Executive Summary

Introduction

Energy has been universally recognized as one of the most important drivers for economic growth and development. Access to affordable and reliable electricity is critical to a country's growth and prosperity. India has made significant progress towards the augmentation of its power infrastructure. However, capacity augmentation of power generation was not commensurate with the exponentially increasing requirements driven by the rising population, expanding economy and a quest for improved quality of life.

National Electricity Policy, 2005 envisaged an ambitious objective of power to all by 2012 and therefore, capacity addition in the power sector infrastructure has been one of the major thrust areas of the Government. Hydro power, one of the sources, is a renewable, economic, non-polluting and environmentally benign source of energy. Hydro power stations have inherent ability for instantaneous starting, stopping, load variations, etc. and help in improving reliability of power system. The generation cost is not only low and inflation free but also reduces with time. Therefore, hydro power is considered to be the best choice for meeting the peak demand. The Central Electricity Authority assessed (1987) country's hydro power potential of 84,044 MW at 60 per cent load factor.

(Para 1.1 and 1.2)

What does our audit cover?

Hydro power is generated by Central and State Public Sector Enterprises as well as private sector companies. The Central Public Sector Enterprises (CPSEs) in hydro power sector mainly include NHPC Limited (NHPC) including its JV Company NHDC Limited, SJVN Limited (SJVNL), THDC India Limited (THDC) and North Eastern Electric Power Corporation Limited (NEEPCO). This report examines the processes from conceptualisation to implementation of Hydro power projects by NHPC, SJVNL, THDC and NEEPCO which aimed at adding a capacity of 11,813 MW during Eleventh Five Year Plan *i.e.* April 2007 to March 2012. All the 16 projects slated for completion by March 2012, taken up for execution by these CPSEs have been covered in the Performance Audit. However, for contract awarding activities, a representative sample of 24 contracts across these four CPSEs was drawn from a total of 53 contracts.

(Para 1.4, 2.1 and 2.5)

Our Major Audit Findings

Performance Audit has revealed significant gaps/deficiencies in the processes associated right from the planning stage to award of contract and execution of the projects. Audit observed that with better planning, coordination, adequate survey, investigations, coordination and monitoring, the CPSEs could have achieved capacity addition closer to the targets.

Significant audit findings are discussed below in brief:

(i) Slippages in the targets for capacity addition

All the four CPSEs prepared their capacity addition plans of 11,813 MW hydro power without due diligence and failed to tie up modalities with all the stakeholders within the existing structural framework. Consequently, the plans had to be scaled down from 11,813 MW to 6,794 MW. Even the scaled down targets which were almost 42 *per cent* less than the original targets could not be achieved. CPSEs were able to achieve capacity additions of only 1,550 MW by March 2012 (*i.e.* 13 *per cent* of the original targets and 23 *per cent* of revised targets).

Besides, these CPSEs are likely to add only 3,774 MW capacity in 12 projects in XII Five Year Plan (2012-2017) as against 14,535 MW in 33 projects envisaged in the Hydro Power Policy 2008.

(Para 1.6, 3.3 and 3.4)

(ii) Delays in Project planning and initial activities

The entire process of project planning and implementation was beset with inordinate delays. NHPC, SJVNL and THDC could complete the pre-investment approval activities within the benchmark of 30 months fixed by the Ministry of Power (MOP) in only two out of 14 Projects[1]. While there was a marginal delay of up to six months in completing these activities in five projects, delays ranged up to 50 months in the remaining seven projects.

(Para 3.5)

(iii) Allotment of Projects to Private Developers

Despite specific directions (August 1999) from Prime Minister's Office (PMO), MOP did not form Special Purpose Vehicle (SPV) for survey, investigation and implementation of the Siang and Subansiri multi purpose projects (six) in the Brahmaputra Basin in Arunachal Pradesh. Instead, GOI allocated (May 2000) six projects (20,700 MW) to NHPC of which only one project i.e. Subansiri Lower (2,000 MW) is being executed by NHPC. Later Government of Arunachal Pradesh (GOAP) allotted (February 2006, August 2009 and March 2010) four of these projects to the private developers/joint ventures. The remaining one project was allotted (February

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1 ***Excludes two projects of NEEPCO as planning activities were not covered in this Performance Audit.***

2009) to NTPC by GOAP for preparation of pre feasibility report. The decision to move from SPV to NHPC and then to private developers only added to the delay in execution of the projects. The projects originally allotted to NHPC in May 2000 have not yet (March 2012) been initiated even after lapse of more than 12 years (against the benchmark time of 10 years from the date of conceptualization of a project to its commissioning). The private developers/joint ventures are still in the process of getting various clearances. Hence, the estimated benefit of generation of 6,600 MW electricity per annum, as per DPRs of four projects allotted to private developers/ joint ventures, has not been achieved.

