

Chapter - II

Performance Audits of Government Companies

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2. Performance Audits relating to Government Companies

2.1 Performance Audit of Karnataka Power Transmission Corporation Limited

Executive Summary

The Company

The Company was incorporated in July 1999 under the Companies Act, 1956 for transmission of electricity. It transmitted 42,933.65 MUs of energy in 2007-08, which increased to 56,890 MUs of energy in 2011-12 (an increase of 32.51 per cent). The Company had 963 Substations and 30,418.64 Ckm of transmission network (March 2012).

Objectives of the Performance Audit

The objectives of the Performance Audit were to assess whether the transmission system was planned and developed in an economical, efficient and effective manner; operation and maintenance were carried out efficiently and effectively; adequate mechanism for procurement of materials and inventory control was in place; there existed a proper financial management system; whether disaster management system was set up for protection; monitoring of existing/ ongoing projects and effecting corrective measures were timely and adequate.

Sampling

Of the 318 Substations constructed, 240 augmented and 399 Lines laid (between 2007 and 2012), audit test checked 48 Substations, 6 augmentation works and 48 Lines (including 42 works in progress).

Audit findings

Planning the network

The actual capital expenditure had increased from ₹ 479 crore in 2005-06 to ₹ 2,093 crore in 2007-08. However, the actual expenditure decreased to ₹ 945 crore in 2011-12. The actual expenditure had been much lower than the initially approved outlays during the last five years. The Karnataka Electricity Regulatory Commission (KERC) had made many

observations on investments while issuing tariff orders every year.

Against the scenario of restricted power supply in the State, the capacity created as at the end of March 2012, compared to projections, was in excess by 1,025 MVA. The cost of creation of this excess capacity worked out to ₹ 50.32 crore.

Project management

There were delays at different stages during construction and test checked 20 Substations and 15 lines were completed indicating major deficiencies in applying for statutory clearances, in solving right of way problems, in handing over sites to contractors, in supply of materials etc. Many works were not commissioned even after completion. Works idled for long periods after commissioning because of non-completion of source lines, redundancy in lines and abandoning of lines. The delay resulted in loss of energy of about ₹ 352.29 crore and incurring of unnecessary interest charges of ₹ 119.66 crore (in test checked projects).

There were 321 ongoing projects as at the end of March 2012. In 42 test checked cases, 14 projects had been delayed after spending ₹ 734.89 crore. Causes attributable were similar to the ones pointed out in the preceding paragraph. In two cases UG Cable was lying idle. The Phase I of SCADA was not completed in time and Phase II is still not completed due to which Availability Based Tariff (ABT) mechanism could not be implemented in the State.

Purchase of transformers

The Company purchased 540 transformers during the period 2007-12 and 492 of them were installed. Commissioning of 357 (value of transformers: ₹ 641.52 crore) of the 492 transformers were delayed for periods ranging between 3 and 49 months.

Transmission facilities to evacuate power

Evacuation of Power from newly commissioned generating stations was found not possible as the transmission lines were not put in place. A Memorandum of Agreement had not been entered in one case. The State purchased short term power at rates ranging between ₹ 4.74 and ₹ 6.77 per unit during 2008-12, to reduce the demand supply gap.

Essential facilities

- 7 stations of 220 KV, 73 stations of 110 KV and 120 stations of 66 KV capacities were having only single transformer.
- Review of line loading revealed that 299 lines were loaded more than 70 per cent of the standards fixed by the Company.
- Of the 89 Nos of 220 kV Substations where Bus Bar Protection Panels had to be installed; only 64 Substations were provided with.
- 52 lines did not maintain the lower limit of prescribed voltage range.
- Manual/guideline and targets for hot-line maintenance were not prepared. The proposed Hot-line Division/Sub-divisions had not been established.
- Six of the 16 generating stations did not have black-start facilities.
- In 6 major 220 KV Sub-stations DG sets were not provided/ not in working condition.
- 709 transformers (33.51 per cent) out of 2,116 transformers commissioned were overloaded (beyond 90 per cent).

However, the Generation-Transmission points and Transmission-Distribution points were provided with 0.2 class meters, which was as per requirement.

Grid management

The Grid discipline of the Company was commendable. The severity of the instances of Grid violation had reduced from 1,085 numbers in 2007-08 to one instance in 2011-12.

Financial management

- Cost on account of depreciation per unit increased from ₹ 0.03 per unit in 2007-08 to ₹ 0.08 in 2011-12, an increase of 167 per cent.
- During the five years under review the Company had mobilized ₹ 7,855.85

crore by way of capital and borrowings and utilized only ₹6,972.75 crore on capital expenditure.

- Internal generation of funds were not sufficient to repay the borrowings fully.
- Return on Capital decreased from 8.85 per cent (2007-08) to 6.24 per cent (2011-12).

Monitoring and control

The main purpose of constitution of the Technical Advisory Committee (TAC) was to ensure standardization in specifications in respect of projects and also to involve experts in the process of technical clearance. The TAC had not met after September 2009.

Conclusion

The Company transmitted 42,933.65 MUs of energy in 2007-08 using a capacity of 34,294.80 MVA. The energy transmitted in 2011-12 was 56,890 MUs with the capacity increasing up to 45,158.80 MVA, indicating creation of excess capacity.

The clearances and permissions in many cases from various statutory authorities were sought for only after the works were awarded ignoring the recommendations of the Task Force (as regards planning and execution). Substations did not become operational because of delay in completing source lines and distribution lines.

Transformers purchased at huge costs remained idle for 3 to 49 months owing to delay in implementation of the projects and improper planning. Instances of idling of underground cable procured at high prices were observed.

The Company failed to draw power from the newly commissioned generating stations for long periods, as evacuation facilities were not put in place.

Availability Based Tariff mechanism (intra-state) was yet to be implemented (September 2012), though KERC has been insisting on it time and again.

The grid discipline by frequency management of the Company was appreciable.

The cost of transmission has increased steadily without corresponding increase in revenue. The capital expenditure was less than the funds mobilised by way of infusion of capital and borrowings, indicating use of long term funds for

purposes other than creation of assets. The conditions put forth by the Government of Karnataka while releasing capital were not adhered to. Non-receipt of ₹ 630.45 crore from Government of Karnataka against taken over pension/gratuity liability affected the profitability of the Company.

The internal control system had weaknesses.

Recommendations

The following recommendations are offered:

- The construction of substations and lines should be need based, against the backdrop of scarce resources; to avoid idling and excess capacity creation. The planning and execution require reorientation to have synchronization of various aspects of implementation of the projects to facilitate taking up of issues such as forest and other statutory clearances, road cutting permissions, etc., well in time and resolving them before award of the works.
- There is need to conduct effectively the survey of the line corridors to avoid the problems like right of way during the course of construction. Adequate enquiries as to suitability of the area and encumbrance should precede the acquisition of land and hindrance free land should be available to contractors for construction of substations, alongwith the award of work.

- Procurement of high value items should be need based to avoid blocking up of funds on materials.

In all the above aspects the recommendations of the Task Force could be the roadmap.

- The Company should speed up implementation of Availability Based Tariff mechanism (intra-state), put in place adequate Disaster Management mechanism and create infrastructure for monitoring of load (availing real time data).
- The Company should plan for evacuation of power from generating stations in time so as to avoid purchase of expensive power from the market and give fillip to growth.
- The stipulations set by the Government while releasing funds towards capital expenditure should be fulfilled. The Subcommittee on borrowings of the Company should document its decisions and follow up actions.

Introduction

2.1.1 The Government of India (GoI), prepared in February 2005 the National Electricity Policy (NEP) with the objective to supply reliable and quality power to all by 2012. The NEP stated that the Transmission System required adequate and timely investment besides efficient and coordinated action to develop a robust and integrated power system for the country. The Policy recognized the need for development of National and State Grid with the coordination of Central/State Transmission Utilities. Transmission of electricity and grid operations in Karnataka are controlled and managed by Karnataka Power Transmission Corporation Limited (Company), which is expected to provide an efficient, adequate and properly coordinated grid management and transmission of energy.

2.1.1.1 The Company was incorporated in July 1999 under the Companies Act 1956, and acts under the administrative control of the Energy Department, Government of Karnataka (GoK). The management of the Company is vested with the Board of Directors (BoD) comprising 15 members appointed by GoK. The day-to-day operations are carried out by the Managing Director, who is the Chief Executive of the Company, with the assistance of Director (Finance), Director (Transmission), Director (Projects), Director (Administration & Human Resources), Chief Conservator of Forests and Company Secretary.

The turnover of the Company was ₹ 1,663.01 crore in the year 2011-12, which was 0.38 *per cent* of State Gross Domestic Product (₹ 4,34,270 crore). There were 9,179 employees as on 31 March 2012. The details of transmission network are given in Paragraph 2.1.8.1 to 2.1.8.4.

The Performance Reviews on Karnataka Power Corporation Limited and Electricity Supply Companies covering generation and distribution activities were included in the Audit Report (Commercial), Government of Karnataka, of the Comptroller and Auditor General of India, for the year ended 31 March 2010 and 31 March 2011 respectively. The Reports are pending for discussion (September 2012) by the Committee on Public Undertakings.

Scope of audit

2.1.2 The present Performance Audit, conducted between January and July 2012, covers the activities of the Company between 2007-08 and 2011-12. Audit examination involved scrutiny of records of different wings at the Head Office, Transmission Billing Centre (TBC), State Load Despatch Centre (SLDC), 4 out of 15 Major Works Divisions and 8 out of 29 Transmission Lines and Substation (TL&SS) Divisions.

The selection of works in the Major Works Divisions was based on the awarded cost of the projects by adopting random sampling without replacement method. Out of 318 substations (10,548.10 MVA) and 399 lines consisting of 4,304.58 Circuit Kilometre (Ckm) constructed and 240 augmentation works

(3,715.10 MVA) undertaken during the review period, 48 Substations of 5,452.60 MVA (52 per cent), 48 lines measuring 1,055.77 Ckm (25 per cent) and 6 augmentation works having 656 MVA (18 per cent) were selected for detailed examination. In addition, 16 out of 101 Purchase Orders (POs) for procurement of materials, issued at Corporate Office, were examined.

Audit objectives

2.1.3 The objectives of the Performance Audit were to assess whether:

- Perspective Plan was prepared in accordance with the guidelines of the National Electricity Policy/Plan and State Electricity Regulatory Commission (SERC) and assessment of impact of failure, if any, in planning;
- the transmission system was developed and commissioned in an economical, efficient and effective manner;
- operation and maintenance of the transmission system were carried out in an optimal manner;
- Disaster Management System was set up to safeguard its operations against unforeseen disruptions;
- effective failure analysis system was set up;
- Financial Management System was effective and efficient. Timely, raising and collection of bills and filing of Annual Revenue Requirement (ARR) for tariff revision;
- an efficient and effective system of procurement of material and an inventory control mechanism was in place;
- Energy Audit System was established; and
- there was a monitoring system in place to review existing/ ongoing projects, take corrective measures to overcome deficiencies identified, respond promptly and adequately to Audit/ Internal audit observations.

Audit criteria

2.1.4 For assessing the achievement of the audit objectives, the criteria were derived from the following:

- Provisions of National Electricity Policy / Plan and National Tariff Policy;
- Perspective Plan and Project Reports of the Company;
- Standard procedures for award of contracts with reference to principles of economy, efficiency, effectiveness, equity and ethics;
- ARR filed with State Electricity Regulatory Commission (SERC) for tariff fixation, circulars, manuals and MIS reports;

- Manual of Transmission Planning Criteria (MTPC);
- Code of Technical Interface (CTI)/ Grid Code consisting of planning, operation, connection codes;
- Directions from State Government and Ministry of Power (MoP), Government of India(GoI);
- Norms/Guidelines issued by SERC and Central Electricity Authority (CEA);
- Report of the Committee constituted by the MoP recommending the ‘Best Practices in Transmission’;
- Report of the Task force constituted by the MoP to analyse critical elements in transmission project implementation; and
- Reports of the Regional Power Committee (RPC)/ Regional Load Despatch Centre (RLDC).

Audit methodology

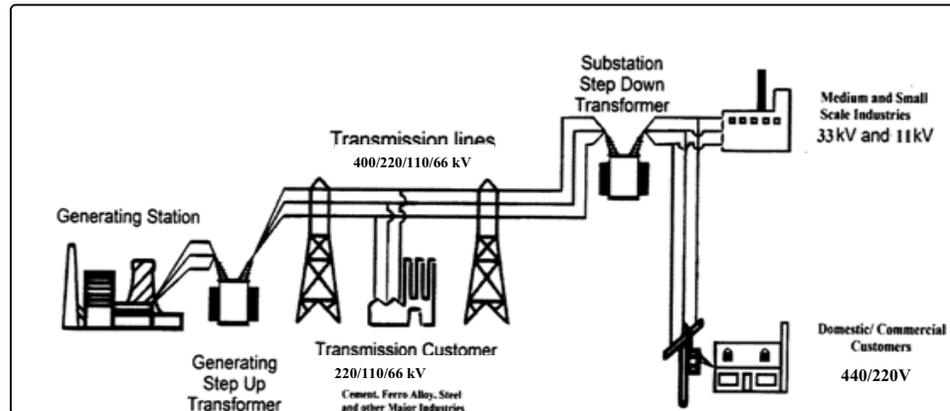
2.1.5 The methodology adopted for attaining the audit objectives with reference to audit criteria consisted of explaining audit objectives to top management, interaction with personnel of the audited entity, analysis of data with reference to audit criteria, discussion of audit findings with the Management and issue of draft review to the Management/ Government for comments.

We reviewed the agenda notes and minutes of the meetings of the Board of Directors, annual budgets, annual accounts, records relating to borrowings, procurement, project implementation and the tariff orders of the Karnataka Electricity Regulatory Commission (KEREC).

Brief description of the transmission process

2.1.6 Transmission of electricity is defined as bulk transfer of power over long distances at high voltages, generally at 66 kV and above. Electric power generated at relatively low voltages in power plants is stepped up to high voltage before it is transmitted to reduce the loss in transmission and to increase efficiency in the Grid. Substations (SSs) are facilities within the high voltage electric system used for stepping-up/ stepping-down voltages from one level to another, connecting electric systems and switching equipment in and out of the system. The step up transmission Substations at the generating stations use transformers to increase the voltages for transmission for long distances. Transmission lines carry high voltage electric power. The step down transmission Substations decrease voltages for sub-transmission and subsequent distribution to consumers. The distribution system includes transformers, lines, poles, and other equipment to supply electricity at specific voltages.

Every transmission system requires a sophisticated system of control called Grid management to ensure balancing of power generation closely with demand. A pictorial representation of the transmission process is given below:



Audit findings

2.1.7 We explained the audit objectives to the Company and the State Government during an Entry Conference held in May 2012. Subsequently, audit findings were reported to the Company and the State Government and discussed in an Exit Conference (September 2012). The Exit Conference was attended by representatives of the Company and State Government. The Company replied to audit findings (December 2012). The views expressed by the Company have been considered while finalizing this performance audit. Government replies were awaited (December 2012).

The audit findings are discussed in subsequent paragraphs.

Planning and development

National Electricity Policy/ National Electricity Plan

2.1.8.1 The transmission segment has a major role in achieving the mission 'Power for All'. The Central Transmission Utility (CTU) and State Transmission Utilities (STUs) have the key responsibility of network planning and development based on the National Electricity Plan in coordination with all agencies concerned. Assessment of demand is an important pre-requisite for planning capacity addition.

Network expansion should be planned and implemented keeping in view the anticipated transmission needs after identifying the requirements in consultation with stakeholders and taking up the implementation after due regulatory approvals. While planning new generation capacities, the requirement of associated transmission capacity would need to be worked out simultaneously in order to avoid mismatch between generation capacity and transmission facilities.

At the end of X Plan (March 2007), the transmission system in the country at 765 HVDC/400/230/220/kV stood at 1.98 lakh Ckm of transmission lines, which was planned to be increased to 2.93 lakh Ckm by end of XI Plan *i.e.*, March 2012. The National Electricity Plan assessed the total inter-regional transmission capacity at the end of 2006-07 as 14,100 MW and further planned to add 23,600 MW in XI plan, bringing the total inter-regional capacity to 37,700 MW.

Transmission network and its growth

2.1.8.2 The Company’s transmission network at the beginning of 2007-08 consisted of 645 Extra High Tension (EHT) Substations with a transmission capacity of 30,895.60 MVA and 26,114.06 Ckm of EHT transmission lines. It increased to 963 Substations with a transmission capacity of 45,158.80 MVA and 30,418.64 Ckm of transmission lines as on 31 March 2012.

2.1.8.3 Details of capacity addition during the review period (2007-12)¹⁷ were as follows:

Particulars	Substations			Lines	
	New	Augmented	MVA	Number	Ckm
Target*	387	271	22,341.20	401	4,935.23
Achievement	318	240	14,263.20	399	4,304.58
Shortfall	69	31	8,078.00	2	630.65
Percentage of shortfall**	17.83	11.44	36.16	0.5	12.78

*No targets were fixed for 2010-11. **Achievement during 2010-11 is taken as target for working out the percentage of shortfall.

The Company did not achieve the targeted capacity additions.

The Company replied that the projects contemplated could not be completed as scheduled due to ROW problems and considerable time was consumed in according clearances by Forest, Railway and Civil Authorities.

2.1.8.4 The Company transmitted 42,933.65 MUs of energy in 2007-08 using a capacity of 9,040 MVA at 220 kV (70 *per cent* of the installed capacity of 12,915 MVA). The quantum of energy transmitted increased to 56,890 MUs in 2011-12 (an increase of 32.51 *per cent*) while the capacity rose to 13,023 MVA at 220 kV (70 *per cent* of the installed capacity 18,605 MVA). The capacity of 13,023 MVA was capable of annually transmitting 96,969 MUs against the requirement of 74,889 MUs at peak demand (10,058 MVA) recorded in 2011-12.

¹⁷ the particulars of voltage-wise capacity additions planned, actual additions, shortfall in capacity, etc., during review period are given in the Annexure-8.

Planning of capital expenditure

2.1.8.5 The Company's planning process consisted of a perspective plan for a five year period (2007-12) in accordance with the National Electricity Plan (NEP). There was no State Electricity Plan. The Company prepares annual capital expenditure plans. The Company prepared a three year rolling plan in line with Multi-Year tariff regulations from the year 2007-08. The Company informed that the planning process involved identification of targets from proposals forwarded by various transmission Zones/ESCOMs, elected representatives, peak demand, total energy requirement, tariff wise consumption and backwardness of the location and those were discussed and finalized by the Technical Advisory Committee.

The new works, augmentation works, works spilled over to the succeeding years, etc., of transmission system in the five years ended March 2012 are tabulated below:

Year	Ongoing, new and augmentation works	Completed works	Works spilled over
2007-08	1,021	258	229
2008-09	548	363	185
2009-10	660	330	149
2010-11	566	244	253
2011-12	793	125	382

2.1.8.6 The outlay budgeted and actual expenditure is tabulated below:

Amount : ₹ in crore

Year	Month of approval of the budget	Approved outlay	Month of approval of the revised outlay	Revised outlay	Actual expenditure placed before the Board	Capex approved by KERC	Actual expenditure as per KERC filings for tariff
2007-08	May 2007	2,400	-	-	-	2,400	2,093
2008-09	June 2008	4,335	August 2008	2,647	-	-	-
			February 2009	2,363	1,912	2,100	1,809
2009-10	June 2009	2,380	September 2009	2,447	-	-	-
			December 2009	2,476	-	-	-
			March 2010	1,300	1,002	2,380	1,452
2010-11	June 2010	1,692	December 2010	1,599	836	1,692	1,133
2011-12	April 2011	1,422	-	-	728 ¹⁸	1,422	945 ¹⁹

- The capital expenditure had increased from the levels of ₹ 479 crore in 2005-06 to ₹ 2,093 crore in 2007-08. The actual outlay decreased to ₹ 945 crore in 2011-12. The actual expenditure had been much lower than the initially approved outlays during the last five years.

¹⁸ cash outflow for the year 2011-12.

¹⁹ as per filings made to KERC. Annual Performance Review for 2011-12 was yet (December 2012) to be finalised by the KERC.

The Planning for capital expenditure was not well founded.

- KERC had noted (December 2007) that the investments as planned needed to be achieved as any material deviations would affect tariff stability. The KERC further observed that 365 works planned for completion in 2007 had not been completed even after substantial amounts were invested and did not accept the delays on account of administrative reasons related to payment of compensation attributed by the Company. The Commission also noted that there were huge differences in the information regarding energy savings in Detailed Project Reports *vis-à-vis* the actual.
- The Board was appraised (June 2008) that huge borrowings would be needed to execute such high capital expenditure plans and in such a scenario the debt equity position would not be favourable. Further, in the meeting of the BoD held in July 2008, the Principal Secretary, Finance Department informed that there was a lot of imbalance in corresponding investment in transmission *vis-à-vis* generation. The action called for study on the adequate levels of transmission system that needed to be available to cater to the existing levels of restricted demand.
- KERC also observed (November 2009) that in respect of 100 works taken up during 2007-08, the payback period was more than 20 years and about 28 works, the pay-back period was more than 35 years, which in effect was more than the life of the equipment, and was therefore not viable.
- KERC, while reviewing the performance of the Company for 2009-10, had noted (December 2010) that the achievement in respect of substations and associated lines was only 60 *per cent* and directed the Company to address issues such as land acquisition, forest clearance and right of way problems in completing the targeted works.
- While approving the tariff of 2011-12, the KERC had noted (December 2010) that in the absence of load flow studies, huge capex proposals if considered would result in front loading of tariff, which would be unfair to consumers. Further, in the Tariff Order of 2012, the Commission noted (April 2012) that the transmission charges worked out to ₹ 1.64 lakh per MW of transmission capacity. This was significantly higher than charges incurred per MW by the Transmission agencies in Gujarat (₹ 1.02 lakh) and Andhra Pradesh (₹ 0.79 lakh).
- The Statutory Auditors of the Company had observed (November 2012) that there was no system of making long-term business plan. The short term business plan consisted of Annual Plan of capital works and revenue budget as approved by the BoD. The Statutory Auditors further observed that in view of anomalies in the budget allocation during 2011-12, re-appropriation of capital budget without change in financial outlay was got approved by the Managing Director and subsequently ratified (January

2012) by the Board. But, the same *vis-à-vis* actual have not been reviewed. Further, the capital expenditure/capital invested, not put to use were not ascertainable in the absence of necessary records/physical verification report.

Some of the salient issues analysed and discussed in the performance review were:

- Network expansion should be planned and implemented keeping in view the anticipated transmission needs and after identifying the requirements in consultation with stakeholders.
- Projects should be taken up for execution after due regulatory approvals to avoid perennial delays.
- A key consideration in planning expansion of transmission infrastructure is the utility's ability to finance the costs of the investment under the regulated rate structure.
- This investment in excess of the requirement is a burden placed on the consumer. Existence of excess/idle capacity in the transmission network coupled with prevalence of overloads and low voltages in certain places reflects unscientific creation of transmission network.

Land for substations

2.1.9 The Government offered (October 2007), 377.14 acres of land at 58 locations in Bangalore Urban District to establish Substations. The Company undertook the task of obtaining revenue sketch, ensuring boundary points *etc.*, and submitting detailed report on the suitability of land for construction of substations. The Company paid (March 2008) ₹ 42.46 crore to the Revenue Authorities for purchase of land at 30 locations, by availing loan from Power Finance Corporation Limited (PFC).

We observed that:

- The Company could not take possession of land at nine locations due to encroachment, non-suitability, land available in pieces *etc.* The Company requested (November 2011) the Revenue Authorities to allot alternate suitable lands. The failure to assess the suitability and ensure encumbrance of land, resulted in payment of ₹ 16 crore to the Revenue Authorities and consequential interest charges of ₹ 6.13 crore²⁰. The loan of ₹ 16 crore was prepaid (September 2011).

The Company replied that in 9 locations the lands handed over were different from the lands offered earlier and also informed that out of 9

²⁰ ₹ 16 crore for four years at 9.58 per cent (lowest weighted average cost of borrowings for period 2007-12).

locations, alternate land was allotted in one case, while refund was yet to be received in respect of the other 8 locations (December 2012).

- The Government of Karnataka allotted (October 2007) 12 acres of land at Sunkadakatte Village in Bangalore for construction of the Substation. Company availed loan from PFC for purchase of the land. The Company paid (March / December 2008) ₹ 4.17 crore to the Government and took (June 2008) procession of the land. The Forest Department objected (June 2010), when the work of providing fencing around the land was taken up. Though a joint survey was conducted (November 2010) by the Revenue Authorities, the Forest Officials and the Company and the survey sketch was submitted (March 2011), the same was not accepted by the Forest Department. The Company did not get back the amount paid. This resulted in payment of ₹ 4.17 crore made out of borrowed funds and interest charges of ₹ 1.59 crore.

