069 mm and 5607 mm and the generation was between 396.67 to 533.56 MU only, indicating that the Board's main objective of improvement in efficiency could not be achieved.

Government stated (August 2005) that the reduction in power generation during 2000-2003 was due to the fact that half the machines of the three stations were under shutdown for renovation and the reduction during 2003-04 was mainly due to very low rainfall compared to other years. The reply is not acceptable since 50 per cent of all the machines were not shutdown during the entire three-year period of renovation. Further, the rainfall in the project area was adequate to generate more power than during the earlier years as indicated in the table.

A few cases of the serious machine problems contributing to the lower efficiency levels of generation are discussed below:

Pitting in the turbine runner buckets

3.32 Turbine runner bucket formed an integral part of the turbine. There were such buckets attached to the system installed at the Pallivasal Power Station. In the technical specification furnished by SNC adequate protection had to be provided to all surfaces of turbine parts which came into contact with water and against erosion due to silty water. Runner buckets were to be given particular consideration.

It was however, noticed in audit that during November 2002, barely 3 months after commissioning, the renovated Units IV, V and VI of Pallivasal Power Station developed cavitations due to erosion of material (pitting) in the buckets of the turbine runners. Unit V was shutdown on 30th October, 2002 to replace the runner with the spare runner supplied by the contractor and the machine restarted on 3rd December, 2002. The manufacturer of the runners viz. Alstom who were also the sub-contractors of SNC for the work, arranged for modification of the runners of Units IV, V and VI, and these were put back in service in May/June 2003.

It would be pertinent to mention that the turbines of the old machines at this Power Station had not experienced any problem of pitting during its operation for more than 50 years.

3.33 The rated speed of the turbines supplied by SNC for Units IV to VI of Pallivasal Power Station was 750 revolutions per minute (rpm) instead of 600 rpm provided in the contract. The change in rpm of the turbines made arbitrarily by SNC violating the contract conditions was not investigated by the Board even though this change was identified (August 2004) as a reason for pitting. In terms of the contract, the supplier was bound to replace/repair the defective equipment supplied. The Board, however, did not initiate any action to obtain replacement of the runners (cost-Rs. 2.78 crore) by the suppliers within the warranty period, which was in operation up to July 2004. The Board continued to repair and use the runner buckets.

3.34 Consequent on the pitting the new turbines of units IV, V and VI of Pallivasal were estimated to require at least two repairs every year and the estimated cost of repair of 3 runners during the useful life of 45 years was Rs. 1.35 crore (3x2x45 at the rate of Rs. 50,000) at the then existing rates. In the absence of specific provisions in the contract, the Board would not be in a position to recover the amount spent on repairs as well as consequential generation loss during repair shutdown.

Government stated (August 2005) that the manufacturer was not able to give a ready made solution to the pitting problem and that for associated expenditure for additional weld repair for 10 years an amount of CAD 60,000 had been recommended by the Board of Members of KSEB to be back charged to SNC. The reply is not tenable in view of the fact that there did not exist any provision in the contract to effect recovery in such case.

Defective governors*

3.35 Ever since installation of the new 'Digital PID Governors' at the Pallivasal, Sengulam and Panniar Power Stations, the speed response of the governors were defective resulting in tripping of generators leading to power interruption as well as generation loss. All the above problems were reported

* Equipment intended to keep the speed of turbines constant under changes in load and other disturbances.

(November 2004) to be due to inadequacy in the operation of the governors supplied by SNC at a cost of Rs. 10.08 crore (3.25 million CAD). SNC is reported to have admitted that the governors were beyond repairs. The Board, however, did not initiate any action either to get replacement for the governors or to recover the cost from SNC.

The Government stated (August 2005) that an amount of 39,000 CAD was proposed to be back-charged to SNC to compensate for the generation loss due to unwanted tripping. The reply is not acceptable in view of the fact that there was neither any provision in the contract for such recovery nor was there any balance due to SNC to adjust the amount.

Thus, the failure to replace or recover the cost of defective governors supplied by the contractor resulted in unproductive expenditure of Rs. 10.08 crore.

Necessity for renovation

3.36 The renovation work of Pallivasal, Sengulam and Panniar Power Stations was undertaken by the Board with the objective of improving efficiency of the machine and reduce the generation loss due to forced shut downs. While taking the decision for renovation, the recommendations (1992) of the CEA that replacement of the machines at Pallivasal Power Station was not necessary in view of the good condition of the plant and the necessity for renovation in the context of proposed Pallivasal Extension Scheme of 60 MW capacity, were not given due consideration. Since the Power Station at Sengulam was of the same type (Pelton) as at Pallivasal and that at Panniar was relatively new (1964) the renovation involving huge cost was not immediately necessary.

The Board also could not ensure quality of the renovation work carried out by SNC, in the absence of technology transfer and training of its engineers by the Contractor. Due to various technical defects in the equipment installed by SNC, the generation of power could not be maintained even at the pre-renovation levels and the Board had to incur avoidable expenditure on repairs and loss of generation due to shutdowns.

Thus, the expenditure on renovation amounting to Rs. 374.50 crore did not yield commensurate gains.

[Audit paragraph 3.1 -3.36 contained in the Report of the C & AG for the year ended on 31st March, 2005]

Audit Paragraph 4.11 (2004-05)

The Board could not recover Rs. 1.23 crore towards energy consumption charges due to a faulty agreement with IOC for supply of fuel oils.

The Board had been using fuel oils (LSHS, HSD Oil) and lubricants for generation of power in its Brahmapuram Diesel Power Plant. For setting up fuel installation having storage and handling facility for fuel oils, the Board leased out land to Indian Oil Corporation Limited (IOC). As per clause 4 (c) of the lease agreement (July 1995) IOC had to pay the charges for consumption of water and electricity consumed on the premises.

For the supply of fuel oils and lubricants, the Board entered into (December 1995) a separate agreement with IOC. In this agreement the Board included clause 9 specifying maintenance of storage and allied facilities by the sellers (IOC) at their own cost. Under the same clause, a provision was also made stating that the maintenance and operation cost would be incurred by the buyers (Board), which was in contradiction to the earlier stated provision. Taking advantage of the ambiguity in the agreement IOC refused to make payment for electricity consumed during the period from July 1998 to July 2005 amounting to Rs. 1.23 crore.

Audit noticed that in a similar agreement for supply of fuel oils, etc. with another company (BPCL), the Board was availing the benefit of concession at the rate of 3.5 per cent on the cost of the oils, etc., in consideration of the electricity and maintenance cost incurred by the Board on full storage establishments.

Thus, absence of due care in drafting the agreement for supply of fuel oil resulted in loss due to non-receipt of charges for energy consumption amounting to Rs. 1.23 crore.

The matter was reported to Management/Government (May 2005); their replies have not been received (September 2005).

[Audit paragraph 4.11 contained in the Report of the C & AG for the year ended on 31st March, 2005].

Audit paragraph 3.1.1-3.1.56 (2002-2003)

Introduction

3.1.1 The power requirement of Kerala since 1957 was being catered to by hydel power plants of the Kerala State Electricity Board (Board). In order to augment the power generation in the State, a task force was appointed (1987) by the State Planning Board to conduct a study on generation of power. The task force estimated a peak load demand of 1127 mega watt (MW) in 1987-88, which was expected to rise to 1426 MW in 1989-90 and further to 3880 MW in 1999-2000.

3.1.2 The Board, thereupon, proposed (July 1987) to take up implementation of eleven hydel projects and one thermal project, involving a capacity addition of 1851 MW, in a phased manner, within a period of nine years ending 1999-2000. A further capacity addition of 411.5 MW was also envisaged by implementing mini/micro hydel projects during the same period.

3.1.3 Consequent to amendment (October 1991) to Section 3 of the Electricity (Supply) Act, 1948 by Government of India, allowing private participation and 100 per cent equity participation by foreign investors in power sector, Government of Kerala also issued (March 1992) orders allowing private participation in generation of power in the State.

3.1.4 The Board had an installed capacity for hydel power generation of 1476.5 MW in 1993. Without considering the earlier projection of peak load demand of 3880 MW in 1999-2000 by the task force and without considering its suggestion to meet the demand by exploiting hydro generation potential in the State, the Board decided (1992-1995) to implement thermal power projects for a further capacity addition of 5158 MW vide Annexure 21.

For this purpose the Board entered into (March 1995 to March 1996) Memorandum of Understanding (MOU) with ten independent power producers (IPPs) for purchase of 4970 MW of power out of which power purchase agreement (PPA) was signed (March 1995) in respect of only one project of 60 MW viz., Kasaragod Power Corporation Limited (KPCL) against which 20 MW capacity was created in the first phase of the project. The Board also signed PPA under bid route* for 157 MW naphtha based power plant with Bombay Suburban Electric Suppliers (BSES).

Simultaneously, the Board signed (January 1995) PPA with National Thermal Power Corporation Limited (NTPC) for purchase of entire generation at a plant load factor (PLF) of 68.5 per cent, from their 359.58 MW, naphtha based power plant at Kayamkulam (KYCCPP).

No records were available with the Board to justify the demand projections made for entering into MOUs/PPAs for these thermal projects.

3.1.5 As against the capacity addition of 7420.5 MW (hydel: 1851 MW, thermal: 5158 MW and micro hydel: 411.5 MW) envisaged between 1987 and 1996, the Board created till March 2003 a capacity addition of 1124.08 MW including two own thermal power projects viz, Brahmapuram Diesel Power Project (BDPP) and Kozhikode Diesel Power Project (KDPP) with installed capacity of 106.6 and 128 MW respectively. The total installed capacity as on 31st March, 2003 was 2598.68 MW.

Organisational set up

3.1.6 The implementation of own thermal projects at BDPP and KDPP was being supervised by the Principal Project Co-ordinator/Project Manager under the control of Chief Engineer (Thermal) till 1998-99 and thereafter up to 31st May, 2002 by the Chief Engineer (Operation and Maintenance-Thermal) under the overall supervision of Member (Technical). From June 2002 onwards the operation of own thermal projects were under the control of Chief Engineer

* Selection of IPPs by inviting quotations through open tenders.

(Generation). Capacity addition through IPPs was supervised by the Investment Promotion and Business Development Cell headed by one Deputy Chief Engineer (IPC) under the control of CE (Electrical) Generation and Systems Operation up to March 1998, the Chief Engineer (Thermal) up to May 2002 and thereafter by the Chief Engineer (Corporate Planning).

Scope of Audit

3.1.7 Implementation of BDPP was reviewed and included in the Report of the Comptroller and Auditor General of India for the year ended 31 March 1998. The review was discussed by COPU in March 2003 and the recommendations are awaited (September 2003). The present review conducted between November 2002 and March 2003, deals with generation of thermal power by Board's own thermal projects (KDPP and BDPP) and purchase of thermal power from NTPC power project (Kayamkulam) and two IPPs (BSES and KPCL) based on PPAs entered into with them.

3.1.8 The draft review was discussed by the Audit Review Committee for State Public Sector Enterprises in the meeting held on 16th September, 2003 which was attended by the Principal Secretary to Government, Department of Power and Chairman of the Board.

Performance of Brahmapuram Diesel Power Project (BDPP)

3.1.9 The base load plant (round the clock operation) of BDPP using LSHS or diesel oil as fuel, with an installed capacity of 106.6 MW (five generators of 21.32 MW each) was synchronised to the grid during May 1997 to November 1998. The total cost of the project was Rs. 444 crore at Rs. 4.17 crore per MW against the original estimated cost Rs. 281.11 crore at Rs. 2.64 crore per MW. The plant was designed for continuous operation for a minimum of 6000 hours per annum corresponding to PLF of 68.5 per cent. Capacity utilisation of the plant for the five years up to 2002-03 was as follows:

Particulars	1998-99	1999-2000	2000-01	2001-02	2002-03
Installed capacity (in million KWH)	812.04	936.37*	933.82	933.82	933.82
Total hours available for operation for 5 generators	38088	43920	43800	43800	43800
Actual hours available for operation (excluding loss of hours due to maintenance, break down, etc.)	27746	30652	27172	17693	24154
Plant availability factor (in per cent)	72.85	69.79	62.04	40.39	55.15
Units sent out (in million KWH)	241.74	391.78	305.13	120.86	255.20
Capacity utilisation (PLF) (per cent)	29.77	41.84	32.68	12.94	27.33

3.1.10 It could be seen from the table that:

- despite fixing a low PLF of 68.5 per cent, the actual capacity utilisation was much lower and ranged between 13 and 42 per cent during the five years up to 2002-03.
- in 2000-01, 2001-02 and 2002-03 the plant availability factor was less than 68.5 per cent due failure of turbo-chargers of three mahcines and failure of turbine rotor of one machine. Board took two years and nine months and four years and six months respectively for repairing the machine/replacing the spares, the cost of which amounted to Rs. 4.50

* installed capacity was more on account of leap year.

crore. Hours lost (39384) on this account during the three years were equivalent to 11.56, 52.97 and 25.37 per cent of available hours. Non-productive fixed cost on this account was Rs. 64.19 crore. The Board did not have a system of periodic procurement of essential spares with a view to carrying out timely repairs and replacements.

Consumption of fuel

3.1.11 Low sulphur heavy stock (LSHS) and diesel oil (HSD) were the base fuel for the plant. As per design, HSD oil is used as a start up fuel. After attaining 35 per cent rated load, the plant automatically switches over to LSHS.

Details of consumption of LSHS and HSD oil, power generated, specific fuel consumption, norms fixed by the manufacturer, excess consumption, cost of power per metric tonne of fuel and total value of excess consumption during the five years up to 2002-03 were as indicated in Annexures 22 and 23. Utilisation of the plant for meeting peak load* demand instead of as base load** plant necessitated frequent stoppage and start up of machines leading to consumption of 9871 MT of LSHS and 2599 kilo litres of HSD oil in excess of norms during the five years up to 2002-03 and resulted in loss of Rs. 12.77 crore.

Uneconomic operation of the plant

3.1.12 The Board was operating the plant mainly as peak load plant at a capacity ranging from 13 to 42 per cent during the five years up to 2002-03, as against PLF of 68.5 per cent equivalent to 6000 hours of operation per annum. At the level of operation of 6000 hours per annum the plant could have sent out 614.016 million KWH of energy per annum. The cost per KWH sent out based on the actual fixed and variable costs for the five years up to 2002-03 was as given in the following table:

Particulars	1998-99	1999-2000	2000-01	2001-02	2002-03
Total Fixed cost (Rs. In crore)	76.59	78.75	75.17	72.36	67.64
Fixed cost per KWH (in Rs.) (at 6000 hours of operation for 614.02 million KWH)	1.25	1.28	1.22	1.18	1.10

* Operation of plant during peak hour of consumption.
** Round the clock operation.

Variable cost per KWH (in Rs.)	1.80	1.95	2.15	2.35	2.89
Total cost per KWH at 6000 hours of operation (in Rs.)	3.05	3.23	3.37	3.53	3.99
Cost per KWH at the present level of operation (in Rs.)	4.97	3.96	4.62	8.34	5.54
Loss per KWH (in Rs.)	1.92	0.73	1.25	4.81	1.55
Energy sent out (in million KWH)	241.74	391.78	305.13	120.86	255.20
Extra avoidable cost for the year (Rs. in crore)	46.41	28.60	38.14	58.13	39.56

The operation of the plant at optimum capacity of 68.5 per cent PLF would have resulted in reduction in cost per KWH of energy produced, by higher absorption of fixed expenses, reduction in consumption of fuel and minimum stoppage of plant. Extra avoidable cost borne by the Board on account of underutilisation of capacity due to operation of the plant for managing the load requirement of peak periods only instead of continuous generation during the five years up to 2002-03 amounted to Rs. 210.84 crore.

Performance of Kozhikode Diesel Power Project (KDPP)

3.1.13 The LSHS/diesel oil based power plant with installed capacity of 128 MW (16 MW x 8) was synchronised to the grid between September and November 1999. The plant was designed to operate as a base load plant (round the clock) at a plant load factor of 80 per cent equivalent to 7000 hours of operation. Capacity utilisation of the plant for the three years up to 2002-03 was as follows:

Particulars	2000-01	2001-02	2002-03
Installed capacity (in million KWH)	1121.28	1121.28	1121.28
Total hours available	70080	70080	70080
Hours available for operation (excluding break down and regular maintenance)	47445	44318	52051
Plant availability factor (in per cent)	67.7	63.24	74.27
Units sent out (in million KWH)	442.71	282.20	373.75
Capacity utilisation (per cent)	39.48	25.17	33.33

3.1.14 Even though the plant was capable of working at 80 per cent PLF, the plant availability was only 68, 63 and 74 per cent in 2000-01, 2001-02 and 2002-03 respectively. The plant was kept shut down for want of fuel for 2690 hours during 2000-01, for want of spares for 8712 hours in 2001-02 and 9216 hours in 2002-03 which represented about 3.84, 12.43 and 13.15 per cent of total available hours in 2000-01, 2001-02 and 2002-03 respectively. Reasons for non-availability of machines for the remaining period were not on record. Failure of the Board to ensure adequate working capital for procurement of fuel and spares resulted in non-productive fixed cost on 20618 production hours amounting to Rs. 23.38 crore.

