



Annexure

Annexure I
(Referred to in Paras No 2.1 (i), 4.1 and 5.1)

Capacity Augmentation Schemes at BHEL (Phase – II)

₹ in crore

S. No.	Name of Unit	Capital Investment Scheme	Estimated cost of the Scheme	Scheduled time for completion	Actual / anticipated month of completion	Delay in months	Whether Selected for Audit
1	HEEP-Hardwar	Capital investment proposal for Steam Turbine including advance blades facilities augmentation to 10020 MW	774.23	Oct' 2009	Dec' 2014	62	Yes
2	HEEP-Hardwar	Capital investment proposal for "Turbo-Generator facilities augmentation to 10020 MW	220.27	Oct' 2009	Oct' 2014	60	Yes
3	HPEP-Hyderabad	Capital investment proposal for "Augmentation of capacity for Steam Turbines"	191.96	Dec' 2009	Nov'2012	35	Yes
4	HPEP-Hyderabad	Capital investment proposal for "Establishment of new blade shop"	105.96	Oct' 2009	Sep' 2012	36	Yes
5	HPEP-Hyderabad	Enhancing the manufacturing capacity of pumps from 187 nos. to 280 nos.	88.17	Oct' 2009	Aug'2012	35	Yes
6	HPEP-Hyderabad	To augment the facilities for manufacture of 47 Generators aggregating to 2720 MW per annum.	92.6	Dec' 2009	Dec' 2012	35	Yes
7	TP-Jhansi	Enhancement of manufacturing capacity for power transformer upto 220 KV class from 8500 MVA to 15000 MVA	94.2	Oct' 2009	Aug' 2012	34	Yes
8	HEP-Bhopal	Capital investment proposal for "New block for manufacture of 765 KV class, HVDC and higher rating transformers	131.55	Jun-08	May' 2011	35	Yes
9	HPBP-Trichy	Capacity Investment proposal for "Capacity augmentation of Boiler Shops"	731.72	Dec' 2009	Jul-12	31	Yes
10	HPBP- Trichy	Capacity enhancement of valve shops from 7850 MT to 13800 MT and to enhance capacity to build valves for higher rating boilers and OSTC	93.39	Dec' 2009	July' 2012	31	Yes
11	CFFP-Haridwar	Capacity Augmentation proposal of Foundry Group, RMS, QM and Service	48.64	Dec'2008	Feb' 2013	50	Yes
12	CFFP-Haridwar	Capacity Augmentation for Forging	48.63	Dec'2009	Dec' 2013	48	Yes
13	CFFP-Haridwar	Capacity Augmentation of Casting- phase-II	13.11	Mar'2010	July'2013	40	Yes
14	EDN Bangalore	Increase in manufacturing capacity of Control Equipment	29.49	Dec'2009	March 2011	15	Yes
Total			2663.92				

Capacity Augmentation Schemes at BHEL (Phase – III)

₹ in crore

S. No.	Name of Unit	Capital Investment Scheme	Estimated cost of the Scheme	Scheduled time for completion	Actual / anticipated month of completion	Delay in months	Whether Selected for Audit
1	HEEP-Haridwar	Capacity augmentation of Thermal sets from 10020 MW to 13020 MW	309.16	Dec.' 2011	Dec' 2014	36	Yes
2	HPBP-Trichy	Capital investment proposal for capacity augmentation of boiler and valve shops phase – III	485.29	Dec' 2011	Aug' 2012	07	Yes
3	HPEP-Hyderabad	Augmentation of manufacturing capacity of HPEP corresponding to BHEL capacity of 20000 MW	697.8	Dec'2011	June' 2013	17	Yes
Total			1492.25				
Grand Total (Phase II+ Phase III)			4156.17				

Annexure II
{Referred to in Para No 2.1 (ii)}
Unit- selected for review

(a) Marketing Unit:

- (i) Power Sector
- (ii) Industry Sector
- (iii) International Operation Division

(b) Corporate Office

(c) Manufacturing Unit:

