

CHAPTER-2

Audit Approach

2.1 Scope of Audit and Audit Sample

The performance audit covers the adequacy and results of efforts of BHEL for capacity expansion and its utilization as detailed below.

(i) **Capacity expansion:** Audit examined records of BHEL commencing from conceptualization to execution of manufacturing capacity expansion (in Phases –II and III for raising the BHEL’s capacity for manufacturing power equipment from 10,000 MW per year to 20,000 MW per year) during 2007-2012 as summed up in Table 3.

Table 3

Details of Schemes		Number of Schemes taken up by BHEL	No of schemes selected in Audit for examination
Ongoing schemes of Phase I as of 1 April 2007		7	Not selected as these relate to Phase I.
New schemes approved and taken up during 2007-12	Phase-II (10,000MW to 15,000 MW)	17	14
	Phase-III (15,000 MW to 20,000 MW)	5	3
Total		29	17
Unfinished schemes as of March 2012 out of the total schemes approved and taken up during 2007-12	Phase-II	13	12*
	Phase-III	5	3*

* Included in total 17 selected schemes.

17 schemes (valuing ₹ 4156.17 crore) pertaining to manufacturing capacity expansion in 10 major power equipments⁷ were selected out of total 22 schemes (valuing ₹ 4737.41 crore) approved and taken up by BHEL during 2007-12. Details of selected schemes are given in *Annexure I*. Various stages of contract management, including cost estimation, tendering process, award of contracts and post-award execution of purchase orders in respect of selected 174⁸ high value purchase orders for the above 17 selected schemes were examined so as to assess the overall efficiency of system of award of purchase orders for capital equipment. Details of the selected sample of purchase orders are summarized in Table 4:

⁷ Steam/Nuclear Turbines, Gas Turbines, Generators, Hydro Turbines, Hydro Generators, Boilers, Power Transformers, Control panels/equipments, Switchgears and Pump Sets.

⁸ HEEP-Haridwar (23), HEP-Bhopal(23), TP-Jhansi (13),HPEP- Hyderabad (44), HPBP-Trichy (48) and EDN Bangalore (23). Purchase orders in respect of HEEP Haridwar, EDN Bangalore and HPBP Trichy were selected on Random basis using 'Random number seed 1965' through IDEA 8 software. However in case of HPEP Hyderabad and TP Jhansi nearly 100 per cent orders were selected. In HEP Bhopal high value orders were selected.

Table 4

Unit Name	No of Schemes selected	Total Population		Selected Sample		Percent	
		No of POs	Value ₹ in crore	No of POs	Value ₹ in crore	PO	Value
EDN Bangalore	1	103	40.45	23	25.04	22.33	61.90
HPBP Trichy	3	235	533.47	48	371.68	20.43	69.67
HPEP Hyderabad	5	45	517.81	44	351.95	97.78	67.97
HEP Bhopal	1	26	57.40	23	49.79	88.46	86.74
HEEP/CFFP Haridwar	6	154	986.88	23	714.98	14.94	72.45
Transformer Plant Jhansi	1	13	38.29	13	38.29	100.00	100.00
Total	17	576	2174.30	174	1551.73	30.21	71.37

(ii) **Capacity utilization:** The extent of capacity utilisation achieved by BHEL was examined in respect of delivery of 10 major power equipments⁹ (contributing 62.67 per cent or ₹ 1.05 lakh crore of the total turnover of ₹ 1.67 lakh crore during the period 1 April 2007 to 31 March 2012 of BHEL). However, erection and commissioning of equipment has not been covered in this Performance Audit as this activity involves readiness of associated civil works and Balance of Plant¹⁰ (BOP) like ash handling, coal handling plants, cooling water system, etc. which are either in the scope of work of others or beyond the direct control of BHEL. All eight units manufacturing these 10 major power equipments apart from three marketing units, Corporate R&D unit, Balance of Plant unit, a Repair plant and Corporate office, were covered in performance audit (*Annexure II*).

In addition, the performance audit also assessed (i) the adequacy of efforts made in development of technology; and (ii) achievements with reference to targets set by Ministry in the Memoranda of Understanding (MOUs), as these aspects have a significant impact on the achievement of capacity utilization and expansion.

Audit of Procurement system in BHEL was last carried out in 2010-11 and the results of Audit had been included in Chapter VI of C&AG's Report No. 10 of 2010-11. As efficiency and effectiveness of procurement system impacts cost effectiveness of a company, Audit also followed up adequacy of action taken by BHEL on the observations and recommendations contained in Chapter VI of C&AG's Report No. 10 of 2010-11.