Consumption of fuel

3.1.15 Low sulphur heavy stock (LSHS) or HSD oil was the fuel for the plant. In accordance with the design, HSD oil had to be used as a start-up fuel. As per the specification of the manufacturer, consumption of fuel per KWH at the terminals of the engine was 194.40 gm. During 2001-02 and 2002-03 the consumption of fuel was in excess of norms, resulting in loss of Rs. 4.96 crore as per details given below:

Particulars	2001-02	2002-03
Energy generated (in million KWH)	294.50	387.08
LSHS consumed (in MT)	58578	78270
Consumption per KWH (in gms)	198.90	202.21
Consumption as per norms (in gms)	194.40	194.40
Excess consumption per KWH (in gms)	4.50	7.81
Excess consumption (in MT)	1325	3023
Average price of LSHS per MT (in Rs.)	9620	12215
Loss (Rs. In crore)	1.27	3.69

The management attributed (March 2003) the excess consumption to the presence of about 1-2 per cent sludge, water, debris and other impurities, low net calorific value of fuel, frequent starts and stops of the plant. The reply is not tenable since the norms fixed by the manufacturer of the plant allowed for 1.25 per cent sludge, water, etc., and other factors attributable were controllable.

Uneconomic operation of the plant

3.1.16 The Board was operating the plant mainly as a peak load plant at a capacity (PLF) of 39, 25 and 33 per cent respectively during the three years up to 2002-03, as against the PLF of 80 per cent fixed as per design, equivalent to 7000 hours of operation per annum. At that level of operation, the plant could have sent out, 869.12 million KWH of energy per annum. The cost of KWH sent, out based on the actual fixed and variable cost for the three year up to 2002-03, was as indicated below:

Particulars	2000-01	2001-02	2002-03
Total fixed cost (Rs. In crore)	86.05	81.41	75.77
Fixed cost per KWH at 7000 hours of operation for 869.12 million KWH (in Rupees)	0.99	0.94	0.87

Variable cost per KWH (in Rupees)	2.24	2.09	2.61
Cost per KWH at 7000 hours of operation (869.12 million KWH) (in Rupees)	3.23	3.03	3.48
Cost per KWH at actual level of operation (in Rupees)	4.18	4.98	4.64
Loss per KWH (in Rupees)	0.95	1.95	1.16
Energy sent out in million KWH	442.71	282.20	373.74
Extra avoidable cost (Rs. in crore)	42.06	55.03	43.35

3.1.17 Operation of the plant at optimum capacity of 80 per cent PLF would have resulted in reduction in cost per KWH of energy produced by way of increased absorption of fixed expenses, reduction in consumption of fuel, and by minimisation of stoppage of plant. Extra avoidable cost borne by the Board due to underutilisation of capacity by running the plant as a peak load plant during the three years up to 2002-03 amounted to Rs. 140.44 crore.

Purchase of thermal power

3.1.18 In order to meet the gap between energy demand and own generation, the Board resorted to purchase of thermal power from Independent Power Producers and National Thermal Power Corporation at higher rates as discussed below:

National Thermal Power Corporation Limited, Kayamkulam (KYCCPP)

3.1.19 The combined cycle* power plant at Kayamkulam, owned by the National Thermal Power Corporation (NTPC) with an installed capacity of 359.58 MW, consisting of two gas turbines (Gts) of 116.6 MW each and one steam turbine (ST) of 126.38 MW was synchronized to grid in November 1998,

* Generation using gas turbine and steam turbine in Combination.

February and December 1999 respectively. Commercial operation# commenced with effect from March 2000. Naphtha was the fuel for the plant and the contracted capacity was 68.5 per cent PLF. The table below indicates installed capacity, units purchased and average PLF for the period 1998-99 to 2002-03:

Particulars	1998-99	1999-2000	2000-01	2001-02	2002-03
Installed capacity (in million KWH)	509.31	2388.14	3149.92	3149.92	3149.92
Power purchased (in million KWH)	243.15	1228.88	1904.38	1280.14	2073.73
Percentage of power Purchased to installed capacity (PLF)	47.74	51.46	60.46	40.64	65.83

3.1.20 Despite fixing the contracted capacity at 68.5 per cent PLF, the actual purchase of power ranged between 41 and 66 per cent only during the five years, resulting in higher cost per KWH purchased, since as per PPA the entire fixed cost was to be paid by the Board irrespective of the quantity of power purchased.

Power purchase agreement and payment of bills

3.1.21 The power purchase agreement (PPA) provides for a two part tariff comprising variable and fixed cost. A review of PPA signed in January 1995 with NTPC and the payments made for purchase of power by the Board indicated absence of proper evaluation of impact of various provisions of PPA before entering into the agreement and also payments involving financial loss to the Board, as discussed in the succeeding paragraphs.

Acceptance of capacity without verification

3.1.22 Standard power purchase agreement prescribed (March 1992) by Government of India, envisaged approval by the bulk power recipient (Board) at

Fixed cost would be payable from the date of declaration of commercial operation.

each stage of implementation of the project, including testing, commissioning and synchronisation to the grid. The PPA entered into between the Board and NTPC does not contain a specific provision to this effect. Instead, the PPA stipulated that the dates of commercial operation of the generating units shall be as declared by NTPC from time to time. As a result, the Board could not satisfy itself of the capacity and maximum continuous rating of the machines installed, mega volt ampere ratio (MVAR)*, power factor, etc. Since Board had to pay fixed charges, taxes and duties to NTPC based on capacity of the plant, necessary provision in this regard should have been incorporated in the PPA to protect the financial interests of the Board. In the absence of relevant provisions in the agreement with NTPC the Board had to accept the power irrespective of power factor.

Payment of income tax

3.1.23 According to clause 5.1 of the PPA, tax on income of NTPC as per the provisions of Income Tax Act, applicable from time to time, shall be recovered from the Board, in proportion to the capacity of Kayamkulam power station to the total operating capacity of NTPC on all India basis at the beginning of the financial year. The Kayamkulam combined cycle power plant was eligible for 100 per cent tax holiday for the first five years of operation (up to March 2003) and 30 per cent for the next five years as per section 80.1A of the Income - Tax Act, 1961, available for enterprises engaged in infrastructure development. Even though no tax was to be paid in respect of the Kayamkulam unit, NTPC had been recovering tax from the Board in proportion to the capacity of the unit to the total generating capacity of NTPC. The amount so claimed by NTPC for the period from April 1999 to June 2003 was Rs. 48.35 crore. Failure of the Board to incorporate suitable provisions in the PPA for claiming the benefit of tax holiday for the Kayamkulam unit and also for payment of income tax thereafter with reference to income of the Kayamkulam plant alone had resulted in avoidable liability of Rs. 48.35 crore of income tax. It was noticed in audit that in the case of BSES and KPCL other two IPPs, the payment of income tax was being

* Reactive power in the cycle.

regulated on the basis of actual liability. The impact of extra payment of income tax on the cost per KWH during April 1999 to June 2003 ranged between 6.34 and 17.96 paise.

Unnecessary payment of cost of 'Hitech Oil'

3.1.24 Government of India notification issued in March 1992 prescribed two part tariff consisting of 'fixed charges' and 'variable charges' for the Combined cycle plant. The variable energy charges claimed by NTPC included, in addition to cost of naphtha, cost of 'Hitech Oil' a specific ingredient for improving operational efficiency of GEC (General Electric Company) make machines, installed at the plant. As per clarification offered (December 2000) by Central Electricity Authority 'Hitech Oil' was a fuel conditioner and not a fuel and was not contributing to calorific output during combustion. NTPC had included weighted average price of 'Hitech Oil' along with the price of Naphtha in their bills. As per guidelines issued (March 1992) by Government of India, cost of naphtha alone was prescribed as the variable cost component in respect of Naphtha based power stations. The adviser to Government of Kerala also advised (January 2001) that, the use of 'Hitech Oil' in power generation shall be at the cost of NTPC, as no improvement in heat rate was involved on mixing 'Hitech Oil' with Naphtha. As the cost of 'Hitech Oil' is a part of operation, reimbursement of cost of 'Hitech Oil' as variable energy charges was not obligatory. Despite the above, the Board had admitted the cost of 'Hitech Oil' in computing the variable charges. Avoidable additional expenditure on this account for the period from December 1998 to March 2003 amounted to Rs. 4.19 crore.

Wasteful expenditure on demand generation

3.1.25 As against the installed capacity of 3149.92 million KWH per annum of the plant, the contracted capacity was only 2157.70 million KWH per annum at a PLF of 68.5 per cent. As per the provisions of PPA, fixed cost incurred by NTPC for operating the plant was to be reimbursed irrespective the power purchased by the Board.

The Board was forced to order the station to back down generation frequently during monsoon months to avoid spillage of water from the hydro generation reservoirs, for absorbing power available from the central pool at cheaper rates and to save variable cost of power purchased from the Kayamkulam Power Station. For the generation capacity not utilised, the Board had to pay deemed generation charges equivalent to the fixed cost of units not purchased. Deemed generation charges paid during 1999-2000 for 1669.03 million KWH of energy not generated and purchased, amounted to Rs. 248.54 crore. This resulted in increase in cost per KWH by 14 paise in 1999-2000, 40 paise in 2000-01, 83 paise in 2001-02 and 24 paise in 2002-03.

Avoidable payment of incentive

3.1.26 Government of India notification (March 1992), stipulated that for generation of power above 68.5 per cent PLF, incentive not exceeding 0.7 per cent of equity capital for every percentage point of increase in PLF would be payable to the generating company and in respect of naphtha based thermal power plants, the extent of backing down ordered by State Electricity Boards beyond PLF of 6000 hours operation (68.5 per cent) in a year should not be reckoned as generation achieved for incentive purpose.

Contrary to the above conditions, the PPA with NTPC in respect of KYCCPP, a naphtha based plant, envisaged payment of incentive for generation of power above 68.5 per cent PLF, at rates ranging between 0.35 and 8.2 per cent of equity capital, reckoning extent of units backed down above 68.5 per cent PLF also as generation achieved. It was noticed in audit that the actual generation by KYCCPP during 2000-01 was only 62.11 per cent, which was below the PLF of 68.5 per cent prescribed in the PPA. Against this NTPC declared 81.61 per cent capacity as available for generation and the Board paid incentive for the 13.11 per cent deemed generation in excess of the PLF of 68.5 per cent as well. Thus, inclusion of a provision in the agreement for reckoning backed down generation as actual generation for purpose of payment of incentive, in violation of the Government of India guidelines, resulted in avoidable payment of Rs. 16.08 crore on 597.79 million KWH of backed down production.

Failure to sell surplus power to other states

3.1.27 Kayamkulam project was originally envisaged as a regional project. The infrastructure facilities were designed for a large project and location was identified on consideration of evacuation system suitable for sharing with other states. Later, when it was decided to utilise the station exclusively for Kerala, the increased capital investment and high transmission costs have added to the high cost of power from the station. Based on directions from Government of India, NTPC proposed (March 1997) to amend the PPA to the effect that in the event of Board's inability to draw 100 per cent power generated by the station, NTPC may divert such quantum of surplus power to other states for which charges were to be paid by beneficiary states. The State Government was averse to such an amendment as it did not anticipate a situation at that point of time where the State will not be able to absorb the entire power from the power station. When the unit started (March 2000) commercial operation, the Board could not draw the entire power generated by KYCCPP. Even then the Government of India suggested (October 2000) for surrender of excess power from the station to other states in the region and for billing of the entire power generated on pooled regional tariff. This suggestion was also not accepted by the State Government/Board on the ground that surrender of excess power could result in load shedding and power cut during summer months. Had the Government/Board accepted the proposal of the Government of India, the payment of deemed generation charges of Rs. 248.54 crore mentioned under paragraph 3.1.25 supra could have been avoided.

BSES Kerala Power Limited

3.1.28 Under the bid route the Board signed (December 1996) PPAs with BSES Kerala Power Limited (BSES) for implementation of two open cycle* power plants of 40 MW each at Thiruvananthapuram and Kochi. A third power plant of 40 MW proposed to be implemented at Kochi was also entrusted (December 1996), without bidding, to BSES for implementation. All the three

* Generator by using gas turbine.

projects were combined and converted as a single combined cycle# power plant of 157 MW for implementation at the site in Kochi. Provisional PPA for combined cycle plant was signed on 23 April, 1998 and final PPA on 3 May, 1999.

3.1.29 The 157 MW naphtha based combined cycle power plant consisting of three gas turbines (GTs) of 40.5 each and one steam turbine (ST) of 35.5 MW were synchronized to grid on 6 June, 2 August, 4 December, 1999 and 23 November, 2000 respectively. As per the PPA (May 1999) the Board had agreed to purchase power generated by the plant at 80 per cent PLF. Despite the synchronisation of the generators to the grid in 1999-2000 and 2000-01, the Board had declared the commercial operation of the plant under open cycle mode with effect from 15 June, 2001 only. Commercial operation of the plant under combined cycle mode was kept in abeyance by the Board (July 2001) on the ground that the generators were not delivering at inter connection point MVAR corresponding to 157 MW 0.8 power factor (PF) as accordance with Article 4 of the PPA read with Schedule 4. Installed capacity, power purchased and percentage of utilisation by the Board during 1999-2003 were as given below:

Particulars	1999-2000	2000-01	2001-02	2002-03
Installed capacity (in million KWH)	643.46	1064.34	1064.34	1372.32
Power purchased (in million KWH)	6.00	120.71	208.44	295.96
Percentage of utilisation by the Board	0.93	11.34	19.58	21.52

3.1.30 The utilisation of capacity by the Board ranged between 0.93 and 21.52 per cent only during 1999-2003 indicating that the PPA for additional capacity of 157 MW was not based on demand and resulted in avoidable payment of deemed generation charges as discussed in paragraph 3.1.33 infra. As a result of under drawal, average cost of purchase of power per unit varied between Rs. 5.25 and Rs. 7.79 during the four years ended 2002-03.

Generator using gas turbine and steam turbine in combination.

Impact of detrimental provisions of PPA

Schedule of implementation

3.1.31 PPA signed with BSES on 3 May, 1999 prescribed that the PPA for the combined cycle plant would supersede the earlier two PPAs signed on 24 December, 1996 and the third PPA signed on 23 April, 1998, which had the effect of changing the schedule of implementation of the project. The Board had complied with all the conditions to be fulfilled as per PPAs signed in December 1996, viz, arranging State Government guarantee for liquidation of Board's liabilities to BSES, opening of letter of credit for ensuring timely payment of invoices and opening of escrow account for securing the payment to BSES, etc., by 10 July, 1998 and the date of completion of the project was 5 April, 2000. As against this, the third gas turbine was synchronized to grid only on 23 November, 2000, after a delay of seven months. However, in the fourth PPA signed on 3 May, 1999, the inclusion of provision for supercession of all earlier PPAs resulted in depriving the Board of compensation of Rs. 2.24 crore, payable by BSES for belated completion of the project under open cycle. The Board had not yet (September 2003) opened the escrow account and letter of credit as per the final PPA (May 1999). Thus, the signing of new PPA had the effect of postponing the date of commissioning till the allied conditions were again satisfied by the Board even though these conditions were fulfilled as per the open cycle agreements signed earlier.

Power factor of energy supplied

3.1.32 Articles 1 and 5 of the PPA for the combined cycle power plant stipulated that the four generators (40.5 MW x 3 and 35.5 MW x 1) would deliver 157 MW at inter connection point at a load factor not less than 0.8 lagging. However, lack of penal provisions in the PPA for supply at lesser power factor, MVA, etc., rendered it impossible for the Board to claim damages for variation in power factor.

Demand generation charges

3.1.33 Despite the inability of BSES to deliver power at 0.8 power factor, the Board had declared the commercial operation of the project with effect from 15 June, 2001 under open cycle mode and purchased 631.11 million KWH of power during the four years up to 2002-03. As per Article 5.1 of the PPA the Board had to purchase entire electricity generated by BSES at 80 per cent PLF at the tariff fixed as per Article 7. Thus, the Board had to pay deemed generation charges to BSES, for short drawal of power with effect from 15 June, 2001, based on availability declaration filed by BSES. During 15 June, 2001 to 31 December, 2002, deemed generation charges payable by the Board for failure to purchase power declared by BSES as available, amounted to Rs. 144.17 crore. The claim has not been settled (September 2003).

Security for ensuring payments to BSES

3.1.34 Article 9 of PPA requires opening of letter of credit for ensuring monthly payments of tariff invoices, and opening of escrow account as security for an amount equal to 1.25 months' aggregate projected payments (fixed and variable) at 80 per cent PLF, in addition to Government guarantee for securing the entire obligations of the Board to BSES. Opening of the escrow account would result in blocking of funds amounting to Rs. 23.18 crore on which Board would sustain a recurring loss by way of interest amounting to Rs. 3.48 crore per annum @ 15 per cent in addition to letter of credit charges of Rs. 7.56 crore per annum. Thus, the inclusion of additional security provisions when the payments were already guaranteed by Government would result in financial loss to the Board.

Station heat rate

3.1.35 Schedule 5 of PPA stipulated that operation of the plant below 75 per cent capacity as per requirements of Board allowed correction of station heat rate and fuel consumption factor. Increase in heat rate results in increase in fuel consumption. During June 1999 to March 2001, BSES had raised bill for

Rs. 62.33 crore towards variable charges on 126.72 million KWH. During this period the plant was operated at less than 75 per cent PLF and station heat rate varied from 2700 to 3700 Kilo calories (kc) per unit. The Board had admitted and paid Rs. 47.49 crore on account of fixed cost based on agreed station heat rate of 2398 kc/KW for 80 per cent PLF as per PPA. As per the provisions of the PPA, the balance amount of Rs. 14.84 crore would also be payable, since the drawal of power by the Board was below 75 per cent capacity. The Board would be liable to pay variable charges at higher rates for underutilisation of contracted capacity in future also. The matter was referred (June 2003) to the Central Electricity Authority for decision.