- (i) Heavy Electrical Equipment Plant (HEEP) and Central Foundry Forge Plant (CFFP), Haridwar,
 - (ii) Heavy Electrical Plant (HEP), Bhopal,
 - (iii) Transformer Plant (TP), Jhansi,
 - (iv) Heavy Power Equipment Plant (HPEP), Hyderabad,
 - (v) High Pressure Boiler Plant & Seamless Steel Plant (HPBP), Trichy,
 - (vi) Boiler Axillaries Plant (BAP), Ranipet and
 - (vii) Electronics Division (EDN), Bangalore
- (d) Corporate R& D, Hyderabad
- (e) **BOP Unit:** Project Engineering Management (PEM), Noida
- (f) **Repair Plant:-**Heavy Equipment Repair Plant (HEPRP), Varanasi

Annexure III
(Referred to in Para No 6.1)

Declared Installed Capacity and its Utilisation

S. No	Name of the Equipments	Units	2007-08		2008-09		2009-10		2010-11		2011-12	
			Installed Capacity	Actual Production	Installed Capacity	Actual Production	Installed Capacity	Actual Production	Installed Capacity	Actual Production	Installed Capacity	Actual Production
1	Steam/Nuclear Turbine (in MWs)	HEP, Bhopal	250	250	250	0	250	0	250	0	250	666
		HPEP, Hyderabad	695	1156	1140	1118.87	1140	797.4	1630	1913	1630	1818
		HEEP, Haridwar	5750	2530	5750	4960	5750	2355	10020	2900	10020	11762
TOTAL			6695	3936	7140	6078.87	7140	3152.4	11900	4813	11900	14246
2	Hydro Turbine (in MWs)	HEP, Bhopal	2500	1284	2500	835	2500	785	2500	1149	2500	854
		HEEP, Haridwar (Hydro Sets)	0	304	0	0	0	0	0	0	0	0
TOTAL			2500	1588	2500	835	2500	785	2500	1149	2500	854
3	Gas Turbine (in MWs)	HPEP, Hyderabad	480	396	992	999.1	992	1287.7	1090	1722	1090	652
TOTAL			480	396	992	999.1	992	1287.7	1090	1722	1090	652
Grand TOTAL OF Turbines			9675	5920	10632	7912.97	10632	5225.1	15490	7684	15490	15752
4	Generators (in MWs)	HEP, Bhopal	2500	869	2500	658	2500	1399	2500	1286	2500	380
		HPEP, Hyderabad	1360	1630	1947	1971	1947	1627	2720	2627	2720	2418
		HEEP, Haridwar	5750	2530	5750	4960	5750	2355	10020	2900	10020	9480
TOTAL			6610	5029	10197	7589	10197	5381	15240	6813	15240	12278
5	Boilers (in MT)	Trichy	108000	305423	411497	439187	481162	545045	481162	595939	714538	686602
TOTAL			108000	305423	411497	439187	481162	545045	481162	595939	714538	686602
6	Power Transformers (in MVA)	HEP, Bhopal	15000	11986	15000	15483	30000	14231	30000	18805	30000	23160
		TP, JHANSI	5500	5974	5500	6221	5500	4571	15000	7397	15000	9585
TOTAL			20500	17960	20500	21704	35500	18802	45000	26202	45000	32745
7	Control Panels & Equipments	HEP, Bhopal (control equipments + control panels) (in Nos)	1200	1589	1200	1473	1200	1693	1200	1975	1200	1987
		EDN, Bangalore (Control equipments) (in Cubicle)	2500	3058	4300	4073	4300	5897	4500	6649	7000	6109
TOTAL												

S. No	Name of the Equipments	Units	2007-08		2008-09		2009-10		2010-11		2011-12	
			Installed Capacity	Actual Production	Installed Capacity	Actual Production	Installed Capacity	Actual Production	Installed Capacity	Actual Production	Installed Capacity	Actual Production
8	Switchgear (in Nos)	HEP, Bhopal	3000	4000	3000	3270	3000	2920	3000	2952	3000	4214
TOTAL			3000	4000	3000	3270	3000	2920	3000	2952	3000	4214
9	Pump Sets (Nos)	HPEP, Hyderabad	126	200	187	201	187	227	280	341	280	351
TOTAL			126	200	187	201	187	227	280	341	280	351

