

2. Performance Audits relating to Government Companies

2.1 Performance Audit on 'Implementation of Lift Irrigation Schemes by Karnataka Neeravari Nigam Limited'.

Executive Summary

Introduction

Lift Irrigation Schemes

Gravity or flow irrigation is a conventional irrigation system wherein water is stored in a dam or barrage or large tanks and drawn for irrigation through canal network. Lift Irrigation Schemes (LIS) are those schemes where pumping machinery is installed on the banks of perennial rivers and streams, seasonal rivers with barrages, in or above the foreshore of storage reservoirs, wells, etc. for pumping water and transporting it through a rising main to higher elevations for irrigation of lands where water cannot be supplied by gravity.

Karnataka Neeravari Nigam Limited

The Karnataka Neeravari Nigam Limited (the Company) was established (December 1998) to plan, build, operate and maintain irrigation projects in the Krishna River basin except Upper Krishna Project in the State. The Company was one of the three Special Purpose Vehicles set up by the Government of Karnataka (GoK) for speedy implementation of irrigation projects in the State.

Audit Objectives

The objectives of the Performance Audit were to assess the effectiveness of the Lift Irrigation Schemes by examining whether:

- the LISs were planned and designed properly;
- the LISs were executed as planned and the objectives set out in the schemes were achieved.

Audit Findings

Inordinate delay in materialising LISs

The Government/Company had taken unreasonably longer time for materialising the LISs for their implementation and completion. The scope of work of six of the 13 sampled LISs was modified multiple times due to

frequent/multiple changes in scope in terms of irrigation potential, number of lifts, alignment of canals, *etc.* causing cost and time overruns. Though the Government had given administrative approvals to seven out of 13 LISs (Bhima, Hipparagi-4 LISs, Singatalur, Tiluvalli) as early as 1991-92 and 1992-93, no action was initiated for their implementation for more than a decade. The projected cost of 13 LISs had gone up by more than 240 *per cent* as compared to initial proposals, from ₹ 3,549.19 crore to ₹ 12,154.81 crore. The farmers, for whose benefit the schemes were launched, are still awaiting the full extent of the envisaged benefit, with no assurance on when the schemes will be completed. (Paragraph 2.1.14)

Creation of excess infrastructure due to ill-planning

The Company constructed lifts under Ainapur LIS and Halyal LIS for creating irrigation potential of 21,962 ha and 20,635 ha respectively at a total cost of ₹ 57.99 crore. The actual irrigation potential was, however, reduced to 7,669 ha and 6,072 ha under these LISs respectively as the beneficiary farmers laid pipe lines directly from the river Krishna for drawing water to their fields after obtaining due permission of the Company in line with the circulars issued by GoK. As a result of creation of lifts without taking cognizance of the reduced irrigation potential due to such permissions, the full benefit of the investment of ₹ 22.10 crore made on the 1st stage lift of Ainapur LIS and ₹ 35.89 crore made on Halyal LIS was not derived as the Company could create only 35 *per cent* and 29 *per cent* of the envisaged potential respectively. (Paragraph 2.1.15)

Unsatisfactory progress

- Singatalur Lift Irrigation Scheme (SLIS) was proposed (1986-87) to irrigate 16,188 ha of drought prone areas covering the districts of Koppal, Gadag and Bellary by utilising 5.06 Thousand Million Cubic Feet (TMC) out of allocated 7.64 TMC of water under left and right banks of the river Tungabhadra. The scheme was originally approved (September 1992) for ₹ 63.62 crore for construction of barrage across the river Tungabhadra and two lifts, one each on either side of the river bank. The scope of the scheme had undergone continuous changes and the latest revision proposed (January 2015) for irrigating 1.07 lakh ha including 0.88 lakh ha under micro irrigation at a cost of ₹ 5,768.04 crore. The Company, after a passage of thirty years of the conception of the scheme, could create irrigation potential of only 19,588 ha with an expenditure of ₹ 1,489 crore as of March 2016. The allocated water of 15.99 TMC is largely underutilised as the proposal of micro irrigation covering 87,792 ha was yet to materialise (December 2016). (Paragraph 2.1.19)
- Hipparagi Project was conceived (October 1991) to irrigate 59,692 ha at a cost of ₹ 186.70 crore. The scope of the scheme had been changed continuously, the latest revised (August 2016) cost being ₹ 3,330.23 crore for irrigating 74,742 ha. The project comprising four lifts *viz.* Halyal, Ainapur, Karimasuti and Savalgi-Tungal was completed between September 2011 and October 2013, *i.e.* after a lapse of twenty years from

its conception. The lift works of Halyal, Karimasuti and Savalgi-Tungal LISs were completed with a delay ranging from six years to seven years beyond the scheduled contract period. The benefit of LISs could not be passed on to the farmers for several years due to delay in completion. (Paragraph 2.1.20)

Avoidable expenditure

- There was substantial reduction in actual quantities executed as compared to the estimated quantities (13 to 24 per cent) based on which the works were awarded for lift works of five LISs due to change in location and alignment subsequent to award of contracts. This variation in quantities was mainly due to award of contracts without conducting detailed survey. Further, the Company failed to exercise the contractual provision to effect change in contract price due to change in scope of the works. The Company paid the full amount to the contractors irrespective of quantities that were actually executed. The reduction in quantities had not only benefited the contractors but also the Company had to incur avoidable expenditure of ₹ 141.70 crore. (Paragraph 2.1.23)
- The Company awarded (December 2014) Gravity Main for Tubachi-Babaleshwara LIS by providing Mild Steel (MS) pipes for a length of 13.37 km. instead of PSC pipes as required by the guidelines issued by WRD. The Technical Subcommittee of the Company, while recommending (June 2012) MS pipes had not given any justification for using MS pipes in deviation from the guidelines. The Company had incurred additional expenditure of ₹ 102.73 crore on account of this deviation which could have been avoided had the work been carried out as per the guidelines. (Paragraph 2.1.24)
- The works of the Guddadamallapura LIS consisting of intake channel, jackwell cum pump house, rising main, gravity main and canal network, awarded (September 2005) at a cost of ₹ 46.02 crore was not completed within the scheduled date of completion of May 2007. The Company closed the contract without risk and cost to the contractor which resulted in additional financial burden to the Company to the extent of ₹ 56.68 crore as the balance works were awarded (January 2010/September 2011) at higher cost. (Paragraph 2.1.26)

Underutilisation of irrigation potential

Though the Company had created irrigation potential of 1.36 lakh ha as of March 2016, the notification for the command area was issued only for 0.41 lakh ha, which was a mere 30 per cent of the total irrigation potential created. The notification for the balance 0.95 lakh ha was not carried out yet, as Field Irrigation Channels (FICs) were not completed. Further, the command area was notified only between 2014-15 and 2016-17 for the potential created between 2010-11 and 2015-16, after a delay upto four years due to delay in completion of FICs. (Paragraph 2.1.32)

Introduction

2.1.1. The geographical area of Karnataka State is 1.91 lakh square kilometres (190.50 lakh hectares). Agriculture being the main occupation in the State, irrigation plays a significant part. Water resources in the State are available from seven river basins¹⁷, the most significant of which is the Krishna River basin which covers 60 per cent of the catchment area *i.e.* 1.13 lakh square kilometres (113.29 lakh hectares). The State Water Policy, 2002 envisaged creation of an ultimate irrigation potential of 45 lakh hectares (ha) under major, medium and minor irrigation projects and to facilitate creation of an additional irrigation potential of 16 lakh ha by individual farmers using ground water.

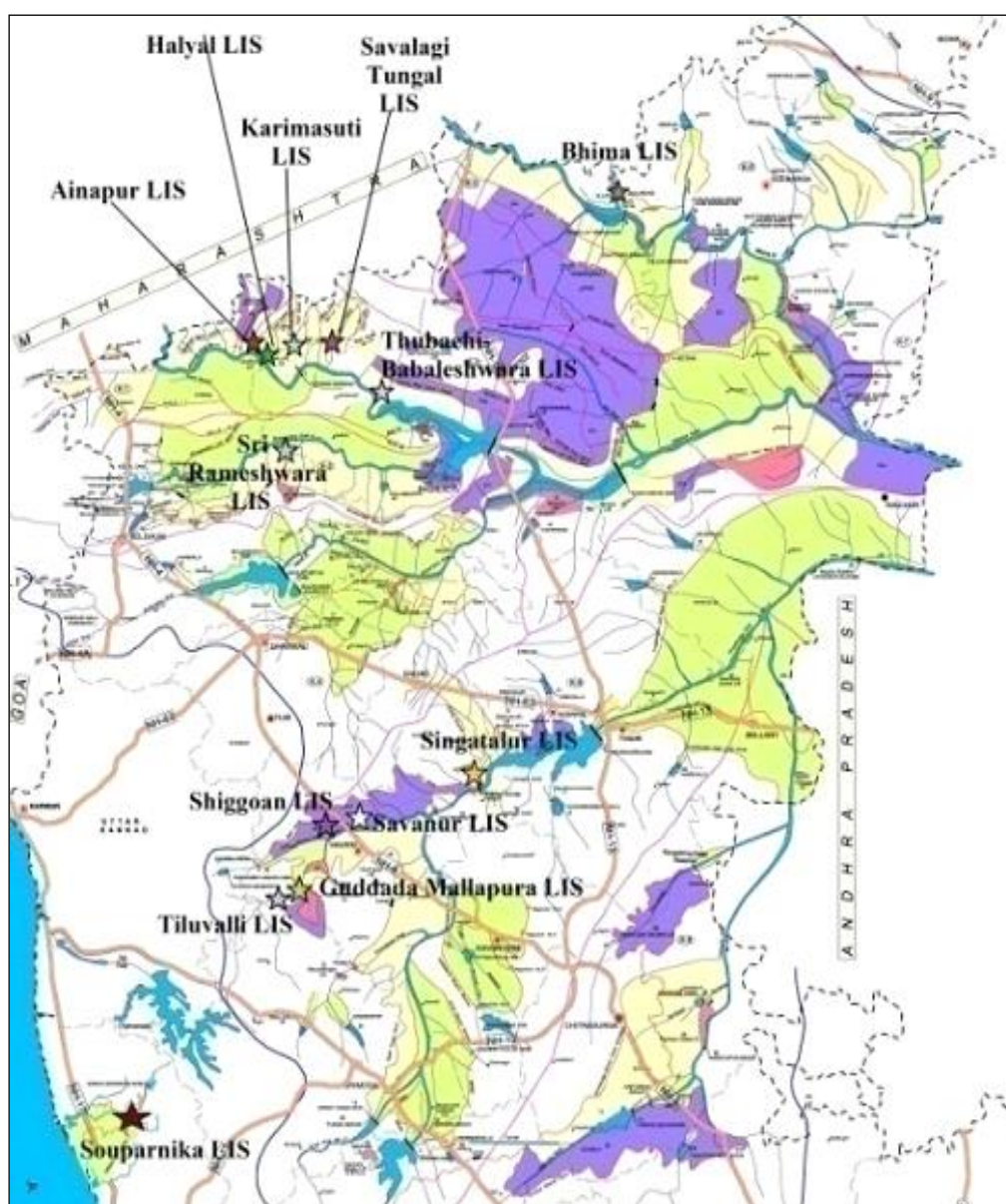


Chart No.2.1.1: Map showing Audit sampled LISs in Krishna River Basin

¹⁷ Other six river basins are Cauvery, Godavari, North Pennar, South Pennar, Palar and West flowing rivers.

Irrigation is carried out primarily by two methods viz. Gravity or Flow Irrigation and Lift Irrigation. The map depicts (Chart No.2.1.1) the sampled Lift Irrigation Schemes in the Krishna River basin and that of its tributaries in the State.

Lift Irrigation Schemes

2.1.2. Gravity or flow irrigation is a conventional irrigation system wherein water is stored in a dam or barrage or large tanks and drawn for irrigation through canal network. Lift Irrigation Schemes (LIS) are those schemes where pumping machinery is installed on the banks of perennial rivers and streams, seasonal rivers with barrages, in or above the foreshore of storage reservoirs, wells, etc. for pumping water and transporting it through a rising main to higher elevations for irrigation of lands where water cannot be supplied by gravity. A Pictorial diagram of conventional irrigation system vis-a-vis LIS is depicted in Chart No.2.1.2:

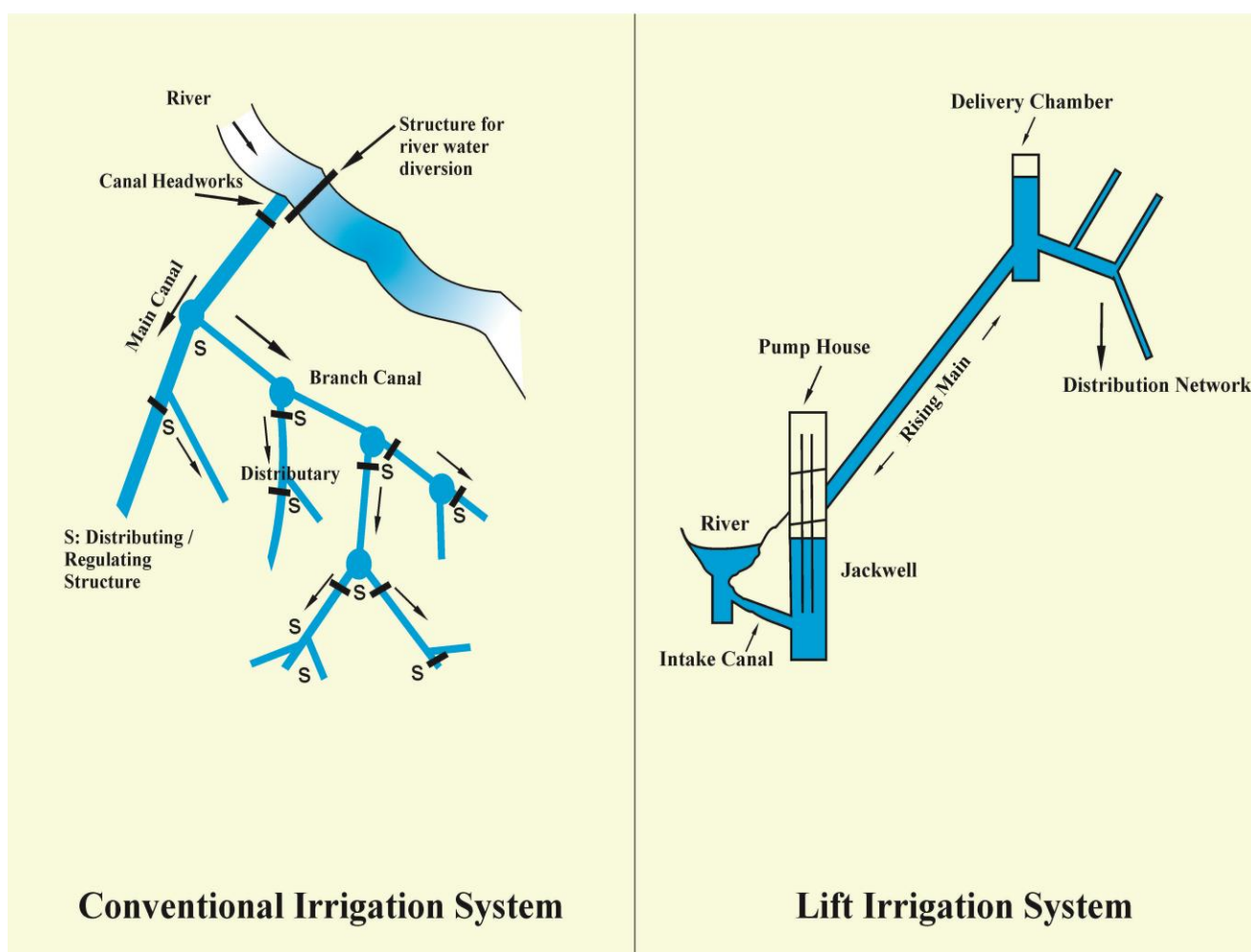


Chart No.2.1.2: Conventional irrigation system vis-a-vis LIS

A typical LIS consists of mainly five components viz. Intake Channel (Canal) to draw water from the source point (river), Jackwell cum pump house which draws water from the Intake Channel and pumps it through Rising Main which

carries water to the higher altitude and a Delivery Chamber from where the water gets distributed through the canal network.

Karnataka Neeravari Nigam Limited

2.1.3. The Karnataka Neeravari Nigam Limited (the Company) was established (December 1998) to plan, build, operate and maintain irrigation projects¹⁸ in the Krishna River basin except Upper Krishna Project in the State. The Company was one of the three Special Purpose Vehicles¹⁹ set up by the Government of Karnataka (GoK) for speedy implementation of irrigation projects in the State.

The funds for implementation of irrigation projects were sourced from the State budget, borrowings from banks and financial institutions, issue of bonds and assistance from the Government of India (GoI) under the Central schemes.

The Company has been implementing 107 irrigation projects with an ultimate potential of 19.30 lakh ha, which includes 6.82 lakh ha under 23 LIS projects. As of March 2016, the Company had created a cumulative potential of 14.21 lakh ha, which includes 4.58 lakh ha under LISs.

Organisational setup

2.1.4. The Company comes under the administrative control of the Water Resource Department (WRD), GoK. The Board of Directors (Board) of the Company, assisted by its Technical Subcommittee (TSC) is the decision making body. The Managing Director of the Company is responsible for managing day-to-day activities and assisting the Board. The projects taken up by the Company were executed and monitored at field level by the Chief Engineers at the Zonal offices assisted by the Superintending Engineers and the Executive Engineers at Circle and Division Offices respectively.

Command Area Development Authority

2.1.5. In pursuance of the Command Areas Development Act, 1980, the GoK constituted six Command Area Development Authorities (CADA) in the State with the objective of ensuring rapid and optimum utilisation of irrigation potential created under major and medium irrigation projects, increasing agricultural production and reducing the gap between the irrigation potential created and its actual utilisation.