The Company replied that when the matter was taken up with Deputy Commissioner it was informed that land belonged to Forest Department. The Deputy Commissioner had instructed to refund the amount, which was yet to be received (December 2012).

Failure to obtain No-objection Certificate from forest department and conduct a joint survey with Revenue and Forest authorities prior to payment and taking the possession was responsible for this loss of interest and idling of capital.

Project management of transmission system

2.1.10.1 A transmission project involves various activities from concept to commissioning. Major milestones in a transmission project are (i) Project formulation, appraisal and approval phase and (ii) Project execution phase. For reduction in project implementation period, the Ministry of Power, Government of India constituted (February 2005) a Task Force on transmission projects. The Task Force recommended (July 2005) remedial action to accelerate the completion of transmission systems. The major recommendations *vis-a-vis* the deviations noticed are given below:

Recommendations of the Task Force	Deviation, effects and explanation (December 2012) of the Management
Undertake various preparatory activities such as surveys, design & testing, processing for forest and other statutory clearances, tendering activities <i>etc.</i> , in advance/parallel to project appraisal and approval phase and go ahead with construction activities once transmission Line Project sanction/approval is received	The preparatory activities were not undertaken in advance/parallel to project appraisal and approval phase and for statutory clearances, which resulted in delayed completion of a large number of projects. These are discussed in Paragraph 2.1.10.4.

Recommendations of the Task Force	Deviation, effects and explanation (December 2012) of the Management
Break-down the transmission projects into clearly defined packages such that the packages can be procured and implemented requiring least coordination and interfacing and the at same time it attracts competition facilitating cost effective procurement	<p>The Company awarded construction of Substation and transmission lines on turnkey/partial turnkey²¹ basis, ignoring the packaging concept recommended by the Task Force.</p> <p>The Company replied that the Task Force had recommended elsewhere in the recommendations that the packages should be few and turnkey type of contracts should be preferred to avoid co-ordination problems, and hence, total turnkey was opted.</p>
Standardize designs of tower fabrication so that six months to twelve months can be saved in project execution	The Company informed that it had adopted standard designs for transmission towers and modifications were done only when field conditions called for the same.

2.1.10.2 Of the 558 substations and 399 lines constructed/augmented between 2007 and 2012, audit test checked 54 Substations and 48 lines. There were delays at different stages in implementation in 24 substations and 25 lines of the test checked cases, indicating deficiencies in planning and execution. The Company could not commission several Substations and lines planned during 2007-12. The details in respect of the test checked projects are given below:

Capacity (kV)	Total number of SS and lines constructed including work in progress		Analysed by Audit (Numbers)		Delay in completion in the test checked projects (Numbers)		Time overrun in test checked projects (Months)		Investment which remained unproductive in test checked projects (₹ in crore)		Benefit lost due to delay in test checked projects (₹ in crore)		Interest charges on unproductive investment (₹ in crore)	
	SS	Lines	SSs	Lines	SS	Lines	SS	Lines	SS	Lines	SS	Lines	SS	Lines
400	1	1	1	0	0	0	-	-	-	-	-	-	-	-
220	43	40	21	17	11	9	5-41	5-47	392.82	844.07	245.18	94.79	61.31	143.37
110	214	138	14	9	5	3	8-24	11-51	26.37	13.29	10.48	8.53	3.85	1.98
66	300	220	18	22	8	13	3-50	11-67	36.95	141.64	19.76	3.62	4.35	34.16
Total	558*	399	54	48	24	25			456.14	999.00	275.42	106.94	69.51	179.51

SS=Substations. *including augmentation works.

²¹ in turnkey projects, the contractor procures and executes all items of work. In a partial turnkey contract, the Company supplies major items such as transformers to the contractor and the balance items are procured and executed by the contractor.

Completed works

2.1.10.3 We analysed the causes for the delays in completion, commissioning and operation of the projects. The analysis in respect of test checked projects are given below:

Projects commenced and completed

2.1.10.4 The cause-wise analysis of the delays in execution of completed works is detailed below:

Causes	Type	No of works delayed	Delay			Investment which remained unproductive (₹ in crore)	Benefit lost (₹ in crore)	Interest charges on unproductive investment (₹ in crore)	Reference to details are given in Annexure-9 (item nos.)
			Up to 1 year	1 to 3 years	3 to 5 years				
1.Delay in applying for permission of Statutory Authorities									
Forest clearance	Lines	2	-	2	-	7.67	--	0.98	1,2
Permission for road cutting	Lines	8	1	7	-	178.84	3.62	26.66	3,4,5,6,7, 8a,8b,8c
2. Right of Way (ROW) problems	Sub-station	1	1	--	-	38.95	28.47	3.06	10
	Lines	6	1	3	2	83.05	49.05	22.20	7,9,11,12,13,14
3.Delay in handing over sites to contractors	Sub-stations	4	--	4	-	47.68	34.46	7.93	13,15,16, 17
4.Delay for want of material	Sub-stations	8	4	4	0	102.94	84.57	12.16	10,18,19, 20,21,22,23, 24
5. Delay in award of associated line works	Sub-stations	3	1	1	1	121.86	43.15	24.43	8(d),25, 26
6. Delay on the part of the contractors	Sub-stations	5	3	1	1	69.56	77.96	14.34	26,27, 28,29,30
	Lines	4	1	1	2	25.81	18.35	2.55	2, 8(d), 14,31
7. Others	Sub-stations	8	2	6	-	43.89	12.66	5.35	15,18,19, 20,25,32, 33,35
	Lines	3	-	3	-	-	-	-	5,13,34

The works were delayed for various reasons; most of them were controllable.

We observed delays in completion of projects for various causes. The cause-wise analysis and the Company's explanations are narrated below:

2.1.10.5 Permission of Statutory Authorities

Forest clearance: In two cases (refer Sl.No.1 of Table above and Annexure 9) the requests for forest clearances were made after 18 and 20 months from the date of approval of Detailed Project Report (DPR) and 7 to 11 months from award of work.

The Company replied that:

- In respect of Kushalnagara, the existence of forest in the corridor could not be identified at the time of survey (August 2004) as the boundary was not marked.
- In the case of Huyoganahalli Substation, the line passed through a social forest, which was converted to wild life sanctuary. The route was revised and approved (October 2008) and the work completed in November 2010.
- Forest clearances were applied for as and when the same were encountered in the approved line corridor during execution.

This was in deviation from the recommendations of Task Force, which recommended obtaining statutory clearances in advance/parallel to project appraisal and approval phase. The belated lodging of requests for clearances was not explained.

Road cutting permission: In eight cases, road cutting permissions were requested for after periods ranging from 2 to 30 months from the date of approval of DPRs and from 1 to 8 months from the award of works (refer Sl.No.1 of Table above and Annexure 9).

Specific replies of the Company to the audit contention are as follows:

- In respect of HSR to Shobha Apartment line work, the application for road cutting was submitted in July 2008 and approval received in August 2009/March 2010.
- In respect of Hoddy-EPIP line, after finalization of route, application for road cutting permission was submitted in October 2008, but clearances were received in April/November 2009.
- In respect of Attibele line works, applications for road cutting through an industrial area was made in January 2008 and permission received in March 2009/September 2009.
- In respect of DG3, DG4 lines, the route survey was conducted in March 2006 and approved in June 2006, after which the Company sought (June 2006) permission for road cutting; but BBMP accorded approval only after five months.
- In respect of laying underground cable from HSR to St.John Woods substation, cable route was approved in October 2007 and road cutting permission was received in March 2008. After approval from BBMP and local authorities for adopting trenchless method for road cutting and cross drainage, the work resumed and was commissioned in March 2009.

The belated lodging of requests for clearances were not explained. Efforts made by the Company to expedite clearances after lodging of requests were not on record. The need to seek approvals and clearances in time is emphasized.

2.1.10.6 Right of Way (ROW)

The Company faced Right of Way (ROW) problems during construction of seven lines²², which resulted in delay by 9 to 46 months (refer Sl.No.2 of Table above and Annexure 9).

Specific replies of the Company to the points raised are as follows:

- In respect of Kadakola –Bastipura line, there were obstruction from private housing societies and KIADB which were cleared in 2008 and 2009.
- In respect of line works connecting Kothipura substation, there were several ROW problems and court cases.
- In respect of Guruvayankere–Puttur line, paper notification was issued in May 2003 requesting to file objections for line passing through their lands. Objections from many land owners were resolved but others approached various courts and final orders were issued in 2008.
- In respect of Manipal-Nittur line, the work was delayed due to ROW problems and court cases filed in various cases. The line was passing through paddy fields and river bank and work was hampered during monsoon season.
- In respect of HSR-St.John Woods the issues related to ROW are given in Paragraph 2.1.10.5 above.

In respect of three projects viz., Kadkola-Bastipura, Guruvayankere-Putur and Manipal-Nittur, there were unresolved ROW problems at the time of award of work. These projects were delayed for completion for periods ranging from 11 to 24 months. Four other projects which had ROW problems were delayed for periods ranging from 9 to 46 months. The Company has no proper mechanism to address the ROW problems adequately.

2.1.10.7 Sites not handed over

In case of four projects, sites were handed over after three to five months of award of works (refer Sl.No.3 of Table above and Annexure 9).

- In respect of M.K.Hubli substation, the Company stated that the Deputy Commissioner had fixed (July 2006) the cost of land at ₹ 5 lakh per acre during land purchase committee meeting. As the cost of land fixed exceeded twice the market value, it was referred to Revenue

²² including one line associated with Sarjapura 220 kV Substation (item no.10 of Annexure 9).

Department, which approved ₹ 3.5 lakh per acre. This was revised (December 2007) to ₹ 4 lakh per acre as land owners were not ready to sell their land. The Company, however, had already decided (October 2007) to pay ₹ 5 lakh per acre, but could purchase only 10 acres 23 guntas as against 13 acres 03 guntas.

- In respect of Aigili Substation the Company accepted the delay of 85 days in handing over the site, but attributed the same to objections from nearby land owners.
- In respect of Madikeri Substation, the contractor refused to accept the work as completion period in letter of intent mentioned was short, the area being under heavy rainfall. After amendment of terms, the site was handed over.

The fact remained that the projects were delayed for periods upto 36 months.

2.1.10.8 Materials not supplied

Eight Substations were delayed for periods ranging from 3 to 25 months for want of materials including transformers (refer Sl.No.4 of Table above and Annexure 9).

The Company replied:

- In the case of Ghataprabaha project, hard rock was encountered and locals objected to blasting. As such the bed work, earth mat of substation, casting of tower *etc.*, were delayed. To avoid idling of equipment the transformers were supplied only after the work reached to a certain stage.
- In respect of Hattargi, Ravandur, Chikkamandya and Huyoganahalli, the Company attributed the slow progress to the contractor, apart from ROW problems. It was stated that transformers were supplied only after the substation work reached a certain stage to avoid possible damages and idling of the equipment which in turn would affect warranty.

Failure to obtain statutory clearances and solve ROW problems in time had the cascading effect on these works.

2.1.10.9 Contractors' delay

- There were delays attributable to the contractors varying between 5 and 43 months in completing nine works (refer Sl.No.6 of Table above and Annexure 9).

Further, to ensure that the projects were completed within the stipulated time, the Company levied liquidated damages at 0.5 *per cent* per week subject to a maximum of 10 *per cent* of the value of undelivered portion

of contract for delay beyond the contractual period. In three cases²³, though the reasons were attributable to the contractors such as delay in commencing the work, liquidated damages of ₹ 2.41 crore recovered were refunded (January/February 2012). The Company stated that refund of liquidated damages was made as the work was completed within the extended target date. The contention of the Company was not acceptable as the works related to substations did not have problems and only associated lines had problems; so there was no necessity to refund the liquidated damages caused due to delay by the contractor.

2.1.10.10 Other reasons

- Delays also occurred due to other reasons such as change in specifications and designs (four cases), approving layout/foundation drawings (seven cases), encountering hard rock during excavation, objection from people *etc.* (refer Sl.No.7 of Table above and Annexure 9).

Due to above reasons, there was a loss of envisaged savings in energy amounting to ₹ 352.29 crore and avoidable interest charges of ₹ 119.66 crore in respect of 20 substations and 15 lines²⁴.

Projects completed, but not commissioned

2.1.11 The cause-wise analysis of the delays for commissioning after completion of substation and lines are given below.

Causes	No of works delayed	Period of idling				Investment which remained unproductive (₹ in crore)	Benefit lost (₹ in crore)	Interest charges on unproductive investment (₹ in crore)	Referred to in Annexure - 9 at item nos.
		Up to 1 year	1 to 3 years	3 to 5 years	More than 5 years				
1. Idling of substations due to non commissioning of source lines	5	2	2	1		136.62	Included in earlier table	8(d),16, 25,26,35	
2. Idling of line for want of Terminal Bay	1	1	-	-	-	15.66	-	1	

We observed that:

- Though the 220 kV substation at Ananda Rao circle, Bangalore was completed in June 2007, the source line (from 220 kV NR Station to Ananda Rao circle substation) was completed only in May 2010. Further, two lines laid for connecting Ananda Rao substation to ‘A’

²³ evacuation lines of Huyoganahalli (₹ 82.03 lakh), Substation at Kushalanagara (₹ 49.39 lakh), Substation at Athani alongwith associated lines (₹ 1.10 crore).

²⁴ more than one reason for delay is applicable in the works.

station was idle as the line between 'A' station and NRS Station was not completed for want of road cutting permission. In addition, the proposed 66 kV substations to draw power from Ananda Rao circle substation (220 kV) also did not materialise owing to non-availability of land. This also resulted in partial loading of Ananda Rao circle substation.

The Company replied that permission for road cutting was applied in February 2005, but BBMP did not allow for open trench digging and hence the matter was resolved after several meetings.

- Aigali Substation was completed in October 2007. As the source line planned from Athani to Aigali did not come up in time due to non-commissioning of link line to Athani, the Company, arranged alternate source of supply and commissioned the Substation in August 2008. The Company replied that due to re-arrangement of existing lines and the work was getting delayed and alternate arrangements were made.
- Substation at Taushi was completed in February 2008. But, the source line (Athani) to Taushi was completed and commissioned only in March 2009 due to delay in commissioning 220KV Athani Station. The Company replied the work was delayed due to ROW problems and rearrangement of existing lines to feed the station.
- In respect of source line works for NIMHANS and EDC Substations the Company replied that applications for permission for road cutting were made only after finalization of the cable route.

Projects commissioned, but idling

2.1.12 Though the Company commissioned several projects, many were idling due to various reasons such as non-synchronisation of Substations and Lines and redundancy. This had resulted in loss of envisaged savings in energy valued at ₹ 5.42 crore and avoidable interest charges of ₹ 0.41 crore. Cases noticed in test check are detailed below:

Sl. No.	Details of the Project	Causes for delay	(a) Commissioned date (b) Idle period (in months) (c) Idle investment (d) Interest on idle investment (e) Envisaged benefit foregone	Reply (December 2012) of the Company and Audit Remarks
1	66 kV Substation at Madikeri	The transformers remained idle, as distribution lines were not constructed by the Chamundeswari Electricity supply Corporation (CESC).	(a) June 2010 (b) 21 months (c) ₹ 0.90 crore (d) ₹ 0.15crore (e) ₹ 4.18 crore	The Company stated that the matter had been taken up with CESC authorities.

Sl. No.	Details of the Project	Causes for delay	(a) Commissioned date (b) Idle period (in months) (c) Idle investment (d) Interest on idle investment (e) Envisaged benefit foregone	Reply (December 2012) of the Company and Audit Remarks
2	Additional Transformer at 66 kV Substation, Chikkamandya		(a) December 2010 (b) 15 months (c) ₹ 1.41 crore (d) ₹ 0.17 crore	
3	66 kV Substation at Jyothinagara		(a) March 2011 (b) 12 months (c) ₹ 0.90 crore (d) ₹ 0.09 crore (e) ₹ 1.24 crore	
4	66 kV UG cable from Hoody to EPIP Substation	<p>A 220 kV substation was planned for construction (January 2007) in the premises of 66 kV EPIP Substation was taken up after four years (February 2011) and laid at a cost of ₹ 28.22 crore.</p> <p>The 66 kV line from Hoody 220 kV Substation to EPIP Substation would be redundant once the 220KV substation work is completed.</p>	(a) March 2010 (b) 24 months	<p>The Company stated that the UG cable work from Hoody to EPIP Substations was taken up to cater to the increase in load and if 66 kV cables were not laid it would not have been possible to supply power required to feed EPIP Substation. The work of 220 kV substation at EPIP was taken up in February 2011 and expected to be completed by May 2013.</p> <p>The reply was not correct in as much as the work of 220 kV substation at EPIP, planned in January 2007, was not immediately taken up for construction, which necessitated construction of the 66 kV line from Hoody.</p>

Projects commenced, but not completed

2.1.13 There were 321 ongoing projects of substations, lines, terminal bays and for augmentation of substations as at end of March 2012, for which Letters of Intent were issued up to March 2012.

2.1.13.1 Of the test checked projects, 42 works were under progress. Fourteen of the 42 projects²⁵ in progress (as at end of March 2012) faced various problems related to statutory clearances, ROW, handing over of sites, supply of transformer and award of work without ensuring supply source. In some cases the contractors failed to complete the works. The projects had been delayed

²⁵ three works that were in progress as at end of December 2011, when the selection was made. As these works were completed by March 2012, the observations are included under paragraph 2.1.10.4.

beyond the stipulated periods of completion. This resulted in loss of envisaged savings in energy amounting to ₹ 30.07 crore and avoidable interest charges of ₹ 129.36 crore.

The details of the above mentioned 14 cases are summarised below:

Sl. No.	Details of the Project	Causes for delay	(a) Scheduled completion (b) Delay in completion (in months) (c) Idle investment (d) Interest on idle investment (e) Envisaged benefit foregone	Reply (December 2012) of the Company and Audit Remarks
1	Underground (UG) Cable line from Hoody to B-Narayanapura limits To release load on transformer at Hoody Station, meet load growth and for reliable power supply around HAL.	<ul style="list-style-type: none"> ➤ Court cases ➤ Obtaining permission from civic bodies. 	(a) August 2006 (b) 67 months (c) ₹ 3.12 crore (d) ₹ 1.27 crore (e) nil	The Company has accepted the facts.
2	Bidadi to Kumbalagodu line The projects (Sl.No.2,3,4) were intended to provide power supply to 11 kV substations, to reduce interruption in 11 kV systems and to improve voltage in and around Kumbalagodu and Hejjala in Bangalore Rural District. The Company issued (5 March 2007 and 13 March 2007) two notices inviting tenders for construction of the line; one through the Chief Engineer in Transmission Zone, Bangalore and another through the Chief Engineer in Corporate Office, Bangalore. The work was awarded in August 2007 for ₹ 7.27 crore. The work was re-tendered and awarded (April 2010) after 32 months.	<ul style="list-style-type: none"> ➤ Contract was cancelled due to issuing two tenders for the same work. ➤ The work was further delayed due to ROW problems and court cases. 	(a) December 2007 and February 2008 (b) 49 month and 51 months (c) ₹ 0.74 crore (d) ₹ 0.04 crore (e) nil	Accepting the facts, the Company stated that in view of the Bidadi to Kumbalagodu line being the source line, the construction of which was in progress, transformers were not allotted to Hejjala Station to avoid idling.
3	Bidadi-Kumbalagodu line to Hejjala Substation. (Refer Sl.No.2)	<ul style="list-style-type: none"> ➤ Non-completion of the Bidadi-Kumbalagodu line. 		
4	Substation at Hejjala (Refer Sl.No.2)	<ul style="list-style-type: none"> ➤ Non-supply of transformers by the Company ➤ Non completion of the source lines 	(a) January 2008 (b) 50 months (c) ₹ 5.10 crore (d) ₹ 1.40 crore (e) ₹ 2.73 crore	

Sl. No.	Details of the Project	Causes for delay	(a) Scheduled completion (b) Delay in completion (in months) (c) Idle investment (d) Interest on idle investment (e) Envisaged benefit foregone	Reply (December 2012) of the Company and Audit Remarks
5	<p>Re-conductoring of 110 kV Belgaum-Ghataprabha line</p> <p>The project envisaged dismantling the old conductor with 'Lynx ACSR' conductor. The Project was intended to maintain un-interrupted power supply to 110 kV Ghataprabha and Hidkal Dam Substations</p>	<p>➤ The contract was awarded without ensuring alternate source of power supply to the Substations.</p>	<p>(a) December 2007 (b) 51 months (c) ₹ 2.16 crore (d) ₹ 0.74 crore (e) nil</p>	<p>The Company stated that the re-conductoring between Belgaum and Ankalagi was carried out by feeding 110 kV power supply from Ghataprabha Station to Ankalagi substation.</p> <p>The reply is not acceptable as the re-conductoring commenced (May 2011) only after connecting the load of 110 kV Ghataprabha Station to 220 kV Ghataprabha Station, which was newly commissioned in December 2010.</p>
6	<p>UG Cable line from 220 kV East Division Compound Substation to 66 kV Substations at M.G.Road B-Station, BMTC-Shantinagara and Austin Town in Bangalore.</p> <p>The works were planned to improve the power position in and around the M.G.Road area.</p>	<p>➤ Want of road-cutting permission,</p> <p>➤ ROW issues</p> <p>➤ Non-availability of space for construction of terminal bay at B-Station</p>	<p>(a) December 2007/January 2008 (b) 51 months (c) ₹ 19.34 crore (d) ₹ 5.50 crore (e) nil</p>	<p>The Company stated that it had applied for road cutting permission after finalization of cable route drawing.</p> <p>The Company added that all the lines were charged between July 2012 and September 2012.</p> <p>The fact remained that road cutting permission was sought for only after finalization of route survey by the contractor after award of work. Owing to lack of space, the Company had to design/construct a Hybrid terminal bay at B-Station subsequently (June 2012) and commissioned (July 2012) the line, which further delayed the work.</p>
7	<p>UG Cable line from HSR Layout Substation to Naganathapura Substation. The Project was taken up to improve voltage conditions at Hosur Road, AECS Layout, Yerrandahalli and HSR Layout.</p>	<p>➤ Want of road cutting permission and encroachment of land at proposed AECS Substation.</p> <p>➤ ROW problems.</p>	<p>(a) June 2008 (b) 45 months (c) ₹ 47.75 crore (d) ₹ 16.76 crore (e) nil</p>	<p>The Company has accepted the facts.</p>

Sl. No.	Details of the Project	Causes for delay	(a) Scheduled completion (b) Delay in completion (in months) (c) Idle investment (d) Interest on idle investment (e) Envisaged benefit foregone	Reply (December 2012) of the Company and Audit Remarks
8	Substation at Karaya and the associated line. The Project envisaged to release the load of Belthangadi and Puttur Substations and to improve the tail-end voltage of Karaya area.	<ul style="list-style-type: none"> ➤ ROW problem ➤ Revision of layout drawings. 	(a) September 2008 (b) 42 months (c) ₹ 6.89 crore (d) ₹ 1.97 crore (e) ₹ 3.19 crore	The Company stated that the delay was due to time taken for clearance (April 2012) of court cases filed in October 2004 in connection with dispute over certain locations. Further, there was delay in obtaining tree felling permission. The reply is not acceptable as the delay occurred due to improper planning and lack of various project preparatory activities. It was also not known why the works were awarded before clearing the court cases.
9	Double circuit line from Somanahalli- Malur Line to Jigani Substation.	<ul style="list-style-type: none"> ➤ The Substation work was awarded without ensuring source of supply. ➤ There was delay on the part of the contractor as well. 	(a) July 2008 and October 2008 respectively. (b) 44 months and 41 months (c) ₹ 32.25 crore (d) ₹ 8.77 crore (e) ₹ 13.04 crore	The Company has accepted the facts.
10	Substation at Jigani The Project was taken up to supply power to the Jigani Station and improve voltage condition in Jigani, Chandapura, Bennarghatta, Anekal and their surrounding areas			
11	The following 220 kV UG Cable lines were proposed to supply reliable power to HSR Layout and NIMHANS Substations.			
	a) HSR Layout to Cable Terminating Tower (CTT).	<ul style="list-style-type: none"> ➤ Want of road cutting permission. ➤ In respect of lines from HSR Layout to CTT and EDC to NIMHANS Substations, permission for road cutting was applied for 12 and 6 months respectively after award of work. 	(a) December 2009 (b) 27 months (c) ₹ 23.74 crore (d) ₹ 4.51 crore (e) nil	The Company has accepted the facts.
	b) East Division Compound (EDC) to NIMHANS Substation.		(a) January 2009 (b) 38 months (c) ₹ 37.72 crore (d) ₹ 9.01 crore (e) nil	
	c) HSR Layout to NIMHANS Substation		(a) January 2009. (b) 38 months (c) ₹ 73.54 crore (d) ₹ 13.46 crore (e) nil	

Sl. No.	Details of the Project	Causes for delay	(a) Scheduled completion (b) Delay in completion (in months) (c) Idle investment (d) Interest on idle investment (e) Envisaged benefit foregone	Reply (December 2012) of the Company and Audit Remarks
12	400 kV Double Circuit line from UPCL to Shanthigrama. The work envisaged to evacuate power from the UPCL generating station.	-	(a) May 2010 (b) 22 months (c) ₹ 446.52 crore (d) ₹ 64.12 crore	The Project is discussed in detail in Paragraph 2.1.15.3
13	110 kV Substation at Madavu and 110 kV line from Puttur to Madavu Substation. Provide new 33 kV source for the existing Substations at Kumber, Kadaba and Ballare in Puttur Taluk and to reduce line loss of 33 kV lines and 11 kV feeders.	➤ Non-handing over site to the contractor. ➤ ROW problems.	(a) January 2011 (b) 14 months (c) ₹ 6.65 crore (d) ₹ 0.68 crore (e) ₹ 4.21 crore	Accepting the facts, the Company stated that the Contractor's proposal for short closure of the contract is under consideration, as the site was yet to be handed over. The Company had spent ₹ 1.23 crore on material portion for substation and ₹ 5.42 crore for line portion of work. As alternate site for substation was yet to be identified, the entire expenditure remained unfruitful.
14	Substation at Vikas Technical Park and Cable line from Somanahalli-Malur line to the Substation. Supply power to the business park in the area.	➤ Change in design of towers (terminating) from Double Circuit to Multi Circuit ➤ Non-availability of source line (Somanahalli to Malur).	(a) October 2011 (b) 5 months (c) ₹ 29.37 crore (d) ₹ 1.13 crore (e) ₹ 6.90 crore	The Company did not furnish specific reply on this issue.
Total			(a) - (b) 5-67 months (c) ₹ 734.89 crore (d) ₹ 129.36 crore (e) ₹ 30.07 crore	

2.1.13.2 Of the remaining 279 ongoing works awarded for ₹ 1,633.26 crore, 142 works were delayed ranging between one to sixty eight months after incurring an expenditure of ₹ 517.57 crore. This caused additional interest charges on borrowings amounting to ₹ 123.69 crore. In 53 of these cases, the projects had been delayed for more than three years, after expending ₹ 318.51 crore.