The PPA did not contain a provision for passing on to the Board any savings due to reduction in station heat rate.

Delay in declaration of commercial operation

3.1.36 Article 7 of the PPA read with tariff tables A to D specifies the fixed and variable charges for purchase of power under open and combined cycle mode separately. As per this condition, variable charges (fuel cost) was payable, based on station heat rate and gross calorific value of fuel at the price of naphtha prevailing during the billing month. As per table A to D variable charges payable was Rs. 1.33 per KWH under open cycle and Rs.1.08 per KWH under combined cycle, based on the price of naphtha of Rs. 6100 per MT prevailing in January 1995, involving a saving of Rupee 0.25 per KWH on changing over to combined cycle mode.

3.1.37 Eventhough, BSES synchronised the steam turbine of 35.5 MW to the KSEB grid on 23 November, 2000 declaration of commercial operation of the plant has been kept in abeyance by the Board till date (September 2003) on the ground that the generators were not delivering MVAR at inter connection point corresponding to 157 MW at 0.8 power factor as per requirements of Article 4 of PPA. Despite the above, the Board had purchased 328.16 million KWH of power from BSES during November 2000 to May 2002 paying variable charges applicable for open cycle, ignoring the savings in variable charges under

combined cycle. Savings lost by the Board due to delay in declaration of commercial operation under combined cycle. Savings lost by the Board due to delay in declaration of commercial operation under combined cycle mode amounted to Rs. 20.39 crore (September 2003).

Kasargod Power Corporation Limited

3.1.38 A Memorandum of Understanding (MOU) was signed (May 1994) between the Government of Kerala and RPG Enterprises, Bombay, for setting up a diesel power project in Kasargod district. PPA was signed (March 1995) by the Board with Kasargod Power Corporation Limited (KPCL), a separate company formed for setting up an LSHS based power plant with capacity of 60 MW. Subsequently (March 1996), the implementation of the project was divided into two phases, the first being a 20 MW plant. Revised PPA was signed in August 1998. The three generators of 7 MW each were synchronised to the grid on 3 March, 2001. As per the PPA, the Board had agreed to purchase power generated by the plant at 80 per cent PLF. Installed capacity, power purchased and percentage of purchase to installed capacity for the period from March 2001 to March 2003 were as given below:

Particulars	2000-01	2001-02	2002-03
Installed capacity (in million KWH)	13.92*	175.20	175.20
Power purchased (in million KWH)	0.06	111.54	146.94
Percentage of purchase to installed capacity	0.43	63.66	83.87

3.1.39 Despite creation of additional capacity of 20 MW, utilisation of capacity by the Board was very low during 2000-01 to 2002-03 resulting in payment of deemed generation charges as discussed in paragraph 3.1.42 infra.

Impact of detrimental provisions of the PPA

Security for ensuring payments to KPCL

3.1.40 Article 9 of PPA requires opening of letter of credit for ensuring monthly payments of tariff invoices and opening of separate bank account viz, 'Escrow Account' as security for an amount equal to 1.25 months' aggregate

* For 29 days only.

projected payments (fixed and variable) at 80 per cent PLF, in addition to Government guarantee for securing the entire obligation of the Board to KPCL. Opening of Escrow Account would result in blocking of funds amounting to Rs. 5.72 crore based on March 2002 bills on which the Board would sustain a recurring loss by way of interest amounting to Rs.0.86 crore per annum @ 15 per cent in addition to letter of credit charges of Rs. 2.33 crore per annum. Inclusion of more than one safety clause for prompt discharge of payment lacked justification.

Rebate for prompt payment of power charges

3.1.41 Government of India guidelines (March 1992) on PPA, envisaged a rebate of 2.5 per cent for payment of bills through letter of credit and one per cent rebate for payment, otherwise than through letter of credit within a period of one month of presentation of bills. The PPA with KPCL does not provide for the benefit of rebate for payment through letter of credit or otherwise. The omission to include such a provision would result in recurring loss of Rs. 1.37 crore per annum on monthly bills of Rs. 4.58 crore payable at 80 per cent contracted capacity.

Deemed generation charges

3.1.42 The Board had agreed (Article 5 of PPA) to purchase entire power generated by KPCL at 80 per cent PLF at the tariff fixed as per Article 7. As per this condition the Board was liable to pay fixed charges as deemed generation charges on units not purchased, limited to 80 per cent PLF, in the event of inability of the Board to purchase power from KPCL. The Board had given backing down instructions to KPCL on several occasions, either to avoid spillage of its hydel reservoirs during monsoon months or for absorbing cheaper power available from central power stations, in order to save variable cost of generation by KPCL. Deemed generation charges paid on 37.13 million KWH of power not purchased during April 2001 to August 2002 amounted to Rs. 2.62 crore.

Payment of excise duty on fuel

3.1.43 As per Government of India notification (March 2001), KPCL was eligible for exemption from payment of excise duty on LSHS used for generation of electricity subject to sanction of the State Government obtained by the IPP

under Section 28 of Indian Electricity Act, 1910 to the effect that KPCL was a licensee under Part II of Indian Electricity Act, 1910 (9 of 1910) to supply electrical energy and to engage in the business of supplying electrical energy. KSEB being engaged in generation and supply of electricity was availing this concession in the generating station at BDPP and KDPP on LSHS consumed. However, the matter was not taken up by the Board with KPCL and the failure of the KPCL in obtaining necessary exemption from payment of duty and passing on the benefit of reduction in cost to the Board, resulted in loss of Rs. 9.99 crore during March 2001 to March 2003.

Payment of exchange rate variation

3.1.44 The proposed means of financing of the KPCL power project as per PPA and actual expenditure on implemention, of the project were as indicated below:

Particulars	As per PPA		Actual	
	Rs. in crore	Percentage to total	Rs. in crore	Percentage to total
Debt:				
i. In Indian rupees	10.49	15.37	47.00	66.41
ii. In Netherlands guilders	35.00	51.30	NIL	NIL
Promoters' contribution:				
i. In Indian rupees	22.74	33.33	12.12	17.13
ii. In US Dollar (equity)	NIL	NIL	11.65	16.46
Total	**68.23**	**100**	**70.77**	**100**

3.1.45 As per Schedule 8 of PPA, borrowings included foreign currency loan in Netherland guilders amounting to Rs. 35 crore, repayable to KPCL in Indian rupees, along with exchange rate variation prevalent on the billing date, as

monthly foreign debt service charges (MFDSC) forming part of fixed charges. On actual implementation of the project, there was no foreign exchange component in the borrowings as originally envisaged and the entire borrowings was in Indian rupees only.

In the absence of any borrowings in foreign currency there was no necessity for payment of MFDSC in terms of Netherlands guilders every month on the basis of original financing pattern. The undue benefit passed on to KPCL by way of payment of exchange rate variation during May 2001 to March 2003 amounted to Rs. 1.26 crore.

Purchase of power from central power stations

3.1.46 The power requirements of the State was being met out of own generation from hydel power stations, purchase from central power stations and independent power producers. The power allocation from central power stations was being made by the Ministry of Power at pre-determined percentages. The average cost per unit (KWH) purchased from central pool ranged between Rs. 1.42 and Rs. 1.91 during 1998-2003.

3.1.47 Eventhough the cost per KWH of power purchased from central pool was cheaper as compared to the cost per KWH of power from own thermal power stations and IPPs, the Board did not draw power from central power stations to the full extent and alternatively purchased power from other costlier sources during April 1999 to August 2001. Avoidable additional expenditure incurred on under-drawn power of 109.06 million KWH from central pool when compared to the variable cost of power purchased from KYCCPP for the period during April 1999 to August 2001 amounted to Rs. 16.47 crore.

Underutilisation of cheaper hydel capacity and procurement of costlier thermal power

3.1.48 The total installed capacity of 19 (including captive capacity created by two private entrepreneurs) hydel power stations in the state as at the end of 31st March, 2003 was 1825.5 MW. The installed capacity, plant load factor fixed,

power generated, capacity utilisation and actual average plant load factor of the 17 projects owned by the Board for the five years up to 2002-03 were as given in Annexure 24.

It could be seen from the Annexure that the average capacity utilisation (PLF) of the 17 projects during the five years up to 31 March 2003 ranged between 31 and 47 per cent only, indicating that substantial portion of the hydro-generation capacity created by the Board by investing huge funds was not utilised fully.

3.1.49 Out of 17 hydel projects having a total capacity of 1792.5 MW, 9 generating stations (Sl.No. 1, 2, 3, 4, 5, 7, 9, 10 & 11 of the Annexure 24) having a total installed capacity of 519.5 MW and having lesser water storage facility had to spill excess water during monsoon season. The Board was to continuously monitor and manage the water availability of these nine stations in such a way that the shutdown of the generators for maintenance and repairs was planned efficiently and the generators kept ready so as to utilise the machines to the maximum extent to avoid spillage of water without producing power. Failure of the Board to effectively manage the available water for hydro generation necessitated purchase of costlier thermal power and resultant loss of Rs. 200.41 crore, as discussed below:

3.1.50 The Pallivasal hydro power station of the Board had a capacity of 37.5 MW with six generators (three each with 5 and 7.5 MW respectively) and the power station with capacity of 48 MW (4 x 12 MW) was also constructed by the Board at Sengulam with the sole intention of using the tail race waters of the Pallivasal project. It was noticed in audit that the maintenance of machines at Pallivasal station was not being carried out in time, and there was undue delay in renovating and repairing the generators during April 1998 to July 2002 ranging from one month to four years.

Failure of the Board to repair and make available the generators at Pallivasal power station within the normal/targeted time during the monsoon season for the three years up to 31 March 2002 resulted in spillage of 313.31 MCM* of water out of which 395.61 million units of energy have been produced @ 0.792 MCM per million units (mu). Since the Sengulam power station was working on the tail race water of Pallivasal, the above spillage of water also contributed to non-generation of 246.68 mu (@1.27 MCM per mu) of power a Sengulam involving a total loss of generation of 642.29 million units of energy. By carrying out the repair and renovation of generators in time the Board could have avoided the additional variable cost of Rs. 186.40 crore on the alternative purchase of 642.29 million KWH of thermal power.

3.1.51 In respect of four hydro-generating stations (Sholayar, Peringalkuthu, Panniyar and Neriyamangalm) the machines were not ready for operation during the monsoon season of 1999-2000 to 2001-02 due to, shutdown of the generators for planned maintenance resulting in a loss of Rs. 14.01 crore on alternative purchase of costlier thermal power.

Impact of thermal generation and power purchases on Board's revenue Under utilisation of capacity

3.1.52 The Board started using thermal power from May 1997 onwards and the total installed capacity as on 31 March 1998 was 1775.78 MW comprising 1690.50 MW hydro power and 85.28 MW thermal power (equivalent to 14808.78 MKWH and 747.05 MKWH respectively). Additional capacity of 822.90 MW consisting of 137 MW hydel power and 685.9 MW thermal power was created during the five years up to 2002-03.

3.1.53 Gross installed capacity (source-wise), maximum demand for peak load consumption, available total thermal capacity, thermal power

* Million cubic metres.

purchased/generated and capacity utilisation for the five years up to 2002-03 are given below:

Particulars	1998-99	1999-2000	2000-01	2001-02	2002-03
Installed capacity (in MW)					
Hydel	1706.50	1756.50	1806.50	1827.50	1827.50
Thermal:					
Own	106.60	234.60	234.60	234.60	234.60
IPPs/NTPC	233.20	481.08	481.08	501.08	536.58
Central pool allocation	416.00	619.00	500.00	500.00	500.00
Gross capacity (in MW)	2462.30	3091.18	3022.18	3063.18	3098.68
Maximum demand for peak load consumption (in MW)	1918	2182	2316	2333	2347
Available total thermal capacity (in million KWH)	1321.66	4532.83	6283.28	6444.56	6755.54
Thermal power purchased/generated (in million KWH)	484.89	1801.31	2772.99	2023.18	3145.58
Capacity utilisation (in per cent)	36.69	39.74	44.13	31.39	46.56

It could be seen from the above that:

- as against the gross installed capacity of 2462.30 to 3098.68 MW during the five years 1998-2003, the maximum demand during peak hour, in these years ranged between 1918 and 2372 MW.

- Despite creating additional capacity of 771.18 MW of costlier thermal power, the actual utilisation of thermal capacity ranged between 31 and 47 per cent only during the five years from 1998-2003.

This indicated that creation of additional thermal capacity of 536.58 MW by way of PPAs with KYCCPP, BSES and KPCL was avoidable and contributed to

losses by way of purchase of power at exorbitant cost and payment of huge amount by way of deemed generation charges as discussed in paragraphs 3.1.25, 3.1.33 and 3.1.42 supra.

3.1.54 Based on the total installed capacity (own generation, PPAs and central pool allocation) the units (KWH) that could have been generated during the four years from 1998-99 to 2001-02 ranged between 21569.75 and 26833.46 million. The actual units produced/purchased ranged between 11164.61 and 12554.06 million representing 44 to 52 per cent against which the sales recorded was between 8667.91 and 10319 MU only. The transmission and distribution loss ranged between 17 and 31 per cent. Thus, the thermal capacity created since May 1999 by way of own projects and PPAs representing generation of 6444.56 MKWH was grossly underutilised which could have been avoided by better utilisation of available water resources, utilising central pool allocation to the full extent and by reducing the transmission and distribution loss which represented the all time high of 31 per cent during 2001-02.

Impact on cost of units sold

3.1.55 Annexure 25 provides for the details of thermal and hydro power available for sale, cost of power purchased/generated and sold, sale realisation thereof, net profit/loss on sale of hydro power/thermal power, etc., during the five years ended 2001-02.

3.1.56 The details in the Annexure indicate that during the year 1997-98 when there was only hydro-power generation and purchase of allocated power from central pool, there was a net profit of Rs. 257.09 crore from sale of power. Even since own generation and purchase of thermal power from IPPs/NTPC started in 1998-99 the Board incurred loss on sale of power ranging between Rs. 239.11 crore and Rs. 1022.06 crore per annum up to 2001-02 resulting in an aggregate net loss of Rs. 2506.33 crore during 1998-2003, despite the fact that the per unit sales realisation registered an increase of 133 per cent. Even the peak load management would have been possible with the effect utilisation of available capacity during the period. The loss was compensated by State Government by

way of subsidy and the percentage of subsidy to gross revenue from sale of power (excluding electricity duty) ranged between 17 and 56.

The above matters were reported to Government/Board in May 2003. Their replies are awaited (September 2003).

[Audit paragraphs 3.1.1 - 3.1.56 contained in the Report of the C & AG for the year ended on 31 March 2003]

Deliberations of the Committee Regarding Audit Report 2011-12

1. The Committee sought explanation for the procurement of pre-stressed concrete poles (PSC) by the Board without proper assessment of its requirement. The witness informed that the demand for the PSCs could not be forecasted exactly because the requirement of PSCs generally arised only during the electrification of buildings after its construction and there wasn't any need to extend the cables prior to the construction. Besides, if some contractors failed to deliver, the shortage of poles had to be made up from the remaining contracts as poles couldn't be procured from the open market and considering these aspects, the quantity was assessed safely in higher side. Owing to all these reasons, it was practically very difficult to assess the exact requirement of PSCs.

2. To a query of the Committee regarding the mode of assessment followed by the Board, the witness informed that they had assessed the requirement of poles for five years on an adhoc basis as five times the requirement for one year. When the Committee enquired about the feasibility of such an assessment method, the witness appealed that the said method was found to be very effective. The Committee however was not fully convinced with the statement of the witness.

3. By citing the instance quoted by the Accountant General, the Committee wanted to get explanation for ordering PSCs amounting to Rs. 17.16 lakhs as against the assessed quantity of 11.80 lakhs. The witness explained that the contractors would deliver only half of the quantity ordered and in many cases Board had to face a lot of difficulties connecting with the shortage of poles due to failure in delivery at the right time. Hence considering all these aspects, the

quantity was usually assessed safely on the higher side. He further added that they were also facing difficulties over the restricted supply system of PSC poles prevailing in the market.

4. To a query of the Committee regarding the functionability of KSEB's yard at Pothencode, Thiruvananthapuram the witness revealed that in Pothencode, the Board had only land and the yard was yet to setup. As of now, they have owned yards at Choolissery in Thrissur District, Mangattuparambu in Kannur District and Mananthavady in Wayanad District.

5. The witness also pointed out that, they are not able to predict the demand for PSCs, since they were not adopting any scientific method of assessment in this regard. The Committee also learned that instead of assessing the actual requirement of poles by considering the ongoing works, Poles held with Board and the new works to be taken up in future, the Board had assessed the requirement of PSC poles in an unscientific and unrealistic manner.

Undue favour to few firms.

6. The Committee enquired why the Board awarded contracts to the firms which were disqualified by the Pre-Qualification Committee during the selection of prequalification bids due to their past poor performance. The witness explained that, a firm named Vallikat Constructions was only pre-qualified while inviting tenders for the supply of Poles to Ernakulam Circle. But it was having a capacity to supply only 50% of the required PSCs in Ernakulam region. He added that if the Board depends upon a single tenderer, the Board could not meet the whole demand of the Ernakulam Circle. Hence in such a scenario, inorder to meet all the demands in Ernakulam region, the Board decided to qualify M/s West Coast Concrete Products eventhough that firm had been supplying Poles since 1984 but it was disqualified due to past one year's default.