The main functions of CADA *inter alia* included construction of Field Irrigation Channels (FIC), regulation of cropping pattern, proper utilisation of available water resources and implementation of participatory irrigation management through establishment of Water Users Co-operative Societies (WUCS) to promote a decentralised, self regulated and efficient water management system.

¹⁸ Construction of Dams, Barrages, Canal networks, Lift Irrigation Schemes, *etc.*

¹⁹ The other two were Krishna Bhagya Jala Nigam Limited and Cauvery Neeravari Nigama Limited.

Audit Objectives

2.1.6. The objectives of the Performance Audit were to assess the effectiveness of the Lift Irrigation Schemes by examining whether:

- the LISs were planned and designed properly;
- the LISs were executed as planned and the objectives set out in the schemes were achieved.

Scope of Audit

2.1.7. The Company had executed 23 LISs during 2011-12 to 2015-16. Out of these 23 LISs falling under six²⁰ zones, the Performance Audit covered 13 LISs²¹ which were selected for detailed audit based on geographical location of LISs, weightage based on project cost, irrigation potential and expenditure incurred. Besides, the transactions related to notification of irrigation potential and formation of WUCS in four²² CADAs were also scrutinised.

Audit Methodology

2.1.8. The methodology adopted for achieving the audit objectives involved explaining the audit objectives to the top management, scrutiny of records at WRD, GoK, Corporate Office of the Company and its divisions and offices of the CADA and issue of audit observations.

We explained the objectives of the Performance Audit to the Government and to the Management of the Company during the Entry Conference held on 20 June 2016. The draft Performance Audit report was discussed with the Government in the Exit Conference held on 12 January 2017.

Audit has been conducted in conformity with the Auditing Standards issued by the Comptroller and Auditor General of India.

Audit Criteria

2.1.9. The Audit Criteria adopted for achieving the audit objectives were derived from the following sources:

- Orders, Administrative approvals and guidelines issued by GoK;
- State Water Policy, 2002 and Guidelines issued by Central Water Commission (CWC);
- Decisions of the Board of Directors and Technical Subcommittee of the Company;

²⁰ Belgavi (nine LISs), Munirabad (one LIS), Kalaburgi (one LIS), Shivamogga (five LISs), Dharwad (six LISs), Siddapur (one LIS).

²¹ Bhima, Guddadamallapura, Hippargi (4 LISs-Ainapur, Halyal, Karimasuti, Savalgi-Tungal), Savanur, Shiggaon, Singatalur, Souparnika, Sri Rameswara, Tiluvalli and Tubachi-Bableschwara.

²² Tunga Bhadra Project CADA (Munirabad), Malaprabha and Ghataprabha Project CADA (Belagavi), Bhadra Reservoir Project CADA (Shivamogga) and Irrigation Project Zone CADA (Kalaburgi).

- Detailed Project Reports (DPRs), Detailed Estimates, Tender conditions and Contract agreements and
- Karnataka Transparency in Public Procurement (KTPP) Act, 1999 and KTPP Rules, 2000.

Acknowledgment

2.1.10. We acknowledge the co-operation extended by the Water Resource Department of GoK and the Management of the Company in facilitating the conduct of the Performance Audit.

Status of LISs

2.1.11. The envisaged irrigation potential for the selected 13 LISs was 3.10 lakh ha²³ with a total water allocation of 47.24 thousand million cubic feet (TMC) at a total project cost of ₹ 12,154.81 crore²⁴ as of March 2016. The Company had achieved irrigation potential of 1.36 lakh ha with a cumulative expenditure of ₹ 4,883.26 crore on these 13 LISs as given in the table below:

Table No.2.1.1: Achievement vis-à-vis envisaged irrigation potential as of March 2016

Sl. No	LIS	River	Water allocation for irrigation (TMC)	Envisaged potential (ha)	Achieved potential (ha)
1	Bhima	Bhima	5.63	24,292	16,721 (Work in progress)
2	Guddadamallapura	Varada	1.00	5,261	Work in progress
3	Ainapur	Krishna	11.64	21,962	74,742
4	Halyal			20,635	
5	Karimasuti			23,100	
6	Savalgi-Tungal			9,045	
7	Savanur	Varada	1.35	15,500	Work in progress
8	Shiggaon	Varada	1.35	13,500	9,900 (Work in progress)
9	Singatalur (SLIS)	Tungabhadra	15.99	1,07,380	19,588 (Work in progress)
10	Souparnika	Souparnika	1.02	1,730	1,730
11	Sri Rameshwara	Ghataprabha	2.20	13,800	13,800
12	Tiluvalli	Varada	0.76	1,012	Work in progress
13	Tubachi-Babaleshwara (TBLIS)	Krishna	6.30	52,700	Work in progress
Total			47.24	3,09,917	1,36,481

²³ Including 0.40 lakh ha added during 2011-16.

²⁴ The cost represents cost as approved in latest DPR by GOK (refer Appendix-4).

Though the achieved potential was projected at 1.36 lakh ha, the actual utilisation of potential was for 0.41 lakh ha which was a mere 30 per cent of the potential created because of non-creation of Field Irrigation Channels (refer Paragraph 2.1.32).

Audit Findings

2.1.12. The Audit findings on the planning and implementation of the selected 13 LISs during the period 2011-12 to 2015-16 are discussed in the succeeding paragraphs.

Deficiency in planning

2.1.13. As per the guidelines issued (March 2003) by the WRD, GoK, a detailed survey was required to be carried out at the site selected for LIS to facilitate preparation of designs and estimates and to establish technical and financial feasibility of the scheme. It also envisaged that the LIS should be identified after careful planning and design including proper selection of the type and capacity of the pumping machinery and size and classification of pipes for the rising main.

We observed that the Company did not conduct any detailed survey prior to taking up of head works²⁵. The initial DPRs and estimates of the LIS works were prepared without any detailed survey of field conditions. Successful bidders of LIS works were also given the responsibility of survey and design of head works, besides execution. As a result, the initial estimates had undergone several modifications during the course of execution. It had also resulted in avoidable cost as commented on in Paragraph 2.1.23.

We further noticed creation of excess infrastructure, selection of wrong sites for the lifts and resultant cost and time overruns. Further, various components of LISs were not synchronized resulting in idle investment and delay in commissioning. Related audit findings are discussed in Paragraphs 2.1.14 to 2.1.17.

Inordinate delay in materialising of LISs

2.1.14. We observed long delays in implementation and completion of LISs. The scope of work of six of the 13 sampled LISs was modified frequently due to multiple/frequent changes in scope in terms of irrigation potential, number of lifts, alignment of canals, *etc.* causing cost and time overruns. The details of initial estimated cost and irrigation potential of 13 LISs *vis-à-vis* their latest revised cost and potential are given in **Appendix-4**.

We observed that though the Government had given administrative approvals to seven out of 13 LISs (Bhima, Hipparagi – 4 LISs, Singatalur and Tiluvalli) as early as 1991-92 and 1992-93, no action was taken to implement them for more than a decade. The projected cost of these 13 LISs had gone up by more

²⁵ Head works consist of Intake Channel, Jackwell cum Pump House, Rising Main Pipes, Delivery Chamber and allied works.

than 240 *per cent* compared to the cost in initial proposals, from ₹ 3,549.19 crore to ₹ 12,154.81 crore (refer **Appendix-4**). Further, the completion of these LISs had been delayed beyond the due dates causing further cost escalation as discussed in the subsequent paragraphs of the report (Paragraphs 2.1.17, 2.1.19, 2.1.20 and 2.1.21). The farmers, for whose benefit the schemes were launched, are still awaiting the full extent of the envisaged benefit, with no assurance on when the schemes will be completed.

Creation of excess infrastructure due to ill-planning

2.1.15. The Company, while identifying the irrigation potential under two LISs of Hipparagi project *viz.*, Ainapur and Halyal, did not account for the fact that most of the farmers whose lands were in the proximity of the river bed (five to ten kilometres from the river bed) had laid pipe lines directly from the river Krishna for drawing water to their fields after obtaining due permission of the Company in line with the circulars issued (July 2002/May 2005) by GoK. The Company's failure to take cognizance of the reduction in irrigation potential due to such pipelines led to the creation of excess infrastructure as described below:

- Ainapur LIS under Hipparagi Project was initially planned (June 2001) for an irrigation potential of 21,962 ha. Accordingly, the infrastructure *viz.* Intake channel, Jackwell cum Pump house, Rising main and combined canal, was created (August 2010) at a total cost of ₹ 22.10 crore. But the actual irrigation potential was reduced to only 1,440 ha as most of the beneficiary farmers under the scheme had laid their own pipelines from the river for drawing water to their fields under permission from the Government/Company. The infrastructure created had, thus, become partly redundant. In order to utilise the excess infrastructure, the Company planned and constructed (October 2013) Ainapur 2nd Stage lift at an additional cost of ₹ 81 crore²⁶ for creating irrigation potential of 6,229 ha. Even after construction of the 2nd Stage lift, the actual irrigation potential created under both the Stages was only 7,669 ha (35 *per cent*) against the infrastructure created for 21,962 ha. Thus, the full benefit of the investment of ₹ 22.10 crore made on the 1st Stage lift was not derived as the Company could create only 35 *per cent* of the envisaged potential.

The Government replied (February 2017) that due to delay in implementation of the scheme the farmers drew water after obtaining permission. Such permission would get automatically cancelled once the LISs were completed.

The Reply is not acceptable as the permission to the farmers were continued to be issued even during 2014-15. It was seen by Audit during July 2016 that the farmers were drawing water through their pipelines from the River bed even after six years of completion of 1st Stage lift.

²⁶ Total cost of ₹ 162.60 crore incurred on head works (₹ 21.26 crore) and canal networks (₹ 141.34 crore) in 2nd Stage is reduced by ₹ 81.61 crore saved in 1st Stage canal network.

- Similar instance was observed in Halyal LIS also wherein it was proposed (June 2001) to irrigate 20,635 ha. Due to delay in execution of the LIS, the farmers had irrigated 14,563 ha by drawing private pipelines and the actual irrigation potential was reduced to 6,072 ha (29 per cent of the envisaged potential). As a result, full benefit of the LIS which was commissioned (September 2011) at a cost of ₹ 35.89 crore could not be derived.

Selection of wrong location for intake channel

2.1.16. The guidelines issued by the WRD envisaged that the location of the LIS should be selected where the site is not prone to sediment deposition at or above the intake level and below the intake foundation level.

TBLIS was envisaged to draw water from the backwaters of Almatti Reservoir to irrigate 52,700 ha. The location of the Jackwell cum pump house of TBLIS was shifted (March 2015) from Janawada village to Kavatagi village due to protest by the villagers. Consequently, the intake channel, which was an integral part of the main work, was also relocated to Kavatagi village. The canal bed level was at Reservoir Level (RL) 507 metres and its ground level was between RL 516.62 metres and RL 524.70 metres. The work of intake channel awarded in December 2014 at a cost of ₹ 7.21 crore was in progress (October 2016).

We observed that the proposed area of the intake channel was under submergence under the back waters of Almatti reservoir when water was impounded upto the RL 519.60 metres as the canal bed level was at RL 507 metres. The status of the location of intake channel before and after submergence is shown below:



Chart No.2.1.3: Intake channel before submergence when water was at RL 507 metres (June 2016)



Chart No.2.1.4: Intake channel after submergence when water was beyond RL 507 metres (July 2016)

The alignment of intake channel was ill-planned as the Company did not take into account the fact that the Almatti reservoir was impounded with water at RL 519.60 metres for four to five months (July to December) in a year, when the water is actually required to be lifted for irrigation. Submergence of the intake channel during the said period would result in silt formation all along the channel warranting recurring cost on desilting and damage to the structure of the channel.

The Government replied (February 2017) that the intake channel was provided with cement concrete lining, *etc.* to avoid siltation.

The reply is not acceptable as continuous submergence of the channel even with cement concrete lining may result in substantial siltation and erosion of the lining itself. The reply was silent on ill-planning regarding construction of the intake channel at level below RL 519.60 metres.

Non-synchronisation of works

2.1.17. The LIS comprises various components *viz.* construction of diversion weir, head works, intake channel, power supply, canal network, *etc.* We observed that in four LISs, these components had not been synchronised resulting in delay in completion of the schemes, as detailed below:

Table No.2.1.2: Cases of delay in completion of LIS due to non-synchronisation

LIS	Facts	Audit observation
Halyal 1 st Stage & 2 nd Stage	<ul style="list-style-type: none"> The head works were completed in December 2007 at a total cost of ₹ 20.38 crore. The lift was, however, commissioned in September 2011 to cater to 20,635 ha. 	<ul style="list-style-type: none"> The power supply works were awarded only in July 2008 <i>i.e.</i> after completion of head works. These works which should have been completed by April 2009 were completed in September 2011 due to rescinding and re-awarding the contract in July 2010. The belated action to take up power supply works had rendered the investment of ₹ 20.38 crore on head works idle without benefits to the farmers for four years. <p>The Government in its reply (February 2017) accepted the fact that there was no substation nearby to cater to the power needs of head works. Hence, the head works were implemented without waiting for power sanction.</p>

LIS	Facts	Audit observation
Shiggaon	<ul style="list-style-type: none"> • The head works were completed at a cost of ₹ 89.57 crore in September 2012 and the power supply works were completed in July 2012/October 2012. The sprinkler irrigation system was completed in July 2014 at a cost of ₹ 174.34 crore to irrigate 9,900 ha. • Apart from 9,900 ha under sprinkler irrigation, the scheme envisaged 3,600 ha under drip irrigation by constructing a diversion weir. 	<ul style="list-style-type: none"> • The envisaged potential of 9,900 ha had to be deferred until July 2014 despite completing the head works in September 2012 as there was no synchronisation of various components of the scheme (head works, power supply and sprinkler system) which were completed in different periods. • The construction of diversion weir required for storing water for irrigating 3,600 ha was awarded (January 2014) at a cost of ₹ 34.24 crore with a stipulation to complete in 18 months. The completion was delayed due to delay in clearances from forest department for land acquisition and finalisation of designs and drawings which was done only in January 2016. The works were under progress and the envisaged irrigation potential had not been created yet (December 2016). <p>The Government replied (February 2017) that the entire process has not been intentionally delayed.</p> <p>However, the fact remains that the delay in implementation of the LIS has failed to create the irrigation potential as envisaged.</p>
Tiluvalli	<ul style="list-style-type: none"> • The lift was commissioned in August 2016 at a cost of ₹ 18.87 crore. The rejuvenation of existing canal was part of the lift 	<ul style="list-style-type: none"> • The contracts for canal rejuvenation were awarded only in January 2016, after a gap of five years of awarding lift works (October 2011) and were in progress (December

LIS	Facts	Audit observation
	<p>works to cater to suffering atchkat²⁷ of 380.63 ha and create additional potential of 525.92 ha apart from existing 297.45 ha.</p>	<p>2016). Therefore, the additional potential could not be irrigated despite completion of the lift works. The investment of ₹ 18.87 crore would not fructify until rejuvenation works are completed.</p> <p>The Government replied (February 2017) that the tenders for rejuvenation were called for as soon as the lift works were near completion and will be completed in March 2017.</p> <p>However, the fact remains that the Lift could not be utilised effectively due to delay in rejuvenation work.</p>
Tubachi-Babales-hwara	<ul style="list-style-type: none"> The scheme was envisaged to cater to 52,700 ha. The head works were awarded in December 2014 at a cost of ₹ 1,022.58 crore and scheduled to be completed in December 2016. The financial progress was ₹ 169.29 crore (March 2016). 	<ul style="list-style-type: none"> The survey for identifying the canal network has been taken up only in May 2016. The belated action of survey work would further delay completion of the canal works and creation of envisaged potential. <p>The Government replied (February 2017) that the Head works were in advanced stage of implementation and canal network estimates were prepared and tender would be floated for execution.</p> <p>This reinforced the audit assertion that there was no synchronisation in execution.</p>

Thus, the Company's failure to synchronize the works of various components of the schemes had not only rendered the investment idle but also deferred the envisaged benefits.

²⁷ Suffering achkat is the irrigation potential situated at the tail end which could not be irrigated due to insufficient water.

Poor implementation

2.1.18. The Company failed to complete the works as planned. There were long delays in completion and avoidable cost overruns due to inaction on the part of the Company on underperforming contractors and unreasonable delay in decision making on closure and re-award of underperforming contracts. Audit observations on implementation of the schemes are detailed in Paragraphs 2.1.19 to 2.1.30.

Unsatisfactory progress

2.1.19. Singatalur Lift Irrigation Scheme (SLIS) was proposed (1986-87) to irrigate 16,188 ha of drought prone areas covering the districts of Koppal, Gadag and Bellary by utilising 5.06 TMC out of the allocated 7.64 TMC of water under the left and right banks of the river Tungabhadra. The scheme was originally approved (September 1992) at a cost of ₹ 63.62 crore for construction of barrage across the river Tungabhadra and two lifts, one each on either side of the river bank. The scope of the scheme had undergone continuous changes subsequently as detailed below:

Table No.2.1.3: Change in the scope of SLIS

Sl. No	Date of revision	Irrigation potential (ha)	Cost (₹ crore)	Reasons for revision
1	December 1998	16,188	123.00	As per the suggestions of Technical committee of the Company.
2	December 2000	47,753	595.00	Additional allocation of water from 7.64 TMC to 18.55 TMC.
3	June 2006	48,658	787.00	As per the Government instructions on utilisation pattern of water and implementation mechanism.
4	April 2011	68,892	1,894.50	
5	January 2015	1,07,380	5,768.04	Introduction of micro irrigation. Out of 1.07 lakh ha, 19,588 ha through flow irrigation and 87,792 ha under micro irrigation.