The Company stated that the projects contemplated could not be completed as:
(a) farmers/landlords raised many ROW problems though survey for the proposed line route was carried out to identify the most economic route and by avoiding forest area, and/or (b) court cases.

Installation of transformers

2.1.14.1 The Company generally awards contracts on partial turnkey basis for construction of Substations. Transformers for the work are supplied by the Company by procuring through tendering process. Orders for transformers are placed for the planned substations and transformers are allotted to the substations. The year wise details of allotment of transformers, commissioned and in progress are as given below:

Year	Type of transformer	Number of transformers	Cost (₹ in crore)	Delay					Un-installed (No delay)	Amount blocked (₹ in crore)	Loss of interest (at 9.58 per cent) on delayed commissioning (₹ in crore)
				< 3 months	3 months to 1 year	1 to 3 years	>3 years	Un-installed			
2007-08	100 MVA	32	178.37	3	12	13	2	2	-	161.18	25.15
	31.5 MVA	12	23.18	5	6	1	0	0	-	13.53	0.79
	Others	257	294.80	73	116	56	8	4	-	203.51	14.17
	Total	301	496.35	81	134	70	10	6	-	378.22	40.11
2008-09	150 MVA	6	44.87	0	2	2	0	2	-	14.96	6.16
	100 MVA	13	71.32	1	10	2	0	0	-	66.56	2.44
	31.5 MVA	8	15.45	3	5	0	0	0	-	9.66	0.36
	Others	71	99.43	18	32	19	2	0	-	101.90	4.88
	Total	98	231.07	22	49	23	2	2	-	193.08	13.84
2009-10	100 MVA	5	24.89	2	0	3	0	0	-	14.05	1.72
	31.5 MVA	8	11.79	2	2	2	0	2	-	5.64	1.13
	Others	49	72.90	8	26	11	0	4	-	60.97	4.44
	Total	62	109.58	12	28	16	0	6	-	80.66	7.30
2010-11	100 MVA	1	4.68	1	0	0	0	0	-	0	0.00
	31.5 MVA	3	4.23	1	2	0	0	0	-	2.82	0.15
	Others	21	17.57	7	5	2	1	6	-	10.87	0.78
	Total	25	26.48	9	7	2	1	6	-	13.69	0.93
2011-12	100 MVA	5	17.29	1	0	0	0	3	1	0	0.45
	Others	49	44.90	10	15	0	0	9	15	16.48	0.34
	Total	54	62.19	11	15	0	0	12	16	16.48	0.79
Grand total		540	925.68	135	233	111	13	32	16	682.11	62.97

Source : Data furnished by Project Monitoring Wing of the Company.

There were huge delays in commissioning of transformers.

We observed that:

- Out of the 540 transformers procured, 492 transformers were commissioned between 2007-08 and 2011-12. Further, commissioning of 357 of the 492 transformers were delayed for periods ranging between 3 and 49 months (value of the transformers was ₹ 641.52 crore).

The interest charges due to delay in commissioning of the 357 transformers worked out to ₹ 49.04 crore. The remaining 48 transformers were yet to be commissioned (March 2012).

- Out of the 48 transformers, which were yet to be commissioned, 32 transformers were allotted for installation between August 2007 and December 2011, delayed its commissioning and loss of interest on the blocked up amount worked out to ₹ 13.94 crore (as on March 2012). The remaining transformers were issued in the last three months (January-March 2012).

The Company replied that commissioning of transformers was delayed due to ROW problems encountered during execution of the line works. Further, out of the 32 transformers issued between August 2007 and December 2011, the Company informed that 10 transformers had been commissioned and the remaining would be commissioned as and when the ROW problems and court cases were settled.

As could be seen there was delay in commissioning of the transformers, resulting in blocking up of funds and payment of interest charges amounting to ₹ 62.97 crore. There was deficiency in planning the procurement of transformers, as the Company continued to purchase transformers for projects which were not in line for commissioning.

Improper planning in procurement of transformer

2.1.14.2 The Company placed (June 2005) an order for four numbers 150 MVA transformers to replace the existing 100 MVA transformers at NRS-Rajajinagar (2 Nos.) and SRS-Peenya (2 Nos.) substations.

- Transformer (No.1) installed (August 2006) at NRS station failed in October 2007. This transformer was repaired (July 2009) after about two years. However, as the load on NRS station was relieved due to installation of stations nearby, it was decided (April 2010), not to upgrade NRS station. The transformer was diverted (September 2010) to Ananda Rao circle substation where it was installed (December 2011). Thus, there was a delay of 879 days in utilizing the transformer after repair.
- Transformer (No.2) received (July 2006) was not installed at NRS, but was transferred to SRS Peenya in July 2007, to replace a failed transformer (No.4).
- Transformer (No.3) was installed (July 2006) at SRS Peenya and was working since then.
- Transformer (No.4) received (September 2006) at SRS Peenya was installed (March 2007). The transformer, however, failed within three months (June 2007) and was repaired only after 1,633 days (December 2010). The transformer was idling till date (December 2012) in the stores.

The Company attributed the delay in installation of transformer (No.1) at Ananda Rao Circle substation to delay in obtaining clearance from BBMP for laying cables and after the cable was laid the transformer was installed.

As could be seen there was no realistic assessment of the need of the transformers. There were enormous delays in repair and even the repaired transformers were idling for long periods of time. Considering the purchase cost of transformer at ₹ 5 crore each, the loss of interest²⁶ worked out to ₹ 1.15 crore and ₹ 2.14 crore for the delays of 879 days and 1,633 days respectively.

Performance of power transformers

2.1.14.3 The table below indicates status of failure of transformers during the years 2007-08 to 2011-12 in the eight TL&SS Divisions test checked:

Year	No. of transformers at the beginning of the year	No. of transformers failed	No. of transformers failed within guarantee period	No. of transformers failed within normal working life	Expenditure on repair and maintenance (₹ in lakh) ²⁷
2007-08	369	8	2	6	9.61
2008-09	418	4	0	4	179.06
2009-10	439	10	0	10	394.53
2010-11	514	5	0	5	134.48
2011-12	531	7	0	7	10.48

It was observed that two 150 MVA transformers costing ₹ 14.96 crore failed during 2007-08. Out of this one transformer was repaired during 2011-12 after a lapse of four years and one transformer was still not repaired (March 2012).

2.1.14.4 An analysis of the failure of transformers for the Company (as a whole) during the review period revealed that on an average 30 transformers failed in a year and 20 were being repaired. Further, on an average about 75 transformers were pending repair. As at end of March 2012, there were 1 number 150 MVA, 12 number of 100 MVA, 3 numbers of 31.5 MVA, 16 numbers of 20 MVA, 10 numbers of 12.5 MVA, 17 numbers of 10 MVA and 9 numbers (less than 10 MVA) transformers were awaiting repairs. As these were high value items, immediate action needs to be taken for repair.

The Company informed that 63 numbers of transformers were awaiting repair (December 2012).

²⁶ at an average borrowing cost of 9.58 per cent.

²⁷ expenditure in respect of transformer failures at NRM, Karkala, Somanahalli and Peenya, NR Mohalla TLSS Divisions for 2007-12 and Hootagalli and Belgaum TLSS for 2007-08 were not furnished.

Delay in implementation of Integrated Extended - SCADA

2.1.14.5 Integrated Extended – SCADA²⁸ was a common integrated solution to cater to the network, extending to the entire state of Karnataka covering the Substations of Transmission, Generation and Distribution Companies and render data to all ESCOMs for scheduling and monitoring. This system was to meet requirements such as extending ABT²⁹ approach to ESCOMs level through ‘Intra-State ABT’ by monitoring User Interfaces (UIs), Remotely Acquired Reading from ETVMs fixed at Inter Face Points (Boundary Points), to run energy billing & energy audit in more sophisticated way, to automate billing & audit and to analyse losses.

We observed that:

- The contract for SCADA works were finalised (December 2006) on single tender basis. As such the competitiveness of the price quoted by the tenderer was not ensured. The Company stated that the bids of eligible bidders were evaluated by subcommittee consisting of members of Company and external members. In view of the single bid the quoted prices were compared with rates ordered by other utilities like BSES, Rajadhani Power Limited and were comparable. Nevertheless, such a procedure was outside the procedural boundaries prescribed by KTPP Act.
- Out of 588 Substations of the Company under Phase-I, only 387 Substations were completed by December 2009. Balance works in 201 Substations were completed by March 2012. In respect of 418 Substations awarded under Phase-II, only 293 Substations were completed up to March 2012.
- The Disaster Recovery Hub at Nelamangala, planned to restore the functions of SLDC within shortest time in case of any major disaster, has not been commissioned so far (December 2012). The Company informed (December 2012) that 9 metre antenna was proposed at the Hub in DPR, but Department of Telecommunication had directed to install 7 metre at Hub and 9 metre antenna at Master Control Centre. As 7 metre antenna was in service at Master Control centre, approval for erection and commission of the same from Department of Telecommunication was awaited and hence the work was delayed.
- The Company had obtained (May 2008) additional bandwidth of 7 MHz by payment of ₹ 65 lakh for the service³⁰ (upto March 2009 with recurring payment of the same amount every year. Because of delay in implementation of substations/SCADA, the bandwidth obtained was not fully utilized. The Company could effectively utilize the bandwidth

²⁸ Supervisory Control and Data Acquisition.

²⁹ refer to paragraph 2.1.17.3 for ABT mechanism.

³⁰ to get information from Remote Terminal Units (RTUs).

only from 2010 onwards. The Company informed (December 2012) that bandwidth was in demand and allocation of bandwidth was a long drawn process involving Department of Space and Department of Telecom. Considering the requirement for all stations, the proposal was submitted and got allocated.

- The benefits envisaged under SCADA and ABT have not been achieved so far due to non-implementation of Phase –II in the Company and ESCOMS. KERC has been insisting the Company and ESCOMS to implement intra-state ABT. The Company replied that implementation of SCADA and Intra State ABT was in progress.

Mismatch between generation and transmission facilities

2.1.15.1 National Electricity Policy envisaged augmenting transmission capacity taking into account the planning of new generation capacities to avoid mismatch between generation capacity and transmission facilities. The Company failed to provide transmission facilities in time matching the plans of the Generation Companies as discussed below:

Power from Priyadarshini Jurala Hydro Electric Project (JHEP)

2.1.15.2 The JHEP was conceived (August 1978) with an agreement between Government of Karnataka and Government of Andhra Pradesh. The Project envisaged an installed capacity of six units of 39.10 MW capacities each and an annual generation of 550 Million Units (MUs), to be shared equally by the States. The MoP, GOI directed (December 1998) to formulate an agreement in consultation with the Andhra Pradesh Government of so that the project could be taken up for execution immediately.

The AP Government had approved the draft Memorandum of Agreement and sent (June 2003) it to the GoK for its approval. As per the agreement, the GoK released (May 2010) ₹ 70 crore to Power Company of Karnataka Limited (PCKL) towards 50 *per cent* cost of power blocks payable to APGENCO.

We observed that:

- The Memorandum of Agreement between the two State Governments and the Power Purchase Agreements with the APGENCO for sharing energy generated have not been entered into so far (October 2012). PCKL did not make payment to APGENCO (December 2012), as the MOA was not signed.
- Contract for power evacuation facilities was awarded in February 2010 to Vensar Construction Limited at a cost of ₹ 22.56 core with scheduled date of completion as February 2011. This was done seven years from the date after the partners had agreed to set up the required transmission lines. The line work was still in progress (December 2012). The Company has spent ₹ 20.84 crore on this project as on December 2012.

- Meanwhile, five units of the JHEP were commissioned and 729.33 MUs of energy was generated from April 2008 to July 2012. The Andhra Pradesh Regulatory Commission had fixed the tariff for the power from this Project at ₹ 2.34 per unit. During the period 2008-12, the ESCOMs procured 4,286.02 MUs of power on short-term basis and at rates ranging from ₹ 4.74 to ₹ 6.77 per unit to reduce the demand supply gap.

Thus, absence of finalising and signing MOA and establishing the power evacuation lines as planned resulted in non-availing of 364.67 MUs (50 per cent of 729.33 MUs).

The Company informed that GoK had accorded approval (September 2010) for the revised MOA with the modification that sharing of power had to be effective from signing of MOA, construction of dedicated lines and payment of ₹ 70 crore. However, the MOA proposed to be signed in January 2011 was not signed due to unforeseen circumstances, and the date for signing was yet to be finalized. It would not be financially prudent to release ₹ 70 crore before signing of MOA and transmission lines were ready to evacuate power. As regards construction of lines for evacuation, the Company stated that the work was awarded in February 2010 and passed through transmission lines of APTRANSCO. Further, due to restricted corridor available at Jurala village, ROW problems necessitated deviation in route; the works were in progress, at the receiving end by the Company and at the sending end by APTRANSCO (December 2012).

Evacuation of power from Udupi Power Corporation Limited

2.1.15.3 The ESCOMS entered into (December 2005) a Power Purchase Agreement (PPA) with the erstwhile Nagarjuna Power Corporation Limited (now Udupi Power Corporation Limited -UPCL) for purchase of 1,015 MW of power. As per the PPA, the units were to be commissioned between February 2010 and June 2010.

We observed that:

- The Company was required to construct 400 kV line from UPCL Substation to 400 kV PGCIL Substation at Shanthigrama to evacuate power. The corridor for this line work passed through 33.67 kms of forest. The Company applied for forest clearance only in February 2008, after delay of two years and eight months subsequent to PPA (December 2005). The forest clearance was received only in February 2011/January 2012 in two stages.
- The contract for construction of the line was awarded for ₹ 396.40 crore in November 2008 with date of completion as May 2010. The line was commissioned in August 2012. The Contractor had been paid ₹ 446.52

crore³¹ as on December 2012. The liquidated damages recovered/ amount withheld was ₹ 107.92 crore.

Mismatch between creation of transmission capacity and generation deprived the State of valuable energy.

- The Company had constructed a 220 kV line with Drake conductor from UPCL to Khemar Substation to provide start up facilities for the proposed Generating Substation of UPCL. The work was awarded in November/December 2008 and completed/commissioned in September/October 2009. As the commissioning of the proposed 400 kV line for evacuation of power was not progressing for want of forest clearance and inadequate carrying capacity of Drake Conductor, it was proposed (February 2010) to replace Drake with Moose conductor. The work for replacement was awarded in March 2010 and completed in April/May 2010. The first unit of the UPCL was synchronized to grid in June 2010 and commercial production commenced (November 2010). The Company in the absence of proper planning incurred additional expenditure of ₹ 5.04 crore³² on replacement of drake conductor.
- The second unit with a capacity of 507.5 MW was synchronized on March 2011. The 400 kV line between UPCL and PGCIL Shanthigramma Substation was commissioned in August 2012. This resulted in the Company not evacuating 507.5 MW of electricity from the second unit during the period from March 2011 to August 2012.

The Company replied that as per the terms of PPA between UPCL and ESCOMs, UPCL had to achieve financial closure within one year from date of signing the agreement, and intimate the same to the Company and ESCOMs. UPCL later claimed that they had signed financial documents in October 2006, but the same had not been intimated to them. The Company further informed that survey for line work was awarded in July 2007, tenders for the line works invited in February 2008 and forest clearance applied for in February 2008. The construction of 400kV line was delayed on account of delay in obtaining forest clearance, ROW problems, settling court cases *etc.*

The reply did not address the issues on many counts. Forest clearance was known to be a long drawn process, in view of the fact that 33.67 kms passed through forest area. The Technical Co-ordination Committee had approved the scheme for evacuation of power in June 2005. The PPA was signed in December 2005. There was a good five years before the scheduled completion of the first unit of UPCL, in April 2010. The Company, being in the business of transmission of power, including construction of lines for decades, should have shown better managerial acumen in implementing this work at a time when the power situation in the State was critical. The reply was silent about evacuation of power from the second unit of UPCL between March 2011 and

³¹ including tree cut charges of ₹ 34.93 crore.

³² difference between the cost of conductors after adjusting cost of released Drake conductors.

August 2012. Thus in the absence of evacuation infrastructure the State had to incur a huge amount of expenditure in purchase of power from the market at prices ranging from ₹ 4.73 to ₹ 14.98 per unit during 2011-12 whereas the 507.50 MW could have been availed of from UPCL at ₹ 3.12 per unit.

Performance of transmission system

2.1.16.1 The performance of the Company mainly depends on efficient maintenance of its EHT transmission network for supply of quality power with minimum interruptions. The performance of the Company with regard to operation and maintenance of the system is discussed in the succeeding paragraphs.

Transmission capacity, peak demand and excess

2.1.16.2 The Company in order to evacuate power from the Generating Stations and to meet the load growth in different regions of the State, constructs substations and lines at different EHT voltages. The voltage levels can be stepped up or down to increase or decrease voltage with minimum loss of energy in the process. The evacuation is normally done at 220 kV level. The transmission capacity (220 kV) created *vis-à-vis* transmitted capacity (peak demand met) as at the end of each year during the five years ending March 2012 were as follows:

Transmission capacity 220 kV(MVA)					
Year	Installed Capacity (MVA)	After leaving 30 per cent towards margin	Peak demand after 2 years		Excess capacity(MVA)
			in MW	in MVA	
2007-08	12,915	9,040	6,897	8,114	926
2008-09	16,365	11,455	7,815	9,194	2,261
2009-10	17,015	11,910	8,549	10,058	1,852
2010-11	17,955	12,568	9,317	10,961	1,607
2011-12	18,605	13,023	10,198	11,998	1,025

We observed that the overall transmission capacity was in excess of the requirement in all the years in comparison to the peak demand³³ likely after two years, the gestation time provided for creation of additional capacity. The existing transmission capacity excluding 30 per cent towards redundancy was in excess of 1,025 MVA at the end of March 2012, which worked out to ₹ 50.32 crore³⁴. The Company added 5,429.20 MVA of transmission capacity during 2008-09 but added only 1,868.40 MVA during 2009-10, 2,337.50 MVA during 2010-11 and 1,228.90 MVA during 2011-12. There was excess capacity creation from 2008-09 as compared to the Electricity Projections Survey.

This investment in excess of the requirement is a burden placed on the consumer. Existence of excess/idle capacity in the transmission network

There was unscientific planning in creation of transmission capacity.

³³ projected peak demand of 2012-13 and 2013-14 are adopted for 2010-11 and 2011-12.

³⁴ at ₹ 4.91 crore per 100 MVA Power transformer, average purchase cost for five years.

coupled with prevalence of overloads and low voltages in certain places reflects unscientific creation of transmission network.

The Company replied that figures indicated in the table were based on restricted power supply in view of the mismatch between demand and supply and if unrestricted power supply was taken into consideration, the peak demand would be much higher. Further, the capacity could not be added at short notice and was created considering future load growth for next five years and to have sufficient spare capacity to meet contingency. Also stations were constructed to avoid low voltages due to lengthy lines.

We observed that on the one hand the overall transmission capacity was in excess of the requirement after considering required capacity two years hence and 30 *per cent* towards redundancy, as brought out in this paragraph; on the other, about 33.51 *per cent* of total transformers in the network recorded annual peak load of more than 90 *per cent* during 2011-12 as brought out in succeeding paragraph. This indicates unscientific planning.

Substations

Construction of substations without assessing load requirements

2.1.16.3 We observed that as on 31st March 2012, the total number of transformers installed was 2,116. Out of this 709 (33.51 *per cent*) transformers recorded annual peak load (2011-12) of more than 90 *per cent* and 34 transformers had peak load less than 20 *per cent*. Further, 69 transformers in 66 kV and 110 kV substations had zero loads³⁵ implying non-connection to feeders by ESCOMs.

The Company replied that the loads on the substations depended on the infrastructure of distribution companies to evacuate load. The reply is not tenable as the planning of substations had to be done after considering requirement of ESCOMs.

Adequacy of substations

2.1.16.4 Manual on Transmission Planning Criteria (MTPC) stipulates that the permissible maximum capacity for different substations *i.e.*, 320 MVA for 220 kV, 150 MVA for 110 kV Substation and 80 MVA³⁶ for 66 kV Substations. Scrutiny of the maximum capacity levels revealed that four numbers of 220 kV and nine 66 kV Substations exceeded the permitted levels in Bangalore Zone.

The Company replied that in order to meet the load demand in Bangalore Urban area, new substations were to be established for which there was scarcity

³⁵ based on data furnished by Planning and Coordination section. This includes 28 transformers which are stated to have zero load and not shown by respective transmission zone, and five transformers which are dismantled.

³⁶ KERC Grid Code norm adopted as MTPC norm was not available.

of land and corridor problem. As such the capacities of the existing substations was enhanced by providing additional transformers.

The Transmission Planning and Security Standards issued by KERC indicated that the size and number of transformers in the Substation shall be planned in such a way that in the event of outage of any single transformer, the remaining transformer(s) could still supply 80 *per cent* of the load.

It was observed that 7 substations of 220 kV, 73 substations of 110 kV and 120 substations of 66 kV capacities were having only single transformer³⁷. Hence, in case of outages a second transformer was not available in these stations to take the load.

The Company replied that some substations were established with single transformers to overcome low voltage problems, restrict length of lines and considering local load conditions. As and when the load increases, second transformer would be provided.

Voltage management

2.1.16.5 The licensees using intra-state transmission system should make all possible efforts to ensure that grid voltage always remains within limits prescribed by Grid code. The bus voltages in 8 TL&SS Divisions of the 4 Zones in the test checked divisions/TL&SS during the period January 2012 to March 2012 are given below:

Voltage class (kV)	Voltage norms as per KERC Grid code (kV)	Number of substations, which varied with the KERC norm	Minimum and Maximum voltage recorded in test checked substations
220	200-245	6	185, 244
110	100-124	12	94, 121
66	60-72.50	34	49.67, 72

Variation from the norms for maintaining the minimum voltage level indicates poor quality of power supply.

The Company replied that bus voltages observed could be due to temporary network conditions such as outages in generation and transmission lines. This was a transient condition and normalcy was brought back immediately.

EHT lines

2.1.16.6 As per MTPC, the permissible line loading cannot normally be more than the Thermal Loading Limit (TLL). The TLL limits the temperature attained by the energized conductors and restricts sag and loss of tensile strength of the lines. Review of line loading revealed that the following lines were loaded more than 70 *per cent*.

³⁷ of a particular voltage class.

Category (kV)	Loading percentage and number of lines			
	70 to 80	80 to 90	90 to 100	Above 100
66	49	38	35	60
110	14	14	9	4
220	30	21	14	11
Total	93	73	58	75

Loading of the lines beyond capacity would result in voltage fluctuations, higher transmission losses and frequent interruptions/breakdowns leading to supply of poor quality power.

The Company replied that transmission line loads recorded were during peak hours and in contingencies. Normal loading of transmission lines were within limits. Whenever load on the line exceeds 70 per cent, action was taken for construction of new substations and lines to meet these load growth and to have sufficient spare capacity.

