

CHAPTER – II

Audit Approach

2.1 Scope of Audit

The performance audit covers activities from generation of electricity to collection of revenue between April 2009 and March 2014 by power stations of the four hydro power CPSEs. In the wake of the incident of flash flood that occurred on 16-17 June 2013 in Uttarakhand, adequacy of disaster management measures was also included in the scope of audit.

2.2 Audit Objectives

The objectives of performance audit were to assess whether:

- (i) The hydro power stations were generating power economically and efficiently as per the envisaged goals;
- (ii) Maintenance of power stations was as per prescribed norms with due regard to economy and efficiency;
- (iii) Tariff notifications and processes prescribed for billing, allowance of rebate, imposition of surcharge and collection of debtors were complied with; and
- (iv) Preparedness for disaster management in the power stations was adequate.

2.3 Audit Criteria

Audit criteria adopted for performance audit included:(i) original Detailed Project Report (DPR) of the power stations and completion/commissioning reports of power stations (ii) operation and maintenance manual of the power stations (iii) CEA's annual maintenance calendar (iv) Indian Electricity Grid Code (IEGC) Regulation 2010 (v) Minutes of the Standing Committees of the regions, Regional Power Committees, Technical Co-ordination Committees (vi) Normative Annual Plant Availability Factor (NAPAF)⁵ for hydro generating stations as prescribed in Central Electricity Regulatory Commission (CERC) Regulations applicable for the period 2009-2014 (vii) CERC (terms and conditions of tariff) Regulations 2004 and 2009 (viii) tariff petitions, review petitions filed by CPSEs and tariff orders issued by CERC (ix) Power Purchase Agreements (PPA) entered into with beneficiaries; (x) Memorandum of Association and Article of Association of CPSEs (xi) Minutes of meetings of Board of Directors of the CPSEs, Committee of Directors, and other Board Level Committees (xii) best practices adopted by the industry (xiii) CEA norms for Disaster Management (xiv) Works and Procurement Policy and Procedure (WPPP) of CPSEs (xv) annual MOUs entered by CPSEs with the Ministry of Power (MoP) (xvi) Cost Audit Reports of power stations (xvii) Disaster Management Plans (DMPs) of selected power stations (xviii) Disaster Management Act, 2005

⁵ *Plant Availability Factor (PAF) fixed on normative basis by CERC in its Notification applicable to the tariff period 2009-2014 in respect of each of the hydro power stations considering plant type (i.e. Storage, Pondage or Run of the River), silt problem, other operating conditions and known plant limitations. Plants were entitled to incentive if actual PAF achieved was more than NAPAF or subject to disincentive if actual PAF achieved was less than NAPAF.*

(xix) Central Water Commission (CWC) guidelines on Emergency Action Plan (EAP) for Dams, May 2006 (xx) State Disaster Management Plans (xxi) Environment Impact Assessment (EIA) notification, 1994.

2.4 Audit Methodology

Entry conference was held with the managements of NHPC, SJVN, THDC and NHDC on 06 August 2014 wherein the scope, objectives, audit criteria and audit sample were discussed. Relevant records at corporate offices and selected power stations of above four CPSEs were examined and discussions held with the senior management from time to time during August 2014 to December 2014 for firming up audit conclusions. The draft performance audit reports were issued to the managements of the above four CPSEs for their comments during January/February 2015. These draft reports were updated/revised after considering the replies of the managements concerned and merged into a consolidated draft report. This report was again issued to the managements of these four CPSEs in May 2015 and exit conferences were held with them to discuss the audit findings in May 2015. Keeping in view the discussions held in the exit conferences, the audit findings/recommendations were modified, and the modified draft report was issued to MoP in June 2015. After receipt of MoP's reply dated 20 August 2015 to the draft report, an Exit Conference was held with MoP and managements of the four CPSEs on 25 August 2015. Representatives from CEA also attended the Exit Conference wherein audit findings and suggestions for improvement proposed in draft report were discussed. MoP's reply (August 2015), discussions at Exit Conference (August 2015) and additional replies received from Managements/MoP on observations and recommendations in August/September 2015 have been considered and duly incorporated in this report.

2.5 Audit Sample

Representative sample of eight NHPC power stations representing 44 *per cent* in terms of number and 49 *per cent* in terms of installed capacity as on 31 March 2014 was drawn using Interactive Data Extraction and Analysis (IDEA) software. In respect of other CPSEs which had one or two power stations, the only power station or the older one, was selected for the purpose of performance audit (details in *Annexure 2.1*).

Table 2.1
CPSE-wise total number of power stations with installed capacity and number of power stations with installed capacity selected for performance audit

Name of CPSE	Population as on 31 March 2014		Sample selected	
	No. of power stations under operation	Installed capacity (MW)	No. of power stations	Installed capacity (MW)
NHPC	18	4831	8 ⁶ (44 per cent)	2359(49 per cent)
SJVN	1	1500	1(100 per cent) (Nathpa-Jhakri)	1500(100 per cent)
THDC	2	1400	1(50 per cent) (Tehri Hydro)	1000(71 per cent)
NHDC	2	1520	1 (50 per cent) (Indira Sagar)	1000 (66 per cent)
TOTAL	23	9251	11 (48 per cent)	5859 (63 per cent)

2.6 Audit Findings

Audit findings are discussed in subsequent chapters under the following headings:

Chapter III: Capacity Utilization and Electricity Generation

Chapter IV: Management of Planned and Forced Outages

Chapter V: Sale of Power and Revenue Collection

Chapter VI: Disaster Management

Chapter VII: Monitoring System

Chapter VIII: Conclusion and Recommendations

2.7 Acknowledgment

Audit appreciates and acknowledges the cooperation extended by MoP and Managements of NHPC, SJVN, THDC and NHDC in facilitating smooth conduct of audit.

⁶ (i) Bairasiul, (ii) Tanakpur, (iii) Chamera-I, (iv) Uri-I, (v) Dhauliganga, (vi) Teesta-V, (vii) Chamera-III and (viii) Chutak