We observed that:

- The scheme, which was conceived way back in 1986-87 had taken off only after twelve years when the barrage work was awarded in 1998-99. The Company had so far incurred ₹ 1,489 crore (March 2016) against the total estimated cost of ₹ 5,768.04 crore and created irrigation potential of 19,588 ha;
- The SLIS comprised construction of five lifts on the left bank and two lifts on the right bank apart from the construction of the barrage. The

works related to the barrage, crest gate, intake channel and head regulator were awarded between August 1998 and July 2011 and completed at a cost of ₹ 170.10 crore in September 2012. The works of the lifts were awarded between September 2005 and May 2010 at a cost of ₹ 495.83 crore and were completed between March 2013 and January 2016 against the due dates of 18 months from the date of award;

- The reasons for delay in completion of works were continuous change in scope, delay in acquisition of land and delay on the part of the contractors. Further, the Company received only ₹ 826.43 crore out of ₹ 2,541.66 crore indented for SLIS during 2011-12 to 2015-16 which hampered the progress;
- Water could be stored only upto 1.435 TMC against the envisaged capacity of 3.12 TMC in the barrage as the Rehabilitation and Resettlement (R&R) works for five villages that would submerge if the water is stored to its full capacity, approved in November 2010 and December 2012, were still under progress (October 2016);
- The decision to introduce micro irrigation for a larger area of 87,792 ha in SLIS may need rethinking as this concept has been withdrawn (May 2016) in the case of TBLIS which has a smaller irrigation potential of 52,700 ha due to its unsuitability in drought prone areas, possibility of depletion in water table, high maintenance cost and likely deterioration of drip equipment during off-season (water flows only for four months in a year);
- As a result of the decision to switch over to micro irrigation, midway, neither the flow irrigation of 68,892 ha as decided in April 2011 was completed nor did the micro irrigation materialise. It is pertinent to mention that the Company could have created 68,892 ha with an approximate expenditure of ₹ 405.50 crore²⁸ in addition to ₹ 1,489 crore incurred so far, as against ₹ 3,873.54 crore (₹ 5,768.04 crore - ₹ 1,894.50 crore) required to be incurred for an additional potential of 38,488 ha under micro irrigation.

Thus, as a result of continuous modifications in the scope of the scheme including the decision to switch over to micro irrigation, the Company, after a passage of thirty years of conception of the scheme, could create irrigation potential of 19,588 ha with an expenditure of ₹ 1,489 crore as of March 2016. The allocated water of 15.99 TMC²⁹ is largely underutilised as the proposal of micro irrigation was yet to materialise (December 2016).

The Government replied (February 2017) that the delay in execution and commissioning of the lifts was mainly because of delay in land acquisition. Non-completion of R&R works and non-impounding of water in the barrage

²⁸ Estimated cost of ₹ 1,894.50 crore for 68,892 ha less the actual expenditure of ₹ 1,489 crore spent on completion of lifts and canal networks.

²⁹ Against the actual water allocation of 18.55 TMC to SLIS, 15.99 TMC is available for irrigation and the balance is used for drinking water and industrial use.

upto FRL has not deprived any irrigation facilities. Micro Irrigation was taken up to provide irrigation facilities to more drought prone areas.

The Government's reply is not acceptable as the works had been delayed by four to six years, which has deprived the farmers irrigation facilities. The reply is silent on the non-suitability of Micro Irrigation for drought prone areas.

2.1.20. Hipparagi Project was conceived (October 1991) to irrigate 59,692 ha at a cost of ₹ 186.70 crore. The scope of the scheme had been changed continuously over a period of twenty years as detailed in the table below:

Table No.2.1.4: Change in the scope of Hipparagi LIS

Sl. No.	Year of approval by GoK	Project cost as per DPR (₹ crore)	Irrigation potential (ha)	Reasons for change in cost and scope of the project.
1	June 2001	901.00	70,079	Included two lifts <i>i.e.</i> Karimasuti and Savalgi-Tungal.
2	April 2007	1,113.00	74,742	Addition of irrigation potential by 4,663 ha.
3	March 2008	1,521.78	74,742	Addition of two lifts Ainapur 2 nd stage and Karimasuthi 2 nd stage.
4	Pending approval	3,330.23	74,742	Increase in schedule of rates and rehabilitation and resettlement works. The revised cost proposed (August 2016) by the Company was pending for approval from GoK (December 2016).

The continuous change in scope of the scheme had delayed completion of Hipparagi LIS. The project comprising four lifts *viz.* Halyal, Ainapur, Karimasuti and Savalgi-Tungal to cater to 74,742 ha was completed between September 2011 and October 2013, *i.e.* after a lapse of twenty years from its conception. The lift works of Halyal, Karimasuti and Savalgi-Tungal LISs were completed with a delay ranging from six years to seven years beyond the scheduled contract period for the reasons as detailed below:

Table No.2.1.5: Cases of delay in completion under Hipparagi LIS

LIS/ Potential (ha)	Due date of completion	Actual date of completion	Period of delay	Reasons for delay
Halyal 1 st Stage & 2 nd Stage (20,635)	Head works – February 2005	September 2011	6 years	<ul style="list-style-type: none"> • Standing water in intake channel. • Rescinding of contract of combined canal twice due to poor progress by the contractors. • Re-awarding the contract to the defaulting contractor.
Karimasuti 1 st stage (19,800)	Head works 1 st stage –	1 st stage- March 2012	7 years	<ul style="list-style-type: none"> • Non-availability of land. • Obstruction by farmers.

LIS/ Potential (ha)	Due date of completion	Actual date of completion	Period of delay	Reasons for delay
	September 2005			<ul style="list-style-type: none"> Poor progress by the contractor. Delay in closing the initial contract (three years). Delay in re-awarding the balance works after closure of initial contract (two years).
Savalagi- Tungal (9,045)	Head works – September 2005	January 2012	7 years	<ul style="list-style-type: none"> Contract was extended several times with nominal penalty, despite breach of scheduled dates.

Thus, it could be seen that the benefit of LISs could not be passed on to the farmers for a period of six to seven years as the lift works had not been completed within the scheduled dates of completion.

The Government replied (February 2017) that appropriate decisions were taken to avoid the contractors approaching the Court of law and to avoid further delay in implementation of work.

The reasons for the delay were avoidable as could be seen from the table. The delay deferred the benefit of the scheme to the farmers. Hence, the reply is not acceptable.

2.1.21. In respect of three LISs viz. Bhima, Guddadamallapura and Sri Rameshwara, we observed that the lift and canal works in these LISs were completed with a delay ranging from five to eight years from the scheduled dates and certain works were still under progress (October 2016) as detailed in Table No. 2.1.6. The delay had caused deferring the envisaged benefits to the farmers.

Table No.2.1.6: Delay in completion of various components of three LISs and reasons for delay

LIS/ Potential (ha)	Due date of completion	Actual date of completion	Period of delay	Reasons for delay
Bhima (24,292)	<ul style="list-style-type: none"> Barrage- February 2005 Balundagi lift and Alligi (B) lift- July 2006/ December 2006 	<ul style="list-style-type: none"> Barrage – March 2010 Balundagi lift – September 2014 Alligi (B) lift – June 2016 	5 to 9 years	<ul style="list-style-type: none"> Due to change in design for a private mini hydel scheme. Delay in land acquisition Non-payment of compensation for standing crops. Slow progress by the contractors.

LIS/ Potential (ha)	Due date of completion	Actual date of completion	Period of delay	Reasons for delay
Guddada- mallapura (5,261)	<ul style="list-style-type: none"> Intake channel, jackwell cum pump house Rising main, Gravity main and canal network – May 2007 	<ul style="list-style-type: none"> Intake channel, jackwell cum pump house Rising main, Gravity main – October 2015 Canal networks in progress (October 2016) 	8 years	<ul style="list-style-type: none"> Change in location of the Jackwell twice. Delay in awarding the balance works (11 months for head works and 32 months for canal works). Non-payment of compensation for standing crops. Non-acquisition of land in time. Underperformance of contractors.
Sri Ramesh- wara (13,800)	Head works – March 2007	March 2013	6 years	<ul style="list-style-type: none"> Change in location of jackwell cum pump house. Delay in approval of designs and drawings. Delay in land acquisition. Slow progress by the contractor.

The Government replied (February 2017) that appropriate decisions are taken to avoid the contractors approaching the Court of law and to avoid further delay in implementation of work.

Change in the scope of work during implementation and delay in taking appropriate decision led to delay in implementation of the project. Hence, the reply is not acceptable.

Avoidable expenditure

2.1.22. The Company failed to invoke contractual provisions on defaulting contractors and follow WRD guidelines on technical specifications and KTPP Act resulting in avoidable expenditure on implementation of LISs. The instances noticed in audit are detailed in Paragraphs 2.1.23 to 2.1.30.

2.1.23. The LISs had been awarded on lumpsum cum turnkey basis through the bidding process. *Clause 32.2* of the bid conditions envisaged that the bills of quantity submitted by the contractor do not affect the total lumpsum price, provided there is no change in scope or specification of work described in the tender document or otherwise provided for in the contract.

We observed that there was substantial reduction in the scope of head works (13 to 24 *per cent*) in respect of five LISs due to change in location and

alignment subsequent to award of contracts. This variation in quantities was mainly due to award of contracts without conducting detailed survey. The Company did not exercise the contractual provision (*Clause 32.2*) to effect the change in lumpsum price due to change in scope of work and the contractors were paid the full amount irrespective of quantities that were executed. As a result, the Company had to incur avoidable expenditure of ₹ 141.70 crore as indicated below:

Table No.2.1.7: Reduction in quantities on head works

LIS	Item of work	Estimated quantity (rmtr*)	Executed quantity (rmtr)	Differential cost ³⁰ (₹ crore)
Savanur LIS	Rising main	17,040	14,857	8.41
Singatalur (Left side 1 st lift)	Rising main	2,200	1,800	5.55
Thubachi-Babaleshwara	Rising main	29,064	22,030	107.80 ³¹
Shiggaon LIS	Sprinkler/PVC pipe line	1,38,377	1,12,512	19.94
Total				141.70

*rmtr – running metre

The Government replied (February 2017) that the contracts were awarded on turnkey basis and hence excess or savings in the contract value would not arise.

The reply is not acceptable as the Company not only awarded the works without conducting detailed survey, but also failed to exercise contractual provisions, which resulted in avoidable expenditure and undue benefit to the contractors.

2.1.24. The guidelines issued (March 2003) by the WRD recommended use of Pre Stressed Concrete (PSC) pipes for Mains where the hydraulic pressure was in the range of 6 kg/cm² to 20 kg/cm². We observed that the Company while awarding (December 2014) Gravity Main for Tubachi-Babaleshwara LIS had provided for Mild Steel (MS) Pipes instead of PSC pipes for a length of 13.37 km. connecting Delivery Chamber (DC)-1 to DC-2 for a discharge of 10.86 cumecs of water to 23,045 ha of command area beyond Don River. The work was in progress (October 2016). The Technical Subcommittee of the Company, while recommending (June 2012) MS pipes had not given any justification although the guidelines stipulated use of PSC pipes. The action of the Company was in deviation from the guidelines as the hydraulic pressure in this case was only 17.05 kg/cm², which was well within the suggested range and hence use of PSC pipes would have been sufficient.

³⁰ The differential cost represents the benefit passed on to the contractors due to reduction in actual executed quantities as compared to the quantities awarded. The cost has been arrived by multiplying differential quantities with the rates as provided in the estimates of the respective LISs in the absence of breakup of quoted rates for these items in the contracts.

³¹ This represents the net cost after deducting savings in gravity main where excess quantity over and above the estimated quantity was executed (1.39 km.) by ₹ 14.42 crore.

The cost of laying MS Pipes was ₹ 138.22 crore, against ₹ 35.49 crore³² for PSC pipes. The additional expenditure of ₹ 102.73 crore incurred on MS pipes could have been avoided had the work been carried out as per the norms specified in the guidelines.

The Government replied (February 2017) that the water had to pass through Don River from RL 682 metres to RL 640 metres. As the PSC pipes involve more number of joints, frequent leakage in joints may lead to stoppage of pumps for maintenance due to heavy pressure.

The reply is not acceptable as the hydraulic pressure in the present case was within the prescribed limit. Further, the number of joints in both MS pipes and PSC pipes are the same as the standard length for both the specifications as per the Schedule of Rates is six metres.

2.1.25. The Notification issued (January 2004) by the Government of India exempted Pumping Machineries, MS Pipes and other equipments used in the LIS projects from Excise Duty.

We observed that the Schedule of Rates of WRD, followed by the Company for the purpose of preparation of estimates for LIS works, was inclusive of all taxes and duties. The Company prepared the estimates that were put for tender without eliminating the Excise Duty on structural steel used for manufacturing MS pipes in respect of all 13 test checked LISs. This stood to benefit contractors who had quoted considering the excise duty element and subsequently got exemption based on the certificate issued by the Company. One such instance in respect of Tubachi-Babaleshwara LIS was noticed in audit. The contractor was benefited to the extent of ₹ 37.67 crore by virtue of such exemption on the estimated quantity of structural steel used for MS pipes in the LIS.

The Government replied (February 2017) that exemption on Excise Duty was given as per the note in the Schedule-B before entrustment of work. As the work was entrusted on Turnkey basis, extra payment does not arise.

The reply is not acceptable as the amount put to tender in respect of MS pipes included Excise Duty, which should have been eliminated.

2.1.26. The works of the Guddadamallapura LIS consisting of intake channel, jackwell cum pump house, rising main, gravity main and canal network was awarded (September 2005) at a cost of ₹ 46.02 crore on turnkey basis to Coramandal Prestcrete (Pvt.) Ltd. The work was scheduled to be completed by May 2007.

The contractor did not complete the work despite the extension of the contract period up to March 2008 by which time financial progress achieved was ₹ 16.23 crore. The Chief Engineer recommended (December 2008) termination of the contract at the risk and cost of the contractor. The contractor failed to respond to the notices issued by the Company and the

³² Calculated at the rates provided in the SR of WRD 2013-14 (₹ 26,542/running metre) for the length of 13.37 km. of PSC pipes.

Company decided (September 2014) to rescind the work without risk and cost to the contractor, but no action has been taken yet to close the contract (December 2016). Meanwhile, the balance works (Head works/Canal works) were awarded (January 2010/September 2011) to two contractors at a total cost of ₹ 86.47 crore. The head works were completed (October 2015) and the canal works were in progress (December 2016).

We observed that the Company awarded the balance works without closing the first contract. Further, the decision to close the contract without risk and cost would result in additional financial burden to the extent of ₹ 56.68 crore³³.

The Government replied (February 2017) that after detailed deliberations by the Technical Subcommittee and the Board, it was decided to close the contract without risk and cost to the contractor to avoid possible legal complications.

The reply is not acceptable as the CE had recommended closure of the contract with risk and cost to the contractor. This has been ignored by the Board leading to undue benefit to the first contractor.

2.1.27. The contract for head works of Karimasuti 1st stage lift, awarded (March 2004) at a cost of ₹ 14.49 crore to be completed by September 2005, was short closed (December 2008) without risk and cost due to poor progress by the contractor. It was re-awarded (April 2010) for the balance work (₹ 10.31 crore) at the cost of ₹ 49.74 crore. The works were completed in March 2012.

We observed that despite the contractor's poor progress (₹ 4.18 crore of ₹ 14.49 crore), the Company decided to close the initial contract only after a delay of three years (December 2008). There was further delay of more than one year to re-award (April 2010) the balance works after closure of the initial contract. There were no recorded reasons for such delay. The Company also failed to invoke risk and cost of the contractor while closing initial contract for non-completion. As a result, the cost of the scheme increased by ₹ 44.82 crore³⁴.

The Government replied (February 2017) that after detailed deliberations at Technical Subcommittee and Board, it was decided to close the contract without risk and cost to avoid possible legal complications.

The reply is not acceptable as the Company failed to invoke contractual terms and there was delay in closing and re-awarding the contract, which resulted in additional cost.

2.1.28. The works of the left bank main canal of SLIS were awarded (November 2012) in two packages (0 km. to 7 km. and 9 km. to 14.50 km.) at

³³ Difference between the value of balance works in the first contract (₹ 29.79 crore) and the re-award value (₹ 86.47 crore).

³⁴ Includes differential cost in re-award (₹ 49.74 crore - ₹ 10.31 crore = ₹ 39.43 crore) and price variation of ₹ 5.39 crore.

a total cost of ₹ 26.85 crore to be completed in nine months. The work progressed to the extent of ₹ 18.11 crore within the scheduled date due to delay in land acquisition. We observed that notification for acquisition of land under lift works was issued even during October 2013 and awards were passed between September 2013 and June 2015, *i.e.* after due dates of completion. The balance works (₹ 8.74 crore) were rescinded and re-awarded (January 2016) at ₹ 26.88 crore. This caused escalation in cost by ₹ 12.53 crore.

The Government replied (February 2017) that the delay was on account of non-availability of land for execution of work. The proposals for land acquisition and notifications were issued much before the actual date of inviting tenders. However, farmers were not ready to handover their lands till final payments were made.

The reply is not acceptable as the awards were passed after due dates of completion. The Company should have ensured the payment of full compensation to farmers.

2.1.29. Regulator provided at the head of canal offtake point from a river is termed as canal head regulator, which regulates the water supply entering into the canal. The Company took up the head regulator work at the left intake channel of SLIS to avoid spilling of water as the ground level of the intake channel in some of chainages was below the FRL 509 metres of Singatalur barrage constructed across river Tungabhadra. The work was completed in June 2012 at a cost of ₹ 23.40 crore.

We observed that while finalising the alignment of the intake channel, the Company had not considered its ground levels which were below the FRL of the barrage. This had necessitated construction of head regulator at an additional cost. Further, the regulator had been kept idle for the last four years pending electrification works (October 2016) of the gates and also pending water storage upto FRL due to non-completion of rehabilitation and resettlement of affected villages (December 2016). Thus, the expenditure of ₹ 23.40 crore incurred on the regulator could have been avoided had the right alignment (above FRL) of intake channel been considered.