Bus Bar Protection Panel (BBPP)

2.1.16.7 Bus bar is used as an application for interconnection of the incoming and outgoing transmission lines and transformers at an electrical substation. Bus Bar Protection Panel limits the impact of the bus bar faults on the entire power network, which prevents unnecessary tripping and selective to trip only those breakers necessary to clear the bus bar fault. BBPP is to be kept in service for all 220 kV Substations to maintain system stability during grid disturbances and to provide faster clearance of faults on 220 kV buses.

We observed that out of 89 of 220 kV Substations (12 were single bus Substations and 77 were double bus Substations) where BBPP were required to be installed, Company provided the panel at 64 Substations and in the remaining 25 Substations the BBPP was not yet provided (September 2012). We further observed that out of 64 Substations where BBPP was available, 51 were in service, 12 had become obsolete/faulty and were yet to be repaired and at one Substation though panels were installed they were yet to be commissioned (September 2012).

The Company informed that 25 Substations, where BBPP was not provided were old stations established when providing BBPP was not in practice. These stations CT's are to be replaced by five core CTs for installing BBPP and are being done in a phased manner. In respect of 12 cases³⁸, the Company informed that action had already been initiated to replace the faulty relays.

Working of hot lines divisions

2.1.16.8 Regular and periodic maintenance of transmission system is of utmost importance for its un-interrupted operation. Apart from scheduled patrolling of lines, Committee for updating the Best Practices of Transmission in the country

³⁸ HSR, TK Halli, A-Station, NRS, Antharasanahally, KB Cross, Kemar, Vajramatti, Humnabad, Sedum, Shahapur and Ittagi.

for maintenance of lines prescribed Hot Line Maintenance, Hot Line Washing, Hot line Puncture Detection of Insulators, preventive maintenance by using portable earthing hot line tools, vibration measurement of the line, thermo-scanning, pollution measurement of the equipment *etc.*

The Hot Line Technique (HLT) envisages attending to maintenance works like hot spots, tightening of nuts and bolts, damages to the conductor, *etc.*, of substations and lines without switching off. As on April 2007 the Company had one hot line division (Peenya) and three subdivisions (Peenya, Shimoga, Hubli) with manpower strength of 27, which increased to six subdivisions with manpower strength of 51 as on 31 March 2012.

We observed that the Company did not prepare any manual/guideline and did it have any targets for maintenance of hotlines /substations. Further, Thermo-Vision Cameras provided at Mysore and Hubli subdivisions were not in working condition.

A review meeting of Hot Line Division was conducted (January 2011) and Managing Director instructed the Research and Development Department to come out with proposal for creation of new 400 kV Hot Line subdivisions and also creation of new division and sub-divisions duly indicating area of operation, location of office, staff structure and tools and plant equipments required.

The Hot Line Division proposed (January 2011) one new Hot Line Division at Hubli, a subdivision at Hoody in Bangalore Zone and a sub-division in Gulbarga Zone. The proposal was approved in principle by the then Managing Director. The Company had not established new divisions and subdivisions as proposed (March 2012).

The Company replied that action had been taken to establish new hotline division/ subdivisions and recruitment of staff had been done, and training to work on live lines was being imparted.

Transmission losses

2.1.16.9 While energy is carried from the generating station to the consumers through the Transmission & Distribution (T&D) network, some energy is lost which is termed as T&D loss. Transmission loss is the difference between energy received from the generating station/grid and energy sent to ESCOMs. The details of transmission losses from 2007-08 to 2011-12 are given below:

Particulars	Unit	Year				
		2007-08	2008-09	2009-10 ³⁹	2010-11	2011-12
Power received for transmission	MUs	42,933.649	44,121.982	47,783.552	50,516.391	56,890.000
Net power transmitted	MUs	41,057.776	42,223.895	45,775.880	48,271.910	54,310.000
Actual Transmission loss	MUs	1,875.873	1,898.087	2,007.672	2,244.481	2,580.000
	Percentage	4.37	4.30	4.20	4.44 ⁴⁰	4.54
Target Transmission loss as per the CEA norm	Percentage	4.00	4.00	4.00	4.00	4.00
Target Transmission loss as per KERC norms	Percentage	4.06	4.03	4.00	4.00	3.98
Excess Transmission Loss	Percentage	0.31	0.27	0.20	0.44	0.56
Transmission loss in excess of KERC norm	MUs	132.767	119.971	96.33	223.824	315.778
	Rate per unit in ₹	3.774	3.676	4.012	4.534	4.534 ⁴¹
	Amount in crore ₹	50.11	44.10	38.65	101.48	143.17

Source: Records of State Load Despatch Centre.

Transmission losses exceeded CEA and KERC norms.

The transmission loss however exceeded the CEA and KERC norms during 2007-08 to 2011-12. Compared to KERC norms, the loss to the ESCOMs was ₹ 377.51 crore.

Further, Karnataka Electricity Regulatory Commission (KERC) stipulated levy of penalty for non-achievement of the transmission losses fixed by KERC. As a result the Company had to pay penalty of ₹ 2.06 crore for the period 2008-11.

The Company furnished (December 2012) revised statistics indicating that the losses were within the norms fixed by KERC. The Company replied that transmission losses for 2010-11 and 2011-12 are calculated taking net input from state's interstate lines. For 2008-09 and 2009-10 the same was calculated after deducting SR loss⁴². Considering this, the Company informed that the transmission losses for the year 2008-09 was 3.507 per cent, 2009-10 was 3.489 per cent, 2010-11 was 3.821 per cent and for 2011-12 it was 3.907 per cent respectively.

³⁹ with effect from December 2009, the Company started billing at Mega Watt per month based on installed generation capacity in proportion to allocation made to ESCOMs.

⁴⁰ the loss as per KERC for 2010-11 was 4.39 per cent.

⁴¹ considering rate per unit for 2010-11.

⁴² input flow into the state grid from outside the state such as Central Generating Station, Unscheduled Interchange, bilateral purchase, STOA etc.

This is factually incorrect as the losses indicated in the table above are the losses considered by the KERC. It was after considering the excess losses over the norms that had imposed penalty during 2008-11⁴³.

Grid management

Maintenance of grid and performance of SLDC

2.1.17.1 Grid Management ensures moment-to-moment power balance in the interconnected power system to take care of reliability, security, economy and efficiency of the power system. The Karnataka State Load Despatch Centre (SLDC), a constituent of Southern Regional Load Despatch Centre (SRLDC), Bangalore, ensures integrated operation of power system in the State. The SLDC co-ordinates with six Area Load Despatch Centres (ALDCs) for data acquisition and transfer, and supervisory control of 220 kV, 110kV and 66 kV equipments. The SLDC levies and collects such fees and charges from the generating companies and licensees engaged in intra-state transmission of electricity as specified by the SERC. The Company confirmed the facts.

Infrastructure for load monitoring

2.1.17.2 Remote Terminal Units/Substation Management Systems (RTUs/SMSs) are essential for monitoring the efficiency of the transmission system and the loads during emergency in Load Despatch Centres as per the Grid norms for all Substations.

All Generators, Major IPPs and even Minor IPPs are integrated (through RTUs/ Substation Automation System with SLDC) and Real Time Data is available with SLDC. As discussed in the review *infra* the SCADA project, RTUs were proposed to be installed in all the 1,006 Substations. As at end of September 2012, implementation of SCADA facility in 108 Substations was pending completion.

The primary link between Area Load Despatch Centres (ALDCs) and Master Control Centre is through Leased Lines. Later on more advanced Technology *viz.*, Multi Frequency Time Dimension and Multi Access (MFTDMA) came into existence. Though the SCADA centre had proposed (December 2009) MFTDMA Technology, a decision has not been taken so far resulting in non-monitoring of load (availing real time data) by the ALDCs, when the leased line is down. The Company replied that action is taken to complete the project.

Non implementation of ABT mechanism

2.1.17.3 Availability Based Tariff reflects all elements of tariff: capacity charges, energy charges and UI charges in respect of State Generating Stations. In the present system, both the fixed and variable costs of a generating station

⁴³ Annual Performance Review for 2011-12 is yet to be finalised by KERC (September 2012).

Intra State ABT is yet to be implemented inspite of KERC's directions.

are charged to the beneficiaries in proportion to the actual energy drawn by them during that period. In the proposed ABT system, the fixed charge for a period is to be prorated among the beneficiaries in the ratio of their entitlement for power from that generating station.

ABT mechanism also enables dispatch of power in relation to a schedule based on the availability of allocated shares of Central Generating Stations (CGS) and State Generating Stations (SGS), with penalty for drawl of power beyond the schedule, which would bring in grid discipline.

In view of these benefits CERC and KERC were constantly insisting KPTCL and ESCOMs to implement 'Intra-State ABT'.

The SCADA works awarded during November 2009 (second phase) was pending completion (September 2012) and as such the intra-state ABT regime could not be implemented.

The Company replied that the implementation of 220 kV ABT was under progress and KERC had been intimated.

Grid discipline by frequency management

2.1.17.4 As per IE Grid Code, the transmission utilities are required to maintain Grid discipline for efficient functioning of the Grid. All the constituent members of the Grid are expected to maintain a system frequency between 49.7 and 50.2 Hertz (Hz) from May 2010. To enforce the grid discipline, the SRLDC issues three types of violation messages (A, B, C), based on severity. Message A is issued when the frequency is less than 49.7 Hz and over-drawl is more than 150 MW or 12 *per cent* of schedule whichever is less. Message B message is issued when frequency is less than 49.5 Hz and over-drawl is between 100 and 200 MWs for more than ten minutes or 200 MW for more than five minutes. Message C (serious nature) is issued 15 minutes after the issue of message B when sustained drawl is more than 100 MW or ten *per cent* of the schedule whichever is less.

We observed that Company achieved good grid discipline through the following measures discussed below. As a result, during 2011-12, there was only one Type A as compared to 911 in 2007-08. Similarly Type B and C messages decreased from 149 and 25 respectively in 2007-08 to nil in 2011-12. The following measures were in operation.

- All Generators in the State and ESCOMs were required to furnish their day-ahead availability and day-ahead requirement to SLDC.
- In real time grid operation, when the system frequency fell below or above the prescribed limits, increase of hydel generation or backing down hydel generation was resorted to. If overdrawl / under drawl persisted, then load shedding / backing down of generating stations on the basis of merit order dispatch was resorted to.

- Voice communication between load dispatch centre, generating stations, substations, visibility of real time generation and power flows was available and the same was ensured by SCADA wing of SLDC.

Southern Regional Load Despatch Center (SRLDC) has appreciated Company's continuing record of nil grid violation messages.

Disaster management

2.1.17.5 Disaster Management (DM) aims at mitigating the impact of a major break down on the system and restoring it in the shortest possible time. It is carried out by deploying Emergency Restoration System, DG sets, vehicles, fire-fighting equipments, skilled and specialized manpower.

We observed that SRLDC identified 15 major generating stations⁴⁴ in the State, out of which black-start facilities were not available in 6 generating stations⁴⁵, indicating the inadequacy in the preparedness for disaster management.

Further, Diesel Generating (DG) sets and Synchronoscope⁴⁶ form part of DM facilities at EHT Substations connecting major generating stations. The SRLDC identified (January 2012) 18 major substations (220KV). The Company informed that DG sets were not in working condition in one station (MRS Shimoga). It was further informed that out of 68 other non major substations, DG sets were not in working condition/not provided in 6 substations. Hubli substation did not have Synchronoscope.

The Company informed (June /December 2012) that action was taken to rectify the DG set at Shimoga station. Further the Company replied that no station was identified as vulnerable and a committee formed for disaster management and to identify vulnerable substations.

Energy accounting and audit

2.1.18 Energy accounting and audit is necessary to assess and reduce the transmission losses. The transmission losses are calculated from the Meter Reading Instrument (MRI) readings obtained from Generation to Transmission (GT) and Transmission to Distribution (TD) Boundary metering points. As on 31 March 2012 there was 2,249 interface boundary metering points between TD (2,180 points) and GT (69 points)⁴⁷. All the GT points and TD points were provided with 0.2 class meters. Energy accounting and audit was being done by the Company.

⁴⁴ including one Central Generating Station and three Independent Power Producers.

⁴⁵ Raichur Thermal Power Station, Bellary Thermal Power Station and stations at Yelhanka, Kiaga, Jindal Power and Udupi Power Corporation Limited.

⁴⁶ a device that indicates the degree to which system generators or power networks are synchronized with one another.

⁴⁷ excluding 11 interface points of GT in IPP projects.

Financial management

2.1.19.1 National Electricity Policy 2005 envisaged financial turnaround and commercial viability of the Power Sector. The financial position of the Company for the five year ended 2011-12 is as under:

₹ in crore

Particulars	2007-08	2008-09	2009-10	2010-11	2011-12
A. Liabilities					
Paid up Capital (including share deposit) ⁴⁸	690.32	990.32	1175.32	1,575.32	1,675.32
Reserves and Surplus (including Capital Grants)	280.71	308.88	345.93	422.14	499.52
Borrowings (Loan Funds)	3,236.07	4,473.55	5,198.76	5,506.67	5,587.77
Current Liabilities and Provisions	5,166.12	4,704.69	4,285.79	4,441.92	4,010.05
Deferred Tax	274.29	274.29	274.29	274.29	274.29
Total	9,647.51	10,751.73	11,280.09	12,220.34	12,046.95
B. Assets					
Gross Block	5,469.31	6,884.31	7,808.59	9,025.51	9,959.21
Less: Depreciation	1,794.19	1,977.14	2,305.91	2,696.01	3,130.94
Net Block	3,675.12	4,907.17	5,502.68	6,329.50	6,828.27
Capital Works-in-Progress	2,540.51	2,835.20	2,922.22	2,591.29	2,522.75
Current Assets, Loans and Advances	3,426.95	3,002.51	2,838.01	3,284.10	2,688.88
Assets not in use	4.93	6.85	17.18	15.45	7.05
Total	9,647.51	10,751.73	11,280.09	12,220.34	12,046.95
Debt-equity ratio	4.69	3.86	3.36	3.16	2.71
Interest (net of interest during construction capitalised)	278.16	394.65	483.70	537.33	496.82
Profit before tax	124.88	22.75	5.96	1.63	8.71
Return on capital employed	403.04	417.40	489.66	538.96	505.53
Capital Employed	4,524.24	6,089.14	7,046.44	7,830.63	8,106.20
Percentage of return on Capital Employed	8.85	6.85	6.95	6.88	6.24

- The borrowings stood at ₹ 5,587.77 crore as at 31 March 2012, which was 1.7 times the debts outstanding (₹ 3,236.07 crore) as at 31 March 2008.
- The Debt Equity ratio had improved from 4.69:1 in 2007-08 to 2.71:1 in 2011-12 against the norm to be adopted for financing of capital cost of projects of 2.33:1 determined by the CERC. This improvement was due to infusion of further equity by GoK to the tune of ₹ 985 crore over a period of five years.

⁴⁸ for 2007-08 and 2008-09 share deposit included ₹ 42.86 crore and ₹ 42.95 crore under 'Adjustments pending re-notification by Government.' However, from 2009-10 onwards the same is shown under 'Current liabilities'. Hence, for comparison purposes, figures for 2007-08 and 2008-09 are re-classified. Debt equity ratio is also accordingly worked out.

- The GoK while releasing the funds (2008-12) had stipulated that the Company should prepare the design and monitoring framework for the entire capital expenditure for each project with investment above ₹ 5 crore and obtain cabinet approval. These guidelines were not adhered to.
- The Return on Capital (RoC) employed is an index of efficiency and profitability in capital investments. The RoC decreased from 8.85 *per cent* in 2007-08 to 6.24 *per cent* in 2011-12 due to decrease of profit from ₹ 124.88 crore in 2007-08 to ₹ 8.71 crore in 2011-12, coupled with increase in net fixed assets (including capital work in progress) from ₹ 6,215.63 crore to ₹ 9,351.02 crore in the same period.
- The total profit of ₹ 163.93 crore, generated during the years 2007-08 to 2011-12 was on account of withdrawal of excess provisions amounting to ₹ 533.09 crore.

The Company stated that withdrawal of excess provisions of earlier years were a normal business transaction. The recovery of full cost out of operating revenue depends on various factors like tariff revision, timing of tariff revision, significant changes in expenditure items *etc.*

Fact, however, remained that the profits in each of the years from 2007-08 to 2010-11 has to be related to withdrawal of excess provisions.

The Company further stated that though the equity infusion from State Government was not to the required extent and the debt-equity ratio was near the normative level. The impact of increase in net fixed assets was significant on the change in Return on Capital. As regards non-compliance to guidelines of GoK while releasing equity, it was stated that observations were noted for guidance and compliance in future.

2.1.19.2 The working results of the Company during the five years ended 2011-12 are tabulated below:

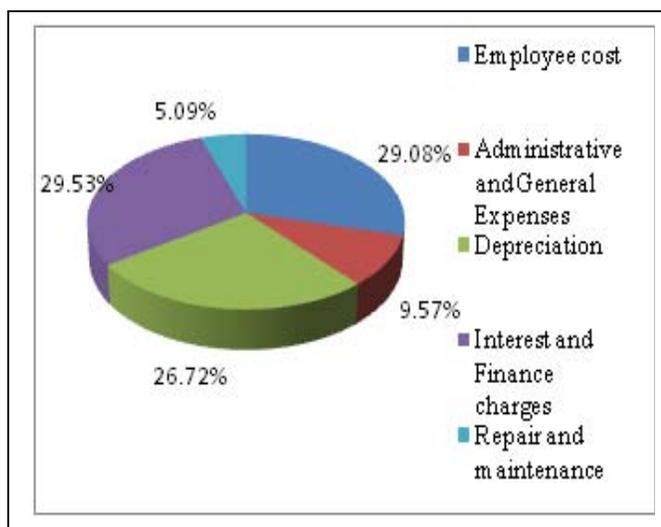
₹ in crore

Sl. No.	Description	2007-08	2008-09	2009-10	2010-11	2011-12
1	Income					
	Revenue from transmission of power	765.99	799.02	925.55	1,215.22	1,663.01
	Other income	203.87	173.54	306.34	239.62	28.04
	Total Income	969.86	972.56	1,231.89	1,454.84	1,691.05
2	Transmission					
(a)	Installed capacity (MVA)	34,295	39,754	41,622	44,463	45,158
(b)	Energy handled (MUs)	42,934	44,122	47,784	50,516	56,890
(c)	Loss in transmission (MUs)	1,876	1,898	2,008	2,244	2,580
	Net power transmitted (b)- (c)	41,058	42,224	45,776	48,272	54,310
3	Expenditure					
(a)	Fixed cost					
(i)	Employees cost	223.41	204.09	225.13	386.80	489.27

Sl. No.	Description	2007-08	2008-09	2009-10	2010-11	2011-12
(ii)	Administrative and General expenses ⁴⁹	183.93 ⁵⁰	141.47	91.99	51.19	161.07 ⁵¹
(iii)	Depreciation	138.43	185.95	358.57	406.98	449.53
(iv)	Interest and Finance charges (net after capitalisation)	278.17	394.65	483.70	537.33	496.82
	Total fixed cost	823.94	926.16	1,159.39	1,382.30	1,596.69
	Variable cost					
(b)	Repairs and Maintenance	21.04	23.65	66.54	70.91	85.65
	Total variable cost	21.04	23.65	66.54	70.91	85.65
(c)	Total cost 3 (a) + (b)	844.98	949.81	1,225.93	1,453.21	1,682.34
4	Realisation (₹ per unit)	0.24	0.23	0.27	0.30	0.31
5	Fixed cost (₹ per unit)	0.20	0.22	0.25	0.29	0.29
6	Variable cost (₹ per unit)	0.01	0.01	0.01	0.01	0.02
7	Total cost (per unit) (5+6)	0.21	0.23	0.26	0.30	0.31
8	Contribution (₹ per unit) (4-6)	0.23	0.22	0.26	0.29	0.29
9	Profit (+)/Loss\(-) (₹ per unit) (4-7)	0.03	0.00	0.01	0.01	0.00

2.1.19.3 The depreciation, employee cost, interest and finance charges constituted major elements of cost (over 85 per cent of total cost)

These costs represented 26.72, 29.08 and 29.53 per cent respectively of the total cost in 2011-12. The cost per unit increased by 52 per cent from ₹ 0.21 to ₹ 0.31 during the period 2007-08 to



2011-12. The contribution per unit, which signifies recovery of fixed cost⁵² increased by 26 per cent from ₹ 0.23 in 2007-08 to ₹ 0.29 in 2011-12.

⁴⁹ includes power purchase cost of ₹ 22.89 crore, ₹ 71.04 crore, ₹ 8.17 crore, ₹ 1.16 crore and ₹ 0.54 crore in 2007-08 to 2011-12 respectively. This had arisen on account of revision of tariff for power purchase made prior to June 2005.

⁵⁰ includes bad and doubtful debts and miscellaneous losses written off ₹ 116.47 crore.

⁵¹ includes interest on belated payment for power purchase ₹ 108.21 crore. During 2007-08 to 2011-12 interest on belated payments for power purchase was included in interest and finance charges.

⁵² fixed cost included depreciation, interest and finance charges, employee cost and administrative and general expenses.

Depreciation cost increased by 167 *per cent* to ₹ 0.08 per unit in 2011-12 from ₹ 0.03 per unit in 2007-08. During this period the increase in quantum of energy transmitted was only 32 *per cent*, which indicated that investment on development of transmission infrastructure was far in excess of requirement. The Company replied that average depreciation rate from 2009-10 increased to 4.82 *per cent* from 3.01 *per cent*. We observed that even after factoring in the increase in rates of depreciation, the depreciation cost doubled between 2007-08 and 2011-12.

Non reconciliation of receivables and payables

2.1.19.4 The payables and receivables as depicted in the books of the Company and in ESCOMs in each of the years 2007-08 to 2010-11 are tabulated below.

₹ in crore

Year	Receivables from ESCOMs as per KPTCL books	Payable to KPTCL as per books of ESCOMs	Payables to ESCOMs as per KPTCL books	Receivables from KPTCL as per books of ESCOMs
2007-08	21.02	265.52	44.21	701.16
2008-09	34.51	192.39	103.94	547.62
2009-10	27.23	191.87	119.30	610.03
2010-11 ⁵³	148.05	191.60	118.64	542.94

Payables and receivables between Company and ESCOMs showed huge differences.

The payables and receivables showed significant variations warranting reconciliation, as it could have wide ramifications.

The Company replied that reconciliation work has been taken up and all efforts would be made to reconcile by the time accounts for 2012-13 are finalized.

Transmission charges

2.1.19.5 The GoK had ordered (May 2005) that each ESCOM shall open a current ESCROW Account with the banks for clearing the bills of the Company towards transmission charges.

Accordingly, the Company executed (July 2005) a tripartite agreement with each ESCOM and the Banks (ESCROW Agent), which maintained the collection account of respective ESCOMs. The details of transmission charges, average monthly outstanding dues, and interest burden on the Company during 2007-08 to 2011-12 were as under:

⁵³ Accounts for 2011-12 of ESCOMs are under finalization (September 2012).

Year	Outstanding amount at the beginning of the year (1 April)	Average monthly outstanding dues during the year	Outstanding amount at the end of the year (31 March)	Average interest rate of borrowings (per cent)	Additional interest burden (₹ in crore)
	(₹ in crore)				
2007-08	110.89	2.90	144.80	9.58	13.87
2008-09	144.80	2.98	180.30	10.71	19.31
2009-10	180.30	4.94	243.27	9.78	23.79
2010-11	243.27	1.74	234.40	9.91	23.23
2011-12	234.40	1.41	144.00	11.28	16.24
Total additional interest burden					96.45

The terms of ESCROW agreement entitles the Company to recover dues on first charge basis. Nevertheless, revenue recoverable accumulated year after year. The Company borrowed funds to meet its capital expenditure plans. The Company could have reduced its interest burden by ₹ 96.45 crore timely recovery of transmission charges.

The Company stated that the right to recover transmission charges on first charge basis was not enforced since ESCOMs were Government Companies.

Fund management

2.1.19.6 The financial management of the Company included borrowings for capital works, debt servicing, billing and collection of transmission charges. Billing and revenue collection have been with separately in Paragraph 2.1.19.5. Details of funds obtained through borrowings and capital infusion by the Government *vis-à-vis* capital expenditure and servicing of debt are indicated in the table below:

Particulars	₹ in crore					Total
	2007-08	2008-09	2009-10	2010-11	2011-12	
Infusion of share capital by the Government	0	300.00	185.00	400.00	100.00	985.00
Borrowings	1,492.56	1,513.78	1,408.45	1,913.06	543.00	6,870.85
Total	1,492.56	1,813.78	1,593.45	2,313.06	643.00	7,855.85
Capital assets	2,500.61	1,709.69	1,011.31	885.98	865.16	6,972.75
Repayment of borrowings	376.54	276.30	683.24	1,605.15	461.89	3,403.12
Total	2,877.15	1,985.99	1,694.55	2,491.13	1,327.05	10,375.87

Internal generation of funds were insufficient for repayment of borrowings fully.