7. At this juncture, the Deputy Accountant General argued that the Board had not incorporated such an explanation in their submitted reply so far and the witness admitted it.

8. The Committee wanted to get explanation for awarding contracts to M/s Suman Concrete Products which was initially disqualified by the Pre-Qualification Committee. The witness explained that M/s Suman Concrete Products was not initially pre-qualified in view of previous experience. He added that M/s Suman Concrete Products who was an existing supplier of Poles to Karnataka State PSU informed that Poles would be brought to Kerala at reduced rates by exempting excise duty, the Purchase Committee decided to pre-qualify them.

9. The Committee enquired whether there was any provision to qualify the already disqualified firms based on the representation submitted to the Chairman of the Board. The witness stated that Pre-Qualification Committee mainly gave emphasis to select most competent bidder capable of supplying best quality products. Also those firms were disqualified not on the basis of the quality of their product and the decision was taken by the Purchase Committee and not the Chairman of the Board, since there was no other option left over with KSEB for arranging the poles.

10. When the Committee sought explanation for awarding contracts to four new firms which were promoted by a previously defaulted supplier the witness informed that the companies having large cumulative turnover usually opted to register as new firms in new names inorder to get exemption from the excise duty.

11. The Committee was not satisfied with the explanation of the witness and opined that the Board ought to have denied those firms from participating in the auction since they had already proved as defaulters by themselves. The Committee also criticized the Board for not including the above listed points in the reply furnished by them on the audit objection. While admitting the mistake, the witness stated that if the pre-qualification criteria were made more meticulous, it would adversely affect the production of required quantity of PSCs.

12. The Committee objected the view point taken by the Board in this regard and remarked that instead of insisting the contractors to strictly abide by the contract terms and conditions, the Board had permitted the contractors to violate the same.

13. The Committee considered the biased attitude of the Board towards the contractors with serious concern and remarked that the contract terms and conditions formulated by the Board had no validity since what they were doing practically was just opposite to the theoretical aspects of contract provisions.

14. The Committee learned that the tenders did not prescribe the maximum number of ECs for which a bidder can submit its bids. In that scenario, the Committee enquired whether the Board had taken into account the production capacity of the bidders while placing the orders. The witness replied that inorder to ensure maximum competition, the tender did not prescribe the maximum number of ECS for which a bidder can submit bids. He also added that the production capacity could not be considered by the pre-qualification Committee, but was considered by the Purchase Committee while deciding to place orders.

15. The Committee wanted to know whether the Board imposed any penalty on the contractors for their non-compliance to contract provisions. The witness revealed that payment had been withheld in cases of short supply. They had filed a case in the Hon. High Court against the delayed supply of agreed quantity by the Companies and it was now under consideration of the Board. He added that the bills were not settled yet.

16. The Committee was dissatisfied to note that the Board refixed the targets by merely considering the request of the suppliers only and not considering the request of the Electrical Circles eventhough it was mentioned in the contract that monthly targets should not be refixed on any account. The Committee pointed out that inorder to overcome the shortage of poles due to the non-consideration of the requests of Electrical Circles, the Board diverted the poles from other circles which resulted in an expenditure of ₹ 44.85 lakh towards transportation charges. The Committee remarked that such action was against the financial interest of the Board.

17. The Committee sought explanation on the audit objection regarding the advance payment made to M/s PICOS Ltd., Pinarayi in contradiction to the terms of contract. The witness replied that though it was mentioned in the contract that payments should be made within 45 days of the presentation of bills, the Board considered M/s PICOS Ltd. as a special case hence it was a workers Industrial Co-oporative Society and decided to release 50% of the basic price immediately after testing the poles subject to the condition that the poles should be transported within 15 days from the date of allocation. He also added that there wasn't any loss to KSEB in this regard.

18. The Committee enquired why the Board did not collect security deposit as stipulated in the contract terms. The witness stated that if security deposit was collected at a rate of 5% of the total contract value it would be become a very huge amount. Hence it was found to be impractical and the Board decided to limit the rate of security deposit at 1% for one year.

19. The Committee remarked that it was evident from this instance that legal cell of the Board had miserably failed to incorporate feasible terms and conditions in the contract. The witness stated that they had already constituted a Committee in this regard and the Committee in its report suggested that there wasn't any need to modify the existing terms and conditions of the contract.

20. The Committee sought explanation on the audit objection regarding the non-levy of penalty for belated supply as per the terms of contract. By expressing its dissidence over the said objection raised by the Accountant General, the witness stated that the Accountant General had interpreted the contract agreement in a quite different manner. According to KSEB's view, the penalty would be imposed quarterly at the rate of 5% of the value of poles short supplied and the contract was not bound to make up the shortfall of a quarter in subsequent quarters and in the contract it was clearly stated that no retrospective adjustment of poles would be made. But as per the Accountant General's view, the contractor had to compensate the short supply in a quarter in the subsequent quarters eventhough the penalty for that short supply had already been levied.

21. When the Committee asked for Auditor's version, the Senior Audit officer informed that as per the agreement, penalty had to be imposed for belated supply only and not for quarterly short supply. The Committee opined that since the contract was of a lump-sum type, the Board adjusted the penalty for belated supply on a quarterly basis in favour of the contractor.

22. At this juncture, the Director (Finance) KSEB clarified that in the contract agreement it was clearly mentioned that if the contractor failed to achieve the quarterly target as per the above schedule, penalty would be imposed quarterly at the rate of five percent of the value of the poles short supplied and Committee was convinced with that clarification.

23. The Committee enquired why the Board refunded the penalty of ₹ 62.74 lakh to five contractors by violating clause 12 of the Contract agreement. The witness replied that hence the Board was aware of the fact that it was quite insufficient to set up a yard within three months, Board took a lienient view and decided to refund the penalty of ₹ 62.47 lakh imposed from five contractors for the delay in setting up new pole casting yards.

24. The Committee was not satisfied with the explanation of the witness and blamed the Board for incorporating non practical terms and conditions in the contract agreement. The Committee also remarked that the Board had nullified the purpose of the contract terms and conditions by deliberately altering them in favour of the contractors.

25. The Committee wanted to get explanation on the audit objection regarding the post contract modification of the contract terms and conditions to the advantage of the contractor. The Secretary, Power Department replied that price variation clause would be included only if the price of the materials exceeded by 10% from their value on the due date of tender and it was stipulated in the contract that increase upto 10% should be ready to bear by the Contractors. For that particular period inaddition to cement and steel, price of all materials exceeded by 10%. He also added that stoppage of agreement by the contractors due to the payment of price variation was one of the reason for the short supply of poles.

Moreover, practical difficulties were there in limiting the price variation by 10% in a long term contract for five years. The witness informed that power had been delegated by the Board to amend the agreement with a supplementary agreement if it was found necessary.

26. The Committee sought explanation on the audit objection regarding the payment of transportation charges to the contractors in violation of the terms of contract. The witness clarified that the said transportation charges pointed out by the Accountant General was ₹ 577.100/- which had already been recovered from M/s Pooja Industries for the supply of poles in Kottayam Electrical Circle. However, the Bill had not been settled yet. He also assured that they would definitely realize that amount from the responsible contractor at the earliest.

27. The Committee wanted to get details about the Chief Engineer (Transmission control and Maintenance) (CE (TC&M) who recommended modifications/amendments to the terms and conditions of the contract without analysing the financial implication, that ultimately resulted in undue financial benefits to the contractors. The Committee directed the Board to conduct a detailed enquiry in this regard and needs to take strong action against the accused.

28. When the Committee sought explanation on the audit objection regarding the unsecured stocking of poles along the roadside, the witness replied that it was not possible to stock all the poles required for a circle at the Sub Regional stores due to lack of space. Moreover, in the case of Electrical Circles having very large geographical area, huge additional expenses would be required for transporting the poles to their final destinations & hence the poles was stacked along the road side, he added.

29. The Accountant General cited with proof that many poles got damaged and even buried under soil while widening the roads, the witness objected and said that the poles were damaged once it was not taken back by the contractors. He added that no good poles had been damaged by the PWD during maintenance works and no loss had been sustained to the KSE board in this regard.

30. When the Committee enquired about the discrepancies observed on physical verification of the stock of poles under Electrical Circle, the witness admitted that out of the purchased quantity of 11 lakh poles, the mismatch in MASA (Material At Site Account) pointed out by the Accountant General was occurred in one electrical section only and it was observed in the case of approximately 210 poles out of 9000 poles required to the section and that might be considered as a serious loss.

31. The Committee enquired on what ground the Board had entered into new contracts at higher rates before the expiry of the existing contracts. The witness stated that as per the opinion of Accountant General, the contractor was bound to perform the contract in full and in case of non-supply, the contractor was not only supposed to pay penalty but also need to supply the defaulted quantity of poles during the subsequent period. But this was not possible since as per the purchase order condition, the contractor were not bound to supply the defaulted quantity and their responsibility would end with the payment of penalty. Hence in order to procure the balance quantity of poles, it was inevitable for the Board to enter into new contracts before the expiry of the existing ones.

32. The Committee was not fully convinced with the explanation of the witness and suspected that by imposing penalty on the defaulted contractors, the Board was deliberately giving a chance to the contractor to get away from the responsibility of supplying the balance quantity against the previous contract and to enter into new contracts at higher rates than that of the current long term contracts.

33. The Committee is of the view that by incorporating the provision of penalty in the contract agreement the Board itself placed loophole for helping the contractors to get rid of the existing contracts and to enter its new contracts at higher rates during the time of price hike.

34. To a specific question of the Committee regarding the imposition of penalty and risk and cost provisions, the witness informed that those provisions

were invoked against the violation of contract agreements and there were a lot of cases going on against the imposition of risk and cost provisions. He also added that the decision in this regard were taken only after proper and thorough analysis.

35. The Committee is of the view that the Board had adopted different approaches to various contractors and also commented that most of the decisions taken by the Board was devoid of any equal justice.

36. The Committee expressed its strong displeasure over the inefficiency of the legal cell of the Board in litigation management. The Committee pointed out that Kerala Electricity Board was the largest litigant in the state and more than 750 crores of rupees were blocked due to litigation and around 23000 cases were still pending. Therefore the Committee remarked that it was very essential to restructure the legal cell of the Board.

37. The witness replied that in addition to legal cell, there were also standing counsels functioning in each district. But in some cases, even the responsible lawyers had made deliberate delay in forwarding the final judgement of the cases to headquarters before the appeal period.

38. The Secretary, Power Department also disclosed that eventhough the Board had appointed the District Judge as the legal head in the Legal Cell and those who had LLB qualification were appointed as Nodal Officer to monitor the cases, there was no mechanism to control the lawyers who appeared in the court for presenting the cases.

39. While considering the audit para with regard to the tree cutting compensation, the Secretary, Power Department informed that petitions came before the Board mainly related to theft of Power and Compensation with regard to tree cutting. The Committee sought explanation on the audit objection regarding the non-compliance with provisions of its own manual by the Board which had resulted in avoidable litigation. The witness admitted that there were a few mistakes from their side in amending the manual. He further responded that they were still following the manual formulated in 1967 and according to that

manual, the tree cutting compensation was fixed at 5%. But in the light of decision in Livisna case by the Supreme Court all district courts followed 8% annually. So they have to amend the manual accordingly.

40. When the Committee enquired whether the Board implemented total monitoring system in the legal cell, the witness informed that there had been a total monitoring facility functioning already in the legal cell with District Judge as the head of it and Monitoring was done by the person appointed by the Hon. High Court.

41. The Committee wanted to know the details of action undertaken by the Board to realize the pending electricity charges from its defaulted consumers. The witness informed that for the defaulted consumers, they would initially gave a notice period of 15 days followed by the disconnection of supply of electricity in the case of non-payment of dues after the 15 days of notice period. Moreover, they would also initiate revenue recovery measures for the realization of defaulted amount.

42. The Committee was of the view that the Board always showed an over enthusiasm in disconnecting the supply of domestic consumers at a single instance of default but turned a blind eye towards large scale industries which committed regular default by the non-payment of dues amounting to crores of rupees. Hence, the Committee wanted to know the details of action taken by the Board against the industrial units which have to pay crores of rupees as dues to the Board. The witness replied that strict measures had been taken to recover dues from industrial units. However, there were some specific cases including FACT, Autokast Limited, Kerala Water Authority etc. from which the Board was not able to recover the dues due to the distressing conditions of those institutions. The Committee suggested that in the case of non-repayment of electricity arrears, electricity had to be disconnected at least for an hour.

43. The Committee wanted to get clarification on the audit objection regarding the non-charging of separate rates in case of non segregation of light/power loads and unauthorized use of electricity in respect of HT/EHT

consumers which led to a loss of revenue amounting to ₹ 7.52 crore. The witness replied that as per the Kerala State Electricity Board Terms and Conditions of supply 2005(TCS), HT/EHT consumers with light load consumption higher than 10% of the power load consumption must install a separate sub-meter, else they had to pay penalty for that. He added that almost 99% of the consumers were following that and penalty were imposed against those who violate the same.

44. The Committee wanted to know whether the Board had undertaken any method to reduce the energy consumption. The witness informed that for reducing the energy consumption, prescriptions were given by the Energy Management Centre (EMC) of KSEB based on the audit conducted by them. Based on that, they also provided loans at a rate of 6% interest.

45. The Committee sought clarification on the audit objection regarding the irregular payment of Isolated Area Allowance without the approval of Government which had resulted in an extra expenditure of ₹ 43.80 lakh. The witness answered that though there was a restriction in the pay revision order of 2007 regarding the payment of Isolated Area Allowance (IAA) to officers who were drawing Hydel/Investigation Allowances, Government had later ratified the action taken by them for the payment of IAA together with Hydel/Investigation Allowance to the officers by relaxing the restriction formerly imposed on it.

46. To a query of the Committee regarding the Isolated areas, the witness replied that isolated Areas as notified by the Board comprised of Peringalkoothu, Moozhiyar, Kochupampa, Edamalayar, Kakkayam and Triveni-Pampa.

47. The Committee enquired whether all the officers working at isolated areas were eligible for IAA. The witness informed that all the officers working at isolated areas were given IAA at a rate of 10% of their Basic Pay subject to a maximum of ₹ 1300 per month.

48. The Committee was of the opinion that it was good to give some allowances to those persons working at hazardous working locations. The Committee was able to understand the good intention behind the Board's decision eventhough it was without the approval of Government.

49. With regard to the audit para the Committee opined that the Board did not have sufficient planning because they had decided to create own thermal generation capacity without considering the suggestion of the Taskforce to meet the demand by exploiting hydro generation potential in the State. The Committee also expressed its discontent over the decision of the Board to purchase thermal power from independent power producers without proper assessment of the energy requirement and peak load demand.

50. The Committee was dissatisfied to note that the under utilisation of two already implemented thermal projects of the Board such as Brahmapuram Diesel Power Project and Kozhikode Diesel Power Project resulted in a loss of ₹ 351.28 crore.

51. The Committee was aggrieved to note that the Board decided to generate/Purchase thermal power without evaluating future financial implications.

52. The Committee was of the opinion that if the Board had utilised the water resources and power available from the Central pool, reduce transmission and distribution losses created additional thermal capacity, such losses could have been minimized to a certain extent.

Audit Report (2004-05)

53. The Committee opined that the State Government and Board may put in place a proper system for Project Formulation and Management. Efforts should be made to derive the benefit of accepted best practices and procedures in the identification of consultants and vendors for execution of projects with a view to protect the financial interests of the Board.

54. The Committee directed that the Board should finalise tenders for supply and installation directly with the manufacturers rather than through intermediaries and should take adequate care to ensure quality as well as performance of plants procured.

55. The Committee suggested that prior to finalisation of project contracts, the Board should compare the cost of similar foreign/indigeneous projects

finalised/executed to secure cost effectiveness and value for money. Adequate care should also be taken in reducing financing costs while negotiating finance from foreign sources.

56. The Committee found that the Board had incurred an avoidable loss of ₹ 1.23 crore towards energy consumption charges due to a faulty agreement with IOC for supply of fuel oils. The Committee deprecated the irresponsibility on the part of the officers of the Board who failed to draft the agreement for supply of fuel oils with due care which had resulted in such a huge loss.

Audit Report (2005-06)

57. The Committee was displeased to note that budget estimates were not prepared on a scientific basis with respect to schemes/projects to be executed during the ensuing year and the revenue budget hadn't portrayed a realistic estimate of the revenue and expenditure of the Board. The Committee was of the view that the annual budgets prepared by the Board did not serve the purpose of fund management since the estimates not only widely varied from actuals but non analysis of the variation was also being done.

58. The Committee expressed its strong discontent over the impetuous action of the Board in diverting a substantial portion of capital receipts for revenue purposes and sourcing huge long term funds for debt servicing and meeting revenue expenditure.

59. The Committee was perturbed to learn that the liquidity position of the Board was affected due to accounting of huge funds as subsidy receivable without cash flow from the Government and during the period 2001-02 to 2005-06, realisation against receivables had decreased and Government Departments/State Public sector units were the major defaulters.

60. The Committee found that delay in swapping and rescheduling of loans had resulted in extra financing cost and the inadequacy of internal control had resulted in misappropriation/defalcation. The Committee gave a direction that

measures should be initiated by the Board in time for reducing the financing cost by adopting better financing strategies like swapping rescheduling etc. of loans. The Committee also directed that the internal control should be made more effective and result oriented.