The Government replied (February 2017) that Head Regulator was necessary for regulating the flow into the intake canal on the 1st lift and Mundwad & Hammagi lift.

However, the Head Regulator has been kept idle for the last four years and hence reply is not acceptable.

2.1.30. As per KTPP Act (Section 12), the tender inviting authority has to communicate the notice inviting tenders to the Tender Bulletin Officer³⁵ concerned immediately after issue of the notice for publication.

We observed that the notice inviting tender (January 2012) for construction of Halasur Diversion Weir across river Varada for Shiggaon LIS was not

³⁵ Officer (Deputy Secretary at State level and Deputy Commissioner of the respective Districts at district level) appointed by the State Government.

communicated to the Tender Bulletin Officer concerned for its publication in tender bulletin. As a result, the bid received (April 2012) for ₹ 23.48 crore against tendered cost of ₹ 25.55 crore had to be cancelled due to non-compliance with the provisions of KTPP Act. Subsequent tender invited in May 2012 was also cancelled as the quoted rates were on higher side (24.2 per cent above the amount put to tender). The contract was awarded only in January 2014 at a cost of ₹ 34.24 crore³⁶ to the successful bidder against the tender dated October 2012. Thus, the cost of the work had increased by ₹ 4.15 crore³⁷ besides time overrun of two years.

The Government replied (February 2017) that though the notification was forwarded in advance, the delay was caused at different stages of transit.

The reply is not acceptable as it was the responsibility of the tenderer to ensure that the invitation of bids was published in the tender bulletin.

Violation of safety norms

2.1.31. The Central Water Commission (CWC) issued (June 1987) dam safety norms on construction and operation of dams and barrages. We observed that the Company had not complied with these norms in respect of four barrages viz. Hipparagi, Singatalur, Souparnika and Bhima as observed below:

Table No.2.1.8: Violation of safety norms

Norm	Non-compliance
<p>Initial filling of reservoir:</p> <p>The newly constructed dams are required to be inspected by State Dam Safety panel constituted by the State Government before initial filling to assess the soundness/readiness of the dam or barrage. (Para 4.3.2.2 of CWC norms)</p>	<ul style="list-style-type: none"> • The construction of Hipparagi barrage across the river Krishna was completed (March 2004) with a gross storage capacity of six TMC and water was impounded upto the FRL 524.87 metres since its completion. • The construction of Singatalur barrage across the river Tungabhadra was completed in November 2010 with a gross storage capacity of 3.12 TMC with an FRL of 509 metres. Water was impounded upto the FRL of 505.5 metres since September 2012. • Souparnika bridge cum barrage across the river Souparnika was completed in December 2012 with a capacity of 0.01 TMC of water and FRL of 15 metres. Water was impounded in March 2013. <p>In all these cases, the soundness/readiness of the dam or barrage through inspection was not assessed before impounding water.</p>

³⁶ This included cost of ₹ 6.61 crore on hydro mechanical works which were not part of initial tender (January 2012).

³⁷ Difference between awarded cost (₹ 34.24 crore – ₹ 6.61 crore on extra work = ₹ 27.63 crore) and the initial offer (₹ 23.48 crore).

Norm	Non-compliance
<p>Flood Forecasting System:</p> <p>A suitable gauging arrangement is to be made at the upstream of the barrage for flood forecasting to manage inflow and outflow of the water. Emergency Action Plan (EAP) has to be evolved to minimize the property damage and loss of life. (Para 7.4.5 & Chapter VIII of CWC norms)</p>	<ul style="list-style-type: none"> • In none of the three barrages (Hipparagi, Singatalur, Souparnika) such flood forecasting system was established (September 2016). • EAP was prepared in case of Hipparagi which was pending approval (September 2016), while EAPs have not been prepared for the other two barrages (Singatalur, Souparnika).
<p>Gate operation schedules:</p> <p>To evolve proper Gate operation schedules considering the site conditions, stages of operations at various levels and flood situations, etc. (Para 7.4.1 of CWC norms)</p>	<ul style="list-style-type: none"> • The Company had not prepared the Gate operation Schedules in Hipparagi, Souparnika and Bhima barrages. (September 2016).

Impounding of water in the barrages without assessing their soundness and readiness may endanger the lives of people living downstream in case of breach. Non-adherence to flood forecasting system and gate operation schedules showed the apathy of the Company towards safety norms which can have disastrous consequences.

We further observed that the Company's circular dated October 2011 stipulated that the Chief Engineers concerned should recommend payment of contract bills after obtaining certification from a specialised agency (third party) on the quality of works carried out in case of turnkey contracts involving electro-mechanical works. The Company, however, made the payments for the five LISs³⁸ without ensuring quality of the works through certification from a third party.

The Government stated (February 2017) that the audit contention was noted and all guidelines would be implemented in due course of time, duly following the safety norms.

Underutilisation of irrigation potential

2.1.32. Field Irrigation Channels (FICs) are the channels which carry water from the branch canals into the fields and are vital for achieving the intended objective of creating the targeted irrigation potential in real



Chart No.2.1.5: Field Irrigation Channel

³⁸ Bhima, Guddamallapura, SLIS, Hipparagi, Souparnika.

terms. It is pertinent to quote the reference of State Water Policy, 2002 wherein it was acknowledged that there was a gap in utilisation of created irrigation potential due to delays in the construction of FICs, levelling of land and lack of farmer participation in irrigation management. Despite such acknowledgement, the scenario had not changed even now (October 2016). Even CWC had informed (October 2015) WRD, GoK that the widening gap between irrigation potential created and its utilisation was a cause of concern as large investments were lying unutilised.

The State Water Policy, 2002 also envisaged *inter alia* formation and empowerment of WUCS and Federations for participatory irrigation management. The Working Group on Water Resources for the XI Plan (2007-12) recommended (December 2006) that WUCS should also be involved in planning, budgeting, implementation and management of irrigation systems to ensure optimum utilisation of irrigation potential created.

We observed that though irrigation potential to the extent of 1.36 lakh ha was created in respect of nine LISs as of March 2016, the notification for the command area³⁹ was issued only for 0.41 lakh ha, which represents only 30 per cent of the total irrigation potential created as detailed below:

Table No. 2.1.9: Details of irrigation potential notified *vis-a-vis* created

Name of the LIS	Potential achieved		Date of notification	Potential notified (ha)	Potential to be notified (ha)
	Area (ha)	Month			
Ainapur	21,962	August 2010 to October 2013	January 2016	16,383	5,579
Bhima	16,721	March 2012 to May 2015	January 2015	3,875	12,846
Halyal	20,635	September 2011 to December 2011	January 2016	15,015	5,620
Karimasuti	23,100	January 2012 to March 2014	January 2016	2,812	20,288
Savalgi-Tungal	9,045	January 2012 to March 2014	January 2016	2,827	6,218
Shiggaon	9,900	June 2013	March 2015	Nil	9,900
Singatalur	19,588	September 2012 to January 2016	June 2016	Nil	19,588
Souparnika	1,730	December 2012	Yet to be done	Nil	1,730
Sri Rameshwara	13,800	March 2013	Yet to be done	Nil	13,800
Total	1,36,481			40,912	95,569

It can be seen that the command area was notified only between 2014-15 and 2016-17 for the potential created between 2010-11 and 2015-16, after a delay upto four years due to delay in completion of FICs. Thus, the farmers were deprived of their due at two stages of implementation of the LISs – first, completion of the schemes with long delay and secondly, failure to complete FICs even after creating the irrigation potential.

³⁹ Command area refers to the area which can be irrigated from a scheme and is fit for cultivation.

Significantly, the irrigation potential of 40,912 ha includes 28,856 ha irrigated by the farmers drawing water directly from the river through their own pipelines as observed in Paragraph 2.1.15. Hence, the potential declared as created is not in order to the extent of 28,856 ha. The notification for the balance 95,569 ha has not been carried out yet, as FICs were still under progress (December 2016).

WUCS had not been formed so far in any of the LISs except for Bhima and Shiggaon. In the absence of notification of the command area and non-formation of WUCS, effective water management as envisaged in the State Water Policy was not possible. Also, the role of CADA in conducting awareness programme was very limited as the Company had not handed over the command area fully yet (October 2016).

The Government replied (February 2017) that due to scanty rainfall Sri Rameshwara LIS area could not be notified and steps would be initiated to notify other areas under irrigation. Also, WUCSs would be set up under the guidance of the CADA concerned, wherever they have not been set up already.

Conclusions

Audit Objective-1: Whether the LISs were planned and designed properly?

- **The Company prepared Detailed Project Reports and the initial estimates without conducting detailed survey of field conditions which was not in line with the guidelines issued by the WRD. This had resulted in substantial variations in the scope of the works during the course of execution causing unwarranted cost and time overruns. The cost of the schemes had gone up by more than 240 per cent as compared to initial proposals, from ₹ 3,549.19 crore to ₹ 12,154.81 crore. Since the various components of the lift works had not been synchronised, the commissioning of LISs was delayed. Besides, the investments fell idle and farmers were unable to reap the intended benefits.**

Audit Objective-2: Whether the LISs were executed as planned and the objectives set out in the schemes were achieved?

- **The Company failed to create the envisaged irrigation potential within the set time frame. The completed schemes (Halyal, Karimasuti, Savalgi-Tungal, Sri Rameshwara and Souparnika) were delayed upto seven years with reference to scheduled dates of completion, while seven LISs (Bhima, Guddadamallapura, Savanur, Shiggaon, SLIS, Tiluvalli and TBLIS) were yet to be completed even after due dates.**
- **The delay in achieving the envisaged potential can be attributed to the Company's failure to take timely action to close and re-award the incomplete contracts and increase in the scope of works after award. The delay had caused deferment of benefits to the farmers.**

In addition, the Company incurred avoidable cost of ₹ 386.01 crore⁴⁰ on account of violation of contractual provisions and guidelines of WRD.

- There was a shortfall of 55.96 per cent in achieving the irrigation potential in 13 LISs and underutilisation of the created potential by 70 per cent due to non-completion of FICs. Water User Co-operative Societies were not formed except in two LISs and therefore participatory irrigation management to promote a decentralised and self regulated efficient water management system as envisaged in the State Water Policy did not materialise.

Recommendations

1. The Company needs to conduct detailed survey of field conditions before awarding contracts. Scope of works should be well defined and realistic estimates should be prepared in line with the guidelines issued by WRD.
2. Various components of the LISs should be synchronised as to ensure that all the works are completed in tandem and the schemes are commissioned within the stipulated time frame.
3. Field irrigation channels may be completed in a time-bound manner so that the created irrigation potential can be utilised.
4. Water User Co-operative Societies as envisaged in the State Water Policy may be formed for effective water management.

⁴⁰ Refer Paragraphs 2.1.23, 2.1.24 and 2.1.26 to 2.1.30 of the Report (₹ 141.70 crore + ₹ 102.73 crore + ₹ 56.68 crore + ₹ 44.82 crore + ₹ 12.53 crore + ₹ 23.40 crore + ₹ 4.15 crore = ₹ 386.01 crore).

2.2 Performance Audit on 'Implementation of Restructured Accelerated Power Development and Reforms Programme by the Electricity Supply Companies in Karnataka'.

Executive Summary

Introduction

The Government of India had modified the erstwhile Accelerated Power Development and Reforms Programme during XI Plan (2007-12) as 'Restructured Accelerated Power Development and Reforms Programme' (RAPDRP) with the aim of restoring the commercial viability of the distribution sector by putting in place appropriate mechanism to reduce Aggregate Technical and Commercial (AT&C) losses, establish reliable and sustainable automated systems for collection of base line data, adopt IT in the areas of energy accounting and consumer care and strengthen the distribution network.

The Programme was implemented by Electricity Supply Companies (ESCOMs) in Karnataka in two parts viz. Part-A and Part-B. Part-A included the projects for establishment of baseline data and IT applications for energy accounting and auditing and IT based consumer service centres. Part-B included regular distribution strengthening projects.

In Karnataka, 98 towns under Part-A and 81 towns under Part-B of the Programme were sanctioned at a total cost of ₹ 398.71 crore (February 2009) and ₹ 786.58 crore (between March 2010 and June 2010) respectively. Part-A was implemented by all the five ESCOMs viz. Bangalore Electricity Supply Company Limited (BESCOM), Chamundeshwari Electricity Supply Corporation Limited (CESC), Gulbarga Electricity Supply Company Limited (GESCOM), Hubli Electricity Supply Company Limited (HESCOM) and Mangalore Electricity Supply Company Limited (MESCOM), while Part-B was implemented by four ESCOMs, except MESCOM.

Audit Objectives

The Audit objectives were to assess whether:

- The planning for implementation of the Programme was adequate;
- The Programme has been implemented in an efficient, effective and economical manner to achieve the intended objectives.

Audit Findings

Implementation of the Programme without completion of pilots

The ESCOMs had taken up implementation of Part-A of the Programme in one town in each of the ESCOMs as pilot project. The ESCOMs issued Detailed Work Awards between February 2010 and May 2010 with a

stipulation to complete the same within 12 months. The pilot implementation in respect of four of the five towns selected was completed with delay ranging from two to five years from the scheduled date. On account of non-completion of pilots within the scheduled time, the ESCOMs could not gauge potential hindrances in implementation of Part-A of the Programme in other towns. Implementation in other towns had commenced simultaneously along with pilot towns without resolving the bottlenecks encountered in pilot towns. (Paragraph 2.2.12)

Declaration of towns ‘go-live’ without completion

BESCOM declared (between January 2013 and March 2014) 60 of the 98 towns ‘go-live’ and the balance 38 towns in March 2016 without ensuring that all the functions in the modules were operational and User Acceptance Test had been run successfully in the production environment, which was not in line with the guidelines issued by Power Finance Corporation (PFC). (Paragraph 2.2.13)

DTC metering

The ESCOMs failed to assess whether the existing DTC meters were Device Language Message Specification (DLMS) compliant. Non-compliance of the existing meters with DLMS was ignored by the ESCOMs while deciding (December 2009) to install meters at the unmetered Distribution Transformer Centers (DTCs). This contributed to the delay in the completion of the Programme as the non-compliant meters continued to be replaced with DLMS compliant meters until 2015-16. (Paragraph 2.2.16)

Feeder level metering

The ESCOMs had delayed the decision to replace the feeder level meters which act as input energy points to the project areas and are critical to ascertain AT&C losses. During installation of modems in the meters, ESCOMs observed (May 2016) that data was not being communicated by the existing meters making the assessment of accurate AT&C losses difficult. Meter reading was being taken manually every month and uploaded into the RAPDRP system for determining the AT&C losses in the project areas. Even after this exercise, AT&C loss figures continued to be erroneous due to errors in uploading the data into system. (Paragraph 2.2.17)

Failure of modems

Information Technology Implementing Agency (ITIA) installed (August 2010 onwards) 59,520 modems at DTCs, boundary meters and HT consumers under all the five ESCOMs. The ESCOMs found that modems were not communicating the data and perforce they had to procure (June 2015) new modems which were installed by March 2016. As a result, the replacement of meters took almost six years. The day-wise analysis of functioning of modems during the period March 2016 to July 2016 in five ESCOMs revealed that the percentage of modems that were communicating data was very poor. There was not only delay in installation of modems but the installed modems

were still to function to their potential. This had delayed the process of analysing the results of meter reading and AT&C losses. (Paragraph 2.2.19)

Failure to update the incremental assets

The ESCOMs failed to update the incremental assets and consumers as and when they were added. The ESCOMs took up the job of updation of assets only in January 2015 *i.e.* after a lapse of three years from the scheduled date of completion (February 2012) of Part-A of the Programme, instead of updating the assets simultaneously with their addition. The delay in updation/non-updation of assets into RAPDRP system had resulted in delay in completion of the Programme and determining accurate AT&C losses. (Paragraph 2.2.21)

Deficient planning

PFC sanctioned Detailed Project Reports (DPRs) of 81 towns between March 2010 and June 2010 for implementation of the works under Part-B. Considering a reasonable period of six months to finalise the tenders from the date of sanctioning of the DPRs, ESCOMs awarded the contracts after a lapse of five to 21 months, which contributed to delay in completion of the works. The reasons for delay in awarding of works were inclusion of works in the estimates which were not feasible for implementation, multiple revisions of estimates and frequent amendment to terms of contracts, unwarranted cancellation of tenders, *etc.* (Paragraphs 2.2.24 to 2.2.28)

Ineffective implementation

The ESCOMs awarded the works under Part-B for strengthening works of electrical distribution network including replacement of consumer electro-mechanical meters with tamper proof electro-static meters between March 2011 and August 2012. The stipulated period of completion ranged from 12 to 24 months from the dates of award of works. The ESCOMs had not only released payments to the contractors in violation of contractual terms but also failed to initiate action on the contractors for the delay in completion beyond the stipulated period. The delay in completion of works ranged from 6 to 38 months. (Paragraph 2.2.29)

Violation of contractual provisions

The ESCOMs paid 75 to 92 *per cent* of the value of the material supplied in respect of contracts awarded in three towns *viz.* Ramanagara, Mysuru and Kollegal without the equipment being commissioned which was in violation of the contractual terms. Such extra payment amounting to ₹ 10.53 crore was made (between December 2012 and October 2014) based on the requests of the contractors concerned. (Paragraph 2.2.32)

Unviable investment

The guidelines issued by PFC prescribed the criterion of Return on Investment (RoI) to be not less than 10 *per cent* for a town to be eligible for inclusion under the Programme. BESCOM and HESCOM had included three towns

(₹ 63.42 crore) and six towns (₹ 14.63 crore) respectively under the Programme though RoI was less than 10 *per cent* rendering the investment possibly unviable. (*Paragraph 2.2.38*)