The Company had mobilized ₹ 7,855.85 crore by way of capital and borrowings during the five years under review. It utilized ₹ 6,972.75 crore as capital expenditure. Balance amount of ₹ 883.10 crore had gone for debt servicing. Internal generation of funds were insufficient for repayment of borrowings fully.

2.1.19.7 In the scheme of unbundling the erstwhile KPTCL, Government of Karnataka had taken over the liability of pension and gratuity to retired and in service employees amounting to ₹ 4,702 crore as on 31 May 2002. Though the Government was required to make arrangement for funding the Pension and Gratuity Trust to this extent, it decided to make payment on ‘as you go’ basis for settlement of its share of employees terminal benefits. Even this liability was not discharged in full in any of the years and balance receivable was ₹ 630.45 crore as on 31 March 2012. The Trust had been meeting the shortfall from the amounts paid by the Company and ESCOMs to meet the accrued liabilities to be paid in future years. Since the Company was contributing to the Trust funds more than its liability every year, the profitability and liquidity of the Company was affected.

Tariff fixation

2.1.19.8 Transmission service charges are the main source of generation of funds. The transmission tariff as approved by Karnataka Electricity Regulatory Commission (KERC) from time to time is payable by all the users of transmission network.

As per the provisions of KERC (terms and conditions for determination of transmission tariff) Regulations 2006, the Company files an ARR with the KERC to meet the cost pertaining to the transmission business for each financial year, which would be permitted to be recovered through tariffs and charges by the Commission. The Company is required to file the Annual Revenue Requirement (ARR) each year with the KERC, 120 days before the commencement of the first financial year of Multi Year Tariff (MYT) period.

The details about filing of ARR are in the table below.

MYT for	Due date for filing	Actual date of filing	Delay in days	Date of approval	Effective date
2007-08 to 2009-10	30.11.2006	30.11.2006	Nil	06.07.2007	1.07.2007
2007-08 to 2009-10 (Revised) ⁵⁴	-	-	-	31.12.2007	1.07.2007
2009-10 (Revised) ⁵⁵	-	30.06.2009	-	25.11.2009	1.12.2009
2010-11 to 2012-13	30.12.2009	13.08.2010	227	7.12.2010	1.01.2011

The Company delayed the filing of ARR for MYT 2010-13 by 227 days beyond the due date of filing. This resulted in delayed collection of Tariff for the year 2010-11 from January 2011 onwards, which otherwise could have been from April 2010. Consequently, the Company claimed lesser transmission charges of ₹ 143.52 crore between April 2010 and December 2010, which

⁵⁴ as per the orders of Appellate Tribunal for Electricity (ATE) dated 04.12.2007, KERC issued (December 2007) revised order for 2007-08.

⁵⁵ as per the order (May 2008) of ATE, KERC issued revised (November 2009) order for 2009-10 apart from Annual Performance Review for 2007-08 and 2008-09.

would otherwise have been available for meeting its Capital Expenditure programmes in 2011-12 and would have saved interest on borrowings to the tune of ₹ 16.19 crore⁵⁶ in the year.

The Company replied that the GoK had requested KERC to allow time till 30 June 2009 for filing ERC, which was allowed by them.

The impact on finances of the Company was real and the financial compulsions demanded that ARR should be filed in time.

2.1.19.9 The ARR proposals made by the Company and approved by the Commission are given below:

Year	Transmission tariff					
	Total capacity as per filing of the Company	Revenue Requirement as per filing of Company (₹ in crore)	Total Capacity as per KERC (MW)	Revenue Requirement revised by KERC (₹ in crore)	Revised Tariff by KERC (per MW per Month)	Dis-allowed revenue requirement (₹ in crore)
2007-08	41,408.40 (MU)	817.90	7,249	713.95	89,699	103.95
2008-09	45,055.01 (MU)	1,061.19	7,726	819.05	95,869	242.14
2009-10	49,254.60 (MU)	1,098.08	9,249	942.25	1,02,427	155.83
2010-11	11,572.00 (MW)	1,452.60	11,572	1,201.44	95,646	251.16
2011-12	13,477.00 (MW)	1,956.27	13,477	1,542.13	95,356	414.14

KERC undertakes the Annual Performance Review (APR) considering the actual expenditure incurred and revenue earned as per audited financial statements, subsequent to approval of MYT.

The major disallowances of expenditure by the KERC for the period 2007-08 to 2011-12 are:

- Power purchase cost of ₹ 103.25 crore. The Company, however, adjusted an amount of ₹ 98.06 crore against the amounts payable to ESCOMs, thus, passing on the burden to them.
- Operation and Maintenance expenses beyond the norms fixed by the KERC of ₹ 158.64 crore.
- Interest on power purchase dues of ₹ 438.81 crore relating to the period up to June 2005 accounted during 2007-08 to 2011-12, for which the Company has demanded subsidy from the Government.

Material management

2.1.20.1 The key functions in material management are laying down inventory control policy, procurement of materials and disposal of obsolete inventory. The Company had not formulated any procurement policy and adopted its laid

⁵⁶ considering the average borrowing cost of 11.28 per cent for 2011-12.

down procedures for finalizing the quantities of material to be procured considering the stock position.

Purchase and idling of underground cable

2.1.20.2 The work of construction of substations at Dobbaspet was awarded in May 2007 and commissioned in March 2009. The Company without taking cognizance of the above work, awarded (September 2008) another work for laying 17.49 kms of 1,000 sq.mm cable from SRS Peenya Substation to Widia Substation for ₹ 27.49 crore to a firm on total turnkey basis. The firm supplied (February 2009) 17.46 kms of cable and its accessories valued at ₹ 24.29 crore.

The Company realizing the fact of laying underground cable from SRS Peenya to Widia substation would be redundant, cancelled (February 2009) the above work and decided (February 2009) to divert the cable to another work (NRS to A-station-tower 28). The work was awarded (May 2010) to the same firm without calling for tenders, which was completed (May 2012). Thus, the underground cable was idling for the period from February 2009 to May 2010. Thus, procuring UG Cables for a work without requirement resulted in idling of materials and payment of interest of ₹ 1.85 crore⁵⁷ on borrowed funds.

The Company confirmed the facts.

2.1.20.3 The Company placed (June 2007/March 2008) an order for supply of 32.703 kms of 630 sq.mm cable (at 66 kV voltage class) for ₹ 25.39 crore for execution of works of Vrishabavathi Valley line in Bangalore. The Contractor supplied 31.86 kms of cables in March 2008.

We observed that the Company already had decided (July 2006) to use only 1,000 sq.mm underground cable at 66 kV voltage class in Bangalore urban areas. The Company further decided (September 2009) to use 1,000 sq.mm cable for the above work, in place of 630 sq.mm cable. Since the decision to use only 1,000 sq.mm underground cable in Bangalore urban areas was already in force, the purchase of 630 sq.mm cable lacked justification. The material received (March 2008) was lying idle (March 2012) resulting in unnecessary payment of interest charges of ₹ 4.82 crore on borrowed funds.

The Company replied that the cable procured for Vrishabavathi Valley would be utilized for three works, which had been awarded in August 2012.

Consumption of materials

2.1.20.4 The details of consumption and closing stock of materials for the period 2007-08 to 2011-12 are detailed below:

⁵⁷ loss of interest on 16.62 kms upto May 2010 (proposed to be used by EPI for the new work) and 0.84 kms, which was not utilised upto March 2012.

₹ in crore

Year	Consumption (per annum)	Consumption (per month)	Closing stock	Closing stock in terms of months' consumption (per cent)
2007-08	2,091.42	174.29	107.15	61.48
2008-09	1,320.53	110.04	111.55	101.37
2009-10	781.66	65.14	101.14	155.27
2010-11	599.85	49.99	106.09	212.22
2011-12	581.04	48.42	108.30	223.48

The closing stock in terms of number of months' consumption increased from 61.48 *per cent* in 2007-08 to 223.48 *per cent* in 2011-12. The Company, however, has not fixed standard minimum level or re-order level of material requirement.

The Company stated that it was necessary to have 5 *per cent* stock as contingency materials and observation was taken note of for fixing standard minimum level for re-order level of material requirement.

Non-moving and scrap materials in stores

2.1.20.5 The value of non-moving, surplus, obsolete, unserviceable and scrap material⁵⁸ for last five years is given below:

₹ in crore

Particulars	2007-08	2008-09	2009-10	2010-11	2011-12
Surplus/obsolete/ unserviceable/ scrap	2.14	2.89	6.41	6.01	13.08
Non-moving (not used for more than three years)	Not available	Not available	13.86	14.80	18.65
Total	-	-	20.27	20.81	31.73

The value of the scrap and obsolete materials in stock was on increasing trend between 2007-08 and 2011-12.

The Company replied that when the rate quoted was below the rates fixed by Metal and Scrap Trading Corporation, it leads to re-tendering and delay in disposal of scrap.

Monitoring and control

2.1.21.1 The performance of the substations and lines on various parameters like maximum and minimum voltage levels, breakdowns, voltage profiles should be recorded /maintained as per the Grid code standards.

⁵⁸ as per the ERP statements.

The Company collects and consolidates the peak load of substations and loading of lines. The field Divisions of TL&SS units compile the monthly MIS reports indicating the performance of the units as well as equipments installed. These reports however are not evaluated at corporate level.

While approving the T&D schemes, the Company envisaged benefits in terms of reduction in line losses, improvement in voltage levels and the load growth to be achieved by the new schemes. The benefits actually accrued have not been analysed by the Company.

The Company stated that post analysis work of 60 of the 300 substations constructed between 2007 and 2010, was entrusted to a private agency. The agency had completed analysis of 30 substations and observed that Benefit Cost Ratio was 3.43, justifying the investment made.

Technical Advisory Committee meetings

2.1.21.2 As per the direction (May 2003) of BoD a Technical Advisory Committee (TAC) was constituted in May 2003 with a view to ensure standardization in specifications in respect of projects and also to involve experts in the process of technical clearance. The TAC was reconstituted in April 2009.

We observed that the TAC had not held meetings after September 2009 defeating the very purpose of its constitution.

The Company stated that TAC was only an advisory committee and not mandatory. Only the proposals cleared by the TAC were to be included in the Annual Plan of Works. The works for inclusion in annual program were approved by the Board.

The fact remains that the expertise of the TAC has not been utilised from September 2009.

Internal Controls and Internal Audit

2.1.21.3 Internal control is a process designed for providing reasonable assurance for efficiency of operations, reliability of financial reporting and compliance with applicable laws and statutes and detection of errors and frauds. The deficiencies noted are discussed below:

Absence of internal controls in finance wing

2.1.21.4 The Company availed both long term and short term loans from financial institutions (FIs) and commercial banks regularly for meeting its capital expenditure and repayment of borrowings. The borrowings as at end of 2011-12 stood at ₹ 5,587.77 crore.

We observed that periodical data and analysis as to the fund requirement at the point of availing loan, details of projects for which loans were required *etc.*,

were not maintained. Further, deliberations/negotiations held with banks, prevailing rates of interest, justification for selecting a particular bank *etc.*, were not placed before the approving authority⁵⁹. Action taken on the decisions of the Borrowing Subcommittee was not deliberated in the subsequent meetings as part of compliance mechanism.

The Company replied (July 2012) that efforts would be made to place the details and justification of selection before the Borrowing subcommittee in future.

Audit Committee

2.1.21.5 The Company constituted an Audit Committee (AC) as required under Section 292A of the Companies Act, 1956. As per the terms of reference specified (June 2001/December 2005) by the BoD, AC should discuss with the Auditors periodically about the Internal Control System and the scope of audit including observations of the auditors, review of the half-yearly and Annual Financial Statements before submission to the Board, ensure compliance of internal control systems, financial and risk management policies and fraud and fraudulent risks *etc.*,

We observed:

- Though notices were reportedly sent to Statutory Auditors to attend AC meetings held as per section 292A (5) of the Act, the Auditors had not attended the three meetings held between September 2007 and March 2009).
- The Annual Accounts for the financial year 2010-11 was placed directly before the Board of Directors without review by the AC. Thus the provisions contained in Section 292A (6) of the Companies Act, 1956 was not followed. The Accounts of 2011-12 were placed before the Board after approval by AC.

The Company, while confirming the facts informed that in order to expedite the process of submission of accounts to statutory auditors and AG auditors and to adopt the audited accounts thereupon within the scheduled date of 30th September, the accounts had been directly taken to the Board without any willful intention to overlook the review of same by audit committee. The Company further stated that observation was noted and it would ensure that annual accounts are reviewed by audit committee before placing it to Board.

Acknowledgment

We acknowledge the co-operation extended by the Energy Department, GoK and the Company in facilitating the conduct of performance audit.

⁵⁹ as per the delegation of powers, Borrowing subcommittee and Managing Director/ Director (Finance) are the approving authority for long term and short term loans respectively.

Conclusion

- The Company transmitted 42,933.65 MUs of energy in 2007-08 using a capacity of 34,294.80 MVA. The energy transmitted in 2011-12 was 56,890 MUs with the capacity increasing up to 45,158.80 MVA, indicating creation of excess capacity.
- The clearances and permissions in many cases from various statutory authorities were sought for only after the works were awarded ignoring the recommendations of the Task Force (as regards planning and execution). Substations did not become operational because of delay in completing source lines and distribution lines.
- Transformers purchased at huge costs remained idle for 3 to 49 months owing to delay in implementation of the projects and improper planning. Instances of idling of underground cable procured at high prices were observed.
- The Company failed to draw power from the newly commissioned generating stations for long periods, as evacuation facilities were not put in place.
- Availability Based Tariff mechanism (intra-state) was yet to be implemented (September 2012), though KERC has been insisting on it time and again.
- The grid discipline by frequency management of the Company was appreciable.
- The cost of transmission has increased steadily without corresponding increase in revenue. The capital expenditure was less than the funds mobilised by way of infusion of capital and borrowings, indicating use of long term funds for purposes other than creation of assets. The conditions put forth by the Government of Karnataka while releasing capital were not adhered to. Non-receipt of ₹ 630.45 crore from Government of Karnataka against taken over pension/gratuity liability affected the profitability of the Company.
- The internal control system in the area of operation of Subcommittees and in financial decisions had weaknesses.

Recommendations

The following recommendations are offered:

- The construction of substations and lines should be need based, against the backdrop of scarce resources; to avoid idling and excess

capacity creation. The planning and execution require reorientation to have synchronization of various aspects of implementation of the projects to facilitate taking up of issues such as forest and other statutory clearances, road cutting permissions, etc., well in time and resolving them before award of the works.

- There is need to conduct effectively the survey of the line corridors to avoid the problems like right of way during the course of construction. Adequate enquiries as to suitability of the area and encumbrance should precede the acquisition of land and hindrance free land should be available to contractors for construction of substations, alongwith the award of work.
- Procurement of high value items should be need based to avoid blocking up of funds on materials.

In all the above aspects the recommendations of the Task Force could be the roadmap.

- The Company should speed up implementation of Availability Based Tariff mechanism (intra-state), put in place adequate Disaster Management mechanism and create infrastructure for monitoring of load (availing real time data).
- The Company should plan for evacuation of power from generating stations in time so as to avoid purchase of expensive power from the market and give fillip to growth.
- The stipulations set by the Government while releasing funds towards capital expenditure should be fulfilled. The Subcommittee on borrowings of the Company should document its decisions and follow up actions.

2.2 Performance Audit on the Modernisation of Canal System of Bhadra Reservoir Project by Karnataka Neeravari Nigam Limited

Executive Summary

The Company

The Company was incorporated in December 1998 under the Companies Act, 1956 to execute, operate and maintain irrigation projects in the State, excluding Upper Krishna Project. The Bhadra Reservoir Project (BRP) and the work of modernisation of its canal system were brought under the control of the Company in February 2004.

Objectives of the Performance Audit

The Performance Audit on the modernisation of the irrigation canals of the BRP was carried out to assess whether reasonable care was exercised in planning, in preparation of estimates, the designing was after adequate study, the contracts were awarded in a transparent manner complying with the provisions of Karnataka Transparency in Public Procurement (KTPP) Act and the guidelines of Central Vigilance Commission (CVC), works were executed as per the time schedule. It was also to assess whether the intended objective of providing sufficient water to the entire atchkat including tail end users was achieved with 61.70 tmc of water allocated as per Krishna Water Disputes Tribunal.

Audit findings

Planning

The Company was initially required to take up the modernization of vulnerable reaches of the main and branch canal of the Bhadra Reservoir Project. Estimates were revised at a later date by including the entire stretch of the canals. As a consequence the scope of work and quantities awarded changed again and again leading to cost and time overrun.

The project was envisaged to start in June 2007 and to complete by December 2007. It was still going on, even after five years (December 2012).

The project was formulated (2001) to irrigate a command area of 1.05 lakh hectares, including the suffering tail-end atchkat of about 9,118 hectares. But, supply of water to the tail end atchkat of about 2,132 ha continued to be affected even after expending ₹ 1,003.33 crore.

Estimates of work and reporting of progress

The estimates and extent of work were not determined leading to repeated changes. The progress reported by each agency varied.

Contract management

The works, which were originally envisaged under six packages were split again and again and are now executed in 33 packages. The works included in all packages still remained incomplete.

Despite the recommendation of the Expert Committee to modernise only the vulnerable reaches of main and branch canals, the Company decided to modernise the entire stretch of main and branch canals without approval of competent authority.

Limiting the tender access only to the Category-I contractors enrolled with the Company, who satisfied the prescribed prequalification criteria resulted in foregoing the competitive rates. After calling for tenders, the scope of the work was changed with increase in quantities, in contravention of the KTPP Act. Several contracts were awarded on single tender basis under the plea of urgency. Award of the contracts at negotiated rates violated the GoK and CVC guidelines.

The Company included price variation clause in the contracts contrary to the Government directions, which afforded undue benefit of ₹ 50.18 crore to the contractors.

The Company accorded extension of time without assessing the requirement of time in

each case. Despite non-completion of the work even within the extended period, liquidated damages as per the agreements of ₹ 49.22 crore was not levied.

Execution

Providing Cement Concrete (CC) lining to the entire length of 103 kms of Right Bank Canal which mainly runs through rocky strata was not justified and avoidable expenditure thus incurred could not be quantified.

In respect of silt removal, excavation of soft rock, embankment, CC lining and UCRS masonry, there was huge increase in quantities actually executed from the estimated quantities.

Non-adherence to the technical/Indian Standard (IS) specifications

The Code of practice of the Bureau of Indian Standards (BIS) prescribed certain standards for Cement Concrete lining of canals and Full Supply Depth/Freeboard. These were not adhered to/complied with, which resulted in avoidable and unfruitful expenditure of ₹ 165.66 crore.

Financial management

Delay in obtaining the clearance of the Planning Commission for the modernisation project, resulted in short receipt of the Central Assistance (Grants) of ₹ 65.29 crore.

Water management

The water management mechanism was deficient, which led to violation of crop pattern in irrigated area ranging from 66.83 per cent to 70.05 per cent of the total area irrigated.

Conclusion

We conclude that:

- The project was envisaged to start in June 2007 and to be completed by December 2007. Even after five years (December 2012) from the scheduled completion date, the project was still in progress.
- Despite incurring ₹ 1,003.33 crore on modernisation, about 2,132 ha of the

‘suffering’ tail end atchkat of 9,118 hectares remained without water supply (September 2012).

- The estimates and extent of work were not determined, leading to change in scope of modernisation programme.
- The Company decided to modernise the entire stretch of main and branch canals ignoring the recommendation of the Expert Committee to limit it to vulnerable structures and without the approval of competent authority.
- Change of scope after inviting tenders was in contravention of the KTPP Act. Limiting the tender access only to the Category-I contractors enrolled with the Company, who satisfied the prescribed the pre-qualification criteria, resulted in foregoing competitive rates.
- Award of the contracts at negotiated rates and on single tender basis in several cases under the plea of urgency was in violation of the GoK and CVC guidelines.
- The works, which were originally envisaged under six packages were split again and again and are now executed in 33 packages. The Company extended time of completion (January 2011) in respect of all the contracts without levying liquidated damages for delays.
- The Company included price variation for works to be completed in seven months as well, in contravention of the orders of the Government of Karnataka. Adoption of lower rates as base price for calculation of price variation of cement resulted in undue benefit to the contractors.
- The Company ignored the specification of the Bureau of Indian Standards (BIS) by resorting to excess thickness of lining of canals and lining beyond the required height resulting in creation of excessive Free Boards. The avoidable expenditure was ₹ 165.66 crore.
- There was huge difference between the demands for water charges and maintenance cess registered by the

Revenue Authorities and that raised by the Irrigation Officers. There was no proper monitoring mechanism.

Recommendations

The following recommendations are offered:

- The Government orders/ directions/ design manual of the Irrigation department, provisions of the KTPP Act and CVC guidelines should be scrupulously followed in tendering and awarding of contracts.
 - There should be definite estimates of the quantum of work to be executed. The
- time frame should be clearly defined and adhered to.
 - The management of contract and additional quantities executed, needed to be investigated.
 - Efforts should be made to avail the full extent of Central Financial Assistance.
 - There is need to create awareness on the prescribed crop pattern.

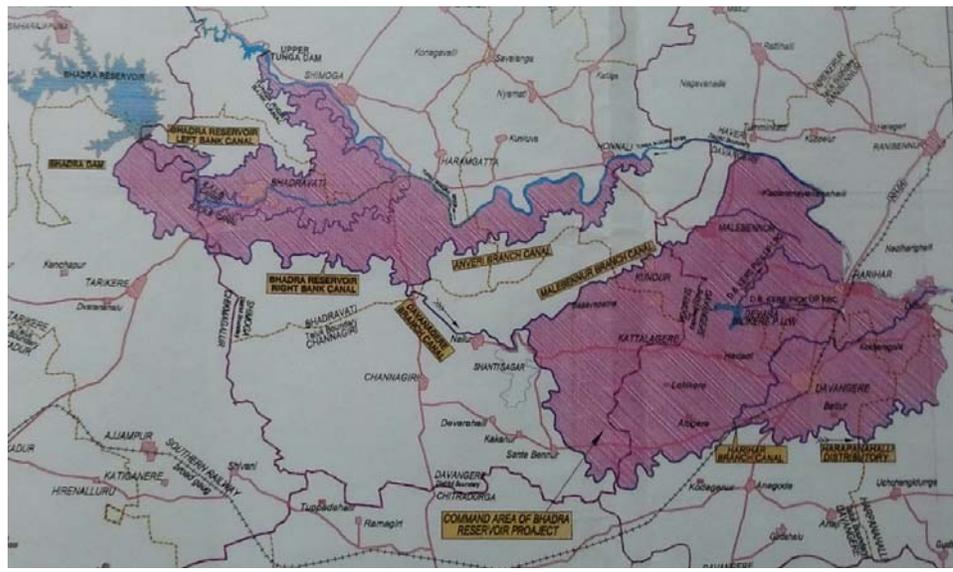
Introduction

2.2.1 Karnataka Neeravari Nigam Limited (Company) was incorporated in December 1998 under the Companies, Act 1956. The main objectives of the Company *inter alia*, are to:

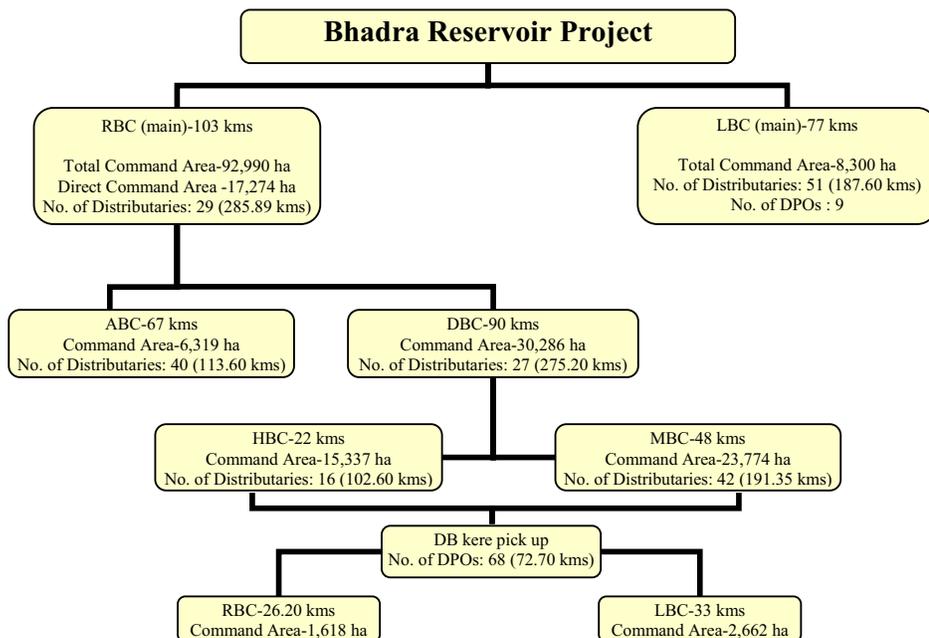
- Plan, investigate, estimate, build, operate and maintain irrigation projects and the works of Command Area Development Authority in any part of the State of Karnataka in the Krishna Basin (excluding the Upper Krishna Project),
- Prepare Detailed Project Reports (DPR) and estimates of such irrigation projects and build them after obtaining necessary approvals and sanctions,
- Resettle and rehabilitate people affected by the building of irrigation projects,
- Build or cause to be built dams, barrages, reservoirs, irrigation canals and distributaries, power houses, electricity transmission lines, *etc.*

Bhadra Reservoir Project and canal system

2.2.2 The River Bhadra originates from the Varaha Hills in the Western Ghats of Karnataka and joins River Tunga at Kudli near Shimoga and from there it is known as Tungabhadra which is a major tributary of River Krishna. The Bhadra Reservoir Project (BRP) was constructed across River Bhadra between 1947 and 1959 for irrigating the arid regions of Shimoga, Chikmagalur and Davanagere districts. The project was to irrigate an area of 1,05,570 hectares (ha). The Canal system of the Project was completed and the water was provided for irrigation from 1966 onwards. The Krishna Water Disputes Tribunal (KWDT) had allocated 61.70 Thousand Million Cubic Feet (tmc) of water to the Project (1972). The map of the command area irrigated by the Project is given below:



The Graphical representation of the Canal Network and Command Area of BRP is given as under:



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The Command Area Development Authority (CADA), Shimoga, a Statutory Body, deals with development of the Command Area, creates awareness of the conservation of land and water, constructs Field Channels and Field Drains, establishes / facilitates the Water Users Co-operative Societies (WUCS) to promote a decentralized and self regulated management system for the efficient water distribution and is bestowed with the task of reclamation of water logged and saline areas.