(Para 3.6)

(iv) Gaps/deficiencies in Survey and Investigation

Despite Policy on Hydro Power Development of GOI (1998) emphasising thorough survey and investigation of potential hydro sites on an advanced scientific basis before preparation of DPRs, NHPC and SJVNL did not focus adequately on the critical activities of project survey and investigations. Till 2006, NHPC did not have any norms for the number of holes required to be drilled during survey and investigation. NHPC and SJVNL encountered several 'geological surprises' (like variations in the rock classes during excavation) in the execution of projects causing an adverse cascading impact on the time and cost of these projects. Even after devising norms in January 2007, NHPC expressed difficulty in following these norms on different grounds.

(Para 4.1.1 and 4.1.2)

Audit further noticed that in Parbati-II Project (800 MW), NHPC adopted 'Tunnel Boring Technology'– a technology for drilling a tunnel, despite concerns expressed by various authorities like Geological Survey of India, MOP and Central Water Commission, *etc.* The Tunnel Boring Machine (TBM) got stuck in the tunnel and NHPC had to terminate (March 2012) the contract due to persistent poor performance of the contractor leading to estimated cost overrun of ₹243.54 crore and time overrun of 99 months.

{Para 4.2 and 6.2 (d)}

A time of 8 months was taken for investment approval after Techno Economic Clearance in case of Subansiri Lower of NHPC whereas it ranged between 10 and 29 months in respect of other 12 projects[2] (excluding Koteshwar Project of THDC[3]).

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[2] ***Excludes two projects of NEEPCO as planning activities were not covered in this Performance Audit.***

[3] ***A time of 127 months was taken in respect of Koteshwar project of THDC after obtaining TEC (August 1989) as Committee of Secretaries decided to take up this project after the work of Tehri Stage-I project picked up.***

The Working Group on Power for Eleventh Plan (2007-12) envisaged (February 2007) cost of construction at ₹4.50 crore per MW for the run of the river hydro projects. The approved per MW cost of construction of nine out of 12 run of the river hydro projects[4] approved by CCEA between July 1998 and January 2007 ranged between ₹4.90 crore and ₹14.12 crore as against ₹4.50 crore per MW envisaged by the Working Group. However, the anticipated cost of construction of 11 out of above 12 projects is much higher than the approved cost and ranged between 18 to 112 per cent of the approved cost. Besides per MW anticipated cost of above 12 projects also ranged between ₹4.97 crore to ₹20.80 crore as against ₹4.50 crore per MW envisaged by the Working Group.

(Para 4.3.1)

(v) Lack of transparency in the process of award of contracts

Till July 2004, there were no guidelines for fixation of Pre qualification (PQ) criteria in NHPC but a practice of fixation of PQ criteria by a multidisciplinary Committee was being followed. Audit appreciates that out of total 16 contracts (13 contracts prior to July 2004 and three contracts after issuance of guidelines), this practice was followed in 13 contracts.

(Para 5.2(a))

In five out of the 16 contracts examined in Audit, NHPC relaxed PQ criteria after the close of sale of tender documents.

(Para 5.2 (b))

Against the target of 9.5 months for completion of tendering activities from publication of NIT to issue of letter of award, NHPC took 14 to 28 months in 15 out of 16 contracts reviewed in Audit. SJVNL took 21 to 28 months in three contracts selected for examination in audit while THDC took 39 to 80 months in three contracts examined in audit.

(Para 5.4.1)

(vi) Inadequacies in Execution of Projects

The Central Electricity Authority envisaged a timeline of 10 years for a large size hydro project from planning to commissioning while NHPC has prescribed a timeline of about 6.5 to 9.5 years. Against this, two projects (Omkareshwar and Sewa-II) completed so far were executed within above benchmark. Two projects- 'Teesta-V' of NHPC and 'Koteshwar' of THDC were completed in 11 and 13 years respectively. Nine ongoing projects are likely to take between 11 and 19 years; Rampur project of SJVNL is likely to be completed in nine years and the data regarding conceptualisation of two projects of NEEPCO was not available.

(Para 6.1)

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[4] ***Koteshwar project of THDC and Omkareshwar project of NHPC (JV with MP Govt.) are storage type.***

Delay in execution of 16 projects by four CPSEs resulted in revision of their initial approved cost of ₹ 30,005 crore to ₹ 44,712 crore. In seven completed/ongoing projects, the cost overrun was in the range of 53 to 148 per cent.

The main reasons for delay in project execution were geological surprises. Other controllable factors like delay in handing over of access roads to the contractors, wrong assessment of land requirements, delay in issuance of construction drawings, increase in scope of work due to incorrect assessment of bill of quantities, etc. also contributed to delay in execution of the projects.

Thorough survey and investigation as envisaged in the Policy on Hydro Power Development (1998) would have minimized the geological surprises. Other factors like delay in handing over of access roads, delay in issuance of construction drawings, etc. could have been controlled by proper coordination and monitoring by the CPSEs.