Avoidable borrowings at higher cost

Three ESCOMs (GESCOM, HESCOM, MESCOM) had received loan of ₹ 57.99 crore from PFC against the eligibility of ₹ 106.04 crore. The received amount was much less than the actual expenditure of ₹ 90.56 crore incurred by these ESCOMs. ESCOMs failed to pursue PFC to release the instalments due though they had spent ₹ 32.57 crore more than the disbursement. Non-receipt of amount due from PFC had forced the ESCOMs to spend out of funds borrowed at higher rate of interest. (*Paragraph 2.2.40*)

Likely financial burden on consumers

The ESCOMs were required to complete the works under Part-A and Part-B within three years from the date of sanction to avail the benefit of conversion of loan into grant. The ESCOMs had received ₹ 276.84 crore under Part-A and ₹ 109.05 crore under Part-B from PFC as of March 2016. Although the scheduled date of completion of the Programme was extended upto March 2016/September 2016, there was no commitment from the Ministry of Power, GoI on conversion of loan into grant in the changed scenario of breaching of the deadlines by ESCOMs. In the event of non-conversion of loan into grant, it is likely that the entire loan availed under the Programme would become a burden on the consumers as the cost is factored into tariff. (*Paragraph 2.2.41*)

Ineffective monitoring

There was no monitoring during 2011-12, 2014-15 and 2015-16 by Distribution Reforms Committee as it did not meet even once at the time when implementation was at critical stage. Monthly meetings held through video conferencing headed by the Energy Department did not identify bottlenecks in implementation in order to resolve them. Similarly, monthly meetings headed by the Managing Directors/Chief Engineers held at ESCOMs level for monitoring Part-B had merely noted the progress achieved and did not identify the problems in execution or resolve them. (*Paragraph 2.2.42*)

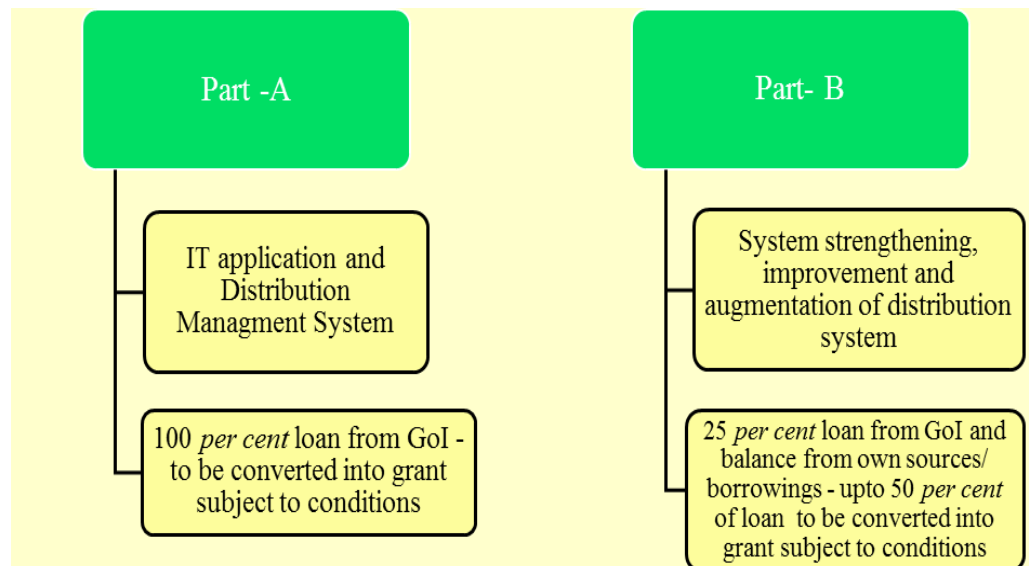
Introduction

2.2.1. As a part of the Government of India's (GoI) initiative in power sector reforms in the country, the initial focus was more on bringing about structural changes like unbundling of the State Electricity Boards and creation of independent generation, transmission and distribution companies. Ministry of Power, GoI found that power distribution was the weakest link in the entire value chain and this sector cannot achieve viability unless issues in the power distribution sector are resolved.

In this background, the Ministry of Power, GoI had modified (XI Plan: 2007-12) the Accelerated Power Development and Reforms Programme introduced in 2002-03 as "Restructured Accelerated Power Development and Reforms Programme" (RAPDRP/the Programme) with the aim of restoring the commercial viability of the distribution sector by putting in place appropriate mechanism to:

- reduce the Aggregate Technical and Commercial (AT&C) losses;
- establish reliable and sustainable automated systems for collection of base line data;
- adopt IT in the areas of energy accounting and consumer care and
- strengthen the distribution network.

The Programme was implemented in two parts viz., Part-A and Part-B as shown below:



Implementation mechanism

2.2.2. The Programme covered towns (project) and cities with a population of more than 30,000. Power Finance Corporation (PFC) was the ‘Nodal Agency’ for the operationalisation and implementation of the Programme, under the overall supervision of the Ministry of Power (MoP), GoI. A Quadripartite Agreement, which was a prerequisite for release of funds under the Programme, was concluded (February 2009) between five Electricity Supply Companies⁴¹ (ESCOMs), GoI, PFC and the Government of Karnataka (GoK).

The ESCOMs were to prepare DPRs of Part-A projects in-house or by appointing an IT Consultant through bidding from the panel of IT Consultants notified by PFC and submit them to PFC for approval. The sanctioned projects were to be implemented on turnkey basis by appointing the IT Implementing Agency (ITIA) through bidding from the panel of IT Implementing Agencies notified by PFC to ensure quality and expeditious implementation. Similarly, the sanctioned projects of Part-B were to be implemented preferably on turnkey basis.

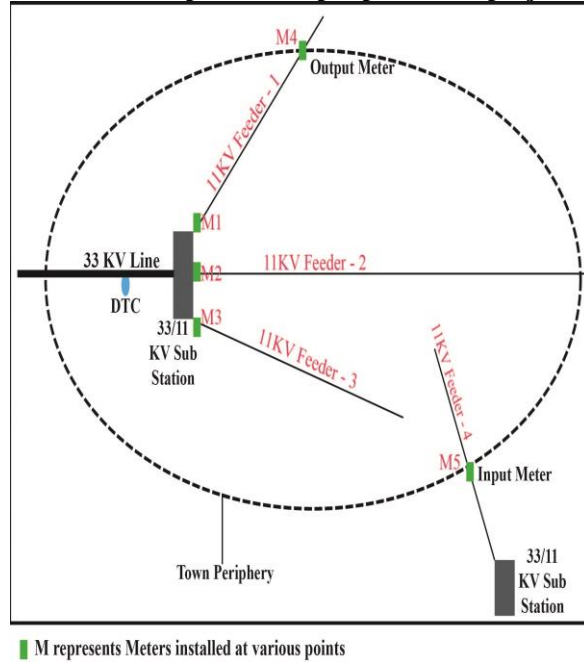
2.2.3. AT&C losses comprise of technical and commercial losses. Technical losses occur at transformation and distribution levels due to inherent resistance and poor power factor in the electrical network, while commercial losses arise mainly on account of unaccounted consumption of energy. This occurs due to discrepancy in meter reading, tampering of meters and theft by direct hooking.

In order to measure the energy supply and consumption accurately in the project area⁴², ESCOMs were required to ensure that energy input points of the project area’s electricity network viz. incoming lines of 33/11 kV sub-stations and 33 kV and 11 kV feeders supplying power to the project area were metered. ESCOMs were also to ensure that project areas were electrically ring fenced to measure net input energy (difference of energy input and output) of the project area through installation of import/export meters at the boundary of those lines that are feeding outside as well as inside project area. A schematic diagram showing the input and output points in a typical project area is depicted below:

⁴¹ Bangalore Electricity Supply Company Limited (BESCOM), Chamundeshwari Electricity Supply Corporation Limited (CESC), Gulbarga Electricity Supply Company Limited (GESCOM), Hubli Electricity Supply Company Limited (HESCOM) and Mangalore Electricity Supply Company Limited (MESCOM).

⁴² Project area is the area of the town covered under Part-A of the Programme.

Chart No:2.2.1: Input and output points in a project area



The System Requirement Specifications (SRS) issued by PFC under the Programme provide guidance for automation of the existing business processes and invoking appropriate IT resources associated with it to be implemented under Part-A of the Programme. SRS stipulated 17 essential IT modules⁴³ for collection of base line data, energy accounting, auditing and establishment of customer care centres.

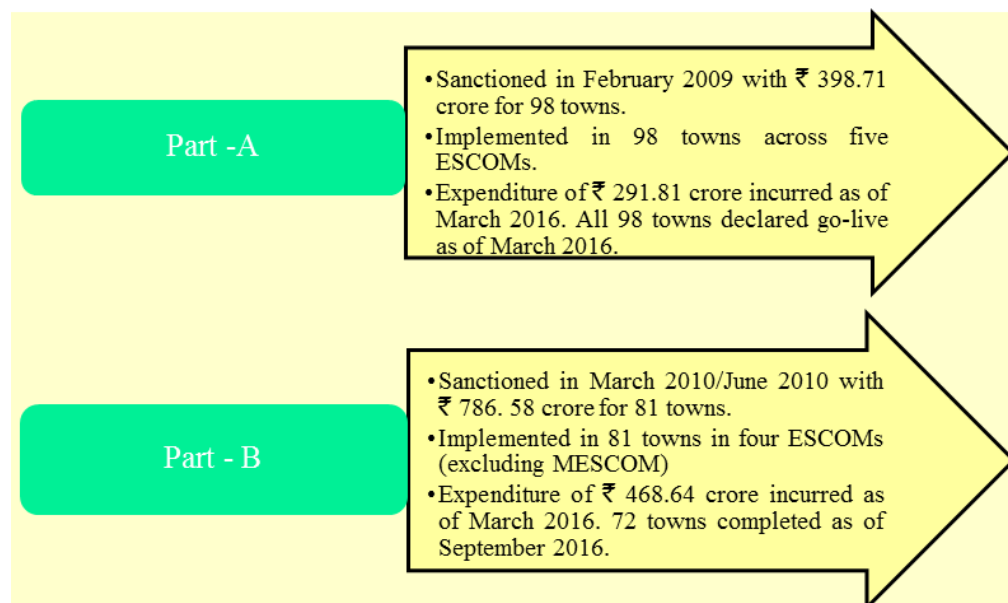
BESCOM, which was the nodal agency to implement Part-A on behalf all the five ESCOMs, appointed (December 2009) Infosys Technologies Limited as Information Technology Implementing Agency (ITIA) entrusting the following responsibilities to it:

- Ensure quality and expeditious implementation;
- Installation and configuration of software, hardware and other equipments at Data Centre and Disaster Recovery Centre and various other locations specified by ESCOMs;
- Survey, asset mapping and creation of digitised maps incorporating customer and asset information and
- Installation of data acquisition equipments at sub-stations, Distribution Transformer Centres (DTCs), sub-division offices of the ESCOMs and consumers.

⁴³ Meter Data Acquisition, Energy Audit, New Connection, Disconnection & Dismantling, GIS based customer indexing and asset mapping, GIS based integrated network analysis, Centralised Customer Care Services, Management Information System, Web Self Service, Identity and Access Management System, System Security Requirement, Metering, Billing, Collections, Asset Management, Maintenance Management.

Status of implementation

2.2.4. The status of implementation of the Programme is as depicted below:



The scheduled dates, February 2012 and June 2013 for completion of Part-A and Part-B respectively, were extended several times during the course of implementation, the latest deadlines being March 2016 and September 2016 for Part-A and Part-B respectively.

GoK sought (August 2016) extension of time from PFC upto March 2017 for completion of Part-A of the Programme. For Part-B, extension was given upto September 2016 for seven towns under GESCOM and two towns under CESC but further extensions were sought upto December 2016 and March 2017 respectively, which were awaited (December 2016).

Audit Objectives

2.2.5. The Audit objectives were to assess whether:

- The planning for implementation of the Programme was adequate;
- The Programme has been implemented in an efficient, effective and economical manner to achieve the intended objectives.

Scope of Audit

2.2.6. The scope of audit involved review of records at the corporate offices of the five ESCOMs and at the selected units (refer **Appendix-5**) under these ESCOMs for the period 2009-16⁴⁴. Thirty out of 98 towns (projects) under Part-A and 26 out of 81 towns (projects) under Part-B were selected for detailed audit using monetary unit sampling prioritising projects with higher

⁴⁴ As the implementation commenced in 2009 and audit of the Programme is being taken up for the first time, the Performance Audit covered seven years upto March 2016.

cost. The sample was selected ensuring minimum of 25 per cent of the total towns each under Part-A and Part-B covering all the five ESCOMs except MESCOM in case of Part-B.

Audit Methodology

2.2.7. The methodology adopted for attaining the audit objectives involved discussing audit objectives with the Government and the top management, scrutiny of records at ESCOMs and their units and issue of audit observations.

We explained the objectives of the Performance Audit to the Government and to the Management of the ESCOMs during an Entry Conference⁴⁵ held on 19 June 2015. The draft Audit Report was discussed with the Government in the Exit Conference held on 16 January 2017.

Audit has been conducted in conformity with the Auditing Standards issued by the Comptroller and Auditor General of India.

Audit Criteria

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

- The programme guidelines issued by MoP, GoI;
- Guidelines, orders and specifications issued by PFC;
- Detailed Project Reports (DPRs), Tender conditions and Contract agreements.

Acknowledgement

2.2.9. Audit acknowledges the cooperation extended by the Energy Department of the GoK and the Managements of the ESCOMs in facilitating the conduct of Performance Audit.

Audit Findings

2.2.10. The audit findings are discussed in the succeeding paragraphs. The views of the Government and Management wherever received have been considered and suitably incorporated in the Report.

Planning and Implementation of Part-A

2.2.11. Part-A of the Programme essentially involved implementation of 17 IT modules for data acquisition, new connections/disconnections, energy accounting and audit, network analysis management, maintenance management, asset management, Management Information System (MIS), metering, billing, collection, etc.

⁴⁵ Entry Conference was held at the time of finalisation of all India Performance Audit. No separate Entry Conference was held with the Government for the State Report.

This entire exercise was aimed at establishing base line data collection system for the distribution utilities so that they are able to capture AT&C losses in a precise manner without manual intervention and also to plan and implement corrective measures in Part-B.

Audit findings on implementation of Part-A of the Programme are discussed in Paragraphs 2.2.12 to 2.2.22.

Implementation of the Programme without completion of pilots

2.2.12. The ESCOMs had taken up implementation of Part-A in one town in each of the ESCOMs as pilot project *i.e.* Bengaluru (W4 sub-division) (BESCOM), Mandya (CESC), Kalaburgi (GESCOM), Dharwad (HESCOM) and Shikaripura (MESCOM). As per the General Conditions of Supply, the ITIA was expected to complete the pilot implementation within 12 months from the dates of award of contract by the ESCOMs. The ESCOMs issued Detailed Work Awards (DWA) between February 2010 and May 2010 with a stipulation to complete the same within 12 months. The purpose of pilots was to assess the feasibility or otherwise of the Programme before embarking on a large scale implementation.

We observed that the pilot implementation in respect of four of the five⁴⁶ towns selected was completed with delay ranging from two to five years from the scheduled dates. The reasons for delay are given below:

Table No.2.2.1: Reasons for delay in completion of pilot projects

Town	Date of DWA	Due date of completion	Date of 'go-live'	Reasons for delay
Dharwad (HESCOM)	May 2010	May 2011	March 2016	<ul style="list-style-type: none"> • Issue of material (hardware and software) by ITIA started only in June 2011 • Existing data on assets and consumers were migrated to RAPDRP system only in October 2011 • ITIA delayed survey of consumers and all data generated did not match with the records of HESCOM. Even the data on commissioning of DTC were not recorded. • Consumer indexing was done in March 2012.

⁴⁶ In BESCOM, pilot project was done in a sub-division in Bengaluru town but declaration of completion was made for Bengaluru town as a whole, hence not considered for review in audit.

Town	Date of DWA	Due date of completion	Date of 'go-live'	Reasons for delay
				<ul style="list-style-type: none"> • Delay in installing DLMS compliant meters in DTCs, HT consumers and Boundary meters (February 2013). • Delay in migration of incremental assets. The work has not been completed (February 2017).
Kalaburgi (GESCOM)	March 2010	March 2011	March 2016	<ul style="list-style-type: none"> • Delay in Geographic Information System (GIS), asset mapping, consumer indexing and validation of data. The works have not been completed (February 2017). • Delay in migration of existing data to RAPDRP system. • Delay in metering DLMS compliant meters to DTCs, HT consumers and Boundary meters.
Mandya (CESC)	March 2010	March 2011	January 2013	
Shikaripura (MESCOM)	May 2010	May 2011	March 2013	<ul style="list-style-type: none"> • Delay in DTC metering (completed in July 2014). Delay in migration of incremental assets and non mapping of consumers to DTCs /feeders. The works have not been completed (February 2017).

On account of non-completion of the pilots within the scheduled time, the ESCOMs could not gauge potential hindrances in the implementation of Part-A of the Programme in other towns. Even though two pilot projects (Mandya and Shikaripura) were declared 'go-live', these towns were also facing the same problems as the other towns as all the functions in the Modules were not operationalised fully and User Acceptance Test (UAT) was not completed successfully.

The implementation in the other towns had commenced simultaneously with the pilot projects without resolving the bottlenecks encountered in the pilots. The ESCOMs faced problems such as missing/ drop out of consumers during uploading and downloading to the system, delay in processing of collections

received through off-line cash counter solutions, problems in bulk printing of High Tension (HT) bills, frequent failure of connectivity and link to server, issue of erroneous bills to consumers, non-user-friendly software, non-generation of Low Tension bills in the system, long pending new connections, incomplete customer history, *etc.*

These problems could have been mitigated to a greater extent and the delay in completion of the Programme in other towns avoided or reduced, had the pilots been completed first and the problems and solutions analysed before taking up full scale implementation.