61. The Committee found that even though the computerisation of all distribution sections was scheduled to be completed by March 2004, only 33 per cent of sections had been computerised by that time. The Committee criticized the officers of the Board for their delay in completing the computerisation of the sections with in the scheduled time and directed them to expedite it.

62. The Committee was much distressed to note that due to the failure of the Board to introduce Personal Digital Analyser for generating invoice at the door step of the consumer, 95 percent of bills were being generated manually and were subsequently feed in to computers increasing the risk of data entry errors and data manipulation. Also, the system was not generating bills as per business rules as controls over input of data were poor and processing was erroneous in many cases leading to continuing revenue loss to the Board.

63. The Committee urged the Board to introduce PDA to fully automate the billing process and reduce manual work. The Committee directed the Board to scrutinize all manual collections from March 2004 onwards at all computerized sections to assess the quantum of receipts that had escaped accounting in the system.

64. With a view to minimize the scope of data manipulation, the Committee suggested the Board to set up Data centres with facility for centralised processing of data and enforcing rigidity in data input to avoid process errors.

65. The Committee was perturbed to learn that lack of awareness among staff about the system security endued the system vulnerable to unauthorised access and loss of data integrity. Therefore the Committee gave a direction that

the Board should strengthen system security and business continuity planning by imparting proper user awareness training in Computer Assisted Audit Technique and developing effective Audit modules suitable for Internal Auditors and External Auditors.

66. The Committee was perturbed to learn that granting of rebate in contravention of the provisions of the agreement and in violation of the formula prescribed for maximum demand relief resulted in extending of undue benefit of ₹ 1.12 crore to Indsil Electromelts Limited (IEL).

67. The Committee observed that the failure of the Board to invoke reduction in prices on belated supplies and refund of liquidated damages already levied in terms of the contract resulted in a loss of ₹ 1.06 crore.

68. The Committee deprecated the inexplicable action of the Board in misutilising incentive funds released by the Government of India for development of power sector for payment of donation and gift resulting in non-productive expenditure of ₹ 2.50 crore. The Committee was of the view that neither the donation to a society nor the gift to Board employees could be considered as a utilisation for improvement of power sector and commented the said action of the Board as unjustifiable.

69. The Committee seriously viewed the failure on the part of Board in terminating the order in time and recovering the additional cost on alternate procurement of meters at the risk and cost of HPL Socomec (P) Limited (HPL) which had resulted in an avoidable expenditure of ₹ 68.6 lakh. The Committee flayed the irresponsibility and negligence on the part of the officers concerned and opined that officers who failed to discharge their duty in good faith and responsibility was highly regrettable.

70. The Committee observed that the imprudent decision of the Board to bear the statutory variations in taxes and levies in respect of tenders/purchase orders already issued by the Board by ignoring the fact that the tenderers had quoted for meters taking into account the future enhancement in taxes and levies, had resulted in an undue benefit of ₹ 20.55 lakh to the supplier.

71. The Committee observed that the failure of the Board to procure materials from the second lowest tenderer within the validity period by terminating the purchase order with NLE on account of its non supply of materials in time resulted in an avoidable loss of ₹ 18.25 lakh.

Audit Report (2007-08)

72. The Committee was much displeased to note that the Board while having an estimated potential of 1000 MW for development of small Hydro-electric projects had implemented only seven projects with a total capacity of 29.10 MW during the tenth plan period (2002-2007) against 10 projects of 40.85 MW targetted. The Committee also found that there was delay ranging from eight months to 129 months in the implementation of projects mainly due to delay in acquisition of land, according sanction, awarding of tenders and non synchronisation of various works due to the absence of proper planning and co-ordination.

73. The Committee suggested that the Board should implement small hydro electric projects within the scheduled time through better planning and co-ordination of work by ensuring proper synchronisation in the implementation of the work to avoid idling of completed work and thereby achieving the envisaged benefit.

74. The Committee was aggrieved to note that the project financing was not cost effective and the benefit of subsidy available from MNES was not availed of to a substantial extent. The Committee observed that there was lack of transparency in the planning and formulation of Chinese assisted projects due to which the benefit of competitive rates could not be availed of on account of deviation from the normal procedures of global tendering. Therefore the Committee gave a direction that the Board should ensure close monitoring in an effective manner so as to avoid time and cost overrun.

75. In order to avoid the loss of generation arising from delay in execution of projects and various technical and design defects the Committee directed the Board to follow best commercial practices in evaluation and award of contracts so

that technically qualified and experienced contractors were selected to avoid technical and design defects and failure of the equipments during post commissioning period.

76. The Committee criticized the unscrupulous decision of the Board to include departmentally executed rural electrification works under Rajiv Gandhi Grameen Vidyatikaran Yojana (RGGVY) scheme in violation of the Rural Electrification Corporation (REC) guidelines and conditions of tripartite agreement which rendered it ineligible for capital subsidy of ₹ 10.57 crore. The Committee was not convinced with the Board's explanation that the social obligation of the board to provide power supply to certain classes of prospective consumers, forced them to execute the work proposed under the scheme without waiting indefinitely for favouring the turnkey contractor.

77. The Committee observed that the omission of the Board in prescribing compounded rate of interest in the quotation invited for short term deposits from banks resulted in an interest loss of ₹ 30.68 lakh.

78. The Committee expressed strong discontent over the decision of the Board to waive an annual increase in pole rentals without justifiable ground that had resulted in undue benefits to Asianet to the extent of ₹ 7.79 crore. The Committee observed that without getting the stay pending before the court vacated, the Board had waived annual increase of 12.5 percent in pole rentals and allowed a nominal increase of five percent thereby extending undue benefit to Asianet.

79. The Committee seriously viewed the failure on the part of Board to deduct tax at source on interest payment in confirmity with provisions of Income Tax Act, 1961 which might result its liability to the extent of ₹ 1.59 crore.

80. The Committee deprecated the irresponsibility on the part of the officials of the Board in deducting the tax at source on interest payment and commented their act as unjustifiable.

81. The Committee observed that the decision of the Board to purchase CMRI without connected accessories (RF module) resulted in blocking up of funds amounting to ₹ 75.35 lakh and avoidable interest liability of ₹ 10.66 lakh. The Committee was aggrieved to note that the wrong decision of the Board to purchase CMRI without connected accessories resulted in already purchased CMRI idle.

Audit Report (2009-10)

82. The Committee observed that the State could not achieve the required capacity addition due to the unrealistic capacity addition plan of the Board. The Committee was much displeased to note that out of the five projects viz., KAES (100MW), Athirappally (163 MW), Pallivasal (60MW), Thottiyar (40 MW) and Mankulam (40 MW) included in the plan towards capacity addition during 11th plan only the first scheme was being commissioned during the plan period which actually spilled over from 10th plan. The Committee suggested that the Board should evolve an action plan on priority basis to expedite the implementation of future five year plan projects inorder to avoid slippages.

83. The Committee was aggrieved to note that the Board failed to develop power potential from renewable sources and not utilised liberal financial assistance from Central Government for different schemes of MNRE. The Committee observed that main hurdle faced by the Board in implementing new projects were forest/environmental clearances and land acquisition. The Committee opined that policy guidelines from Government in matters of forest clearances, land acquisition and rehabilitation of people affected by projects would be helpful to the Board in its efforts to meet the targets for capacity addition.

84. The Committee observed that the Board could not conduct the maintenance needs of Diesel Power Stations due to delay in decision making on cost benefit analysis and could not undertake overdue R&M works of its older stations in time due to capacity constraints and financial problems. The Committee suggested that in order to take timely decision on project management, the Board should establish proper system for project monitoring. On account of

the deficiencies in contract management, which paved the way for time and cost overruns, the Committee highlighted the need for more stringent pre-qualification norms while short listing the contract agencies.

85. The Committee was much displeased to note that PLF of thermal power plants of the Board was very low due to curtailed operation. The Committee was of the opinion that cost benefit aspects of operation of Thermal Stations have to be examined more closely with updated and accurate cost data and ensure the possibility of optimising the utilisation with a view to contain the operational cost.

86. The Committee was perturbed to learn that the performance results of the small HE projects were discouraging and none of them achieved the generation capacity projected in their DPRs during the review period. The Committee found that decisions on project finance were taken without giving due consideration to the opinion of Finance Wing. Therefore the Committee directed the Board to strengthen its Finance Wing so as to ensure the active involvement in decision making of all project Finance.

CONCLUSIONS/RECOMMENDATIONS

87. The Committee understands that the Board had failed to assess the actual requirement of pre-stressed concrete poles which resulted in the shortage of poles in some Electrical Circles. To overcome this crisis, the Board diverted the poles from other circles which lead to a heavy loss as transportation charge. The Committee points out that such action was against the financial interest of the Board and recommends that the Board should ensure that the assessment of actual requirements are done accurately and scientifically.

88. The Committee observe that the Company was forced to terminate the contract awarded for the supply of 3.92 lakh poles in three Electrical Circles due to the failure of the firms to supply poles as per schedule. The Committee noted that since disqualified firms failed to supply the balance poles after the supply of 40% of the agreed quantity, the Company was forced to terminate the contract.

89. The Committee criticises the procedural irregularity of the Board in qualifying the firms which were already disqualified by the Pre-Qualification Committee. The Committee blames the decision of the Board to award contracts by violating the existing tender/contract terms and conditions in favour of the contractors. The Committee directs the Board to insist the contractors to follow the contract terms and conditions strictly and impose penalty for their non-compliance to contract provisions. The Committee also recommends that the legal cell of the Board should frame feasible terms and conditions in the contract.

90. The Committee expresses its strong displeasure over the unsecured stocking of poles along the road side which got damaged and even buried under the soil over the passage of time. Therefore the Committee recommends that the Board should maintain Material At Site Account (MASA) properly in order to avoid the discrepancies on physical verification of the stock of poles.

91. The Committee express its strong discontent over the inefficiency of the legal cell of the Board in litigation management. So the Committee recommends the Board to restructure the legal cell by appointing senior experienced lawyers for the proper handling of cases.

92. The Committee was appalled to note that Board's functioning was still based on the Manual formulated in 1967. The Committee expressed strong displeasure of KSEB following an outdated Manual and directs the Board to amend the Manual by incorporating provisions to make it relevant.

93. While considering the Audit Report of the year 2002-03, the Committee express its discontent over the decision of the Board to generate thermal power without evaluating future financial implications and purchase of thermal power from independent power producers without proper assessment of energy requirement and peak load demand. The Committee recommends the Board to avoid payment of deemed generation charges, that should properly balance the thermal and hydro generation and should study the possibility of selling surplus thermal power to other states. The Committee suggests that the Board may consider promoting mini hydel projects at various locations in the state similar to

Barapol projects in Kannur district. Such small power generation units will be cost effective and meet the energy needs of the local communities. This would be useful in remote places where the logistics do not permit laying of transmission lines.

94. On perusal of the Audit Report of the year 2004-05, the Committee is of the opinion that the Board should finalise tenders for supply and installation directly with the manufacturers rather than through the intermediaries. The Committee also recommends that prior to finalisation of project contracts, the Board should compare the cost of similar foreign/indigenous projects finalised/executed to secure cost effectiveness and value for money.

95. Committee asserts its opinion that meticulous care should be taken in fixing consultants and vendors for execution of projects strictly keeping the financial interests of the state intact. Adequate measures to reduce costs should be taken while negotiating with foreign sources and follow up action taken to ensure that foreign grants linked to projects are ultimately received without fail and gainfully utilised.

96. Going through the Audit Report (2005-06), the Committee realises that the budget estimates were prepared without any scientific basis with respect to Schemes/Projects to be executed during the ensuring year. Therefore the Committee directs the Board to evolve an effective system for the preparation of more realistic budgets, so that it will help foster the purpose of better management.

97. The Committee having analysed utilisation of capital receipts views that it is highly improper to divert capital assets to meet revenue expenses which adversely affected the implementation of new schemes/projects. Therefore the Committee suggests to devise more scientific and transparent system of cash flow analysis to improve fund management.

98. The Committee is also unhappy with the laxity in collection of revenue, paving the way for accumulation of arrears and recommends to the Board to initiate a special drive to recoup the arrears within a stipulated period.

99. The Committee understands that the Board had failed to introduce Personal Digital Analyser for generating invoice at the door step of the consumer. Therefore the Committee insists the Board to introduce PDA to fully automate the billing process and thereby reduce manual work.

100. The Committee finds that the Internal Audit wing could not conduct audit proceedings effectively as there was no audit module in the software. Therefore the Committee recommends that the Internal Audit should be strengthened by imparting training in Computer Assisted Audit Technique and developing effective Audit modules suitable for Internal and External Auditors.

101. While analysing the Audit Report of the year 2007-08 the Committee had noted an inexcusable delay upto 129 months in the implementation of projects due to the delay in acquisition of land, according sanction, awarding tenders and non-synchronisation of various works due to the absence of proper planning and co-ordination. Therefore the Committee directs the Board to implement small Hydro-Electric projects within the scheduled time through better planning and co-ordination of work. The Committee also recommends that the Board may ensure close monitoring in an effective manner so as to avoid delay and cost over run.

102. While considering the Audit Report of the year 2009-10, the Committee understands that the major hurdles faced by the Board in implementing new projects were due to delay in obtaining forest/environmental clearances and land acquisition. So the Committee directs the Board to follow the policy guidelines from Government in matters of forest clearances, land acquisition and rehabilitation of people displaced by the projects which would be helpful to the Board to meet the targets of capacity addition.

103. The Committee finds that the Plant Load Factor of thermal power plants of the Board was very low due to the curtailed operation. Therefore the Committee recommends to examine the cost benefit aspects of operation of Thermal Stations with updated and accurate cost data and ensure the possibility of optimising the utilisation with a view to control the operational cost.

104. The Committee also recommends that the Board may take serious measures to reduce transmission and distribution loss take precaution against power theft and create additional power generation by encouraging mini hydel projects. The Committee also suggests that proper utilisation of power from Central pool would go a long way towards reducing power deficit and stabilising the precarious situation that arise from time to time.

Thiruvananthapuram,
26th April, 2017.

C. DIVAKARAN,
Chairman,
Committee on Public Undertakings.

APPENDIX I

SUMMARY OF MAIN CONCLUSION/RECOMMENDATIONS

Sl. No.	Para No.	Department Concerned	Conclusions/Recommendations
(1)	(2)	(3)	(4)
1	87	Power	The Committee understands that the Board had failed to assess the actual requirement of pre-stressed concrete poles which resulted in the shortage of poles in some Electrical Circles. To overcome this crisis, the Board diverted the poles from other circles which lead to a heavy loss as transportation charge. The Committee points out that such action was against the financial interest of the Board and recommends that the Board should ensure that the assessment of actual requirements are done accurately and scientifically.
2	88	Power	The Committee observe that the Company was forced to terminate the contract awarded for the supply of 3.92 lakh poles in three Electrical Circles due to the failure of the firms to supply poles as per schedule. The Committee noted that since disqualified firms failed to supply the balance poles after the supply of 40% of the agreed quantity, the Company was forced to terminate the contract.
3	89	power	The Committee criticises the procedural irregularity of the Board in qualifying the firms which were already disqualified by the Pre-Qualification Committee. The Committee blames the decision of the Board to award

			contracts by violating the existing tender/contract terms and conditions in favour of the contractors. The Committee directs the Board to insist the contractors to follow the contract terms and conditions strictly and impose penalty for their non-compliance to contract provisions. The Committee also recommends that the legal cell of the Board should frame feasible terms and conditions in the contract.
4	90	power	The Committee expresses its strong displeasure over the unsecured stocking of poles along the road side which got damaged and even buried under the soil over the passage of time. Therefore the Committee recommends that the Board should maintain Material At Site Account (MASA) properly in order to avoid the discrepancies on physical verification of the stock of poles.
5	91	power	The Committee express its strong discontent over the inefficiency of the legal cell of the Board in litigation management. So the Committee recommends the Board to restructure the legal cell by appointing senior experienced lawyers for the proper handling of cases.
6	92	power	The Committee was appalled to note that Board's functioning was still based on the Manual formulated in 1967. The Committee expressed strong displeasure of KSEB following an outdated Manual and directs the Board to amend the Manual by incorporating provisions to make it relevant.

7	93	power	While considering the Audit Report of the year 2002-03, the Committee express its discontent over the decision of the Board to generate thermal power without evaluating future financial implications and purchase of thermal power from independent power producers without proper assessment of energy requirement and peak load demand. The Committee recommends the Board to avoid payment of deemed generation charges, that should properly balance the thermal and hydro generation and should study the possibility of selling surplus thermal power to other states. The Committee suggests that the Board may consider promoting mini hydel projects at various locations in the state similar to Barapol projects in Kannur district. Such small power generation units will be cost effective and meet the energy needs of the local communities. This would be useful in remote places where the logistics do not permit laying of transmission lines.
8	94	power	On perusal of the Audit Report of the year 2004-05, the Committee is of the opinion that the Board should finalise tenders for supply and installation directly with the manufacturers rather than through the intermediaries. The Committee also recommends that prior to finalisation of project contracts, the Board should compare the cost of similar foreign/indigenous projects finalised/executed to secure cost effectiveness and value for money.