Organizational setup

2.2.3 The modernisation of canal system of the Bhadra Reservoir Project was one amongst the many projects executed by the Company. The Superintending Engineer, Bhadra Project Circle is in charge of this project, under the control of the Chief Engineer, Upper Tunga Project Zone, Shimoga, who in turn reports to the Managing Director of the Company.

The Bhadra Project Circle has Bhadravathi, Davanagere and Malebennur divisions under its control, each headed by an Executive Engineer and having ten sub-divisions.

⁶⁰ RBC – Right Bank Canal
LBC – Left Bank Canal
ABC – Anvery Branch Canal
DB kere – Devara Belekere

DBC – Davanagere Branch Canal
HBC – Harihar Branch Canal
MBC – Malebennur Branch Canal
DPO – Direct Pipe Outlet

Scope and methodology

2.2.4 The present Performance Audit covered the modernisation of canal system of Bhadra Reservoir Project. The records of the Corporate Office, Office of the Chief Engineer, Superintending Engineer and all the three divisions involved in execution of the Project, covering the period from 2006-07 to 2011-12, were test checked in audit.

We scrutinized the minutes and agenda papers of meetings of the Board of Directors (Board) and Technical Sub-committee (TSC), correspondence with the administrative department, instructions of GoK and GoI pertaining to the relevant activity, Detailed Project Reports, estimates, contract documents for collection of data and gathering of evidence. We also interacted with the Management to elicit their views and opinions on issues.

Audit objectives

2.2.5 The objectives of the Performance Audit were to assess whether:

- Planning and designing were after adequate study.
- Detailed estimates were prepared in compliance with the design parameters.
- The financial requirements were projected realistically, identifying the sources of funds and its availability ensuring proper fund flow.
- The contracts were awarded in a transparent manner and executed with due quality control.
- The intended objective of providing adequate water to irrigate the entire atchkat including tail end users with reduced usage of water was achieved.
- There existed monitoring controls to ensure that the farmers follow the prescribed cropping pattern and avoid unauthorised atchkat.
- Levy and collection of water charges were as prescribed.

Audit criteria

2.2.6 The Audit criteria considered for assessing the achievement of the audit objectives were derived from the following sources:

- Guidelines issued by Water Resources Department (WRD) of the Government of Karnataka, Central Water Commission (CWC) and other Ministries.
- Survey report on conception, specifications and targets in the Detailed Project Report (DPR), Annual Work Programmes / Annual plans,

Investigation / survey reports, external consultancy reports, estimates and Indian standards / specifications.

- Notice Inviting Tenders (NIT), agreement conditions, schedule of rates, bill of quantity complying with the parameters for similar works undertaken by the Company, other Public Sector Undertakings in the irrigation sector and the Department of Water Resources.
- Provisions / instructions / guidelines *etc.*, of the Company and Karnataka Transparency in Public Procurement (KTPP) Act and KTPP Rules.
- Reports of Monitoring Cell at Corporate office / Project level and instructions / directions by the Company to the field offices on water discharge for the Project.
- Directions of Agricultural Department / Water Users Co-operative Societies to maintain cropping pattern.

Audit findings

2.2.7 The objectives of the Performance Audit with reference to the audit criteria were explained to the Company during an ‘Entry Conference’ held in June 2012. The audit findings were reported to the Management, which were discussed in an Exit Conference held on 19 Nov 2012. The Exit Conference was attended by the Principal Secretary, Water Resources Department, Government of Karnataka and the Managing Director of the Company. The views expressed by the Government/Management (December 2012) have been considered while finalizing the Performance Audit. The audit findings are discussed in subsequent paragraphs.

Planning

2.2.8.1 Planning is a significant aspect in timely implementation of any project, as it involves realistic and exact scope of the works through preparation of proper estimates, conducting field survey, identifying all the technical items / components of the work and framing appropriate terms and conditions of tender. In addition it involves formulating/adopting a definite strategy to reap the envisaged benefits as per plan.

The original design (in 1960) of the canal system of the Project did not contemplate any lining and water was being released for nearly 300 days in a year except during the period of canal closure for about 60-75 days. The main canals, branch canals and connected distributaries were unlined and there was a heavy seepage loss. Further, most of the structures were in dilapidated condition due to continuous usage. In the command area of the Project there was violation of cropping pattern, unauthorized atchkat, large base period⁶¹

⁶¹ leakages and losses in the system.

and hence, the utilization of water was at an average of 74 tmc against the 61.70 tmc of allotted water.

The Government of Karnataka constituted (December 2001) an Expert Committee headed by Shri.D.C.Kulkarni (Retired Chief Engineer) to study the possibilities of modernising Bhadra Canal System during irrigation period. The Expert Committee, after extensive survey of the Project, recommended (August 2003) modernisation of the canal system, which *inter alia*, included:

- Providing Cement Concrete (CC) lining to vulnerable reaches of the main and branch canals;
- Providing CC lining to distributaries and repair works to masonry/concrete.

The Expert Committee also recommended that these works were to be executed during ‘off’ period. Repair to concrete slabs and beams could be tackled anytime. These works were to be estimated initially and were to be tackled phase-wise in tune with the availability of funds.

The modernisation work of the Project was transferred (February 2004) to the Company for implementation after accepting the recommendations of the Expert Committee.

Based on the recommendations of the Expert Committee an estimate for ₹ 471 crore was prepared (January 2005). The Board directed (June 2005) that the estimate be submitted to the Government for approval. Pending approval thereof, repair of structures and lining of vulnerable reaches of the main and branch canal costing ₹ 82 crore were executed between June and November 2006. This included ₹ 47 crore for rehabilitation of aqueducts, tunnels, cross regulator cum escape and ₹ 35 crore towards Cement Concrete lining in critical reaches. The Government accorded approval for these works in January 2007.

The Company further decided (November 2006) to take up the balance work estimated to cost ₹ 389 crore in six packages during 2007-08, so as to complete the modernisation by June 2008.

Technical consultancy

2.2.8.2 The Board approved (August 2007) the entrustment of the work of survey, investigation, preparation of drawings and Draft Tender Proposals (DTP) to a Consultant. The agreement was entered into with the consultant in November 2007.

We observed that:

- The Consultant had completed (January to April 2007) the survey work much before the decision (August 2007) of the Board to entrust the

consultancy work. The reasons for entrustment of survey work to the Consultant prior to the decision of the Board were not available on record.

- The Consultant had carried out the study of cross section of the existing main canals at 90 metre intervals. As per the subsequent commercial offer (May 2007), the Consultant had proposed to conduct the survey at 50 metre intervals. Further, Paragraph 2.2 of Annexure ‘D’ of the Agreement (November 2007) had stipulated that the cross section levels of the main canals should be taken at close intervals to bring out the true picture of the canal as it existed. The cross section level was also to be taken at close intervals particularly where there was sudden change in the side slope or in levels. The Consultant had not adhered to his offer.

The Company, however, paid (April 2008) ₹ 1.12 crore to the Consultant, despite the above inconsistencies.

The Government stated (December 2012) that as tenders for modernisation were invited for all the works so as to fix the contractors for all packages before the closure of the canals and considering the time constraints it was decided to engage the service of consultant for which *post facto* approval was accorded to the techno-commercial offer, based on which agreement was entered in November 2007.

We observed that techno-commercial offer of the Consultant was received only in May 2007 after the work was completed in April 2007. Hence the question of obtaining *post facto* approval did not arise. Further, when approval for award of work was sought, the Board was not informed of the completion of the work. Analysis of cross sections specifying field conditions was not available to substantiate the statement that there were special circumstances for ignoring the guidelines in the Indian Standards, manuals, circulars *etc.*

We further observed that the TSC had discussed (August 2008) and noted that extra financial implications and increase in cost were mainly due to adoption of incorrect parameters of canal.

Estimates, Extent of work, Approvals

2.2.8.3 The particulars of proposals, estimates and details of work are tabulated below:

Particulars of proposals and estimates	Month of preparation of estimate	Estimated amount (₹ in crore)	Details of work			Remarks
			Main canal (kms)	Distributaries (kms)	Structures (numbers)	
Initial DPR	January 2005	471.00	254.45	1,188.42	5,486	This estimate was based on SR 2004-05 for the vulnerable reaches.
Modified estimate	March 2007	702.60	466.20	1,360.00	5,486	Balance work excluding ₹ 82 crore and the additional items of work such as cross drainage were included and

Particulars of proposals and estimates	Month of preparation of estimate	Estimated amount (₹ in crore)	Details of work			Remarks
			Main canal (kms)	Distributaries (kms)	Structures (numbers)	
						the estimate was recast at the rate of SR 2006-07.
Further revision	January 2008	951.00	466.20	1,229.00	3,314	In compliance to the observation of CWC, the detailed estimate was prepared by the Consultant based on SR 2007-08 for which administrative approval was accorded (February 2008).
Latest revised cost	March 2012	1,091.77	466.20	1,506.30	3,676	The probable cost as per the Monitoring Report of the CWC, for which no estimate has been prepared.

We observed that the length of distributaries and the number of structures varied in each estimate as indicated in the table above. It was evident that the Company had no definite knowledge of the length of the distributaries and number of structures in the canal system for modernisation. Consequently, the scope and quantum of works awarded to contractors changed time and again.

The estimated cost of work now stands at ₹ 1,188.29 crore⁶², as against the estimate of ₹ 471 crore for modernisation of vulnerable reaches of main and branch canals, entire stretch of distributaries and structures.

The Government stated that the initial proposal was to modernise vulnerable reaches of main canal and distributaries and reconstruction of structures, which were in a dilapidated condition at an estimated cost of ₹ 471 core. As decided in the meeting held in December 2006 under the Chairmanship of the Chief Minister, the modernisation of entire canal network was taken up at an estimated cost of ₹ 951 crore. Since the changes in length and number of structures were accounted in the estimate of ₹ 951 crore itself before re-tendering the work, the contention of audit that Company had no definite knowledge needed review.

The reply is factually incorrect for (a) a decision to modernisation of the entire stretch of canals was not a subject of discussion in the meeting held in December 2006. It was emphasized in the meeting that tendering process should be over before 1 June 2007 to take up the work immediately and execute all works by December 2007, (b) the estimate of ₹ 951 crore was the third in the series of estimates and the number of structures varied each time (c) the work was tendered and re-tendered before the estimate was revised to ₹ 951 crore, and (d) in the latest revised cost of March 2012 the length of distributaries and number of structures changed again.

⁶² latest estimated cost ₹ 1,091.77 crore plus work already done ₹ 82 crore plus value of work done in rescinded contractors ₹ 14.52 crore.

Contract management

2.2.9.1 Efficient contract management includes safeguarding interest of the organization by ensuring strict compliance of the terms and conditions of the contract.

As stated, the TSC discussed (November/December 2006) that the balance works costing ₹ 389 crore could be taken up for execution during the subsequent year (2007-08). The works were decided to be executed within 8 months and it was suggested that water in the canal could be stopped for Rabi season of 2007 and the works executed between 15 November 2007 and June 2008.

The TSC also recommended that the works could be taken up for execution on regular tender basis by making packages of about ₹ 50 crore each. The amount put to tender was of ₹ 389.15 crore spilt into six packages⁶³ ranging between ₹ 73.60 crore and ₹ 57.56 crore.

The pre-qualification-cum-tender notification was issued (December 2006) inviting percentage tenders from Category I Contractors appearing in the selected list of contractors of the Company, who satisfied the pre-qualification criteria, under two cover system. The TSC further directed that necessary action should be taken to see that the tenders were finalized, so that the agencies had sufficient time for mobilization and could start the works by November 2007, soon after stoppage of water in the canal. The funds were planned to be tied up in three years (2006-09).

Our observations are discussed in succeeding paragraphs:

Increasing the extent of modernisation without authority

Change in scope of modernisation was devoid of sanction.

2.2.9.2 The Expert Committee recommended to take up modernisation of the vulnerable reaches of the main and branch canals of 254.45 kms. The Company, accordingly, invited (December 2006) tenders. Subsequently, the Company modified (April 2007) the tender by including the entire stretch of main and branch canals of 466.20 kms in the course of tender process, increasing the cost to ₹ 702.60 crore.

There was no approval of the Board of the Company or Government for change in the scope of modernisation which was at variance with the recommendations of the Expert Committee. Therefore, the modernisation of the entire stretch of main and branch canals was, *prima facie*, not need based and was deficient since it was devoid of official sanction.

⁶³ the number of packages periodically increased over time and all the 33 packages are in progress. The changes from 6 to 33 packages over time and details of cost are given in Annexure- 10.

The Company stated that the decision was to get the assistance under Accelerated Irrigation Benefit Programme under Prime minister's relief package announced during 2006. It was to reduce the consumption of water by 10 tmc by modernising the canals for optimum usage of water and to extend the benefit to farmers of tail end reaches. The project was cleared by Central Water Commission. Hence, the actions of the Company to modernise the entire canal could not be concluded *prima facie* as not need based.

The reply is silent about the authority on whose direction the estimate was revised to include modernisation of entire stretch of main and branch canals from the earlier estimate for modernisation of only vulnerable reaches as recommended in the Report of the Expert Committee. Moreover, it was recorded in the Report that upon completion of modernisation of vulnerable reaches of main and branch canals and lining the distributaries, there would be reduction of 10 tmc of water. Therefore, modernisation of the entire stretch of main and branch canals as funds were available under Central Scheme lacks justification.

Change in scope of work after calling for tenders

2.2.9.3 The pre-qualification-cum-tender notification (22 December 2006) for works to be awarded on percentage⁶⁴ basis, *inter alia*, stipulated that the work was to be completed in eight months. The contractors could request for tender documents upto 31 January 2007 to satisfy the pre-qualification criteria. Completion of pre-qualification process and issue of blank documents were to be done by 30 March 2007 and pre-bid meeting was to be held on 16 April 2007. The last date for submission of tenders in two part bid (Technical and Financial) was 15 May 2007.

Change in scope of work after calling for tenders reduced transparency.

However, in the meeting held (26 December 2006) by the then Chief Minister, the Minister for Rural Water Supply and Sugar stated that work of modernisation needed to be taken up only during monsoon season, else, the work not needed to start at all. The Minister for Water Resources directed that a programme be designed in such a way that suitable modifications were made in the tender process, finalization of contractors for work be done before 1 June 2007 and all works be taken up immediately thereon and completed before December 2007.

The Company issued (27 December 2006) a corrigendum reducing the time limit for execution of work to seven months. Further, the last date of submission of tenders was revised to 28 March 2007. In another corrigendum (24 January 2007) the time limit for submission of tenders was revised to 9 April 2007.

⁶⁴ where the tenderer quotes an overall percentage above or below the amount put to tender.

In the TSC meeting (23 March 2007), it was informed that 23 contractors qualified for bidding for the six packages. The TSC also informed that detailed estimates had been prepared expanding the scope of modernisation works, which worked out to ₹ 702.60 crore.

A third corrigendum (12 April 2007) was issued increasing the amount put to tender to ₹ 702.60 crore and work packages was split into 12. And, the contractors shortlisted earlier for the six packages, created on the basis of the estimate of ₹ 389 crore, were declared eligible to participate in all the subdivided works within each package. The last date for submission of technical and financial bids was 26 April 2007 and date of opening was 2 May 2007.

We observed that even-though there was substantial increase in scope of work and amount put to tender, the Company restricted the tender only to the contractors, who had pre-qualified for the six packages in the earlier tender notification (December 2006).

It was further observed that the change in scope of work from vulnerable reaches to the entire stretch, led to manifold increase in comparison to the quantities already tendered. The Clause 12(5) of the KTPP Act, stipulates that the tender documents shall indicate the quantity proposed to be procured in the tender, and the Tender Accepting Authority shall be ordinarily permitted to vary the quantity finally ordered only to the extent of twenty five *per cent* either way of the requirement indicated in the tender documents. The provision in the KTPP Act was overlooked.

Further, it is prudent that in case where the specification or scope of work in a tender have undergone major change before tender is finalized, a fresh tender should be called for, giving sufficient notice to the tenderers.

The Government stated that since there was no change made against the quantities mentioned in the Schedule B of tender documents issued to the pre-qualified bidders as per technical bid of the 12 packages there is no contravention of the KTPP Act.

The contention of the Government that the quantities had not increased in this revision was not tenable as the estimate for ₹ 389 crore was for modernisation of only vulnerable reaches of main and branch canals (254.45 kms) but the estimate for ₹ 702.60 crore was for modernisation of entire canal (466.20 kms) and distributaries. The reply is also not factually correct, as the huge increase in quantities is discussed in Paragraph 2.2.10.3.

Lack of transparency in award of works

2.2.9.4 In response to the third corrigenda (April 2007) for twelve packages, the Company received (May 2007) offers for ten packages from the pre-qualified contractors. Evaluation of tender (Technical and Financial) was done on 8 and 11 May 2007. The contracts were finalized in June 2007 with stipulation to complete the work by December 2007. Seven packages had elicited only single offer each and these single bid offers were accepted.

The GoK had issued (December 2002) guidelines for conducting negotiations before award of contract. It was recognized that negotiations even with the lowest bidder defeats the very ethics of competitive bidding and should not be resorted to solely for the purpose of reduction of rates. The guidelines stipulated that negotiation solely for the purpose of obtaining lower prices would be appropriate only in exceptional circumstances. In such cases also, the first option was to reject all the tenders and invite fresh tenders.

The Central Vigilance Commission guidelines (March 2007) also stipulate that there should normally be no post-tender negotiations. If at all negotiations are warranted under exceptional circumstances the Company should record and document, the justification and details of such negotiations, if any. The Company could negotiate with lowest bidder(s) for bare minimum quantity for urgent requirements if the re-tendering is unavoidable. Negotiations should be held only under exceptional circumstances.

We observed that

- The Company did not reject the single bids and accepted the tenders at negotiated rates, on grounds of speedy execution of the modernisation. The works were not completed (December 2012), even after a lapse of five years, defeating the very purpose of single tenders in the guise of saving time.
- The records of details of such negotiations, documents showing the name and designations of the authorized officers, who conducted negotiations, details of bidders who participated in the negotiations, records of discussions and the justification for decisions were not made available to audit.
- The 10 packages were awarded (June/July 2007) to the contractors after revising the estimates of all the 12 packages upward: first the estimate amount was revised applying the Schedule of Rates (SR) of 2007-08, which was effective from 2 April 2007. Further, on the demand of the bidders, the cost of cement items was reworked applying the prevailing market prices of cement of ₹ 225 per bag, as against ₹ 190 per bag in SR 2007-08. The Company agreed for five *per cent* extra on such revised total cost. It is to be noted that, in effect, the percentage increase worked out to an increase between 7.44 *per cent* and 34.90 *per cent* above the amount put to tender.

- Competitiveness was curtailed by limiting the tender opportunity to Category-I contractors enrolled with the Company and eliminating furthermore by setting pre-qualification criteria and again eliminating more through two-bid system.

The Company replied that it had categorized the different agencies as per empanelled procedure adopted looking into the capacity of executing the works, turn over, machineries they have *etc.*, and were classified under different categories and based on the value of works to be executed. These agencies were exempt from pre-qualification under normal circumstances. Pre-qualification was made mandatory as Bhadra modernisation works required special skills and capability, as the cost was very high and were to be executed within specific time period. Wide publicity was given as per KPPP Act and there was thumping response to the notification. 127 bids (20 to 23 per package) satisfied the prequalification criteria for six packages. Hence, there was no curtailment of competition in tenders.

As far as violation of CVC guidelines were concerned, the Company stated that bid amounts were 42 *per cent* to 87 *per cent* higher than the amounts put to tender. Heavy fluctuations in rates of steel and cement, possible increase in cost of construction material, difficulty in conveying material to site were stated to be the reason. Moreover, Government had already taken a decision to ground (start) the works by completely stopping water in canal during June 2007 to December 2007. Hence, based on Finance Department circular (December 2002), 5 *per cent* above the updated Schedule of Rates was admitted. Deliberations before approving the tenders were not only to reduce the price but to ground the works duly following well established procedures set by Government/Company. While entrusting works for non responsive tenders/rescinded works, the balance cost had been worked out based on the prevailing Schedule of Rates at the time of approval of tenders and premium of tender had been decided considering well established procedures of Government/Company.

The reply was not acceptable as the same set of 20 to 23 pre-qualified contractors bid for every package. Hence, the argument of the Government that the Company received good response was misleading. Moreover, of the 12 packages, single bids were received for seven packages and there was no response for two packages.

When the tenders were invited (December 2006), the works were programmed to be completed by June 2008. After inviting tenders the cost of work nearly doubled to ₹ 702.60 crore; while the time limit for completion (by December 2007) was reduced to half. Such a large work was being executed through selected contractors by splitting the packages again and again to suit the contractors' capability. This curtailed competition and increased dependency and cost. The fact remained that the Company could have resorted to open tenders paving the way for more competition. The cost of the project had

gone up to ₹ 1,188.29 crore, due to increase in quantities and cost of construction material.

In their eagerness to start the works and complete them, the Company had consented for rates at a premium, accepting market rates of cement and inclusion of price variation clause for works to be completed within seven months as against Government guidelines. As could be seen, these actions did not derive the intended objective of completing the works within seven months. The project was incomplete even after five years (December 2012).

Non-verification of tender capacity of the contractors

2.2.9.5 The Government of Karnataka had, *inter-alia*, instructed (December 2002) that the pre-qualification documents and the tender documents following two-cover System should have stipulations to check the aggregate of the qualifying criteria of the individual contracts, when the bidder was lowest for more than one contract and also check the available tender capacity of the contractor.

We observed the following:

- There was no such provision in the pre-qualification document or tender document to check the 'Tender Capacity' of the tenderer by taking into account the maximum value of the works completed in a year, the value of the balance commitment of works *etc.*
- The Company awarded (June 2007) two packages to GVPR Engineers Limited (GVPR) amounting ₹ 73.49 crore and ₹ 85.02 crore respectively. The stipulated date of completion was December 2007. Decision was taken to release water in Left Bank Canal (LBC) and Right Bank Canal (RBC) from 5 December 2007. Even though water was not let-out in the canals where GVPR was entrusted with the work, it failed to complete the work within the stipulated time (December 2007). The work was still pending completion (September 2012).

Further, against a tender notification (October 2010) GVPR was awarded (December 2010) another contract amounting to ₹ 71.31 crore with a stipulated date of completion (March 2011) of three months from the date of agreement. This work was rescinded after executing works valued at ₹ 2.78 crore.

- IVRCL Infrastructure and Projects Limited (IVRCL) was awarded (June/July 2007) work for ₹ 95.90 crore and another work for ₹ 106.83 crore. The Company rescinded (October 2010) the second contract after executing work of ₹ 5.81 crore.

- SSJV Projects Private Limited (SSJV) was awarded (September 2007) four contracts totaling to ₹ 90.73 crore. The contracts were rescinded subsequently without risk and cost to the contractor (discussed in detail in Paragraphs 2.2.9.7 and 2.2.10.7).
- Amrutha Constructions Private Limited (Amrutha Constructions) was awarded (December 2010/December 2011) two packages for ₹ 152.27 crore. The work was in progress (September 2012).