⁹ Steam/Nuclear Turbines, Gas Turbines, Generators, Hydro Turbines, Hydro Generators, Boilers, Power Transformers, Control panels/equipments, Switchgears and Pump Sets.

¹⁰ Equipment other than main plant equipment of Turbines, Boilers and Generators required for a Power plant is called Balance of Plant.

2.2 Audit Objectives

The objectives of performance audit were to assess the:-

- economy, effectiveness and efficiency of planning for expansion of manufacturing capacity including the system of award of contracts;
- effectiveness and efficiency of execution of manufacturing capacity expansion schemes;
- extent of utilisation of manufacturing capacity including adequacy of steps taken to prevent decline in market share;
- results of efforts towards development of technology;
- fixation and extent of achievement of targets in MOU with administrative ministry; and
- effectiveness of monitoring mechanism.

2.3 Audit Criteria

Audit criteria adopted for the performance audit were derived from:

- Reports of Ministry of Power / Ministry of Heavy Industries and Public Enterprises/ Planning Commission/ Central Electricity Authority;
- Agenda and Minutes of the meetings of the Board of Directors and its Sub Committees;
- Purchase Policy, Organization Methods Instructions and Supplier Evaluation, Approval & Review Procedure;
- Production Plans and Scheduling of Floor Shop;
- Internal guidelines in respect of Outsourcing; and
- Guidelines of Department of Public Enterprises (DPE) in respect of MOUs and incentive payments.

2.4 Audit Methodology

An entry conference was held on 23 September 2011 with the Management of BHEL at its Corporate Office, where the scope, objectives, criteria and methodology of audit were discussed and agreed upon. Audit examined the relevant records in the Department of Heavy Industry, Ministry of Heavy Industries and Public Enterprises, (Ministry), Ministry of Power (MOP) and selected units /offices of BHEL during September 2011 to February 2012. Audit process involved collection of data, discussion with Management, issue of draft Report to each concerned unit and issue of Consolidated draft Report to the Corporate Management of BHEL after suitably incorporating replies of Management. Report was also issued to Ministry on 29 January 2013 incorporating reply of Corporate Management of BHEL. Management furnished its reply to the Ministry on 02 April 2013 with a copy to this office which was duly incorporated in draft Report. An Exit conference to discuss significant audit findings and recommendations with the Management was held on 05 April 2013. Ministry forwarded (30 April 2013) the reply of Management of 02 April 2013 without their specific comments on

the issues raised in the draft report. Ministry was again requested (15 May 2013) to furnish their specific comments to the audit observations pertaining to fixation and achievement of MOU targets included in the Chapter 8 of draft performance audit report as the Ministry was actively involved in fixation of targets and evaluation of performance of BHEL. Ministry thereafter endorsed (June 2013) the reply submitted by BHEL in respect of Chapter 8 of the performance audit report.

Draft performance audit report was modified considering the replies of the Management, Ministry and discussions held in the Exit conference (April 2013) with the Management. Modified draft report was again issued to the Ministry as well as Management on 05 August 2013 for their comments. Reply of the Management to the revised draft report was received on 9 September 2013 which was followed by a second Exit Conference with the Management as well as Ministry on 16 September 2013 mainly to ensure better understanding and appreciation of technical issues as well as genuine concerns of BHEL. In the second Exit conference (September 2013) Ministry endorsed the reply dated 9 September 2013 of the Management. The present report incorporates the views expressed by the Ministry and Management in their replies forwarded to Audit and views expressed at various stages as detailed above.

2.5 Audit Findings

Audit findings are discussed in the succeeding chapters as detailed below:

- Chapter-3: Planning for Expansion of Manufacturing Capacity;
- Chapter-4: System of Award of Purchase Orders;
- Chapter-5: Execution of Manufacturing Capacity Expansion Schemes;
- Chapter-6: Utilisation of Manufacturing Capacity and trend of Market Share;
- Chapter-7: Development of Technology;
- Chapter-8: Fixation and Achievement of MOU Targets;
- Chapter-9: Monitoring Mechanism; and
- Chapter-10: Conclusion and Recommendations.

2.6 Acknowledgement

Audit acknowledges the co-operation extended by the management of BHEL, Department of Heavy Industry, Ministry of Heavy Industries and Public Enterprises and Ministry of Power (MOP) in facilitating the conduct of this performance audit.