9	95	power	Committee asserts its opinion that meticulous care should be taken in fixing consultants and vendors for execution of projects strictly keeping the financial interests of the state intact. Adequate measures to reduce costs should be taken while negotiating with foreign sources and follow up action taken to ensure that foreign grants linked to projects are ultimately received without fail and gainfully utilised.
10	96	power	Going through the Audit Report (2005-06), the Committee realises that the budget estimates were prepared without any scientific basis with respect to Schemes/Projects to be executed during the ensuring year. Therefore the Committee directs the Board to evolve an effective system for the preparation of more realistic budgets, so that it will help foster the purpose of better management.
11	97	power	The Committee having analysed utilisation of capital receipts views that it is highly improper to divert capital assets to meet revenue expenses which adversely affected the implementation of new schemes/projects. Therefore the Committee suggests to devise more scientific and transparent system of cash flow analysis to improve fund management.
12	98	power	The Committee is also unhappy with the laxity in collection of revenue, paving the way for accumulation of arrears and recommends to the Board to initiate a special drive to recoup the arrears within a stipulated period.

13	99	power	The Committee understands that the Board had failed to introduce Personal Digital Analyser for generating invoice at the door step of the consumer. Therefore the Committee insists the Board to introduce PDA to fully automate the billing process and thereby reduce manual work.
14	100	power	The Committee finds that the Internal Audit wing could not conduct audit proceedings effectively as there was no audit module in the software. Therefore the Committee recommends that the Internal Audit should be strengthened by imparting training in Computer Assisted Audit Technique and developing effective Audit modules suitable for Internal and External Auditors.
15	101	power	While analysing the Audit Report of the year 2007-08 the Committee had noted an inexcusable delay upto 129 months in the implementation of projects due to the delay in acquisition of land, according sanction, awarding tenders and non-synchronisation of various works due to the absence of proper planning and co-ordination. Therefore the Committee directs the Board to implement small Hydro-Electric projects within the scheduled time through better planning and co-ordination of work. The Committee also recommends that the Board may ensure close monitoring in an effective manner so as to avoid delay and cost over run.
16	102	power	While considering the Audit Report of the year 2009-10, the Committee understands that the major hurdles faced by the Board in

			implementing new projects were due to delay in obtaining forest/environmental clearances and land acquisition. So the Committee directs the Board to follow the policy guidelines from Government in matters of forest clearances, land acquisition and rehabilitation of people displaced by the projects which would be helpful to the Board to meet the targets of capacity addition.
17	103	power	The Committee finds that the Plant Load Factor of thermal power plants of the Board was very low due to the curtailed operation. Therefore the Committee recommends to examine the cost benefit aspects of operation of Thermal Stations with updated and accurate cost data and ensure the possibility of optimising the utilisation with a view to control the operational cost.
18	104	power	The Committee also recommends that the Board may take serious measures to reduce transmission and distribution loss take precaution against power theft and create additional power generation by encouraging mini hydel projects. The Committee also suggests that proper utilisation of power from Central pool would go a long way towards reducing power deficit and stabilising the precarious situation that arise from time to time.

APPENDIX II

Action Taken Report on para 2.3.1 in the C&AG Report (Commercial) for the Year ended on 31st March 2012.

Audit Para-2.3.1-Non -charging of separate rates in case of non segragation of light/Power loads and unauthorised use of Electricity in respect of HT/EHT consumers led to loss of revenue amounting to Rs. 7.52 crore.	Action Taken Report
2.3.1 As per K.S.E.Board Ltd. Terms and Conditions of Supply, 2005 (TCS), an agreement has to be entered into between Kerala State Electricity Board (K.S.E.Board Ltd.) and the consumer. Terms of the agreement with High Tension (HT)/ Extra High Tension (EHT) consumers inter alia provided for charging of separate rates in case of non-segregation of light and power load, unauthorised use of electricity etc. Invoking these provisions had the benefit of additional revenue accruing to K.S.E.Board. K.S.E.Board, however, did not carry out inspection of the consumers premises to identify such unauthorised use/non-segregation of load which led to loss of revenue as detailed below: (a) As per tariff notifications for HT and EHT consumers issued by K.S.E.Board from time to time and is incorporated in the agreement for supply of energy when the connected lighting load of the factory is more than five per cent of the connected load for power, the whole lighting load is to be segregated and metered by a sub-meter and lighting consumption in excess over 10 percent of the bulk supply consumption for power is to be charged at 7 paise extra per kWh for EHT and 25 paise extra per kWh for HT consumers. If segregation and sub-metering was not made as specified above, the bill amount of the consumers is to be increased for demand and energy charges by 10 percent and 20 per cent for EHT and HT consumers respectively. The audit observed (May 2012) that out of the total 1304 HT consumers, information pertaining to light and power loads was available only in respect of 400 consumers. Of these 400 consumers, 56 consumers had not installed separate sub-meters despite their light load exceeding five per cent of the total load. K.S.E.Board, however, did not charge rates applicable for non-installation	a) As per tariff notification for the HT & EHT consumers, only I (A) industrial consumers need to segregate their power load and light load, when the light load is more than 5% of the power load. As observed during audit of 1304 HT consumers, verified the details of 400 consumers by the Audit and found that 56 consumers had not installed separate sub meters. After physical verification of 56 consumers mentioned in the Audit, action had been taken, details of which are furnished below:- Light load less than 5% / Light Load- Power Load Segregated (No penalisation) - 22 Penal bill already issued - 1 Non-Industrial (No penalization) - 1 Penal Bill issued as per Audit - 32 Total 56 Penal bills were issued to 32 consumers amounting to Rs.1,34,94,027/-. But certain consumers moved to judicial foram against penalization. In the last part of the audit observation there is a reference to the balance 904 consumers whose information is said to be absent. Out of the balance 904 consumers (1304-400 = 904), 834 consumers are having light load less than 5% of

of separate meter @ 20 per cent of the bill amount on demand and energy charges. The loss of revenue to K.S.E.Board for the limited period of September 2010 to march 2012 alone worked out to Rs. 4.78 crore. In the absence of information in respect of the balance 904 consumers, the shortfall, if any, in revenue collection could not be assessed by audit.

(b) As per the agreement for supply of HT/EHT energy, the consumer shall not make any alteration, without prior approval of K.S.E.Board so as to increase the obligation of K.S.E.Board to supply electrical energy in excess of agreed Contract Demand (CD)/Connected Load (CL). If the consumer fails to obtain prior approval from K.S.E.Board to increase the CD, K.S.E.Board shall charge penalty as per TCS, after giving notice (Clause 14(a)/(b) of the agreement). The consumer as per clause 15 of the agreement shall be liable to pay excess demand charges at 50 percent of demand charges as per tariff notification, if agreement for revised CD is not executed but prior approval is obtained. As per clause 50(1)/(2) of TCS, if a consumer is found to be indulging in unauthorised use of electricity, the electricity charges payable on such usage shall be charged as per Section 126 of the Electricity Act, 2003, i.e at twice the rate applicable for relevant category of services for the entire period during which such unauthorised use of electricity has taken place, after giving notice.

The Audit observed (July 2012) that the Recorded Maximum Demand (RMD) in respect of 78 consumers was in excess of CD for a period ranging from six to eighteen consecutive months indicating misuse/theft of energy. In such cases, the Assessing Officer (AO) of the sections along with Anti Power Theft Squad (APTS) of the region was to conduct inspection of premises of theseconsumers with a view to ascertain the unauthorised use of energy and to provisionally bill for misuse of energy. AO/APTS, however, did not carry out such an inspection. Further, Executive Engineers/Deputy Chief Engineers concerned also did not monitor the consumption by the consumer and direct power load and hence segregation is not required. Notices have been issued to balance 70 consumers whose light load exceeded more than 5% of power load.

(b) After the enactment of the Electricity Act – 2003, KSE Board has been levying all charges from consumers including penalties at the rates fixed by the Kerala State Electricity Regulatory Commission from time to time. Though, KSE Board in its tariff petition dated 24-07-2009 had requested to enhance the rate of excess demand from 150% to 200%, of the normal demand charge, Kerala State Electricity Regulatory Commission in its tariff order dated 02-12-2009 had allowed the consumers to consume the excess demand over Contract Demand as detailed below.

(i) Normal time (6AM to 6PM) and peak time (6PM to 10 PM)	the excess demand over contract demand to be charged 50% extra
(ii) Off peak time (10PM to 6 AM)	Consumers are allowed to consume upto 130% of the CD without any penalty. The excess demand over the excess RMD over 130% of the CD is to be charged 50% extra.

KSE Board has been charging the excess demand at the rates approved by KSERC as detailed above.

The transactions between the K.S.E.B and the consumer are regulated by the Electricity Act 2003, Kerala Electricity Supply Code 2005, K.S.E.B Terms & Conditions of Supply, 2005and the Schedule of Tariff and Terms and Conditions for Retail Supply brought out by the KSERC from time to time.

The Kerala Electricity Supply Code 2005 and K.S.E.B Terms and Conditions of Supply, 2005 stipulates that for HT & EHT consumers, the contract demand shall be treated as the connected load which is binding on K.S.E.B. The Kerala Electricity Supply Code clearly stipulates the penalty to be imposed in cases of Maximum Demand exceeding the registered CD and the licensee is authorized to penalize the consumer only on the basis of the same. Such penalization is being done automatically every month along with the regular energy bill of the consumer and additional penalization as suggested by the audit will not legally stand as it will violate the existing regulations.

AO/APTS squads to conduct inspection of premises. As such, only 150 percent (Normal demand charges 100 percent plus excess demand charges 50 percent) was charged for such RMD in excess of CD. K.S.E.Board while explaining (October 2012) the reasons for lapses assured to take steps to review the tariff order and that direction would be given to field offices to inspect the premises of such consumers. Failure to conduct inspection of premises resulted in non billing of penal charges for the misuse of energy at twice the rate of demand charges as provided in the TCS and consequent loss of revenue of Rs. 2.74 crore (reckoned at 200 percent of tariff rates less already billed 150 percent) to K.S.E.Board in respect of 78 consumers during September 2010 to February 2012.	It may be noted that there is an inconsistency between the operation of section 126 of the Act and the tariff order issued by the KSERC. As far as billing is concerned the licensee is bound to follow the tariff order, there by the charging of 150% is in line with the tariff order. If the APTS squad inspects and charges 200% as per section 126, it will amount to subsequent additional penalization, which may invite disputes and litigation. Steps have been initiated to take up the matter before KSERC to resolve this issue and the decision of KSERC will be communicated to audit as soon as possible.

In the light of the above clarifications, Hon. CoPU may kindly be appraised to get the recommendations dropped.

Annexure 10

Statement showing additional transportation cost incurred due to diversion of poles from other circles by Kerala State Electricity Board

(Referred to in paragraph 2.2.1)

(2011-2012)

Period		7 m poles diverted	8 m poles diverted	9 m poles diverted	Name of the Circle from which poles diverted	Name of the supplier who was asked to divert the poles	Name of the Circle to which poles diverted	Supplier of the circle to which poles diverted	Additional Transportation charges paid (₹)	Details of supply in the circle to which diversion was made				
From	To									Actual quantity ordered (as per P.O.)	Revised ordered quantity	Actual supply against revised quantity	Short supply against revised quantity	Remarks
Feb 2009	Dec 2010	5279	2190	13611	Pathanamthitta	Vellackama thathil Industries	Alappuzha	Venad Structurals	1249382	174000	171450	125042	46408	Ordered Quantity of 7 m was reduced from 90000 nos. to 83350 nos.
Oct. 2009	Sep. 2010	560	...	520	Pathanamthitta	do	Kottayam	Pooja Industries	91340	111000	94350	33541	63809	The ordered quantity for the period from 10/2005 to 05/2006 was considered due to the failure of the contractor to prepare casting yard before the scheduled date of commencement of supply. Further the monthly supply target of 9 m in respect of Kottayam LC was reduced from 600 nos/month to 450 nos/month w.e.f. 1.6.2008 and the monthly target of Pala LC was reduced from 420 nos/month to 315 nos/month w.e.f. 9.6.2008 due to limited production capacity of the supplier.
Dec. 2008	Mar. 2010	300	...	5277	Pathanamthitta	do	Pala	Pooja Industries	856966	104000	88340	65148	23192	
Sep 2009	Feb. 2011	...	...	2860	Pathanamthitta	do	Thodupuzha	Pooja Industries	1563576	90090	78000	23220	54780	Due to non-issue of allocation and non-preparation of the pole casting yard within the lead time, the ordered quantity for the period from 5/2006 to 12/2006 was condoned.
Mar. 2010	Dec. 2010	300	380	1500	Pathanamthitta	do	Trivandrum (Urban)	Imperial Trading Company	357405	110000	108750	98810	9940	
Dec. 2008	Mar. 2010	...	...	1840	Kottayam	Pooja Industries	Alappuzha	Venad Structurals	366281	174000	171450	125042	46408	Detailed above
Total extra expenditure									**4484950**					

Annexure 11

Statement showing additional transportation charges paid to the same contractor for diversion of poles from one EC to another by Kerala State Electricity Board

(Referred to in paragraph 2.2.1)

(2011-2012)

Period		7 M poles diverted	8 M poles diverted	9 M poles diverted	Name of the Circle from which poles diverted	Name of the supplier who was asked to divert the poles	Name of the Circle to which poles diverted	Name of the contractor who took the contract for both the circles	Amount paid	Actual quantity ordered (as per P.O.) for the circle to which poles were diverted	Revised ordered quantity	Actual supply against the revised quantity	Short supply against revised quantity	Remarks
From	To													
Jun-2010	Aug-2010	...	...	1750	Kottayam	Pooja Industries	Pala	Pooja Industries	239434	104000	88340	65148	23192	Diversion by same supplier
Total extra expenditure									**239434**					

Annexure 12

Statement showing short recovery of risk and cost amount due to reduction in security deposit by Kerala State Electricity Board
(Referred to in paragraph 2.2.1)

(2011-2012)

(Amount in ₹)

Name of the Contractor	Name of the Circle	Assessed liability	Amount recovered		Total amount recovered (D + E)	Total amount that could have been recovered if 5 *per cent* of contract amount was kept as security deposit			Short recovery (I - F)
			Recovery made at Circle office (ie. retention, penalty)	Recovery made through invoking bank guarantee and amount collected as bank guarantee from bills		Security deposit as per original agreement (5 *per cent* of contract value)	Recoveries made at Circle office (as detailed in column no D)	Total (H+I)	
A	B	C	D	E	F	G	H	I	J
Suman Concrete Products	Kannur	15951681	6579246	1216225	7795471	6081125	6579246	12660371	4864900
West Coast Concrete Products	Ernakulam & Perumbavoor	8708332	400682	880000	1280682	4395600	400682	4796282	3515600
Roopa Construction Company	Kozhikode	10365064	2713730	1053225	3766955	5266125	2713730	7979855	4212900
Total Short recovery									**12593400**

Annexure 13

Statement showing payment of ineligible price escalation by Kerala State Electricity Board
(Referred to in paragraph 2.2.1)

(2011-2012)

(Amount in ₹)

Name of the Circle	Name of the Contractor	Price escalation to be given	Actual Price escalation given	Excess Price escalation
Thiruvananthapuram (Rural)	Imperial Trading Company	5440956	23105790	17664834
Pathanamthitta	Vellackamattathil Industries	184833	57365298	57180465
Alappuzha	Venad Structurals	809	12380746	12379937
Kottayam	Venad Structurals	370208	12231942	11861734
Kottayam	Pooja Industries	96752	5990523	5893771
Thodupuzha	Pooja Industries	0	6493718	6493718
Thodupuzha	Vallikkat Constructions	210143	1138206	928063
Perumbavoor	Kothamangalam Aggregates	4806936	11247268	6440331
Thrissur	Raphael & Company	1848976	23397325	21548349
Thirur	Varuna Engineering Works	941048	3245334	2304286
Kozhikode	Mecon Prefabs	346806	720756	373950
Kozhikode	Roopa Construction Company	55506	106898	51392
Vadakara	Pinarayi Industrial Co-operative Society	1366953	4897549	3530596
Kannur	Pinarayi Industrial Co-operative Society	273770	13561407	13287637
Kannur	Suman Concrete Products	0	3984326.4	3984326
Kasaragod	Suma Concrete Products	0	5016592	5016592
Total		**15943697**	**184883677**	**168939980**

Annexure 14

Statement showing break-up details of pending cases and appeals as on 31 March 2012 in Kerala State Electricity Board

(Referred to in paragraph 2.2.2)

(2011-2012)

Category of cases	No. of cases
Original suits	4195
Electricity (Original Petitions)	6653
Consumers' Dispute Redressal Forums (CDRFs)	3741
Motor Accident Claim Tribunal (MACT)	307
Consumers' Grievance Redressal Forums(CGRFs)	112
Lokayukta , Thiruvananthapuram	440
Permanent Lok Adalath, Thiruvananthapuram	47
Land Acquisition Reference (LAR)	1279
Family Court	41
Human Rights Commission	262
Tax Tribunal	94
Workmen's Compensation Case	12
High Court (Original)	5558
Total	**22741**
Details of appeals pending	
Name of Court	**Number**
High Court	634
Supreme Court	424
Kerala State Consumer Dispute Redressal Commission (KSCDRC)	204
National Commission	10
Tax Tribunal	37
Ombudsman	17
Total	**1326**

Annexure 14

Statement showing operational performance of Kerala State Electricity Board

(Referred to in paragraph 3.16)

(2009 - 10)