(Para 6.1)

NHPC extended undue favour to M/s HJV (led by MAYTAS Infra Limited) in fixation of PQ criteria, relaxation of PQ criteria after close of sale of tender documents and also award of work though M/S HJV did not fulfil the PQ criteria. NHPC also extended advances of ₹131.65 crore to it beyond contractual provisions. There was laxity in monitoring the execution of work and the pace of work was very slow. On being pointed out in Audit, NHPC terminated (March 2012) the contract due to persistent slow progress of work and encashed bank guarantees available with it. This resulted in blocking of ₹182.48 crore with remote chances of recovery, estimated extra expenditure of ₹243.54 crore besides time overrun of 99 months in the execution of project.

{Para 5.2(a) to 5.2(d) and 6.2(d)}

Tunnel boring machine (TBM) deployed by M/s HJV got stuck in the tunnel due to ingression of water slush and loose rock. For resumption of work, a Committee chaired by former Secretary (Power) was constituted by MOP for advice. On the recommendation of the Committee, NHPC released (April 2008) an advance of ₹72 crore to enable M/s HJV to meet its outstanding liabilities. Audit observed that the Chairman of the Committee was also a member of the Board of Directors of one of the JV partners of M/s HJV and therefore, there was a clear conflict of interest in his two responsibilities.

{Para 6.2(e)}

NHPC agreed to compensate a contractor (M/s Om Metals-SPML JV) for compression of schedule of hydro mechanical works relating to Chamera-III and Uri-II projects and paid an amount of ₹13.60 crore to the contractor. Compression of the schedule was not justified as the civil works were already running behind schedule.

{Para 6.2(b)}

As the progress of work was not satisfactory, THDC constituted (March 2007) a high level 'Empowered Committee' to get the work done by making direct payment to the manufacturers/suppliers *etc.* against the orders placed by M/s PCL Intertech Lenhydro (PCL). As on 31 March 2012, an advance of ₹190.42 crore was recoverable from the contractor (PCL) on account of payments released at his risk and cost against which performance guarantee/cash of only ₹56.28 crore were available with THDC.

{Para 6.2(g)}

NEEPCO failed to protect its financial interest as insurance cover taken by a contractor during execution of tunnel work under Package-I was deficient. NEEPCO did not ensure that the extra items subsequently executed were got insured by the contractor through 'Add on cover' or a new policy. Consequently, NEEPCO suffered a loss of ₹19.88 crore due to damage of extra items of work executed by the contractor in two accidents in January 2007 and December 2007. This amount could not be recovered by NEEPCO either from the contractor or the insurance company.

{Para 6.2(h)}

(vii) Monitoring Mechanism and Impact Assessment

Though a monitoring mechanism was in place in these CPSEs, it did not have the desired impact in removing the project impediments. Even controllable factors like delay in handing over of access roads to contractors, issuance of construction drawings, incorrect assessment of Bills of Quantities, etc. were not addressed in time to contain project delays. Monitoring by the MOP also did not help in ensuring timely action on the identified problem areas in execution.

(Para 7.1)

Delays in commissioning of projects have led to CPSEs losing the opportunity of generating 26,282.97 MUs of electricity annually (as per the DPRs). Further, additional return on equity to the tune of ₹1474.57 crore permissible under CERC Regulations, 2009 has also been foregone by the CPSEs.

(Para 7.2)

What do we recommend?

Based on the audit findings, the following recommendations are made:

Ministry of Power, Government of India

1. MOP should coordinate with concerned State Government and other authorities like CEA, MOEF, MOWR for timely preparation of DPRs, allocation of projects and monitor progress of projects to ensure timely completion of projects for exploitation of hydro power potential in India. Desirability of a High Powered Committee chaired by Secretary (Power) with Members from other nodal Ministries/State Governments as a single window mechanism to monitor and expedite the process of necessary clearances should be explored.

2. The Hydro Policies 1998 and 2008 of GOI allowed State Governments to select developers through MOU route for hydro projects up to 100 MW only and follow a transparent procedure for awarding potential sites to the private sector. MOP, through its oversight role, should therefore impress upon the State Governments to allocate hydro power projects above 100 MW to the developers in a fair, transparent and competitive manner.

NHPC Limited, SJVN Limited, NEEPCO and THDC India Limited

3. CPSEs should ensure that adequate survey and investigation are conducted before preparation of DPR to mitigate the risk of subsequent geological surprises during project execution and consequential increase in volume of work, change in design and resultant Time/Cost overruns.

4. CPSEs should adhere to the established best practices for PQ criteria, bidding and contract management to eliminate the possibility of unfair advantage to some bidders over the others.

5. CPSEs should make their long term plan in line with the GOI Hydro Policy and start their preparedness much in advance as it takes about 10 years from conception to commissioning of a Hydro project.

6. CPSEs should streamline their internal control systems and monitoring mechanism to ensure adherence to the contractual terms by the bidders.