Annexure IV
{Referred to in Para No. 6.3.2 (c)}

Details of variation between estimates and actual costs of components in respect of HPBP Trichy

Sl.No	PO Nos	Estimate	Actual	Variation	
		Amount (₹ in lakh)	Amount (₹ in lakh)	Amount (₹ in lakh)	Percentage
1	2	3	4	5(3-4)	6(5/4)
1	I3/1400	1223.17	942.54	(-) 280.63	(-) 29.77
2	I3/1401	1223.17	661.99	(-) 561.18	(-) 84.77
3	I3/1402	1223.17	660.81	(-) 562.36	(-) 85.10
4	I3/1403	1223.17	693.24	(-) 529.93	(-) 43.32
5	U2/0387	1965.38	1120.92	(-) 844.46	(-) 75.34
6	U2/0388	1965.38	1021.93	(-) 943.45	(-) 92.32
7	U5/0635	7594.55	4187.10	(-) 3407.45	(-) 81.38
8	U5/0637	7594.55	3668.43	(-) 3926.12	(-) 107.02
9	U1/0162	950.56	863.90	(-) 86.66	(-) 10.03
10	U0/0435	433.98	345.07	(-) 88.91	(-) 25.77
11	U5/0649	4584.80	3783.26	(-) 801.54	(-) 21.19
12	U2/0385	1965.38	912.69	(-) 1052.69	(-) 115.34
13	U2/0386	1965.38	796.73	(-)1168.65	(-) 146.68
14	U5/0639	4817.61	3157.18	(-)1660.43	(-) 52.59
15	U5/0640	4817.61	2988.78	(-) 1828.83	(-) 61.19
16	U5/0656	4244.76	2863.22	(-) 1381.54	(-) 48.25
17	U5/0647	5330.83	3210.58	(-) 2120.25	(-) 66.04
18	U5/0648	5330.83	2628.19	(-) 2702.64	(-) 102.83
19	U5/0645	5639.58	3562.73	(-) 2076.85	(-) 58.29

Annexure –V
(Referred to in Para No. 6.3.4)

**Issue wise details of audit observations and deficiencies noticed in the follow up action in
Chapter VI of Audit Report No. of 2010-11**

Sl. No.	Observation	Management Reply	Further Remarks
1	<p>Purchase Policy and Purchase Procedure</p> <p>Due to various deficiencies noticed in the purchase policy and procedures, it was recommended that BHEL needs to develop comprehensive guidelines/policy on procurement to be followed uniformly by the units. Management in their ATN report (October 2011) intimated that revised purchase policy was under approval. However as per further reply (January 2012) of the Management, the revised purchase policy had been kept on hold in view of proposed Public Procurement Act. Thus, due to non approval of revised purchase policy no action on the audit observation/recommendation was taken by the Management. <i>(Refer Para no 6.6.2 and Recommendation no 6.1 of Report-10 of 2010-11).</i></p>	<p>Management stated (September 2013) that revised purchase policy-2013 has since been approved by the Board of Directors on 22 March 2013 and has since been issued on 8 April 2013.</p>	<p>The Management had assured (January 2010) that constitution of Purchase Committee will be made mandatory for all procurements exceeding ₹ five crore whereas as per clause no. 11.2 of the purchase policy 2013, formation of purchase committee is mandatory for tenders above ₹ 20 crore.</p>
2	<p>Procurement by Limited/ Single tender</p> <p>Audit had observed that 94 <i>per cent</i> contracts were awarded on Limited/ Single tender basis during 2006-09. Further review of procurement made during 2009-10 and 2010-11 revealed that the procurement through Limited/ Single tenders was 94.10 <i>per cent</i> and 90.00 <i>per cent</i> respectively. As such there was no improvement in the Procurement system. <i>(Refer Para no. 6.6.3.1 of Report-10 of 2010-11).</i></p>	<p>Management stated (September 2013) that the revised Purchase policy 2013 clause no. 3.0 provides thrust on vendor base expansion, especially where there are less than four vendors for an item in the Product Material Directory (PMD). Further clause 5.2.2 (Limited Tender) provides that “whenever the number of registered suppliers in PMD is less than four, it should be recorded that the process as in clause 3.4 is being followed.” Purchase through Single tender where there is only one registered supplier in the PMD is permitted only</p>	<p>No further remarks. However, implementation of revised policy would be watched in Audit.</p>