In all the above cases, two or more contracts were entrusted to the same contractor without evaluating the tender capacity of the contractors, in violation of the instruction of the Government of Karnataka. This had resulted either in delay in execution of contracts or rescinding the contracts without risk and cost.

The Company replied that IVRCL had completed one package, GVPR had almost completed two of the three packages and Amrutha Constructions had completed the two packages. In respect of works entrusted to SSJV, GVPR and IVRCL, where the agencies had failed to complete the work were due to practical problems *viz.*, seepage in initial reaches of canal, unprecedented heavy rain during 2007-08, and early release of water for protecting standing crops. The Company further stated that only qualified/categorized agencies only were allowed to participate in all the tenders following the KTPP Act and the eligible contractors cannot be denied in participating in tenders. The Company further stated that the other alternate left was to rescind the contracts of incomplete works looking into the merits/demerits in each case as per conditions of the contract.

The reply of the Company was not acceptable as evident from the facts that the cost of each of the 12 packages were in the range of ₹ 50 crore to ₹ 75 crore, only to suit the capability of the contractors empanelled with the Company to execute the works. The Company had stated that they intended to complete the work in seven months. By awarding more than one work to many contractors, the stated intentions of splitting packages were defeated. It also affected timely completion of the project, as also cost overrun.

Price Variation clause

2.2.9.6 In the TSC meeting (December 2006), it was noted that the Government had issued directions (November 2004) for inclusion of Price Variation clause where works costing more than ₹ 1 crore and period of completion was 12 months or more. The TSC further noted that in the instant tender the period between receipt of tender (May 2007) and completion date (June 2008) was more than 12 months and also keeping in view that the major portion of the modernisation work consisted of cement and steel, it was suggested that price variation clause would be included in the tender with base indices as on date of opening of tender.

PV clause was included in tenders in violation of Government order.

The Board decided (14 December 2006) to recommend to the Government to close the canal for 8 months from November 2007 to June 2008 and work out alternate arrangements to be made for meeting water requirements of the farmers. The Board further approved the additional conditions ⁶⁵ and price variation clause in the tenders.

We observed that initially the decision was to complete the works by June 2008 and accordingly PV clause was allowed to be incorporated. After the meeting held (26 December 2006) by the then Chief Minister, the work was directed to be completed by December 2007 (less than 12 months). However, the Company included the Price Variation Clause in the agreements, which was in violation of instructions (November 2004) of the Government of Karnataka for inclusion of PV clause only for the works which complete in 12 months or more.

We also observed that the Company sanctioned extension of time for completion of works regularly, for all the packages, without penalty, up to January 2011. Payments towards price variation were granted to the contractors for works executed throughout the period as per the PV clause. The directions of the Government were not complied with. The payment for price variation in respect of 16 packages amounted to ₹ 50.18 crore.

The Company had not incorporated price variation clause in the tenders invited after December 2008, which proved that the earlier action to include the clause was incorrect.

The Company replied that the PV clause was included after obtaining approval from the competent authority. The Company also stated that inclusion of PV clause was an added advantage since closing the contract of different packages after expiry of contract period would be disadvantageous when compared to the payment made through PV clause. Contracts were continued beyond 12 months as the reasons for the delays were not attributable to the agencies and also considering the fact that average annual increase of the cost was 15 *per cent*.

The justification lacks rationale due to the fact that inclusion of PV clause for works with completion period less than 12 months was in violation of Government order/directions. Further, when the completion of work was compressed to seven months timeframe, the inclusion of PV clause in the agreement was not brought to the notice of the Board for its decision. As on date (September 2012), all the 33 contracts were still in progress beyond the contract period, out of which only 16 include PV clause. Inclusion of the clause has also proved to be a cause to execute the work as per the schedule of the contractor with no risk and cost to them. The remaining 17 contracts without PV clause are being executed without any enhanced rates and the

⁶⁵ agency to submit a detailed execution plan and fortnightly programme and works to be constantly monitored by the Chief Engineer and in case of slippages, penalty/ liquidated damages as indicated in the agreement to be levied.

argument that minimum annual increase of 15 *per cent* of the cost would have been there was unjustified.

Works for which the contractors evinced no interest

2.2.9.7 Two packages, amounting to ₹ 68.78 crore and ₹ 56.76 crore respectively, for which no quotations were received against the pre-qualification-cum-tender notice of December 2006 (Corrigenda of April 2007) were split into seven packages, each with re-cast tender cost of about ₹ 20 crore and re-tendered in May 2007. Tenders were received only for five of the seven packages and agreements were entered into (September 2007) with price variation clause.

We observed that this time, the tenders were open to all Category-I contractors of the Company and no other pre-qualification criteria was specified. The pre-qualification criteria set in May 2007 were ignored for these packages.

We also observed that the one contractor SSJV was awarded four (September 2007) out of the seven packages totaling to ₹ 90.73 crore on single tender basis and works were scheduled to be completed by March 2008. SSJV was not one of the pre-qualified contractors of the tender of December 2006 (including the three Corrigenda upto April 2007). Two contracts were awarded at 6.48 *per cent* and 6.55 *per cent* below and two at 5 *per cent* above the amounts in the tender recast by adopting the latest market price of cement and steel. Price Variation Clause was included in all the agreements.

We observed that SSJV executed works costing ₹ 5.93 crore upto December 2007 (in three months time) and the progress of work was slow. Further, consequent to release of water in the canal in December 2007, the contractor stopped the work. The Company had adopted a different set of standards for this tender and did not assess the capacity of the contractor to execute all the four packages simultaneously. This defeated the very purpose of splitting up the works. The contracts were rescinded (November 2009) without risk and cost to the contractor.

The four rescinded contracts were again split into ten packages: one package amounting to ₹ 53.44 crore for main canal and nine other packages for distributaries and structures for amounts ranging between ₹ 2 crore and ₹ 5 crore each and tenders were invited in August 2009 from the Category-I contractors enrolled with the Company. Five packages were awarded during December 2009 to June 2010. These contracts were awarded at 6.97 *per cent* to 15 *per cent* above the amount in the tender revised by considering the updated rate analysis to SR 2007-08 by adopting rates of labour and material of Public Works (P&IWTD) of SR 2009-10 of Shimoga Circle.

The balance 5 packages were retendered (January 2010) and awarded in December 2010/February 2011. These five packages were awarded at prices, which were 10 *per cent* to 14.45 *per cent* above the recast amounts as per the

WRD SR of 2010-11 including 25 per cent weightage. Price variation was not included in these contracts.

2.2.9.8 Similarly, the two packages out of above mentioned seven packages for which offers were not received in the tender of May 2007 were again split into ten packages of about ₹ 5 crore each and tendered (August 2007). Eight works were awarded in September 2008. These eight were awarded at 5 per cent above the amount put to tender, recast with SR 2007-08.

Two of above mentioned 10 were again tendered (October 2008) and awarded in June 2010. These were awarded at prices, 14.90 per cent above the amount put to tender, recast by SR 2008-09 by adopting rates of labour and material of Public Works (P&IWTD) of SR 2008-09. Price Variation Clause was included in these ten contracts.

The issues discussed above and the lapses of KNNL are brought out below in nutshell:

Issues	Lapses
Modernisation of the entire stretch of main and branch canals <i>vis-à-vis</i> vulnerable reaches	Modernisation of entire stretch of main and branch canals is not supported by the Expert Committee, decision of the Board or GoK.
Change of scope of work after inviting tenders	This was in contravention of the KTPP Act.
The tender was limited only to the Category I contractors enrolled with the Company, who satisfied the prescribed pre-qualification criteria.	Competitive rates were foregone.
Awarded most of the works on single tender basis	7 of 10 packages were awarded on single tender basis, without exercising option for rejection, in violation of the GoK and CVC guidelines.
Award of contracts at negotiated rates	Negotiations were held with contractors and works awarded at different rates, disregarding the quoted percentages, in violation of the GoK and CVC guidelines.
Multiple contracts to contractors	Inspite of splitting and re-splitting works, multiple contracts were awarded to some contractors. Many of the contracts were rescinded subsequently due to lack of progress.
Price Variation	Price Variation Clause was included contrary to the GoK directives.

2.2.9.9 The cumulative effect of the above mentioned splitting of works and delay in completion resulted in cost overrun as tabulated below:

Name of Package	Original packages (Estimated cost)		Split of original package (Revised cost)		Final position of packages ⁶⁶		Total expenditure up to October 2012
	December 2006		April 2007				
	No.	₹ in crore	No.	₹ in crore	No.	₹ in crore	
LBC Main Canal, Distributary and Structures	1	57.56	1	68.78	10	108.03	93.57
RBC Main Canal, Distributary and Structures	1	73.60	3	187.56	15	381.25	292.24
MBC, Distributary and Structures	1	61.70	1	73.17	1	95.90	84.99
DBC 0-30 kms, Distributary and Structures	1	60.45	2	96.45	2	127.51	122.37
DBC 30-90 kms, Distributary and Structures	1	68.11	2	110.79	2	148.32	127.39
ABC, HBC and DB Kere pick up, Distributary and structures	1	67.73	3	165.85	3	230.01	213.21
Total	6	389.15	12	702.60	33	1,091.02	933.77

The Company stated that progress was hampered due to heavy rainfall, early release of water in the proposed closure period, agitation by farmers on some local issues, practical /technical problems, non-response from bidders. The modernisation involved 2,000 kms network of canals, 3,600 structures requiring renovation/reconstruction costing ₹ 951 crore was a huge task and with all efforts the works were commenced during 2007-08 and about ₹ 220 crore could be spent. The Company added that the main reasons for failure to complete the work was rescinding/repackaging/retendering/refixing the agencies as major stumbling block was non-availability of clear working period in subsequent closure periods and these problems were not attributable to the contractors. The approval has been obtained from GoI for completion of project by 2013.

We are of the view that the initial decisions, planning, tendering and award of works were against this backdrop.

Execution

Physical progress

2.2.10.1 The details of the length of the main and branch canals, distributaries and number of structures planned for execution *vis-à-vis* the progress achieved and the short fall in physical progress as on 31 March 2012 were as follows:

⁶⁶ the packages were with reference to different tender notifications.

Canal	Programme			Progress			Shortfall		
	A	B	C	A	B	C	A	B	C
LBC	77.00	189.60	325	77.00	120.86	122	0	68.74	203
RBC	98.60	289.39	1,106	90.00	196.86	326	8.60	92.53	780
MBC	48.00	191.35	585	48.00	191.35	585	0	0	0
ABC	66.70	120.35	250	65.00	114.00	242	1.70	6.35	8
HBC	20.54	188.21	549	20.45	178.75	407	0.09	9.46	142
DBC	90.00	441.70	753	82.57	364.85	600	7.43	76.85	153
DBKP	58.51	85.70	108	58.51	85.70	108	0	0	0
Total	459.35⁶⁷	1,506.30	3,676	441.53	1,252.37	2,390	17.82	253.93	1,286
Short fall in percentage							3.88	16.86	34.98

A. Main and branch canal (in kms). B. Distributary and minors (in kms). C. Structures (in numbers).

The work of modernisation of canal, estimated to be completed by December 2007 was still in progress (December 2012), even after a lapse of five years.

We observed that

- The modernisation should have been completed by December 2007 was still in progress (December 2012) even after five years. The Company should have prescribed definite action plan for completion by enforcing the conditions of the contracts strictly for execution. The contractors, however, were given extension time and again till 31 January 2011.
- While approving the first extension to contractors from January 2008 to December 2008, the Board stated that the targeted progress was not achieved due to heavy rains during the year 2007-08 and letting of water in the canal from 5 January 2008. The Board, while giving further extension of time up to January 2011 noted that there was shortage of materials and demand for construction materials had increased. Removal of silt and drying the canal for concrete works and bringing the canal back to original shape was also projected as reasons for further extension of time.
- The Company implemented the execution of modernisation works of ₹ 82 crore in the year 2006-07 and ₹ 217.31 crore in 2007-08 without fixing physical and financial targets. In the subsequent years, the Company fixed physical and financial targets, which were never achieved.
- Between 2006-07 and 2011-12 the Company spent ₹ 1,003.33 crore (March 2012) and the work was still in progress (September 2012). As on 31 March 2012, 17.32 kms of main and branch Canals, 253.93 kms. Of distributaries and minors and 1,286 structures were yet to be modernised/repaired. The modernisation is now projected to cost ₹ 1,188.29 crore.

The Government agreed that there was shortfall in some years due to the reasons, which were not attributable either towards management or the contractors.

⁶⁷ excludes 4.30 kms of tunnel work for which modernisation work has not been undertaken.

Reporting of the proposals and progress

2.2.10.2 The actual physical progress achieved and physical progress reported to CWC as on 31 March 2012 are given in the table below:

Particulars of work	Length of canals and number of structures in existence in the Project	Proposed for modernisation to CWC		Progress achieved as on 31 March 2012		
		As per initial decision	As per the latest proposal under AIBP	As per progress report of Chief Engineer	As per AIBP Report	Difference
Main Canal (km)	466.20	466.20	459	453	442	11
Distributaries (km)	1,229	1,360	1,506.30	1,528	1,252	276
Structures (Numbers)	3,314	5,486	3,676	2,509	2,390	119

We observed that:

- The figures reported by the Chief Engineer to the Company varied from the figures certified by the Central Water Commission under the AIBP.
- The extent of work done *vis-à-vis* the payment made has to be reconciled to determine the exact quantum of work executed.

The Government stated (December 2012) that physical progress reported and the figures certified by AIBP are not at variance. Documents in the possession of audit, however, revealed that there were variations in the figures.

Excess quantities executed

2.2.10.3 The table below indicates quantities estimated for vulnerable reaches *vis-à-vis* for the entire stretch of main and branch canals.

Item	Estimated quantities for vulnerable reaches (₹ 471 crore)	Estimated quantities for entire stretch of canals (₹ 951 crore)	Actual quantities executed (including Extra Financial Implications(EFI) wherever details available)	Difference between the quantities for vulnerable reaches and entire stretch of canals (3-2) (Percentage in brackets)	Excess quantities executed with reference to the quantities estimated for the entire length (4-3) (Percentage in brackets)
(1)	(2)	(3)	(4)	(5)	(6)
Excavation in ordinary soil (m ³)	4,00,591	30,88,893	27,70,990	26,88,302 (671.08)	-
Excavation in soft rock (m ³)	22,365	4,32,010	2,98,282	4,09,645 (1,831.63)	-
Excavation in hard rock (m ³)	-	4,92,365	2,58,854	4,92,365 (NA)	-
Embankment (m ³)	12,89,629	31,88,752	37,57,619	18,99,123 (147.26)	5,68,867 (17.84)
CC lining-manual (m ³)	3,397	38,390	57,670	34,993 (1,030.11)	19,280 (50.22)
CC lining-paver (m ²)	3,25,063	63,09,949	60,32,002	59,84,886 (1,841.15)	-
UCRS masonry (m ³)	37,014	1,71,824	2,23,656	1,34,810 (364.21)	51,832 (30.17)
Silt removal (m ³)	85,417	11,43,778	13,22,315	10,58,361 (1,239.05)	1,78,537 (15.61)

- Owing to change of scope of work, the estimated quantities increased by percentages between 147.26 and 1,841.15. The quantities actually

The variation between actual quantities as compared to estimated quantities for various items of work ranged from 147 per cent to 1,841.15 per cent.

executed over the estimate for the entire stretch of the canals ranged between 15.61 per cent and 50.22 per cent. The quantities actually executed in respect of silt removal, excavation of soft rock, embankment, CC lining and UCRS masonry recorded phenomenal increase.

- In the Report of modernisation of canal system on which the estimate for modernisation was prepared, it was envisaged that the utilization (average) of 74 tmc water could be reduced to 61.70 tmc, the allocated water as per the KWDT and bring the potential back to 1,05,570 ha with the quantities in the initial estimate for ₹ 471 crore.

We opine that the decision to execute additional quantities beyond the ones envisaged in the initial estimate lacked justification and therefore, needed investigation.

Multifold increase in Un-coarsed Rubble Stone Masonry (UCRS)

2.2.10.4 The Company estimated UCRS quantity of 8,370 cum for the reach of RBC 0 to 60 km and 4,306 cum for the reach of 61 to 103 kms in the estimate of ₹ 951 crore. Against this quantity, 8,729 cum in the reach of 0 to 60 km was executed (August 2008) by IVRCL, which was rescinded (October 2010). Despite the fact that IVRCL had already executed the UCRS masonry of more than the estimated quantities (8,729-8,370 = 359 cum), a quantity of 56,671 cum was further put to tender, against which 59,568 cum (₹ 16.18 crore) was executed by three different agencies (packages 2A1, 2A2, 2A3) in addition to CC lining of the entire stretch, as on March 2012.

No reason was on record for executing such additional quantities to the extent of 612 per cent over and above the originally estimated quantities. It is relevant to state that in the reach of 61 to 103 km, no UCRS masonry was executed against the estimated quantity of 4,306 cum, as on March 2012.

The reply of the Company/Government is awaited.

Structures modernised

2.2.10.5 The table below indicates the numbers of structures planned for modernisation and actually executed till March 2012.

Name of the canal	Number of structures proposed in the estimate of ₹ 471 crore	Number of structures in the revised estimate costing ₹ 951 crore	Number of structures as per subsequent plans	Number of structures completed as on 31 March 2012
LBC	262	305	325	122
RBC	1,057	947	1,106	326
ABC	990	247	250	242
MBC	1,506	497	585	585
DBC & HBC	1,227	1,215	1,302	1,007
DB Pickup Dam	269	103	108	108
Measuring device	156	-	-	-
Dam & allied works	19	-	-	-
Total	5,486	3,314	3,676	2,390

The Expert Committee had noted that by modernising the structures a quantum of 101 cusecs seepage losses could be avoided and the work needed to be undertaken on top-priority.

The estimated number of structures for modernisation were changed from estimate to estimate (5,486 to 3,314 to 3,676). However, only 2,390 of 3,676 structures had been completed till 31 March 2012. The reply of the Company/ Government is awaited.

Cement Concrete lining of rocky strata

2.2.10.6 The Expert Committee had recommended (August 2003) modernisation of the canal system, which, *inter alia*, included providing Cement Concrete (CC) lining to *vulnerable reaches* of the main and branch canals.

As regards Right Bank Canal (a main canal), the Expert Committee had stated that the canal runs in rocky strata for its full length of 103 kms. The Committee estimated the total wetted perimeter as 27.98 lakh sq.mtrs consisting of rock parts (23.76 lakh sq.mtrs) and soil parts (4.22 lakh sq.mtrs). Further, the Technical Consultants, appointed for survey and preparation of estimates, had also suggested lining of 38.98 kms, out of 103 kms of RBC.

Usually, the stretch containing rock needs no lining. If block-jointed rock had created rough surfaces, when excavated, the bed and sides can be smoothed to reduce the hydraulic roughness.

The Company had contracted for lining of the entire stretch of the canal to various contractors for a quantity of 28.93 lakh sq.mtrs by providing and laying *in-situ* vibrated M15 grade ready mix cement concrete using 20 mm down size coarse aggregate using pavers. The contractors had executed (July 2012) 24.36 lakh sq.mtrs. The work was still in progress. (September 2012).

We observed that the decision to line the entire length of 103 kms of RBC, which mainly runs through rocky strata, was not justified and avoidable expenditure thus could not be quantified. The reply of the Company/ Government is awaited.

Termination of contracts

2.2.10.7 As there was no response to Package 1 (LBC and its distributaries), it was split into four packages and tenders were invited afresh (May 2007). These packages were awarded (September 2007) to SSJV Projects Private Limited (SSJV) for ₹ 90.73 crore, with stipulation to complete the works by March 2008. As water was released to the canal on 5 December 2007, the time available was 90 days, during which period the progress achieved was only ₹ 5.93 crore. The Contractor requested (May 2008) for extension of time of six months excluding monsoon and advance of ₹ 2 crore per package,

which were not accepted. After 18 months all the four contracts were rescinded (November 2009), without risk and cost.

The Chief Engineer split the works into 10 packages and tendered them in August 2009 and TSC approved (August 2009) the decision to split the works. The works were awarded to different contractors between December 2009 and June 2010 for a total contract value of ₹ 108.03 crore, with stipulation to complete the works in nine months.

We observed that on the one hand the Company had refused extension of time for six months to the contractor and on the other took no action to restart the work for almost 1½ years from the date of request of the earlier contractor. This resulted in delay in completion of the works and extra expenditure of ₹ 23.23 crore⁶⁸.

2.2.10.8 The work of modernisation relating in the reach 0 to 60 km of RBC (Package-2A) was entrusted (July 2007) to IVRCL Private Limited, for a contract value of ₹ 106.83 crore. The agency stopped (December 2007) the works after executing works valued at ₹ 5.81 crore on account of releasing of water in the canal on 5 December 2007.

The Board decided (December 2007) that wherever the contractors did not agree in writing to complete the work at the tendered rates if the canal was closed for a period of three months other than monsoon period, the Chief Engineer was authorized to close the contracts on ‘as is where is basis’.

IVRCL, however, requested for extension of time of contract, with six months continued closure of canal without letting water into it, for completion of the balance works. The Company, however, did not immediately take decision to rescind the contract. The contract was terminated in October 2010, after a lapse of 33 months, without risk and cost.

The balance work amounted to ₹ 101.02 crore at the tendered cost. Additional quantities required for completion of work due to earlier defective estimation was ₹ 47.74 crore. The balance and additional works were split into three packages (2A1, 2A2 and 2A3) for invitation of tender (October 2010). The Company received offers for two packages (2A1 and 2A3), which were awarded in December 2010. Tenders for the other package (2A2) were invited (August 2011) and contract was awarded (November 2011). The total contract value in respect of these three packages amounted to ₹ 223.58 crore. These contracts did not provide for Price Variation clause but included weightage of 25 per cent towards CC lining works, with stipulation to complete the work in a period of three months. The extra burden due termination of contracts without risk and cost and delay in decision amounted to ₹ 50.80 crore.⁶⁹

⁶⁸ ₹ 108.03 crore less (₹ 90.73 crore less ₹ 5.93 crore).

⁶⁹ considering the proportionate cost of award in the retender, excluding additional works.

As stated above, the Package 2A1 related to the work of 0 to 20 km, which was entrusted (December 2010) to GVPR for a contract price of ₹ 71.31 crore. The contract provided for additional 25 *per cent* weightage for CC lining works carried out within one full closure period as prescribed in the Schedule of Rates of 2010-11. The agency could not complete one full closure period since only one month was available during the closure period of 2010. GVPR after executing works valued at ₹ 2.78 crore stopped (December 2010) the work on account of releasing of water in the canal and requested (June 2011) for extension of time upto December 2011 with 25 *per cent* weightage for the items of CC lining on the grounds that one full canal closure period was not provided as per the agreement. This was not accepted by the Company. The contract was terminated (September 2011) without risk and cost in violation of the terms of the contract.

Tenders were invited (September 2011) for balance work of the Package and was entrusted to another contractor (Hayagreeva Infrastructure Projects) for ₹ 77.74 crore, inclusive of 25 *per cent* weightage for CC lining works. While the request of GVPR for extension and weightage of 25 *per cent* was not allowed, the agreement with the second contractor to complete the balance work in December 2011 stipulated to be completed by January 2012 was inclusive of 25 *per cent* weightage on CC lining works. The avoidable extra expenditure on account of such improper decisions amounted to ₹ 9.21 crore.

Thus, improper decisions and inordinate delays resulted in avoidable extra expenditure of ₹ 60.01 crore (*i.e.*, ₹ 50.80 crore + ₹ 9.21 crore).

The Government stated that due to practical difficulties faced during execution and following of departmental procedure in rescinding and re-entrustment of contract there was considerable delay which was not attributable to mismanagement and the main aim was to complete the modernisation work at least in the extended period.

The contention of the Government was not acceptable since the rescinding of contract without risk and cost was contrary to the terms of contract and there was no justification for the delays of 18 months and 33 months in rescinding the respective contracts of LBC and RBC.

Inadmissible payments for price variation of Cement

2.2.10.9 The Price Variation Clause was included in the agreement to compensate for the increase in prices of all components during the course of execution. The period from when the price variations have to be allowed was, therefore, very important, as change in base period would lead to excess payment.

The Company entrusted ten works during June 2007 at five *per cent* above the SR of 2007-08 recast with price of cement prevailing during May-June 2007. The price of cement as per the SR of 2007-08 effective from 2 April 2007 was ₹ 190 per bag, which was increased to ₹ 225 per bag, the price prevailing

during May to June 2007 and this was factored in at the time of acceptance of tenders. In other words, the contractors were already paid for the increase in price of Cement during May-June 2007 through the recast amount.

The Company, however, allowed the variation in price of cement taking the base rate as ₹ 190 per bag instead of ₹ 225 per bag. Hence, the price escalation should have been allowed from July 2007. This had resulted in extending undue benefit of ₹ 7.66 crore to the contractors.