Sl No	Particulars	2005-06	2006-07	2007-08	2008-09	2009-10
1	Installed capacity			(MW)		
(a)	Thermal	234.60	234.60	234.60	234.60	234.60
(b)	Hydel	1831.60	1849.10	1854.10	1886.60	1889.85
(c)	Gas	...	...	...	...	...
(d)	Others (Wind farm)	2.03	2.03	2.03	2.03	2.03
	TOTAL	2068.23	2085.73	2090.73	2123.23	2126.48
2	Normal maximum demand (MW)	2624.00	2880.00	3020.00	2931.00	2998.00
	Percentage increase/decrease (-) over previous year		9.76	4.86	(-)2.95	2.29
3	Power generated			(MKWH)		
(a)	Thermal	148.99	247.02	374.14	653.54	592.27
(b)	Hydel	7449.88	7496.62	8327.45	5839.28	6646.27
(c)	Gas	...	...	...	...	...
(d)	Others	1.91	2.14	1.96	1.68	1.84
	TOTAL	7600.78	7745.78	8703.55	6494.50	7240.38
	Percentage increase/decrease (-) over previous year		1.91	12.37	(-)25.38	11.48
4	Less: Auxiliary consumption					
(a)	Thermal	6.48	8.47	10.80	17.19	17.37
	(Percentage)	4.35	3.43	2.89	2.63	2.93
(b)	Hydel	30.60	32.86	34.67	26.90	21.56
	(Percentage)	0.41	0.44	0.42	0.46	0.32
(c)	Substations	9.34	9.34	10.39	9.97	11.93
	(Percentage)					
	TOTAL	46.42	50.67	55.86	54.06	50.86
	(Percentage)	0.61	0.65	0.64	0.83	0.70
5	Net Power generated	7554.36	7695.11	8647.69	6440.44	7189.52
6	Total demand (in M Us)	13618.96	14798.06	15375.55	15606.09	17335.58
7	Deficit (-)/Surplus (+) power	(-)6064.60	(-)7102.95	(-)6727.86	(-)9165.65	(-)10146.06
8	Power purchased	6700.50	8149.84	8074.62	9628.98	10199.96
9	Total Generation & Power purchased (5+8)	14254.86	15844.95	16722.31	16069.42	17389.48
10	Power sold					
(a)	Within the State*	13618.96	14798.06	15375.55	15606.09	17335.58
(b)	Other States / through traders	635.9	1046.89	1346.76	463.33	53.90
	Total power sold	14254.86	15844.95	16722.31	16069.42	17389.48
	*including T&D loss and external loss	3349.16	3467.06	3325.7	3191.78	3364.48
	T&D Loss (Percentage)	24.59	23.43	21.63	20.45	19.40

Annexure 15

Statement showing capacity additions of Kerala State Electricity Board during review period

(Referred to in paragraph 3.25)

Sl No	Particulars of power station	Installed capacity as on 1st April 2005 (2009-10)	Additions during 2005-10	Installed capacity on 31 March 2010
		(MW)		
1	Idukki	780.00	...	780.00
2	Sabarigiri	300.00	30.00[1]	330.00
3	Lower Periyar	180.00	...	180.00
4	Kuttiadi	75.00	...	75.00
5	Kuttiadi Extension	50.00	...	50.00
6	Idamalayar	75.00	...	75.00
7	Sholayar	54.00	...	54.00
8	Kakkad	50.00	...	50.00
9	Sengulam	48.00	...	48.00
10	Neriamangalam	48.00	4.50[2]	52.50
11	Neriamangalam Extension Scheme	...	25.00[3]	25.00
12	Pallivasal	37.50	...	37.50
13	Poringal	32.00	...	32.00
14	Panniar	30.00	2.00[4]	32.00
15	Poringalkuthu Left Bank Extension	16.00	...	16.00
16	Kallada	15.00	...	15.00
17	Chembukkadavu I & II	6.45	...	6.45
18	Urumi I & II	6.15	...	6.15
19	Peppara	3.00	...	3.00
20	Malampuzha	2.50	...	2.50
21	Madupetty	2.00	...	2.00
22	Malankara		10.50[5]	10.5
23	Lower Meenmutty		3.50[6]	3.50
24	Kuttiadi Tail Race		3.75[7]	3.75
	Total Hydel	**1810.6**	**79.25**	**1889.85**
25	Brahmapuram Diesel Power Plant	106.60	...	106.60
26	Kozhikode Diesel Power Plant	128.00	...	128.00
	Total Thermal	**234.60**	...	**234.60**
27	Wind Mill	**2.03**	...	**2.03**
	Grand Total	**2047.23**	**79.25**	**2126.48**

[1] 10 MW each in 2005-06 and 2006-07 and 5 each in 2007-08 and 2008-09

[2] 2.5 MW in 2005-06 and 2 MW in 2006-07
[3] 2008-09
[4] 2009-10
[5] 7 MW in 2005-06 and 3.5 MW in 2006-07
[6] 1.5 MW in 2005-06 and 2 MW in 2006-07
[7] 2.5 MW in 2008-09 and 1.25 MW in 2009-10

Annexure 16

Statement showing status of forest/ environmental clearances of 11th Plan projects in Kerala State Electricity Board

(Referred to in paragraph 3.43)

(2009-10)

Sl No	Name of Project	Request for forest clearances	Stage I/ Stage II clearance	Application for environmental clearance	Status of environmental clearance
1	Athirappally (163 MW)	20/11/1996 (from Govt. of Kerala to Govt. of India)	Stage I – 22/12/1997 Stage II – 16/12/1999	31/12/1996	Obtained on 20/01/1998 Suspended on High Court Intervention on 17/10/01 Suspension revoked and clearance obtained on 10/02/05 Clearance quashed by HC on 23/03/06
				06/11/2006	Obtained on 18/07/07 Challenged by Hon'ble HC of Kerala (PIL pending)
2	Kuttiady Addl. Extn. Scheme (100 MW)	24/05/2000	Stage I – 23/02/2001 Stage II – 20/09/2001	08/08/2000	27/04/2001
3	Pallivasal Extn. (60 MW)	Not required	-	18/09/2002	07/11/2003
4	Thottiar HEP (40 MW)	01/01/2003	Stage I – 23/03/2005 Stage II – 14/07/2009	Not required	-
5	Mankulam HEP (40 MW)	30/05/2001	Stage I – 08/12/2008 Stage II – 15/04/2009	20/03/2003	02/08/2004
6	Achencoil HEP (30 MW)	Yet to be applied for	-	29/11/2007	Stage I- 16/09/08 E.I.A. Study in progress
7	Perumthenaruvi HEP (10 MW)	10/11/2004	Stage I – 04/08/2008 Stage II – Pending for want of land for compensatory afforestation	Not required	-

Annexure 17

Statement showing details of tendering of projects in Kerala State Electricity Board

(Referred to in paragraph 3.49)

(2009 - 10)

Sl No	Name of Project	Date of tender	Publicity	Contract PAC (₹ in crore)	No. of bidders	Name of selected contractor	Date of award of work	Date of completion
1	Lower Meenmutty	02/03/02	National level	8.35	4	Asian Tech-VA Tech Consortium	20/01/03	31/05/06
2	Pallivasal Extension Scheme	15/12/04	International Competitive Bidding	222	3	M/s. Essar-DEC- CPPL Consortium	30/09/06	in progress
3	Neriamangalam Extension Scheme	07/12/2000	National	35.06	4	VA Tech-Asian Tech Consortium	03/04/03	25/05/08
4	Ranni- Perinad	30/01/08	ICB	30.84	9	KBL- KECL-Aryacon Consortium	25/10/08	in progress
5	Thottiar	31/08/07	ICB	144	2	CPPL Chongquing	20/10/08	in progress
6	Chathankottunada	27/05/09	National	45.36	4	Coramandel-BHEL Consortium	02/08/09	in progress
7	Adyanpara	02/04/06	National	21.32	4	KBL-Aryacon Consortium	30/05/07	in progress
8	Poozhithode	25/05/08	National	32.79	2	PGC- FMEPL Consortium	03/04/09	in progress
9	Vilangad	06/09/09	National	59.49	4	PGC- FMEPL Consortium	02/05/10	in progress
10	Peechi	24/02/09	ICB	10.42	2	M/s. SILK	07/04/10	in progress

Annexure 18

Statement showing consumption of fuel in excess of norms by Thermal Stations of Kerala State Electricity Board

(Referred to in paragraph 3.5.3)

(2009-10)

I. BDPP

1. LSHS

		2005-'06	2006-'07	2007-'08	2008-'09	2009-'10
1	Consumption (MT)	9893.92	13715.7	16342.1	39817	43842.8
2	Generation (MU)	49.319	68.749	81.45	201.309	222.156
3	Specific Fuel Consumption (gm/kwh)	200.61	199.50	200.64	197.79	197.35
4	Norms (gm/kwh)	190.03	190.03	190.03	190.03	190.03
5	Excess on units generated (MT) (3-4*2)	521.80	651.05	864.18	1562.16	1626.18
6	Cost/ MT (₹)	15717.50	21214.00	24232.70	31083.30	29401.5
7	Value of Excess Consumption (₹ in Lakh)	82.01	138.11	209.42	485.57	478.12
		LSHS Total (₹ in Lakh)				1393.23

2. HSD

1	Net Consumption (KL)	1636.08	4129.36	3593.84	3763.34	2652.06
2	Generation (MU)	6.448	16.611	14.362	15.186	10.686
3	Specific Fuel Consumption (ml/kwh)	253.73	248.59	250.23	247.82	248.18
4	Norms (ml/kwh)	211.99	211.99	211.99	211.99	211.99
5	Excess on units generated (KL) (3-4*2)	269.14	607.96	549.20	544.11	386.73
6	Cost/ KL (₹)	26241.70	28768.00	27528.40	29996.70	28935.70
7	Value of Excess Consumption (₹ in Lakh)	70.63	174.90	151.19	163.22	111.90
		HSD Total ₹ in Lakh)				671.84
		BDPP Total (₹ in Lakh)				**2065.07**

II. KDPP

LSHS

		2005-'06	2006-'07	2007-'08	2008-'09	2009-'10
1	Consumption (MT)	19074.40	32979.10	57231.80	89997.20	74157.20
2	Generation (MU)	93.38	161.656	278.375	437.237	359.475
3	Specific Fuel Consumption (gm/kwh)	204.27	204.01	205.59	205.83	206.293
4	Norms (gm/kwh)	194.40	194.40	194.40	194.40	194.4
5	Excess on units generated (MT) (3-4*2)	921.66	1553.51	3115.02	4997.62	4275.23
6	Cost/ MT (₹)	15985.20	20608.50	25076.60	30455.40	28087.30
7	Value of Excess Consumption (₹ in Lakh)	147.33	320.16	781.14	1522.04	1200.80
		KDPP Total (₹ in Lakh)				**3971.47**

9/4/2017.

Annexure 19

Statement showing generation potential as per design, actual generation, plant load factor (PLF) as per design and actual plant load factor in Kerala State Electricity Board

(Referred to in paragraph 3.56 & 3.58) (2009-10)

Sl. No	Name of Station	Year	Energy to be generated as per design (MU)	Installed capacity (MW)	Generation potential for installed capacity (MU)	PLF as per design %	Actual generation (MU)	Actual PLF %
1	Idukki	2005-'06	2398	780	6832.80	35.10	2704.35	39.58
		2006-'07	2398	780	6832.80	35.10	2436.92	35.67
		2007-'08	2398	780	6832.80	35.10	3316.02	48.53
		2008-'09	2398	780	6832.80	35.10	2097.51	30.70
		2009-'10	2398	780	6832.80	35.10	2035.63	29.79
2	Sabarigiri	2005-'06	1338	310	2715.60	49.27	1471	54.17
		2006-'07	1338	320	2803.20	47.73	1556.48	55.53
		2007-'08	1338	330	2890.80	46.28	1541.35	53.32
		2008-'09	1338	330	2890.80	46.28	962.67	33.30
		2009-'10	1338	330	2890.80	46.28	1402.39	48.51
3	Lower Periyar	2005-'06	493	180	1576.80	31.27	631.49	40.05
		2006-'07	493	180	1576.80	31.27	645.02	40.91
		2007-'08	493	180	1576.80	31.27	677.97	43.00
		2008-'09	493	180	1576.80	31.27	483.36	30.65
		2009-'10	493	180	1576.80	31.27	525.26	33.31
4	Kuttiadi & KES	2005-'06	343	125	1095.00	31.32	515.55	47.08
		2006-'07	343	125	1095.00	31.32	645.38	58.94
		2007-'08	343	125	1095.00	31.32	644.72	58.88
		2008-'09	343	125	1095.00	31.32	594.55	54.30
		2009-'10	343	125	1095.00	31.32	634.52	57.95
5	Idamalayar	2005-'06	380	75	657.00	57.84	366.09	55.72
		2006-'07	380	75	657.00	57.84	386.68	58.86
		2007-'08	380	75	657.00	57.84	474.63	72.24
		2008-'09	380	75	657.00	57.84	293.79	44.72
		2009-'10	380	75	657.00	57.84	333.93	50.83
6	Sholayar	2005-'06	233	54	473.04	49.26	290.37	61.38
		2006-'07	233	54	473.04	49.26	265.75	56.18
		2007-'08	233	54	473.04	49.26	254.68	53.84
		2008-'09	233	54	473.04	49.26	213.89	45.22
		2009-'10	233	54	473.04	49.26	229.76	48.57
7	Neriamangalam and NES (commissioned in	2005-'06	237	50.5	442.38	53.57	245.32	55.45
		2006-'07	237	52.5	459.90	51.53	277.5	60.34
		2007-'08	237	52.5	459.90	51.53	313.06	68.07
		2008-'09	295.27	77.5	678.90	43.49	319.26	47.03
		2009-'10	295.27	77.5	678.90	43.49	336.16	49.52

SL No	Name of Station	Year	Energy to be generated as per design (MU)	Installed capacity (MW)	Generation potential for installed capacity (MU)	PLF as per design %	Actual generation (MU)	Actual PLF %
	May 08)							
		2005-'06	262	50	438.00	59.82	248.77	56.80
		2006-'07	262	50	438.00	59.82	248.57	56.75
8	Kakkad	2007-'08	262	50	438.00	59.82	246.75	56.34
		2008-'09	262	50	438.00	59.82	162.8	37.17
		2009-'10	262	50	438.00	59.82	224.16	51.18
		2005-'06	182	48	420.48	43.28	188.79	44.90
		2006-'07	182	48	420.48	43.28	176.23	41.91
9	Sengulam	2007-'08	182	48	420.48	43.28	164.77	39.19
		2008-'09	182	48	420.48	43.28	153.66	36.54
		2009-'10	182	48	420.48	43.28	157.78	37.52
		2005-'06	284	37.5	328.50	86.45	238.41	72.58
		2006-'07	284	37.5	328.50	86.45	241.69	73.57
10	Pallivasal	2007-'08	284	37.5	328.50	86.45	229.04	69.72
		2008-'09	284	37.5	328.50	86.45	197.96	60.26
		2009-'10	284	37.5	328.50	86.45	240.16	73.11
		2005-'06	244	48	420.48	58.03	270.07	64.23
		2006-'07	244	48	420.48	58.03	292.28	69.51
11	Poringal & PLBE	2007-'08	244	48	420.48	58.03	222.52	52.92
		2008-'09	244	48	420.48	58.03	237.06	56.38
		2009-'10	244	48	420.48	58.03	264.77	62.97
		2005-'06	158	30	262.80	60.12	159.86	60.83
		2006-'07	158	30	262.80	60.12	168.2	64.00
12	Panniar	2007-'08	158	30	262.80	60.12	69.24	26.35
		2008-'09	158	30	262.80	60.12	0	0.00
		2009-'10	158	32	280.32	56.36	132.8	47.37
		2005-'06	65	15	131.40	49.47	64.11	48.79
		2006-'07	65	15	131.40	49.47	76.16	57.96
13	Kallada	2007-'08	65	15	131.40	49.47	73.03	55.58
		2008-'09	65	15	131.40	49.47	46.34	35.27
		2009-'10	65	15	131.40	49.47	60.41	45.97
	Malankara	2005-'06	44	7	61.32	71.75	20.58	33.56
	(2 no. 6.8.05)	2006-'07	44	10.50	61.32	71.75	32.22	52.54
14	(3rd 27.8.06)	2007-'08	44	10.50	61.32	71.75	43.7	71.27
		2008-'09	44	10.50	61.32	71.75	33.49	54.62
		2009-'10	44	10.50	61.32	71.75	32.46	52.94