The Government replied (February 2017) that the project being vast, time was needed to resolve issues and the field staff were not able to understand the software fully. Pilot implementation and go-live in particular were delayed owing to incomplete field activities in pilot towns. However, towns other than pilots were declared go-live based on completion of field activities and software solution without waiting for all the activities to be completed in the pilot towns. The reply is not correct as the towns were declared as ‘go-live’ even before completion of the works as explained in Paragraph 2.2.13 below.

Declaration of towns ‘go-live’ without completion

2.2.13. ITIA was responsible to supply, install and commission one integrated solution within the framework provided in the SRS issued by PFC. As per the SRS (Para 3.5 of General Technical Specifications), a town was to be declared ‘go-live’ when the software was run with actual live data at site for three months without any bugs.

We observed that BESCOM declared (between January 2013 and March 2014) 60 of the 98 towns ‘go-live’ and the balance 38 towns in March 2016 without ensuring that all the functions in the modules were operational and UAT had been run successfully in the production environment. The ESCOMs’ action of declaring the towns ‘go-live’ was not in order for the following reasons:

1. As per the SRS, 1,731 functions were to be implemented in 17 modules across all ESCOMs. As per the SRS, to declare ‘go live’, 100 *per cent* functions were to be implemented. As of October 2016, only 11 of 17 modules had been completed to the extent of 90 to 100 *per cent* of the functions. In the remaining 7 modules, completion was between 58 and 88 *per cent* due to meter and modem issues, slowness of GIS *etc.* (refer **Appendix-6**).
2. UAT is a software testing process where the system is tested for acceptability and validates the end to end business flow. UAT was proposed to be conducted in the production environment. As per the SRS, ITIA was to fix all errors identified from UAT and get approval from the ESCOMs before declaring ‘go-live’. We observed that as per the latest UAT, 73 out of the proposed 443 tests were pending execution (October 2016), yet the towns were declared ‘go-live’ (refer **Appendix-7**).

3. In HESCOM, only 843 of the 4,852 modems at DTC/feeder level installed in 26 go-live towns were communicating data. HESCOM had questioned (between April 2014 and September 2014) BESCOM over the validity of declaring these towns 'go-live' without resolving such problems. Similarly, GESCOM complained (May 2014) to BESCOM on non-functioning of the modems. The billing of HT consumers was carried out manually by taking readings from consumer premises which were then uploaded into the system as the modems installed were not communicating data properly. Thus, towns had been declared 'go-live' without accounting for the deficiencies in the functioning of the system.

In respect of the observations (Sl.No.1 and 2 above) the Government replied (February 2017) that the current status of SRS and UAT compliance was 95.84 *per cent* and 94 *per cent*, respectively, considering all the ESCOMs. The Government also stated that in CESC, the major functionalities of the core utility business were not affected and hence, declaration of go-live in other towns was taken up. The reply confirms the audit observation that works had not been completed even till date (February 2017). The Government has not replied to the observation at Sl.No.3.

4. Further analysis by Audit on the functioning of one of the modules *viz.* New Connection module implemented by the ESCOMs revealed that the module was not functioning as per the SRS. As per the SRS, when the service order for a new connection approval was generated, the system should trigger the billing module to generate a bill. Audit test check of data of two/three months⁴⁷ in each of the ESCOMs during 2015-16 and 2016-17 revealed that out of 53,212 new connections released, issue of first bill was delayed in 7,240 cases by three months to three years.

The Government replied (February 2017) that currently in 97.56 *per cent* cases of new connections, first bill is generated and the meters were not read in respect of LT-7 and spot billing machine due to operational issues.

2.2.14. As per the SRS, the ITIA was required to provide the services through Facility Management Service (FMS) so as to manage the entire IT system and enable ESCOMs to realise the desired business objectives. Further, as per General Terms and Conditions of payment schedule, all payments for FMS should only be made after submission of the Energy Audit Reports from the date of declaration of 'go-live'. We observed that 60 towns in the five ESCOMs had been declared 'go-live' during January 2013 to March 2014. This was in spite of the problems in modems, unsuccessful User Acceptance Tests and non-generation of Energy Audit Reports. As these towns were declared 'go-live', the ESCOMs paid ₹ 2.52 crore⁴⁸ to ITIA towards FMS

⁴⁷ BESCOM (May June, July 2015/June, July, August 2016); CESC (June, July 2015/March, April 2016); GESCOM (July, August 2015/May, June, July 2016); HESCOM (April, May, June 2016); MESCOM (July, August, September 2015/March, April, May 2016).

⁴⁸ BESCOM (₹ 0. 25 crore) CESC (₹ 1.37 crore), and GESCOM (₹ 0. 90 crore).

charges for the period June 2013 to September 2014, which was irregular as the ESCOMs were yet to generate Energy Audit Reports.

The Government replied (February 2017) that the FMS for all the towns were being considered from the date of go-live, i.e. from April 2016 ending in March 2021 and ITIA had agreed for the same. The payments made earlier towards FMS were being adjusted based on Service Level Agreement Audit Report in ESCOMs.

Metering

2.2.15. The Programme envisaged installation of Automatic Meter Reading (AMR) compatible energy meters with Device Language Message Specification (DLMS) at Distribution Transformer Centers (DTCs) and feeders in the project areas. AMR is the technology of automatically collecting consumption from meters and transferring that data to a central database for billing, analysing, etc. DLMS is the communication standard for meter data exchange. We observed that ESCOMs had delayed the installation of these meters resulting in delay in completion of the Programme as observed in Paragraphs 2.2.16 and 2.2.17.

DTC metering

2.2.16. The supply and installation of DLMS compliant AMR meters at DTCs was in the scope of the ESCOMs. Four ESCOMs⁴⁹ (BESCOM, GESCOM, HESCOM and MESCOM) initially (December 2009) identified 23,052 unmetered DTCs and proposed to install DLMS compliant AMR meters at these DTCs. Subsequently, during the course of installation of modems in the existing meters, the ITIA found (January 2013) that the existing meters at the DTCs (34,001 Nos.) were not DLMS compliant and hence these too needed to be replaced.

We observed that the non-compliance of the existing meters with DLMS was ignored by the ESCOMs while deciding (December 2009) to install meters at the unmetered DTCs. This contributed to the delay in the completion of the Programme as the non-compliant meters continued to be replaced by DLMS compliant AMR meters until 2015-16. Audit observations on replacement of meters are discussed in the table below:

Table No.2.2.2: Observations on replacement of DTC meters

ESCOM	Date of purchase order	Date of completion	Audit remarks
BESCOM	September 2011/ April 2013/ August 2013	October 2013	<ul style="list-style-type: none"> The contractor completed metering of only 11,708 unmetered DTCs out of 15,369 even after extending the contract period from December 2011 to March 2013. BESCOM had completed the work departmentally in

⁴⁹ In case of CESC, no observation was made.

ESCOM	Date of purchase order	Date of completion	Audit remarks
			<p>October 2013.</p> <ul style="list-style-type: none"> BESCOM failed to levy penalty of ₹ 1.22 crore on HPL Electric and Power Private Limited (contractor) for the delay and non-completion of work. The Government replied (February 2017) that penalty was being levied for the delayed works. The decision to replace the existing non-compatible meters with DLMS compliant meters was taken in April/August 2013, <i>i.e.</i> after one year and six months from the scheduled date of completion of Part-A and the work was completed only in October 2013.
GESCOM	March 2012/ August 2013	November 2012/ December 2013	<ul style="list-style-type: none"> GESCOM took ten months to cancel (March 2011) the initial tender (May 2010) for metering DTCs after finding that the meters supplied by the bidder were not as per required specifications. Second tender invited (March 2011) was cancelled in July 2011 due to blacklisting of the successful bidder by Andhra Pradesh Distribution Supply Companies. The delayed decision had delayed the DTC metering further which was completed in November 2012. The purchase order for 6,500 DLMS compliant DTC meters was placed only in August 2013 to replace the existing meters and the work was completed in December 2013. <p>The Government replied (February 2017) that ITIA advised to replace all legacy meters with DLMS meters only after a delay of a year which led to delay in completing DTC metering.</p>
HESCOM	September 2011	February 2013	<ul style="list-style-type: none"> The initial tenders invited in December 2010 and January 2011 separately for supply of 10,100 meters and their erection were cancelled (April 2011) to invite a single tender for synchronizing the supply and erection. This post-bid decision had not only delayed

ESCOM	Date of purchase order	Date of completion	Audit remarks
			replacing the meters but also caused additional cost of ₹ 1.45 crore ⁵⁰ .
MESCOM	May 2013/ February 2014	July 2014	<ul style="list-style-type: none"> The initial Detailed Work Award (DWA) issued in August 2012 based on the rates finalised by another ESCOM (HESCOM) was not accepted by the contractor. Hence revised DWA had to be issued with revised rates in May 2013 causing delay. The work, which was to be completed in July 2013 was completed only in July 2014 as there was delay in line clearance by MESCOM. The work of replacement of 2,580 existing non-compatible DTC meters, taken up in February 2014, was completed in July 2014. 194 DTCs of 250 kVA and above were still to be metered (September 2016). <p>The Government replied (February 2017) that currently all the DTCs were metered with DLMS compatible meters, 75 per cent communication was established and troubleshooting exercise was in progress.</p>

Feeder level metering

2.2.17. The ESCOMs had 2,353 numbers of 11 kV feeders as of March 2016 emanating from 220/132/110 kV sub-stations belonging to Karnataka Power Transmission Corporation Limited (KPTCL). These feeders serve as the input energy points to the project areas.

During integration of data between Supervisory Control and Data Acquisition⁵¹ (SCADA) and DTCs to get feeder level energy audit reports, the ESCOMs observed (November 2012) that correct energy data were not available from the existing SCADA system as all the feeders were not connected to the SCADA system. Hence, meter reading was being taken manually every month and uploaded into the RAPDRP system for determining

⁵⁰ This represents differential cost on 10,100 meters quoted in the subsequent tender and initial tender {10,100 x (₹ 5,200 - ₹ 3,264) = ₹ 1.96 crore} less savings made on erection portion {10,100 x (₹ 7,391 - ₹ 7,899) = ₹ 0.51 crore}.

⁵¹ SCADA is a system for remote monitoring and control that operates with coded signals over communication channels. The State Load Despatch Centre (SLDC) is responsible to ensure integrated operation of the power system in Karnataka. SLDC facilitates Real time Load Despatch functions, Operation and Maintenance of the SCADA System and Energy Accounting.

the AT&C losses in the project area. Even after this exercise, AT&C loss figures continued to be erroneous due to errors in uploading the data into system.

Replacement of the existing meters with DLMS compliant AMR meters was discussed (October 2014) between ITIA, Energy Department, GoK and ESCOMs to replace all the input meters. BESCO, on behalf all ESCOMs, decided (April 2016) to do a Proof of Concept⁵² (POC) by installing modems and Sim to the existing meters themselves. However, during the installation of modems, it was observed (May 2016) that the existing meters were not communicating data. The matter was kept unresolved as the decision to replace the existing meters with DLMS compliant AMR meters and to integrate them with the SCADA system had not materialised (September 2016).

We observed that the ESCOMs had delayed the decision to replace the feeder level meters. The ESCOMs will not be able to measure accurate AT&C losses in the towns where the Programme was implemented unless DLMS compliant AMR meters are installed at feeders.

The Government replied (February 2017) that in CESC integration of RAPDRP system with SCADA was done for 80 feeders, the extent of communication being 50 *per cent*. Further, decision had been taken to replace all non DLMS feeder meters and tender has been invited in November 2016.

Incomplete mapping of consumers

2.2.18. The feeders and DTCs had to be linked (mapped) to the connected consumers so that input and output energy from the feeders and DTCs could be assessed with reference to actual consumption and losses controlled. Consumer mapping enumerates the total number of consumers and tags them to their respective DTCs/feeders. The purpose of consumer mapping is to identify revenue leakages by way of identifying consumers who are not billed or billed under improper category and to generate a master list of consumers.

We observed that 7.41 lakh out of 85.59 lakh installations (consumers) in the MIS customer base were either not mapped or wrongly mapped to the Feeders /DTCs across five ESCOMs as of October 2016. As a result, the AT&C losses at feeder and DTC levels were not accurate as the consumption of unmapped consumers had not been taken into account. HESCO accepted (December 2015) that all the consumers were not mapped to DTCs.

The Government replied (February 2017) that in BESCO, around 4.5 lakh incremental consumers were updated in all modules and the remaining would be completed by March 2017. In CESC, 62,034 consumers out of 1,30,000 identified by ITIA had been mapped and the balance were under progress. In MESCOM, pending consumers would be mapped in incremental survey and in GESCOM, the process of tagging of all consumers to feeders and DTCs was still under progress.

⁵² This is a method to test whether the data could be migrated to the new system.

Failure of modems

2.2.19. As per the SRS, modems were to be integrated with meters to facilitate remote reading of meter data on GPRS network as part of the Meter Data Acquisition System (MDAS) module. As per Request for Proposal (RFP), 59,520 GPRS modems had to be supplied by the ITIA for all ESCOMs. Accordingly, ITIA installed (August 2010 onwards) modems in DTCs, boundary meters and HT consumers under all the five ESCOMs.

ESCOMs found that the modems were unable to communicate data and the matter was referred (September 2013) to the Central Power Research Institute (CPRI) by BESCOM to identify the reasons for the failure of these modems. CPRI reported (January 2014) that faulty earthing at the DTCs was the reason for the failure. ITIA agreed (March 2015) in principle to pay the cost of the modems. BESCOM procured (June 2015) new modems through a tender for all ESCOMs and installation was completed by ESCOMs (March 2016). As a result, the whole process took almost six years.

The day-wise analysis of functioning of modems during the period March 2016 to July 2016 in five ESCOMs⁵³ revealed that the number of modems communicating data was very poor as detailed below:

Table No. 2.2.3: Range of communication of modems

ESCOM	DTC	Boundary meters	HT consumers
	Number of modems communicating data (as percentage)		
BESCOM	0-72	8-55	13-71
CESC	53-54	Meters were not read	21-72
GESCOM	38-41	Meters were not read	21-76
HESCOM	15-54	4-44	3-45
MESCOM	67-70	0-70	16-54

As seen from the above, the communication percentage under DTC in BESCOM was 0-72 which means that no modems were communicating at a given point of time and a maximum of 72 per cent of the modems had communicated during July 2016. Similarly, the communication percentage in other ESCOMs was very poor.

Thus, there was delay in installation of modems and the installed modems were still to function to their potential. This had delayed the entire process of analysing the results of meter reading and AT&C losses (August 2016).

The Government replied (February 2017) that the percentage of communication in respect of HT modem and DTC modem respectively was 77.54 and 69.21 in BESCOM, 88.88 and 58.57 in HESCOM, 95 and 60 in CESC, 97 and 75 MESCOM and 86 and 66 in GESCOM at present.

⁵³ Audit analysis was done for one month in each of the ESCOMs – BESCOM (July 2016), CESC (March 2016 and June 2016), GESCOM (June 2016), HESCOM (May 2016), MESCOM (April 2016).

Poor network services

2.2.20. The scope of ITIA included provision of Local Area Network at Data center, Customer care centers, Sub-division, Division, Circle, Headquarters and other offices of the ESCOMs as per their requirement, along with creation of Virtual Private Network/Multi Protocol Label Switching (VPN/MPLS) based Wide Area Network (WAN) solution.

A tripartite agreement was entered (May 2011/June 2011) into between ESCOMs, ITIA and Network Bandwidth Service Providers (NBSP) *i.e.* Reliance Communications Ltd. and Hughes Communications India Ltd. for primary and secondary network facilities respectively for five years with effect from May 2011. Accordingly, Reliance Communications Ltd. had established 803 links⁵⁴ in the ESCOMs. We observed that:

- Internet connectivity was very poor affecting various modules *viz.* GIS, New Connections, *etc.* and also the functioning of the cash counters at the Divisions and Sub-divisions of the ESCOMs. Based on the advice of ITIA, BESCOM, on trial basis enhanced the bandwidth from two mbps to four mbps in 15 places. Even after increasing the bandwidth at additional cost, the service was not satisfactory. Further, 107 out of the 803 links failed to function. This had affected the day-to-day activities of ESCOMs. As a result, the ESCOMs were using alternate service providers.
- Hughes Communications, the secondary NBSP who was to provide alternate network and bandwidth services in case of failure of the primary network, had also failed to provide effective alternative network solution. It had not established network services in more than 35 *per cent* of the places across all the ESCOMs as of September 2015 *i.e.* after a lapse of four years from the signing of the agreement. In BESCOM and MESCOM, it had delivered only 250 out of 399 links of which only 68 links were active. It had not delivered the balance 149 links.
- BESCOM issued (October 2015) Letter of Intent to Bharati Airtel Ltd., New Delhi for a period of five years to replace Hughes Communications as secondary NBSPs for all the five ESCOMs. The other ESCOMs, however, had issued DWAs belatedly. CESC issued DWA in February 2016, MESCOM in April 2016 and HESCOM in June 2016, while GESCOM was yet to issue DWA (August 2016). Bharati Airtel Ltd. has not created infrastructure yet for secondary network (August 2016).

We observed that the ESCOMs continued to work with inadequate primary network service. As a result of poor network services, the process of declaration of 'go-live' had also been delayed.

⁵⁴ Links refer to the points where the networking is established in a particular office – section office, sub-divisions, divisions, *etc.*

The Government replied (February 2017) that in view of poor performance, the secondary NBSP was replaced with Bharti Airtel Limited and provisioning of 297 links and up-gradation of band width is in progress. In case of primary NBSP, provisioning of 88 links of ESCOMS was in progress.