The Government replied that the tenders were entrusted during June 2007. The market rates of cement during that period was considered to arrive at the updated cost for realistic comparison purpose of the quoted percentage so as to justify the decision of finalizing the tender premium and these calculations were not part of agreements and that the PV of cement was made as per tender document.

Tenders were awarded (June 2007) after computing the rates for individual items by considering the market price of cement prevailing in the quarter of May to June 2007. The payments were made based on these rates. Price variation was therefore applicable only from quarter commencing from July 2007. Hence, the contention that updated cost was used only for comparison purpose was factually incorrect.

Cement Concrete lining

2.2.10.10 The Code of Practice for Cement Concrete (CC) lining on canals published by the Bureau of Indian Standards (BIS) - IS 3873 of 1993, had prescribed the following thickness of CC lining based on canal capacities.

Capacity of canal in cumecs	Depth of water in meters	Thickness of lining in mm
0 to 5	0 to 1	50 to 60
5 to 50	1 to 2.5	60 to 75
50 to 200	2.5 to 4.5	75 to 100

The actual discharge of water in the distributaries and canals varied from 0.03 cumecs to 33.72 cumecs and the depth ranged from 0.25 mtrs to 3.90 mtrs. The Company, deviating from the prescribed standards, provided CC lining of thickness of 100 mm for work executed mechanically through pavers and of 75 mm for manually executed works to the canals, distributaries and minors, irrespective of the carrying capacity and depth. This resulted in excess lining than the prescribed thickness. The extra thickness amounted to 54.39 lakh sq. mtrs. of mechanically executed CC lining and 3.66 lakh cum of manually executed CC lining. Had the Company adopted the thickness of lining as per IS standards, the expenditure could have been reduced by ₹ 106.45 crore.

The Government replied that IS 3873:1993 specifies minimum thickness of CC lining to the canals with reference to the carrying capacity of canal and depth of water and could be increased depending upon the soil strata, canal

characteristics, climatic conditions, structural stability, overturning of sides, durability *etc.*, and that the minimum thickness specified can be relied upon for new canals, but adoption of such thickness for old aged canal would be too risky and unpredictable. Further, it was stated that the Expert committee suggested for 10 cm thick CC lining and hence 10 cm thick CC lining is adopted for bigger canals where mechanical pavers could be used and 7.5 cm thickness is adopted for minor and small channels which would be done manually and thus the decision taken in this regard was not a violation of IS specification as it was commensurate with the field requirement.

The reply was not acceptable for the following reasons.

- The IS code recommends increased thickness in case of freezing climate only and the area where the CC lining was executed did not fall under that category and hence not applicable in relation to climatic conditions.
- Adequate backing of good quality soil as per norms was provided behind the CC lining to counter the swelling pressure in the soil strata.
- The IS specification stipulated was for all canal characteristics, structural stability and durability and was applicable for all canals whether new or old.

Full Supply Depth and Free Board

2.2.10.11 The lining provides smooth surface thereby causing less resistance to the flow of water. The capacity is a function of velocity; higher the velocity, greater the carrying capacity of the canal and consequently, it reduces canal section required. The capacity of a canal is increased by lining it.

The existing sections were designed with reference to those required for unlined canal and accordingly, the Full Supply Depth⁷⁰ (FSD) and Free Board⁷¹ (FB) were worked out. When unlined canals were taken up for lining, the option was to line the canals without changing the section or to reduce the section of the canal. In first option, original section was retained for lining without changing the bed width, height of the FSD would decrease as the carrying capacity in a canal is the function of velocity of water. The lining is to be restricted to reduced FSD plus FB as per norms.

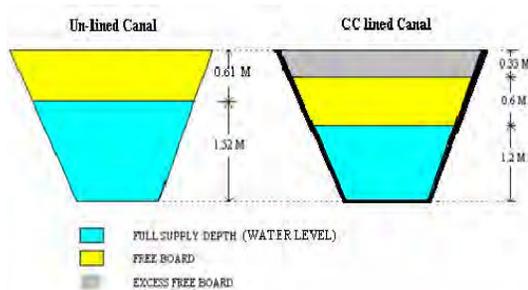
We observed that though the original sections of the canals and distributaries were retained, side lining height was not reduced by working out revised FSD. It was done up to original FSD plus FB level leading to execution of unwarranted side lining above the revised FSD levels and hence expenditure thereon was avoidable.

⁷⁰ water level in the canal at its designed discharge.

⁷¹ the minimum vertical distance provided above FSD in the water way of the canal.

Supply of more water is also not possible, as the quantum is allotted and restricted by the award of the KWDT.

An illustrative diagram indicating change in water level between the unlined and lined canal having same cross section and at a designed discharge is shown alongside:



The avoidable expenditure⁷² with reference to Bureau of Indian Standards 3973 of 1993 worked out to ₹ 59.21 crore.

The Government replied that in view of the age of the canal the guidelines in IS and manuals might have to be ignored or deviated under special circumstances and hence the technical norms were not considered. It was also stated that drastic reduction in FSD was also not thought of since all the outlets existing at canal to canal junctions were already fixed with respect to the originally designed FSDs and drastic reduction in FSD would reduce the outflow of water leading to failure of irrigation.

The Technical Advisory Committee, Irrigation Projects of the GoK had opined (April 2010) that the FSD had to be reduced in case of lining an unlined canal while approving the proposals of modernisation of distributaries of Tungabhadra Left Bank Canal. The carrying capacity of canal up to FSD was for carrying the required discharge and additional FB was prescribed only to accommodate additional quantities of water due to storm. Hence, higher FB was not required as per technical parameters laid down, whether they relate to old or new channels. Analysis of cross sections was not available to substantiate the statement that there were special circumstances for ignoring the guidelines in the IS, manuals, circulars *etc.*

Alteration of measurements

2.2.10.12 The works relating to Left Bank Canal from 0 to 77 Km and its distributaries in four packages were awarded (September 2007) to SSJV Projects Private Limited (SSJV) with stipulation to complete the work by March 2008. The works, *inter alia*, included excavation in ordinary soil (EOS) and removal of silt. The Contractor executed works such as jungle clearance, excavation, silt removal *etc.* The Contractor stopped the work in November 2007 as water was allowed in the canal. The SSJV requested for extension of time (May 2008) for six months excluding monsoon period. The Company did not agree to this request and rescinded the contracts (November 2009). It was reported that pre-measurements were taken on various dates during October and November 2007.

⁷² as per 'Manning's Formula' by taking value of 'N' as 0.018 for CC lining surface, where 'N' represents roughness index of the surface.

However, the Superintending Engineer of the Project issued (January 2009) a notice to SSJV to depute their representative on 12 January 2009 to take final measurements. As SSJV did not respond, final measurements were taken *ex-parte* on 12 January 2009. The final measurements revealed that SSJV had executed some portion of work in Packages 1a and 1b, but had not executed any work in respect of Packages 1c and 1d. On the basis of the final measurements, the total amount payable to the Contractor in four contracts worked out to ₹ 3.37 crore. The actual payment till then (December 2008) was ₹ 3.24 crore.

Meanwhile, the Company altered its decision of January 2009 regarding the quantities of work executed stating that the pre-measurements were recorded during October / November 2007 in the Measurement Books issued to the Section Officer during August 2009 and modified the quantities of work executed. SSJV was paid (September 2010) a further amount of ₹ 1.15 crore in respect of Packages 1(a) and 1(b) and ₹ 1.54 crore in respect of Packages 1(c) and 1(d). Thus, SSJV was paid a total amount of ₹ 5.93 crore as per pre-measurements.

The final measurements taken by the Company was ignored for effecting payments to the SSJV. Thus, the payment of ₹ 2.69 crore was not as per the final measurements taken by the Company.

The balance works were segregated into 10 packages and entrusted to different contractors during 2009-10. The quantities for which payments were made to the SSJV were also included (December 2009) in the package awarded later, which showed that SSJV was paid for quantities not executed by them.

The Government replied that in the course of finalization of first agency the quantities *viz.*, jungle clearance, silt removal and earth work excavation (stripping) were not fully accounted while working out the balance quantities (which was actually executed and recorded by the concerned authorities). The Government further added that the above items, which were executed during 2007, had to be carried out once again due to prolonged period of almost two years in taking up the balance works.

The reply was not acceptable as the Superintending Engineer had recorded (January 2009) the actual measurements based on which the balance quantities were derived. Hence, pre-measurements stated to have been recorded in November 2007 appeared to be unreliable. The statement of the Government that two years had passed and execution of same work again had resulted in extra financial burden on the Company.

Liquidated damages

In spite of delay in completion of work, liquidated damages of ₹ 49.22 crore had not been levied.

2.2.10.13 In accordance with Clause 2d of the conditions of the contract, penalty equal to one *per cent* of the estimated cost of the balance work assessed according to the programme, for every day that the quantity of work remains incomplete, was leviable; provided that the total amount of penalty to be levied did not exceed 7.5 *per cent* of the estimated cost of the entire work.

We observed that Company had extended completion time up to January 2011 in respect of all the 33 contracts. The Company, however, has not levied liquidated damages till date (August 2012) for period after January 2011 which worked out to ₹ 49.22 crore.

The Company stated that delay in progress of works owing to stoppage of work by the farmers for providing RCC lining, unprecedented heavy rains, insufficient canal closure periods and difficulty in conveying of materials. These factors could not be attributed to the contractors or the Company.

The reply was not acceptable as audit had commented the non-levy of liquidated damages from the period from January 2011 onwards.

Financial management

Funding of the project

2.2.11.1 The provision for all capital works of the Company are made by the GoK in the budgets. The Company allocates such funds to different Projects under execution.

During the year 2005-06, the GoI introduced a scheme for providing Central Assistance through Prime Minister's Special Rehabilitation Package under the Accelerated Irrigation Benefit Programme (AIBP).

Central Government Assistance

2.2.11.2 The scheme under AIBP operative from 2006-07, provided for financial grant of 90 *per cent* of expenditure of works of irrigation in identified drought prone districts and 25 *per cent* for other districts.

Out of the three districts covering command area, Chikmagalur (5,067 hectares) was drought prone and the remaining command area of Davanagere (79,262 hectares) and Shimoga (21,241 hectares) was not drought prone. The central assistance eligible was 28.12 *per cent*⁷³ of works component for the whole Project on an average.

⁷³ considering proportionate command area.

To obtain central assistance, the proposals of Projects were required to be submitted to various authorities of GoI, CWC, Ministry of Water Resources (MoWR) and Planning Commission - for their clearance / acceptance.

The year-wise details of the annual work programme proposed to CWC, budgetary allocation, Central Assistance(CA) recommended, released and shortage/excess thereof during the period from 2007-08 to 2011-12 are as under:

₹ in crore							
Year	Proposed Programme to CWC and Planning Commission	Budgetary allocation	Recommended Central Assistance	Actual Expenditure	Eligible Central Assistance at 28.12 per cent	Central Assistance released	Difference in Central Assistance Excess (+) Shortage (-)
2007-08	NA	239.00	-	217.31	61.107	-	-61.107
2008-09	352.09	271.21	99.009	121.49	34.163	99.009	+ 64.846
2009-10	400.00	257.54	47.640	239.30	67.291	41.929	- 25.362
2010-11	340.00	255.00	56.125	143.50	40.352	Nil	-40.352
2011-12	208.00	200.00	58.490	198.99	55.956	52.641	- 3.315
Total			261.264	920.59	258.869	193.579	-65.290

We observed that:

- The Company had submitted (July 2005) the DPR of the Project for techno-economic examination to the CWC. The DPR was examined and the comments of the Central Ground Water Board (CGWB) were forwarded to the Project authorities. The revised estimate of the Project was furnished (July 2007) to the CWC for clearance by the Technical Advisory Committee of the Ministry. The Secretary, MoWR indicated (July / August 2007) that the position was far from satisfactory and directed that the proposals for central assistance be forwarded at the earliest. In response, the Company submitted an estimate for ₹ 957.66 crore to the CWC in January 2008, after complying with their comments. The CWC cleared the estimate for ₹ 951 crore during February 2008. The Government accorded (February 2008) administrative approval and the proposal was cleared (March 2008) by the Planning Commission by limiting the Project cost to ₹ 932 crore, with stipulation to complete the Project by 2009-10.

As could be seen there was delay in obtaining clearance for central assistance. By the time the approval was accorded by the Planning Commission, the year 2007-08 had closed.

Further, though the works component of the entire Project was eligible for assistance, the proposals of the Company for the year 2007-08 included only Chikmagalur and Shimoga Districts. Thus, the Company lost the central assistance of ₹ 61.11 crore for the year 2007-08. Between the years 2008 and 2012, the Company received CA of ₹ 193.58 crore against the eligible amount of ₹ 197.77 crore, resulting in short receipt of ₹ 4.18 crore. The total Central Assistance foregone was ₹ 65.29 crore, as there

was no commitment for reimbursement of the same from the GoI as on date (September 2012).

- As could be seen from table above, the Financial Progress achieved was far less than the budgetary allocation during the year 2008-09 to 2010-11, indicating that the programmes were not drawn scientifically. Further, the entire modernisation was decided (November /December 2006) to be completed by June 2008, which was again decided (December 2006) to be completed by December 2007. While the physical progress was targeted to be completed by December 2007, the financial programme was spread over many years.

The Government accepted the fact that since the investment clearance of the Planning Commission was received on 31 March 2008, the AIBP proposal could not be processed for Central Assistance by MOWR for the year 2007-08, as the funds allotted under AIBP to the State was exhausted. Further, there was a short fall of expenditure in comparison to the programme (proposed to CWC) in the years 2008-09 and 2009-10, which resulted that no CA could be received in 2010-11.

The fact remained that the Government could not receive the CA to the full extent due to various deficiencies attributable to the Company.

Water management

2.2.12.1 The success of an irrigation project depends upon supplying the allocated water to all parts of the command area including tail end reaches and ensuring that the command area is not adversely affected due to water logging.

Notifications were issued by the Superintending Engineer before the commencement of each season as to the extent of command area for each distributary and the types of crops to be grown therein with the date(s) of supply of water. The farmers of the notified area were required to adhere to the notified cropping pattern and were liable for payment of water rates. Growing of non-notified wet crops such as paddy, sugarcane and garden crops against notified semi-dry crops in any area adversely affects the irrigation in lower reaches of the main canals/distributaries as wet crops consume more water. The cropping pattern violation and unauthorized irrigation attract penalty in the form of penal water rates at five times and 15 times the normal water rates respectively.

The Government informed that there was no failure on the part of the department while levying the water rates and the details were submitted to Revenue authorities and also Water Users Co-operative Societies, whose responsibility was to collect the charges.

Crop pattern (CP)

2.2.12.2 The year wise details of the notified crop pattern, extent of total area irrigated and area irrigated with cropping pattern violations during the period from 2006-07 to 2010-11 of the project are as follows:

Year	Total area irrigated	Area in which there was crop violations	Per cent	area in ha	
				Irrigated area as per prescribed crop pattern	Per cent
2006-07	1,81,253	1,21,144	66.84	60,109	33.16
2007-08*	93,413	63,615	68.10	29,798	31.90
2008-09	1,97,016	1,31,668	66.83	65,348	38.50
2009-10	1,90,446	1,31,706	69.16	58,740	33.17
2010-11	1,95,941	1,37,259	70.05	58,682	29.95

* One season of rabi crop only.

Violation of cropping pattern continued over the years.

The violation of crop pattern in irrigated area ranged from 66.83 per cent to 70.05 per cent of the total area irrigated. This was one of the main reasons for higher consumption of water than the allocation and suffering atchkat in tail end reaches.

The Government agreed to the fact of crop violation and stated that the issue was being controlled by creating awareness among the farmers.

Crop loss

2.2.12.3 The TSC had decided (November / December 2006) that the modernisation works be executed within 8 months and for this purpose it was suggested that water in the canal could be stopped for Rabi season of 2007 and works taken up for execution between 15 November 2007 and June 2008. The Board decided (December 2006) to recommend the same to the Government. However, in the meeting held (December 2006) by the then Chief Minister it was decided to complete the works before December 2007.

Failure to complete the works by December 2007 resulted in crop loss of ₹ 248.76 crore and foregoing socio-economic benefits of ₹ 100.64 crore to the farmers as detailed below:

Crop grown	Average area irrigated during previous three seasons (ha)	Yield per hectare (in quintals)	Rate per quintal (in ₹) during 2006-07	Crop loss (₹ in crore)	Farming expenditure (in ₹ per hectare)	Total expenditure (₹ in crore)	Benefit lost (₹ in crore)
(a)	(b)	(c)	(d)	(e)=(b)*(c)*(d)	(f)	(g)=(b)*(f)	(h)=(g)-(e)
Paddy	57,350	43	639	157.58	17,792	102.04	55.54
Sugarcane	7,860	1000	116	91.18	58,625	46.08	45.10
Total				248.76		148.12	100.64

It is also relevant to note that many Rabi and Khariff seasons passed by though the works of modernisation continued for the next five years.

The Government contested the issue of crop loss on the grounds that none of the major projects of such magnitude could be completed as planned due to funding and practical local difficulties connected with the release and stoppage of water based on local conditions. The benefits of modernisation in the long run were more when compared to loss of one crop which had been forgone by end user voluntarily. Even though paddy had not been grown in this period, the farmers had safeguarded the existing sugarcane crop and in addition, they had grown semi-dry crops in the area using rain water. There might not be loss to the extent assessed by audit.

It is evident from the reply that it was not possible to complete the work in one closure period (June to December 2007). The fact remained that there was crop loss and in the absence of data regarding output of the other crops grown during this period, the loss could be quantified only on paddy and sugarcane.

Targeted objectives vis-à-vis achievement

2.2.12.4 The Project was taken up to reduce seepage losses, to reduce the water utilization to the allocated 61.70 tmc and irrigate 1,77,337 hectares of area in both seasons (including supply of water to the suffering atchkat of 9,118 hectares).

We observed that during 2010-11:

- Command area irrigated was only 1,59,651 (in both seasons) and the consumption of water was 69.06 tmc.
- Against the area of 9,118 hectares of atchkat at the tail end of the canal, which suffered for want of water before modernisation, 2,132 hectares was still suffering for want of water (September 2012).

Thus, the utilization of water, which was on an average of 74 tmc before modernisation was taken up had reduced to only 69.06 tmc. This was much higher than the allocation of 61.70 tmc under KWDT Award and one of the objectives of modernisation to reduce the usage of water remains unachieved.

The Government stated that works were nearing completion and suffering atchkat was being reduced. Action was taken to irrigate the balance suffering atchkat.

Water logging

2.2.12.5 Agricultural land is considered waterlogged when soil pores in crop root zone are saturated by a rise of sub-soil water-table. In course of time, such land turns saline or alkaline becoming unfit for cultivation. The main cause of water logging is application of water supplied for irrigation to crops much

beyond the expo-transpiration requirement and inadequate drainage and deficient maintenance of canal network.

We observed that as per the data of the CADA, 34,688 hectares of irrigable land was affected due to water logging, salinity and alkalinity, before modernisation was taken up, as at end of March 2006. As at end of March 2012, the land affected due to these reasons were 23,218 hectares. Compared to the Command area of 1.05 lakh hectares, this land constituted 16.85 *per cent* of the total command area and required reclamation.

We observed that the issue of water logging, salinity and alkalinity affected areas were not appraised to the Government, when the modernisation of the project was taken up. Only the tail end atchkat of 9,118 hectares, suffering for want of water was considered. The targeted irrigable area including the tail end atchkat and the quantum of water drawn have to be viewed in this context.

The Government stated that once the modernisation work was completed the target of limiting the utilisation to 61.70 tmc would be achieved and over-utilisation of water in command area would be reduced, which automatically would control water and salinity effects.

Water Users' Co-operative Societies (WUCS)

2.2.12.6 GoI formulated National Water Policy 2002, which envisaged formation of WUCS by farmers for handing over water management to ensure equitable distribution of water to all parts of the command area. The Working Group on Water Resources for the XI Plan (2007-12) had recommended (December 2006) that Water Users Associations should be involved in planning, budgeting, implementation and management of irrigation systems and hand over the systems to them to ensure optimum utilization of irrigation potential created.

As per the details furnished by CADA, though 270 WUCS were registered, only 153 have executed the Memorandum of Understanding with Water Resources Department of which only 97 have taken over water management (March 2012). The remaining command area was deprived of the mechanism of WUCS.

The Government informed that CADA was taking all necessary steps to form the balance WUCS. Action was also being taken to actively involve the existing WUCS in water management.

Demands by the revenue authorities

2.2.12.7 According to the provisions of Karnataka Irrigation (Levy of Water Rates) Rules 1965, the Irrigation Officers were responsible for raising the demand of water charges and maintenance cess prescribed against each farmer and forward the same to the Revenue Authorities concerned of the taluk/village for registering and recovering the same from the farmers

benefitted through irrigation. The taluk offices are required to maintain watch register of demand, collection and balance (DCB) and forward the extract to Irrigation Officers periodically.

We observed from the DCBs of Revenue Department and demands stated to have been raised by the Irrigation Officers of three divisions during 2006-11, that there was difference (₹ 104.80 crore⁷⁴) between the demands registered by the Revenue Authorities and those stated to have been raised by the Irrigation Officers as given below:

₹ in crore

Division	Taluk	Water charges and cess demanded	Water charges and cess registered by Revenue Authorities	Difference	Collection
Davanagere	Davangere	39.63	7.79	31.84	4.14
	Harihar				
	Channagiri				
Malebennur	Bhadravathi	27.35	1.66	25.69	1.83
	Honnali				
Bhadravathi	Shimoga	23.47	23.47	0.00	3.06
	Bhadravathi				
	Tarikere				
Total		90.45	32.92	57.53	9.03

The Government stated that the observations were noted and that as per the Levy of Water Rates, rules 1965, the demand raised is being collect by the Revenue Authorities till date.

Results of survey of the beneficiaries

2.2.12.8 We held a field survey (August 2012) of the beneficiaries located in the initial, middle and tail end reaches of the Project to assess the impact of modernisation and obtained the following response:

- After modernisation there was no increase of yield per acre in the initial and middle reaches. In tail end reaches there was moderate increase of yield.
- All the farmers including tail end reaches are cultivating wet crops like paddy, sugar cane and garden crops in both Khariff and Rabi seasons as sufficient water was accessible to them.
- The present tariff of water rates was affordable.

⁷⁴ including ₹ 47.27 crore, which was the difference in the opening balance/closing balances in Davangere Division for 2009-10/2010-11.

- Violating the cropping pattern was to grow wet crops on account of availability of water and higher benefits.

This results in excess consumption of water than that allocated.

Acknowledgment

We acknowledge the co-operation extended by Water Resources Department, Government of Karnataka and the Company in facilitating the conduct of audit.

Conclusion

We conclude that:

- **The project was envisaged to start in June 2007 and to be completed by December 2007. Even after five years (December 2012) from the scheduled completion date, the project was still in progress.**
- **Despite incurring ₹ 1,003.33 crore on modernisation, about 2,132 ha of the ‘suffering’ tail end atchkat of 9,118 hectares remained without water supply (September 2012).**
- **The estimates and extent of work were not determined, leading to change in scope of modernisation programme.**
- **The Company decided to modernise the entire stretch of main and branch canals ignoring the recommendation of the Expert Committee to limit it to vulnerable structures and without the approval of competent authority.**
- **Change of scope after inviting tenders was in contravention of the KTPP Act. Limiting the tender access only to the Category-I contractors enrolled with the Company, who satisfied the prescribed the pre-qualification criteria, resulted in foregoing competitive rates.**
- **Award of the contracts at negotiated rates and on single tender basis in several cases under the plea of urgency was in violation of the GoK and CVC guidelines.**
- **The works, which were originally envisaged under six packages were split again and again and are now executed in 33 packages. The Company extended time of completion (January 2011) in respect of all the contracts without levying liquidated damages for delays.**
- **The Company included price variation for works to be completed in seven months as well, in contravention of the orders of the Government of Karnataka. Adoption of lower rates as base price for**

calculation of price variation of cement resulted in undue benefit to the contractors.

- The Company ignored the specification of the Bureau of Indian Standards (BIS) by resorting to excess thickness of lining of canals and lining beyond the required height resulting in creation of excessive Free Boards. The avoidable expenditure was ₹ 165.66 crore.
- There was huge difference between the demands for water charges and maintenance cess registered by the Revenue Authorities and that raised by the Irrigation Officers. There was no proper monitoring mechanism.

Recommendations

We recommended that:

- The Government orders/ directions/ design manual of the Irrigation department, provisions of the KTPP Act and CVC guidelines should be scrupulously followed in tendering and awarding of contracts.
- There should be definite estimates of the quantum of work to be executed. The time frame should be clearly defined and adhered to.
- The management of contract and additional quantities executed, needed to be investigated.
- Efforts should be made to avail the full extent of Central Financial Assistance.
- There is need to create awareness on the prescribed crop pattern.