Sl. No	Name of Station	Year	Energy to be generated as per design (MU)	Installed capacity (MW)	Generation potential for installed capacity (MU)	PLF as per design %	Actual generation (MU)	Actual PLF
15	Peppara	2005-'06	11.50	3.00	26.28	43.76	3.82	14.54
		2006-'07	11.50	3.00	26.28	43.76	7.48	28.46
		2007-'08	11.50	3.00	26.28	43.76	8.17	31.09
		2008-'09	11.50	3.00	26.28	43.76	5.52	21.00
		2009-'10	11.50	3.00	26.28	43.76	6.04	22.98
16	Chempu I	2005-'06	6.59	2.70	23.65	27.86	4.11	17.38
		2006-'07	6.59	2.70	23.65	27.86	4.74	20.04
		2007-'08	6.59	2.70	23.65	27.86	3.85	16.28
		2008-'09	6.59	2.70	23.65	27.86	4.03	17.04
		2009-'10	6.59	2.70	23.65	27.86	3.65	15.43
17	Chempukadavu II	2005-'06	9.03	3.75	32.85	27.49	6.48	19.73
		2006-'07	9.03	3.75	32.85	27.49	7.47	22.74
		2007-'08	9.03	3.75	32.85	27.49	4.73	14.40
		2008-'09	9.03	3.75	32.85	27.49	5.98	18.20
		2009-'10	9.03	3.75	32.85	27.49	4.82	14.67
18	Urumi I	2005-'06	9.72	3.75	32.85	29.59	7.16	21.80
		2006-'07	9.72	3.75	32.85	29.59	8.93	27.18
		2007-'08	9.72	3.75	32.85	29.59	8.65	26.33
		2008-'09	9.72	3.75	32.85	29.59	7.05	21.46
		2009-'10	9.72	3.75	32.85	29.59	6.96	21.19
19	Urumi II	2005-'06	6.28	2.40	21.02	29.87	5.65	26.87
		2006-'07	6.28	2.40	21.02	29.87	5.62	26.73
		2007-'08	6.28	2.40	21.02	29.87	5.29	25.16
		2008-'09	6.28	2.40	21.02	29.87	4.48	21.31
		2009-'10	6.28	2.40	21.02	29.87	4.68	22.26
20	Maduppetty	2005-'06	6.40	2.00	17.52	36.53	6.87	39.21
		2006-'07	6.40	2.00	17.52	36.53	5.68	32.42
		2007-'08	6.40	2.00	17.52	36.53	6.91	39.44
		2008-'09	6.40	2.00	17.52	36.53	5.74	32.76
		2009-'10	6.40	2.00	17.52	36.53	1.91	10.90
21	Malampuzha	2005-'06	5.60	2.50	21.90	25.57	0	0.00
		2006-'07	5.60	2.50	21.90	25.57	0	0.00
		2007-'08	5.60	2.50	21.90	25.57	0	0.00
		2008-'09	5.60	2.50	21.90	25.57	0	0.00
		2009-'10	5.60	2.50	21.90	25.57	0	0.00

Sl. No	Name of Station	Year	Energy to be generated as per design (MU)	Installed capacity (MW)	Generation potential for installed capacity (MU)	PLF as per design %	Actual generation (MU)	Actual PLF %
		2005-'06	0	0.00	0	0.00	0	0.00
		2006-'07	7.63	3.50	30.66	24.89	5.62	18.33
22	L. Meenmutty	2007-'08	7.63	3.50	30.66	24.89	4.85	15.82
		2008-'09	7.63	3.50	30.66	24.89	4.45	14.51
		2009-'10	7.63	3.50	30.66	24.89	3.43	11.19
	KTR	2005-'06	0	0.00	0	0	0	0.00
	(9.11.08)							
	or	2006-'07	0	0	0	0	0	0.00
23	2 in 6/08	2007-'08	0	0	0	0	0	0.00
		2008-'09	14	3.75	32.85	42.62	5.76	17.53
		2009-'10	14	3.75	32.85	42.62	4.62	14.06

Note: At Malankara, one machine is standby.
At Malampuzha there is no generation activity
Generation details of stage I and II of Chembukadavu and Urumi SHEPs are shown separately whereas that of Poringalkuthu Left Bank Extension, Kuttiyadi Extension and Neriamanagalam Extension schemes are clubbed with original stations for analysis purpose.

Annexure 20

Statement showing delay in annual maintenance of renovated machines in Kerala State Electricity Board

(Referred to in paragraph 3.65)

(2009-10)

Machine particulars	Date of re-commission-ing after RMU	Particulars of Annual Maintenance after recommissioning			Remarks
		From	To	No. of days	
Neriamangalam Machine #2 (18 MW)	31/11/05	02/04/07	05/05/07	34	A/M not done for 16 months
		07/04/08	03/05/08	27	-
		26/03/09	20/04/09	26	-
Neriamangalam Machine #3 (18 MW)	29/09/06	25/02/08	30/03/08	35	A/M not done for 17 months
		21/04/09	23/05/09	33	-
Sabarigiri Machine #6 (55 MW)	01/07/05	21/08/06	23/09/06	34	-
		02/01/08	22/01/08	21	A/M not done for 15 months
		24/12/09	30/01/10	38	A/M not done for 23 months
Sabarigiri Machine #5 (55 MW)	04/05/06	21/04/08	08/05/08	18	Shut down during 07/07/06 to 11/11/06 following fire in excitation transformer. A/M not carried out for next 16 months

Annexure 21

Statement showing higher cost of construction of Small HE Projects by Kerala State Electricity Board

(Referred to in paragraph 3.73)

(2009-10)

Sl. No.	Name of Project	Installed Capacity (MW)	Project Cost (₹ in Crore)	Interest During Construction (₹ in Crore)	Total Cost (₹ in Crore)	Cost per MW (₹ in Crore)	Price level reckoned
1	Adyanpara	3.5	17.00	1.40	18.40	5.26	2005
2	Sengulam Tail Race	3.6	19.00	1.57	20.57	5.71	2004-05
3	Anakkampoil	7.5	34.99	2.55	37.54	5.00	2007
4	Kandappanchal	3.75	19.18	1.00	20.18	5.38	2007
5	Chathankottunada II	6	29.92	3.22	33.14	5.52	2004
6	Perunthenaruvi	6	30.00	3.83	33.83	5.64	2004
7	Poozhithode	4.8	23.40	2.17	25.57	5.33	2004
8	Ranni- Perinad	4	18.00	1.94	19.94	4.99	2004
9	Barapole	15	127.59	10.85	138.44	9.23	2007

Annexure 17

(Referred to in Paragraph 3.24)

Statement showing details of civil works on SHEPs executed by

Kerala State Electricity Board

(2007-08)

	Malampuzha		Lower Meenmutty	Malankara		
	Civil Works	Electrical Works		Erection Work	Civil work	Sub-station work
Name of contractor	P.M. Yohannan	Best & Crompton	Asian Techs- VA Tech	SILK	West Coast Concrete Product.	TELK
PAC* (Rs in Lakh)	46.20	226.80	1126.29	2089.08	546.52	261.78
Actual Cost (Rs in lakh)	76.88	251.18	1601.00	2089.08	450.72	246.70
Date of Agreement	September - 1989 September - 1991	December -1988	July-2003	March-1997	October -1999	March-2003
Scheduled date of Commencement	April - 1991	December -1990	February-2003	March -1997	October-1999	March-2003
Actual date of commencement	April - 1991	August - 1995	January-2003	*	December-1999	March-2003
Duration as per agreement (In Months)	10	24	24	28	24	9
Scheduled date of completion	February-1992	December -1990	February-2005	March-1999	October-2001	December-2003
Actual date of completion	December-1994	June-1996	May-2006	August-2006	June - 2005	June-2005
Delay in months	34	56	16	89	44	18
Total months taken for completion	44	80	40	117	68	27
Date of commissioning	November-2002	November -2002	March-2006	October-2005		

* Probable Amount of Contract.

* Details not available.

Annexure 18

(Referred to in paragraph 3.29)

(2007-08)

Statement showing designed and actual generation, designed and actual PLF of various small hydro projects of Kerala State Electricity Board for the five years up to 2006-07.

Name of Project	Energy to be generated as per design (in Mu)	Actual Generation (MU)					PLF As per Design (%)	Actual PLF (per cent)				
		2002-03	2003-04	2004-05	2005-06	2006-07		2002-03	2003-04	2004-05	2005-06	2006-07
Chinese Assisted projects												
Chembukadavu I	6.59	...	1.280	2.471	4.108	4.73	27.86	...	5.41	10.45	17.37	20.00
Chembukadavu II	9.03	...	1.032	3.738	6.476	7.46	27.49	...	3.14	11.36	19.71	22.71
Urumi I	9.72	...	0.015	(Flood)	7.179	8.92	29.59	...	...	...	21.85	27.15
Urumi II	6.28	...	0.015	1.628	5.650	5.61	29.87	...	...	7.75	26.87	26.68
KSEB projects												
Malampuzha	5.60	1.09	0.176	2.951	0.684	2.27	25.57	4.90	0.80	13.48	3.12	10.37
Lower Meenmutty	10.14	...	...	...	...	5.66	33.07	...	...	...	...	18.46
Malankara	65.35	...	...	...	20.562	32.33	71.05	...	...	...	22.38	35.15
Total	**112.71**	**1.09**	**2.518**	**10.788**	**44.659**	**66.98**	...	...	...	...	...	...

994/2017.

ANNEXURE 19

(Referred to in paragraph 3.29)

(2006-07)

Statement showing estimated project cost, actual project cost and cost per KW of installed capacity of the six projects commissioned by Kerala State Electricity Board during the period 2002-2007.

Particulars	Chinese assisted projects				Own projects	
	Chembukadavu I	Chembukadavu II	Urumi I	Urumi II	Lower Meenmutty	Malankara
Estimated PAC (Rs. in crore)	11.38	12.72	13.20	10.95	11.27	41.13
Actual Project cost (Rs. in crore)	12.75	13.86	12.38	12.46	16.01	33.06
Installed Capacity (In KW)	2700	3750	3750	2400	3500	10500
Cost per KW as per DPR (Rs)	42148	33920	35200	45625	32180	39174
Cost per KW (Rs)	47209	36968	33025	51897	45743	31487

(Malampuzha SHEP was not considered as the same was completed in 1999).

Annexure 14

(Referred to in paragraph 3.2.16) (2005-06)

Statement showing systemic deficiencies in manual receipts issued by cashiers in Kerala State Electricity Board

Sl. No.	Details of cases
1	The West Hill Section produced 2 cash receipt books termed 'Provisional Invoice Receipt Book for domestic/non domestic consumers' for audit scrutiny. The first copy of the receipt (yellow copy) was meant for the consumer, the second copy (pink copy) for the billing branch and the third copy (green copy) was for the cashier. However, in receipt book no. 015516, it was noticed that both the pink copy and green copy of Receipt No.229 to 234 were seen blank while the yellow consumer copies for the same were missing. Exact amount collected through these receipts could not be ascertained.
	A comparison of the manual receipts issued on 17.10.2005 with the Consumer Personal Ledger in the system and the Consumer Payment History revealed that 12 manual receipts were seen issued on 17.10.2005 for a total amount of Rs.12,748/- from one counter and 4 receipts for Rs.3,091/ from the other counter. Out of the total of Rs.15,839/- collected manually on 17.10.2005, Rs.1,193/- received from Consumer No.4496 was seen accounted in the System only on 24.10.2005 after a delay of one week. Receipt No. 61/08934 for Rs.287/- received on 17.10.2005 was credited as receipt in the Consumer Account only on 02.06.2006 at the instance of audit.
	In Thiruvalla Section the Cashiers resorted to collection through manual receipts even on days on which there was no disruption of service due to System failure. In the absence of receipt books and Stock Register of Receipt Books, the quantum of manual collection escaping accounting could not be quantified

Annexure 15

(Referred to in paragraph 3.2.24)

Statement showing details of consumers with incomplete data in five Sections of Kerala State Electricity Board

(2005-06)

Particulars	Vellayambalam	Fort	Alappuzha	Thiruvalla	West Hill
Customer table (Number of records)	13361	12115	22698	15236	16651
Connected customers	10454	9106	19872	14084	15344
Connected but not billable	24	98	29	185	130
Dismantled and billable	-	18	49	14	7
Account closed and billable	-	-	5	2	34
Name blank in Customer Name table	767	3427	1974	219	675
Address Blank in Customer address table	3247	7394	2530	619	2267

Annexure 16

(Referred to in paragraph 3.2.26) (2005-06)

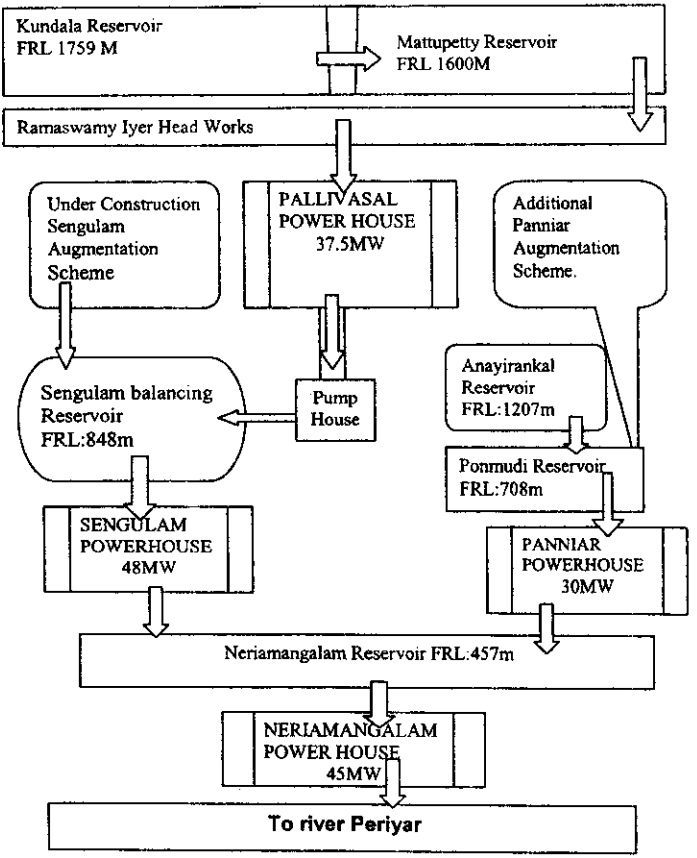
Statement showing details of consumers with gaps in customer ID and customer related table in five Sections of Kerala State Electricity Board

Particulars	Vellayambalam	Fort	Alappuzha	Thiruvalla	West Hill
Number of records in Customer table	13361	12115	22698	15236	16651
Number of gaps	5	3	23	13	10
Number of missing ID	6	3	23	13	10
Number of records in Receipt table	151482	83235	161073	143939	194242
Number of gaps	168	100	544	309	382
Missing Receipt ID	215	139	873	423	503
Number of missing invoices in Invoice_HDR table	860	600	1704	1651	2403
Invoice date after Invoice due date	1	90	3	8	28

Annexure 17

(Referred to in paragraph 3.7)

Flow Chart showing the sources of water and generation of power at Pallivasal, Sengulam and Panniar hydro power projects



FRL – Full Reservoir Level.
M – Meter.

Annexure 18

(Referred to in paragraph 3.28)

Statement showing cost of Renovation & Modernisation of Hydro-electric schemes by other State Electricity Boards in India* during the period from 1992 to 2003

I Completed Projects (2004-05)

State & Board	Project	Capacity in MW	Cost Rs. in crore	Cost per MW Rs. in crore	Nature of Work	Year of completion
Punjab (PSEB)	UBDC I	3x15	8.00	0.18	RM & RES	1992
Karnataka (WNL)	Shiva samudram	6x3 + 4x6	8.00	0.19	RM&LE	1994
Kerala (KSEB)	Sholayar	3x18	7.58	0.14	RM	1996-97
Tamilnadu (TNEB)	Moyar	3x12	1.30	0.036	RM&LE	1990-91
Tripura	Gumti	3x5	17.50	1.17	RM	1994-95
Himachal Pradesh (HPSEB)	Bassi	4x15	4.34	0.096	RM	2000-01
Punjab (PSEB)	BBMB	4x24.2	75.30	0.78	RM,LE &RES	1998-99
Karnataka (WNL)	Mahatma Gandhi	4x12 + 4x18	43.13	0.36	RMU & LE	2002-03
Karnataka (WNL)	Munirabad	2x9 + 1x10.3	3.53	0.12	RM&LE	2002-03
Karnataka (KPCL)	Mani Dam	2x4.5	1.00	0.11	RM	2002-03
Meghalaya (MESEB)	Umium St.I	4x9	84.21	2.34	RM & LE	2002-03
Kerala (KSEB)	Pallivasal Sengulam Panniar	3x5 + 3x7.5 4x12 2x15	374.50	3.24	RM & LE	2002-03

II On going Projects

State & Board	Project	Capacity	Estimated Cost	Cost per MW	Nature of Work	Proposed Year of completion
Himachal Pradesh (HPSEB)	Bassi	4x15	28.60	0.48	RMU & LE	2006-07

* Source:- Central Electricity Authority

Annexure

Punjab (PSEB)	UBDC I &II	3x15 + 3x15.45	7.89	0.13	RM & LE	2006-07
Karnataka (WNL)	Shivasamudram	6x3 + 4x6	68.38	1.63	RM & LE	2004-05
Tamil Nadu (TNEB)	Mettur Dam	4x10	27.37	0.68	RMU & LE	2004-05
Tamil Nadu (TNEB)	Papanasom	4x7	22.79	0.81	RMU &LE	2004-05
Tamil Nadu (TNEB)	Pykara	3x6.65 + 1x11 2x14	26.06	0.44	RMU&LE	2004-05
West Bengal (WBSEB)	Jaldhaka St.I & II	3x9 + 2x4	53.37	1.52	RM & LE	2006-07
Jammu & Kashmir (J&KPDC)	Chenani	5x4.66	23.86	1.02	RMU&LE	2006-07
Jammu & Kashmir (J&KPDC)	Ganderbal	2x3 + 2x4.5	28.87	1.92	RM & LE	2006-07
Jammu & Kashmir (J&KPDC)	Sumba Sindh	2x11.3	16.37	0.72	RMU	2006-07
Punjab (PSEB)	Mukerian St.I	3x15	6.04	0.13	RM	2005-06
Maharashtra (MSEB)	Paina Dam PH	2x18	20.00	0.56	RMU	2006-07

RMU- Renovation, Modernisation & Uprating
RM – Renovation & Modernisation
LE- Life Extension
RES- Restoration

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