Failure to update incremental assets

2.2.21. Consumer indexing and asset mapping for the existing consumers and assets were in the scope of ITIA. The GIS database for network assets and consumers up to 2010-11 was generated by ITIA. The incremental consumers and assets added during the course of implementation were to be updated by the ESCOMs and migrated to RAPDRP system. We observed the following:

- BESCOM awarded the work of updating the incremental data to North South GIS (India) Pvt. Ltd., Hyderabad at a cost of ₹ 12.49 crore on behalf of all the five ESCOMs⁵⁵ in January 2015. As per the work order, data was to be obtained and updated in the GIS on a half-yearly basis for a period of two years from the date of award of work. BESCOM, MESCOM and CESC completed the first cycle of updation of six months data in May 2016, HESCOM in June 2016 and GESCOM has not completed the first cycle in one town (Kalaburgi) against two cycles to be completed.

We observed that the ESCOMs took up the job of updation of assets only in January 2015 *i.e.* after a lapse of three years from the scheduled date of completion (February 2012) of Part-A of the Programme, instead of updating the assets simultaneously with their addition. The delay in/non-updation of assets into RAPDRP system had resulted in delay in completion of the Programme and determining accurate AT&C losses.

CESC replied (January 2017) that second cycle of migration into GIS data base has been completed. CESC, however, was yet to complete the balance three cycles. The reply from other ESCOMs was awaited (February 2017).

- In six⁵⁶ out of 11 towns covered by MESCOM under Part-A, the available data with MESCOM on incremental assets was handed over to ITIA in May 2011 for migration and integration with RAPDRP system. ITIA, however, belatedly found (December 2013) that the data furnished by MESCOM was available only upto 2010 and the incremental assets after 2010 needed to be furnished by MESCOM. MESCOM stated (December 2013) that many additions in the assets had been effected subsequent to handing over of the data to ITIA and furnishing the incremental data was very difficult. The Board of MESCOM decided (January 2015) to conduct a fresh survey of the assets and to invite a short term tender. Accordingly, DWA was issued

⁵⁵ In case of MESCOM, only for five out of eleven towns implemented under the Programme (Bantwal, Puttur, Shikaripura, Kadur and Tarikere) were taken up along with other ESCOMs and the balance six towns was taken up by MESCOM separately.

⁵⁶ Mangaluru, Udupi, Shivamogga, Bhadravathi, Chickmagalur and Sagar.

(May 2015) to North South GIS (India) Ltd., Hyderabad through the tender process at a price of ₹ 2.85 crore with scheduled date of completion of six months.

We observed that in the first place MESCOM delayed handing over of the data to ITIA by two years (date of commencing the Programme- February 2009 to May 2011) and secondly, it did not ensure that the existing data on six towns was updated before being handed over to ITIA. Further, there was delay of four years (May 2011 to May 2015) in deciding to go for fresh survey for which ITIA was also responsible (May 2011 to December 2013) by way of not informing MESCOM about incomplete data. As consumer indexing and asset mapping was critical for determining AT&C loss, the delay on the part of ESCOMs to update the incremental data had defeated the very purpose of the Programme. The ESCOMs could not determine accurate AT&C losses in the absence of updated data.

The Government replied (February 2017) that proposal to constitute a separate GIS cell for updating the activities of assets and consumers in GIS application was underway. Second phase updating in eleven towns was under progress in MESCOM while it was now taken up in GESCOM and 11 out of 14 substations had migrated in CESC in December 2016.

Consumer facilities

2.2.22. As a part of post go-live requirement, consumers would be able to lodge complaints relating to metering, billing, disconnections, energy theft, etc. by calling a toll free consumer care centre. Further, as per the SRS, Intelligent Display Management System (IDMS), touch screen and cash/cheque collection kiosks were to be installed at customer care centers.

We observed that even though ESCOMs had provided a 24x7 customer care helpline, the number provided to consumers (1912) was chargeable to the consumers. Further, the IDMS touch screen and cash/cheque collection Kiosk to be supplied by the ITIA had not been supplied.

As a result, the facilities to the consumers as envisaged in the Programme were denied.

The Government replied (February 2017) that toll free number in BESCOM was implemented in September 2016 while in GESCOM, MESCOM and CESC it has been implemented in February 2017 and in HESCOM it was in progress. It stated that the ITIA had not provided KIOSK for IDMS despite several reminders.

Implementation of Part-B

2.2.23. Part-B of the Programme involved identification of high loss areas, preparation of investment plans for identified areas, implementation of the plan and monitoring of losses. The works under Part-B included strengthening of distribution net work involving renovation, modernisation and strengthening of 11 kV level substations and DTCs, reconductoring of lines at 11kV level and below, replacement of electro-magnetic energy meters with tamper proof electro-static meters, *etc.* The ESCOMs envisaged total energy savings of ₹ 197.26 crore after completion of the works under Part-B in 81 towns sanctioned under the Programme. The guidelines also stipulated that the ESCOMs should pass on part of the financial benefits arising out of reduction in AT&C losses to the consumers of the project area.

We observed that ESCOMs had failed to prepare proper estimates causing revision more than once and delay in awarding contracts. They had further failed to complete the works within the scheduled time. The envisaged energy savings have not been achieved so far due to non-completion of works depriving the consumers the financial benefit thereof. Audit findings on implementation are discussed in the succeeding Paragraphs 2.2.25 to 2.2.37.

Deficient planning

2.2.24. PFC sanctioned DPRs of 81 towns between March 2010 and June 2010 for implementation of the works under Part-B. We observed that considering a reasonable period of six months to finalise the tenders from the date of sanctioning of the DPRs, the ESCOMs awarded the contracts after a lapse of five to 21 months, which contributed to delay in completion of the works (refer **Appendix-8**). The reasons for the delay as analysed by Audit revealed the following lapses.

Improper decision

2.2.25. The initial estimate prepared (March 2010) for executing the works in 21 towns of GESCOM was revised (December 2010) by including a new work of shifting existing consumer meters from the premises of the consumers to the nearest distribution pole to reduce theft of power. Accordingly, tenders were invited (April 2011) and work was awarded (February 2012). The Board of GESCOM, however, decided (April 2013) to drop this new work as meter reading would be impractical if the meters were shifted to the poles. As a result, these works were removed from the scope of the contract subsequent to award of the contract.

We observed that the decision to shift the consumer meters to the poles was taken without assessing its feasibility. Further, the decision to drop the work of shifting consumer meters to the poles from the contract, taken after 14 months of awarding the work, was not communicated to the contractor. As a result, the contractor supplied (March 2014) pole mounted meter boxes worth ₹ 0.62 crore, which were not put to use resulting in unfruitful expenditure.

The Government replied (February 2017) that instructions have now been issued to all offices for making use of tamper proof boxes but the reply was silent on the removal of pole mounting work from the scope of work.

Poor estimation

2.2.26. In CESC, DPRs were sanctioned (March 2010) for an estimated cost of ₹ 179.57 crore for all the 12 towns. Tenders were invited in July 2010 at a cost of ₹ 167.97 crore for strengthening of the electrical distribution network (Tender Enquiry No.30 to 36) and replacing the existing consumer electro-mechanical meters (Tender Enquiry No.37 to 40) with tamper proof electro-static meters.

The award of contract was, however, delayed by 13 to 20 months (refer **Appendix-8**) as the sanctioned DPRs were revised subsequently due to improper estimates, amendments to bid conditions, multiple extension of bid validity, etc. as detailed below:

- Huge variations in estimates amongst the towns and revision of the estimate to ₹ 149.67 crore, retendered in August 2010;
- Amendments to tender (August 2010/September 2010/November 2010/December 2010);
- Revisions of terms of payment clauses, taxes and duties and general and special conditions of the bid (October 2010/November 2010);
- Extension of time for submission of tenders continuously between November 2010 and February 2011 based on the request of the bidders and
- Modification of specifications of mounting structures to be used for transformers (December 2010).

The Government replied (February 2017) that amendments to tender conditions were issued to ensure competitive bidding for effective implementation of the Programme which resulted in delay. The reply is not acceptable as the amendments were the results of poor estimation by CESC.

Unwarranted cancellation of tender

2.2.27. The tenders invited (July 2010) for strengthening works of the distribution network in CESC covered three towns viz., Channarayapatna, Arasikere and Hassan at an estimated cost of ₹ 9.36 crore. The lowest bid of ₹ 11.67 crore, when placed (July 2011) before the Board of CESC, raised the issue of abnormal quantities in the estimates. The matter was referred to a subcommittee which observed (July 2011) that the estimates based on which the tenders had been called were reasonable and fairly accurate. The Board, however, decided (November 2011) to cancel the tender without assigning reasons. The work was retendered (January 2012) and awarded (August 2012) at ₹ 16.41 crore while the lowest offer received in the initial tender was ₹ 11.67 crore.

We observed that the Board had decided to cancel the initial tender without recording any reasons despite the Subcommittee’s feedback stating that the variations were within the permissible limits. The decision of the Board not only resulted in delay in awarding of the contract by one year (July 2011 to August 2012) but also caused extra financial burden of ₹ 4.74 crore.

The Government replied (February 2017) that the re-tender was due to dissent of one of the subcommittee members (out of total 3 members). The Government’s reply is not acceptable as the dissent note was not on record.

Revision of estimates

2.2.28. HESCOM invited (December 2011) tenders for executing the works in 24 towns on partial turnkey basis with the stipulation that transformers be procured from Karnataka Vidyuth Karkhane Limited, a State PSU and single phase/three phase meters from retail outlets authorized by HESCOM. As there was no response for the tender, HESCOM re-invited (January 2012) the bids for executing the works in 24 towns by amending the tender conditions from partial turnkey to total turnkey basis. The works were awarded in June 2012 at a cost of ₹ 50.61 crore.

We observed that HESCOM invited tenders in December 2011 *i.e.* after a lapse of one and half years from the date of approval (March 2010/June 2010) of DPRs. The delay in inviting tender was due to multiple revisions in the estimates. Third party evaluation of base line AT&C losses of the towns included in the Programme done by CPRI revealed (November 2011) that six towns included in the Programme were not eligible for inclusion⁵⁷. This caused revision in estimates as number of towns was reduced to 24 from 31 towns⁵⁸. Further, HESCOM had reduced the quantities due to duplication of works included in the estimates which again caused reduction in estimated quantities. As a result, the initial sanctioned (March 2010) cost of ₹ 205.47 crore for 31 towns was revised thrice (between 2010-11 and 2011-12) and the cost had come down to ₹ 38.23 crore for 24 towns.

Thus, multiple revisions in estimates resulted in delay in awarding the contracts by more than one and half years from the date of sanctioning of DPRs. Further, reduction in estimated quantities had also resulted in avoidable payment of interest as commented on in Paragraph 2.2.39.

The Government replied (February 2017) that delay due to recalling the tender was only 25 days. The reply is not correct as the Government had considered the date of third party inspection (November 2011) to the date of inviting tenders (December 2011) instead of considering the date of approval of DPRs (March/June 2010) to the date of inviting tenders (December 2011).

⁵⁷ HESCOM calculated average AT&C losses for the whole year against the stipulation of continuous three billing cycles in a year.

⁵⁸ The initial estimated 31 towns were reduced to 30 towns by clubbing two towns (Rabkavi and Banahatti) into one.

Ineffective implementation

2.2.29. The ESCOMs awarded the works under Part-B for strengthening works of electrical distribution network including replacement of consumer electro-mechanical meters with tamper proof electro-static meters between March 2011 and August 2012. The stipulated period of completion ranged from 12 months to 24 months from the dates of award of works. The completion of works was delayed ranging from six months to 38 months (refer **Appendix-9**), besides cost escalation as discussed *infra*.

Delay in procurement of materials

2.2.30. GESCOM awarded (between February 2012 and May 2012) the contracts (nine packages) for executing Part-B works in 21 towns on partial turnkey basis at a total cost of ₹ 116.27 crore. The contracts involved reconductoring of 11 kV lines, installation of additional DTCs, replacement of existing meters with electro-static meters, *etc.* The works were to be completed within 11 months from the date of award. As per the contract, GESCOM had to supply electro-static meters and transformers for their erection.

We observed that GESCOM placed purchase orders for supply of meters in September 2013 at a cost of ₹ 25.25 crore, *i.e.* after the due date of completion of the contract period. The delay in placing the purchase orders was on account of delay in getting the test results of the sample electro-static meters from CPRI. The test results were received only in February 2013. GESCOM failed to get the test results expedited by not pursuing the issue and thereby caused delay in placing of purchase orders and completion of contracts.

Similarly, the orders for supply of transformers were placed in May 2012 at a cost of ₹ 7.49 crore with a scheduled completion of delivery upto November 2012 which was extended to February 2013. Supply of transformers was, however, made upto June 2014. We observed that the delay in placing purchase orders for supply of transformers was due to delay in deciding on type of transformers to be erected. GESCOM requested (August 2011) the Ministry of Power for accepting erection of conventional transformers instead of three star rated transformers as stipulated in the guidelines issued under the Programme. The Ministry of Power, however, did not respond to the request of GESCOM. Although the guidelines under the Programme stipulated that the distribution transformers should have efficiency level equivalent or better than that of three star ratings of Bureau of Energy Efficiency, GESCOM decided to erect conventional transformers which had delayed completion of work.

The Government replied (February 2017) that tenders were invited by GESCOM in November 2011 and that there was delay in getting the meters tested by CPRI. GESCOM wanted to match the lowest rates of CESC, hence Purchase Order was placed in September 2013. The reply is not acceptable as GESCOM failed to follow up with CPRI and delay in placing purchase order to match CESC rates was not a prudent decision.

Unfruitful expenditure on material

2.2.31. Autorecloser⁵⁹ and Sectionalizer⁶⁰ supplied at a cost of ₹ 6.11 crore to prevent the tripping of transformers in Davanagere town were not functioning. We observed that despite certification by the Executive Engineer of Davanagere division stating that Autorecloser and Sectionalizer were not functioning, BESCOM released (March 2016) payments to the contractors.

Similarly, the contracts in Ramanagara and Doddaballapura towns of BESCOM included laying Under Ground (UG) cable worth ₹ 1.89 crore, which were executed by the contractors (Shakala Infratech Pvt. Ltd. and Skill Tech Engineers & Contractors Pvt. Ltd.) in March 2012 and May 2012 respectively. The cable was found damaged during inspection by the Executive Engineer/Assistant Executive Engineer concerned as the work had not been done as per the specified norms. The payment against supply, however, was made (December 2011/February 2012/April 2012) in violation of contract conditions.

The Government replied (February 2017) that the work had been completed in January 2017. Regarding damaged UG cable in Ramanagara and Doddaballapura, it was replied that ₹103.09 lakh and ₹10 lakh respectively would be recovered from the pending bills of the Agency. However, the reply was silent on the issue of making payment before completion of the work.

Violation of contractual provisions

2.2.32. The turnkey contracts under Part-B awarded by the ESCOMs included supply and erection portion⁶¹. As per *Clause-8* of the terms of the contracts on payment of supply portion, 50 *per cent* of the ex-works price of the material supplied should be paid on supply of the material and the balance on erection and commissioning of the equipment.

We observed that ESCOMs paid 75 to 92 *per cent* of the value of the material supplied in respect of contracts awarded in three towns *viz.* Ramanagara, Mysuru and Kollegal without the equipment being commissioned which was in violation of the contractual terms. Such extra payment amounting to ₹ 10.53 crore was made (between December 2012 and October 2014) based on the request of the contractors concerned as detailed below:

⁵⁹Reclosers are used on overhead power distribution systems to detect and interrupt momentary faults. They improve service continuity by automatically restoring power to the line after a momentary fault.

⁶⁰The sectionalizer is a self-contained, circuit-opening device used in conjunction with source-side protective devices, such as reclosers or circuit breakers, to automatically isolate faulted sections of electrical distribution systems.

⁶¹ Included 11 kV reconductoring, installation and enhancement of DTCs, replacement of poles and LT phase conversion, *etc.*

Table No.2.2.4: Excess payment to contractors in violation of contract terms

Town	Contractor	Value of material supplied (₹ crore)	50 per cent of value of material (₹ crore)	Actual paid (₹ crore)	Excess payment (₹ crore)
Ramanagara	Skill Tech Engineers & Contractors Pvt. Ltd., Mysuru	6.43	3.22	5.92 (92 per cent)	2.70
Mysuru	Chadalavada Infratech Ltd., Hyderabad	29.08	14.54	21.80 (75 per cent)	7.26
Kollegal	Rajashekhhar & Associates, Bengaluru	1.88	0.94	1.51 (80 per cent)	0.57

It was observed that taking advantage of receipt of payment in advance, these contractors had abandoned the works after payment without completing the erection portion. As a result, the contracts had to be short closed and awarded to other contractors contributing to the delay in completion and cost escalation as observed below:

- The contract of Part-B works in Ramanagara town of BESCOM was awarded in April 2011 at a cost of ₹ 12.04 crore with a stipulation to complete by March 2013. The contractor (Skill Tech Engineers & Contractors Pvt. Ltd., Mysuru) supplied material worth ₹ 6.43 crore and did not execute erection work. The balance work was re-awarded in June 2014 which had resulted in additional cost of ₹ 1.30 crore for their completion. BESCOM, however, failed to invoke risk clause and recover the additional cost from the first contractor. Penalty of ₹ 0.76 crore out of ₹ 1.20 crore leviable was also not recovered.

The Government replied (February 2017) that due to non performance of works by Skilltech Engineers and Contractors Private Ltd., the work was short-closed. Liquidated damages of ₹ 2.15 crore would be recovered from the agency.

- In respect of Mysuru town of CESC, the contractor (Chadalavada Infratech Ltd., Hyderabad) completed only 25 per cent of the work (out of ₹ 98.36 crore awarded in January 2012) within due date (July 2013). CESC failed to terminate the contract despite poor progress. The contract was terminated only in June 2015 i.e. after more than one and half years from the scheduled date and balance work was re-awarded (October 2015) at an additional cost of ₹ 49.41 crore.

The Government replied (February 2017) that action had been initiated to recover the assessed additional burden for re-tendering works, including penalty and liquidated damages for ₹ 80.41 crore.

- In Kollegal town of CESC, the contract awarded (January 2012) at ₹ 5.27 crore to be completed by January 2013, was short closed without risk and cost in March 2016 as the contractor (Rajashekar & Associates) did not show the required progress (financial progress as of March 2014 was only 54 per cent). CESC issued (between July 2013 and October 2015) several notices on shortfall in progress, but failed to either encash or renew the bank guarantee of ₹ 0.53 crore which was valid upto September 2015.

The Government replied (February 2017) that action has since been initiated to recover the assessed additional burden for re-tendering works, including penalty and liquidated damages for ₹ 2.6 crore.

2.2.33. GESCOM and HESCOM did not invoke contractual provisions to penalise the defaulting contractors despite poor progress, which had resulted in non-completion of works within the scheduled date as discussed below:

- The Letter of Intent for the contract in Sindhanur town of GESCOM was issued in September 2011 with a stipulation to complete by August 2012 at a cost of ₹ 2.05 crore. The contractor (A2Z Maintenance & Engineering Services Limited, Haryana) did not commence the work even after the scheduled date of completion had passed. However, GESCOM allowed the contractor to continue to work without levying penalty for the delay. Further, the contractor was rewarded with (March 2016) additional quantities of ₹ 0.71 crore. The financial progress as of July 2016 was only ₹ 1.11 crore.

The Government replied (February 2017) that works were allowed to be completed by the contractor in spite of delay by him as short-closing and getting the balance works done through another agency would have invited several bottlenecks. The reply is not acceptable as the work had still not been completed till December 2016.

- The works valuing ₹ 50.61 crore in 24 towns of HESCOM started in June 2012 were completed in March 2015/June 2015 against the scheduled completion date of June 2013. A Committee formed (July 2015) to analyse the reasons for the delay in completion found (September 2015) that the delay was attributable to the contractor. HESCOM, however, had neither assessed the quantities that were delayed by the contractor nor levied the penalty as required under the terms of contract.

The Government replied (February 2017) that considering the field difficulties, PFC had revised the date of completion of Part-B work to 19 March 2015. Considering this date, the delay ranged from 27 days to four months and ₹ 17.25 lakh towards liquidated damages had been recovered.

Works declared completed without completion

2.2.34. The distribution strengthening works *viz.* reconductoring of LT lines, enhancement of capacity of existing DTCs, *etc.* were undertaken mainly to reduce technical losses due to overload in the existing capacity. We observed that BESCOM, GESCOM and HESCOM had declared the works in towns as completed even before completing the proposed works resulting in non-achievement of envisaged reduction in technical losses as observed at Paragraphs 2.2.35 to 2.2.37.

2.2.35. BESCOM had intimated (August 2016) PFC that Part-B works in all 24 towns were completed between March 2014 and June 2016. Audit review of works in the test checked towns showed that some of the works in Davangere, Tiptur and Tumakuru towns declared as completed were not completed (September 2016). In Tiptur town, the works of 11 kV lines and LT reconductoring were pending completion. Similarly, 90 *per cent* of the works were completed in Tumakuru, while the equipments *viz.* Auto reclosures and Sectionalisers were not commissioned in Davanagere.

The Government replied (February 2017) that the works were completed by the contractor as per his field survey inventory quantity. The reply is not acceptable as the quantity of work as per Detailed Work Award had not been executed.

2.2.36. GESCOM informed (March 2016) PFC that Part-B works in 14 out of 21 towns were completed between January 2015 and November 2015. We observed that some of the left out works *viz.* LT reconductoring, LT conversion and enhancement of DT capacity in these 14 towns were taken up only in April 2016/May 2016 and these works were still under progress (September 2016).

The Government replied (February 2017) that the works were completed in December, 2016. The fact remains that due to delay in awarding the work, the completion of Part-B works were abnormally delayed.

2.2.37. Works in four towns *viz.* Rabakavi, Banahatti, Mahalingpur and Athani in HESCOM were certified as completed between December 2013 and June 2014. We, however, observed that the materials such as PVC pipes, PSC/RCC poles, cross arms, 11 kV insulators, *etc.* required to be used in these towns were received only in August 2014 *i.e.* after the works were certified to be completed. In Athani town, the approval for commissioning of DTCs was given by Directorate of Electrical Inspectorate in August 2014, which was eight months after the declared completion date (18 December 2013).

The Government accepted (February 2017) that the DTCs were commissioned in August 2014.

Fund management

Unviable investment

2.2.38. The guidelines issued by PFC prescribed the criterion of Return on Investment (RoI) to be not less than 10 per cent for a town to be eligible for inclusion under the Programme.

We observed that BESCOM and HESCOM had included three towns (₹ 63.42 crore) and six towns (₹ 14.63 crore) respectively under the Programme though RoI was less than 10 per cent as detailed below:

Table No.2.2.5: Towns having less than 10 per cent of RoI

Sl. No	Town	RoI	Amount invested ⁶² (₹ crore)
BESCOM			
1	Davangere	6.74	49.86
2	Harappanahalli	8.95	3.52
3	Harihara	9.50	10.04
HESCOM			
1	Dandeli	Not calculated	4.87
2	Lakshmeshwar	2.64	1.69
3	Naragund	0.07	2.08
4	Nippani	4.30	1.80
5	Ranebennur	4.28	2.00
6	Savanur	7.44	2.19
Total investment			78.05

Inclusion of above towns without considering RoI would possibly render the investment of ₹ 78.05 crore unviable. The reasons for inclusion of these towns despite lower RoI were not record.

The Government replied (February 2017) that PFC considered Internal Rate of Returns instead of ROI for approval. Since the investment was unviable as per the guideline issued by PFC, it was not a prudent fund management decision.

Avoidable financial burden

2.2.39. HESCOM submitted (March 2010) DPRs for 31 towns at ₹ 205.47 crore under Part-B to PFC, which released (May 2011) ₹ 41.75 crore at 15 per cent of the cost. Subsequently, as six⁶³ towns were found (December 2011) to be ineligible by the third party independent evaluation agency due to error in calculation of base line AT&C losses and also as there was duplication of works in the previous estimates, the cost was reduced to ₹ 38.23 crore. As a result, the Company had to refund the excess amount of loan received along with interest of ₹ 6.55 crore. Considering the interest of ₹ 1.55 crore earned on this excess drawal, the net avoidable interest paid was ₹ 5 crore. The issue of inclusion of ineligible towns and duplication of works resulting in

⁶² Represents actual expenditure incurred on the works in the respective towns.

⁶³ Hubballi, Dharwad, Belagavi, Bagalkot, Ilkal and Haveri.

avoidable interest has already been commented in the Audit Report of the Comptroller and Auditor General of India on Public Sector Undertakings of Government of Karnataka for the year ended March 2014 vide Paragraph 3.15.

The Government replied (February 2017) that PFC would be requested to withdraw the claim.

Avoidable borrowings at higher cost

2.2.40. As per the terms of sanction of loan for implementation of Part-A of the Programme, PFC was to release the sanctioned cost in the form of a loan to the ESCOMs in four instalments viz., 30 per cent each in the first three tranches and the balance 10 per cent after full utilisation of loan disbursed in earlier tranches. The details of sanctioned cost, amount disbursed by PFC and the actual expenditure incurred by ESCOMs as at 31 March 2016 are given below:

Table No.2.2.6: Details of sanctioned cost, amount disbursed by PFC, actual expenditure of three ESCOMs as at 31 March 2016.

(₹ in crore)

ESCOM	Sanctioned Cost	Amount disbursed	Percentage of disbursement to sanction	Actual expenditure	Percentage of expenditure to sanction
HESCOM	54.66	31.54	58	46.40	85
GESCOM	34.11	19.21	56	23.80	70
MESCOM	29.05	7.24	25	20.36	70
Total	117.82	57.99	49	90.56	77

We observed that

- Though the above three ESCOMs⁶⁴ were eligible for release of ₹ 106.04 crore, being 90 per cent of the total sanctioned cost (₹ 117.82 crore), they had received only ₹ 57.99 crore, which was much less than even the actual expenditure of ₹ 90.56 crore incurred by them. ESCOMs failed to pursue PFC to release the amount due though they had spent ₹ 32.57 crore⁶⁵ more than the disbursement. Non-receipt of amount due from PFC had forced the ESCOMs to spend out of funds borrowed at higher rate of interest (more than 10.5 per cent per annum), while the funding received under the Programme was available at a lesser rate (9 per cent per annum).
- PFC raised (March 2014/November 2015) demand twice on ESCOMs for repayment of principal and interest from April 2014 as the works under Part-A were not completed within scheduled/extended period. Meanwhile BESCOM, the nodal agency for Part-A, had requested (July 2014) deferment of repayment schedule in line with the extended scheduled completion period, which was agreed (February

⁶⁴ The other two ESCOMs (BESCOM and CESC) had received the funds equivalent to expenditure incurred by them; hence no comment is made on these ESCOMs.

⁶⁵ Difference between disbursed amount (₹ 57.99 crore) and actual expenditure (₹ 90.56 crore) of three ESCOMs.

2015/February 2016) to by PFC. Three ESCOMs (HESCOM, GESCOM and MESCOM), however, repaid the loan of ₹ 27.74 crore. Considering the fact that the actual expenditure incurred by these three ESCOMs was more than the amount received⁶⁶ and the repayment was made out of borrowings at higher cost, they should have waited for the response from the PFC to the request made by BESCO before repayment.

Thus, non-receipt of funds due under the Programme had resulted in borrowings at higher cost leading to avoidable financial burden on ESCOMs and the consumers as this additional expenditure would be factored into tariff.

Likely financial burden on consumers

2.2.41. PFC sanctioned (February 2009/ March 2012) ₹ 398.71 crore and ₹ 786.58 crore for Part-A and Part-B of the Programme respectively. The ESCOMs were eligible for loan at 100 *per cent* of the sanctioned cost under Part-A and 25 *per cent* under Part-B. The ESCOMs were required to complete the works under Part-A and Part-B within three years from the date of sanction to avail the benefit of conversion of loan into grant. The ESCOMs had received ₹ 276.84 crore under Part-A and ₹ 109.05 crore under Part-B from PFC as of March 2016. Although the scheduled date of completion of the Programme was extended from time to time, the latest being March 2016/September 2016, there was no commitment from the Ministry of Power, GoI on conversion of loan into grant in the changed scenario of breaching of the deadlines by ESCOMs. It is pertinent to note here that the PFC had raised demand on ESCOMs on two occasions (June 2014/November 2015) for repayment of loan along with interest. In fact, three ESCOMs had made partial repayment of loan to the PFC (refer Paragraph 2.2.40). The ESCOMs had not taken up the matter of conversion of loan into grant either with the PFC or Ministry so far (December 2016).

Thus, in the event of non-conversion of loan into grant, it is likely that the entire loan availed and incurred under the Programme would become a burden on the consumers as the cost is factored into tariff.

The Government replied (February 2017) that CESC had met the project time line as specified by PFC. Extension had been accorded by PFC upto June 2016 for completion of the Project. Response to the requests for converting loan into grant was yet to be received from PFC.

Ineffective monitoring

2.2.42. In line with the guidelines issued under the Programme, GoK constituted (November 2008) the Distribution Reforms Committee (DRC) headed by the Chief Secretary to the Government at the State level to monitor the implementation of the Programme. DRC was formed with the task of recommending project proposals of ESCOMs, monitoring compliance to the conditionalities and achieving mile stones and targets under the Programme.

⁶⁶ Advance was received in July 2009 and 1st instalment was received in February 2014 (HESCOM), March 2014 (MESCOM), May 2014 (GESCOM).

We observed that:

- DRC met during 2008-09, 2009-10, 2010-11 and 2013-14 for discussing implementation issues, the last such meeting being held in May 2013. The DRC, during the meeting held in May 2013, directed ITIA to roll out all modules across all the towns by September 2013 and the Managing Directors of ESCOMs and ITIA to jointly review the progress on a daily basis. But there was no follow up on these directives as no meetings were held subsequent to these directions;
- There was no monitoring during 2011-12, 2014-15 and 2015-16 by DRC as it did not meet even once at the time when implementation was at critical stage;
- Monthly meetings held through video conferencing headed by the Energy Department did not identify bottlenecks in implementation in order to resolve them. Similarly, monthly meetings headed by the Managing Directors/Chief Engineers held at ESCOMs level for monitoring Part-B had merely noted the progress achieved and did not identify the problems in execution or resolve them.

CESC replied (January 2017) that it had requested for DRC level meeting to be conducted once in two to three months for monitoring the project. Accordingly, 13 meetings were conducted between 2008-09 and 2015-16. Reply is not acceptable as the DRC did not conduct any meetings during 2011-12, 2014-15 and 2015-16 to monitor the project.

2.2.43. As per the guidelines, ESCOMs were to create IT Cell comprising a team of IT experts having relevant qualifications, experience and background in the field of system integration and IT implementation to guide the implementation of Part-A right from the preparation of DPRs.

We observed that the ESCOMs created IT Cell (BESCOM, HESCOM, MESCOM) between December 2013 and February 2015 *i.e.* after a lapse of four to six years from the date of sanction of Part-A of the Programme, while GESCOM never created one. CESC appointed Track Leaders for each module in February 2015. Creation of IT Cell in time as stipulated could have reduced the problems faced by ESCOMs in the implementation of Part-A of the Programme, which comprised mainly IT components.

The Government replied (February 2017) that the IT cell, with track leads in each of the modules, had been functioning in BESCOM since 2009. Formation of separate IT cadre to meet all IT requirements including RAPDRP was in process. The reply is not acceptable as BESCOM did not have IT experts in the IT Cell stated to have been functioning since the beginning. As the IT Cell was expected to play a crucial role, priority should have been accorded to its formation and proper staffing.

2.2.44. The guidelines stipulated appointment of IT Consultant by the ESCOMs within 15 to 25 days from the date of sanction. The role of the IT Consultant *inter-alia* included assisting the ESCOMs to customize project level bid documents for Part-A, handholding of ESCOMs for implementation from concept to commissioning of the project, project management including participation in testing and commissioning till complete go-live, *etc.*

BESCOM appointed (June 2009) Reliance Infrastructure Limited (RIL) as IT consultant of all the ESCOMs for a period of four years. As RIL did not agree to continue beyond the contract period, BESCOM appointed (March 2015) Ernst & Young LLP (E&Y) as IT Consultant.

We observed that there was a time lag of 21 months in the appointment (March 2015) of E&Y. Thus, the ESCOMs did not have an IT Consultant during the critical phase of implementation. Presence of an IT consultant could have possibly mitigated bottlenecks in implementation of Part-A.

The Government replied (February 2017) that during the intermediate period, the project implementation was monitored by RAPDRP Cell and by the Managing Directors of ESCOMs through weekly video conference. KPMG consultants and IT Advisor were also assisting BESCOM. The reply is not acceptable as the ESCOMs did not have an IT Consultant during this crucial phase for project management to ensure the successful commissioning till go-live, which was required as per the guidelines issued by PFC.

CESC replied (January 2017) that the bottlenecks were resolved after appointing E&Y as consultant. Reply is not acceptable as the issues on communication of modems fixed to the DTC and Feeder meters were not resolved yet.

Conclusions

Audit Objective-1: *Whether the planning for implementation of the Programme was adequate.*

- **The ESCOMs failed to plan the completion of the pilots under Part-A as scheduled. As a result of taking up of Part-A on a large scale without completing the pilots, the bottlenecks in implementation remained unresolved even after a lapse of more than four years beyond the scheduled dates of completion;**
- **The ESCOMs delayed the award of contracts by five months to 21 months. Inclusion of new items of work without feasibility, frequent amendments to the estimates and bid conditions and cancellation of tenders without justified reasons were the reasons for the delay;**
- **BESCOM and HESCOM made investments in three and six towns respectively under Part-B although return on investment was less than 10 per cent stipulated under the guidelines.**

Audit Objective-2: *Whether the Programme has been implemented in an efficient, effective and economical manner to achieve the intended objectives.*

- **The IT applications under Part-A have not been stabilized and the ESCOMs were yet to reap the desired benefits i.e. establishing reliable and automated sustainable systems for collection of base line data and adopting IT in the areas of energy accounting and consumer care, even after a lapse of four years from the scheduled date. This was owing to pending consumer indexing and asset mapping in respect of incremental consumers and assets, poor functioning of modems fitted at DTCs and Feeders, pending installation of input energy meters at feeder level, etc.;**
- **Owing to incomplete works under Part-A, the ESCOMs were not in a position to assess whether distribution strengthening works done under Part-B had actually yielded the desired results in terms of reduction in AT&C losses and envisaged savings;**
- **The ESCOMs had violated contractual provisions in making payments towards supply of materials and failed to penalise the contractors for delay in completion or non-completion of the contracts under Part-B. This had not only caused delay in completion of the works ranging from six months to 38 months from the stipulated dates but also caused additional burden on the ESCOMs due to increase in cost;**
- **The ESCOMs failed to impress upon PFC to release the instalments due in time, which had resulted in avoidable borrowings at higher cost for implementation;**
- **The Distribution Reforms Committee, responsible for overseeing the implementation of the Programme at State Level, had failed to address the bottlenecks in implementation. The review meetings held at ESCOMs level had merely discussed the progress rather than identifying the problems and resolving them.**

Recommendations

- 1. The ESCOMs may ensure that pilots are completed as per schedule before embarking on large scale implementation of a Programme or Scheme so that any hindrances or bottlenecks can be resolved at the initial stages. The learning from the pilots should be utilised during full scale implementation;**
- 2. Incremental assets and consumers need to be mapped and added to the data base for accurate assessment of AT&C losses;**
- 3. The estimates may be proposed based on the field conditions before inviting tenders;**

- 4. The compliance mechanism to contractual terms should be strengthened;**
- 5. The ESCOMs may ensure proper assessment of viability or otherwise of future capital investments;**
- 6. Various authorities/committees constituted for monitoring the implementation, both at the State and ESCOMs levels, should identify the bottlenecks and resolve the issues in a time bound manner.**