		<p>subject to fulfilment of the following {cl. 5.3.1(j)}:</p> <p>(i) Process at cl. 3.4 is being followed.</p> <p>(ii) In case the estimated value of the tender is more than Rs 20 lakh, it shall be recorded that Open Tender for procurement has been resorted to in the last financial year and there was no qualified response.</p> <p>Purchase policy-2013 also specifies a review mechanism for specific Single tender purchases.</p>	
3	<p>Inconsistency in loading for deviation in tender evaluation</p> <p>Audit had observed that uniform guidelines for loading for deviation in delivery system, interest to be loaded in case of deviation in prescribed payment terms were not existing in BHEL due to which different units had adopted different procedures for evaluation of tenders. BHEL in their action taken note (April 2010) intimated that guidelines on uniform loading criteria for tender evaluation were at advance stage of approval. Audit observed that the proposed guidelines are yet to be approved. As such, no improvement in tender evaluation system has been made till date. <i>(Refer Para no Para no. 6.6.3.2 of Report-10 of 2010-11)</i></p>	<p>Management stated (September 2013) that the proposed guidelines are under discussion with the concerned groups and are planned to be issued by Dec 2013.</p>	<p>Management agreed to issue guidelines on evaluation of techno-commercial deviation and uniform loading but same are still under approval.</p>
4	<p>Cost Estimate</p> <p>Audit had observed various shortcomings in the estimation procedures adopted by units (Transmission Business Group and Project Engineering Management Unit) as estimates prepared for procurement of material were based on either budgetary quote or last purchase price of similar items without uniformity in allowing price escalation. Management has not issued cost estimation guidelines even</p>	<p>Management stated (September 2013) that considering nature & wide spectrum of purchases, order of preference among various sources of information cannot be specified as holistic view has to be taken considering available</p>	<p>Audit appreciates the action taken by the Management to improve the system. While the revised guidelines stipulate that estimates should not be worked out just by applying a uniform yearly compounded escalation over similar equipment purchased earlier and should be worked out on the basis of indicative market</p>

	after giving assurance (January 2010) for the same. (<i>Refer Para no.6.6.3.3 of Report-10 of 2010-11</i>).	information. The guidelines are intended to enable the indenter to take an objective view while framing the estimates.	rates/ budgetary offers/ last purchase prices/ economic indices, etc., there is a scope for bringing more objectivity and transparency by laying down order of preference among various sources of information to be used for estimation of prices.
5	Limited Vendor Base Audit had observed the units of BHEL had a very limited vendor base and Bhopal, Haridwar, Hyderabad, Project Engineering Management Noida and Tiruchirappalli units had single vendor register for 538, 286, 16, 302 and 8 material groups respectively. Audit reviewed the present position of vendor registration and noticed that even though BHEL had increased its vendor base by 3455 during 2010-11 but still BHEL is dependent on single vendor for large number (1120) of material categories. Thus, BHEL procurement is still dependent on single vendor and lacked competition as 90 percent of the procurement (₹ 27187 crore) was made through limited/single tender during the year 2010-11. Resultantly the Recommendation that "BHEL needs to review its limited tendering policy in view of thin vendor base and also to bring in more competition", is yet to be fully implemented. (<i>Refer Para no 6.6.4.2 and Recommendation no 6.2 (a) of Report-10 of 2010-11</i>).	Management stated (September 2013) that constant thrust is being given to increase the vendor base resulting in addition of new vendors 1700 in 2011-12 & 1900 in 2012-13 respectively for enhanced competition. Material cost has further come down to the tune of 57.7 per cent of Gross Turnover less Excise duty.	There is a requirement to enlarge the vendor base to promote competition.
6	Delay in Vendor Registration In respect of delay in registration of vendors pointed out in the audit report, Audit analysed the information furnished (January 2012) regarding supplier registration as on 30 September 2011 and noticed that out of 783 applications pending for registration, 284 applications (36 per cent) were more than six months old. This shows that delay in registration of vendors still persisted in substantial number of applications. (<i>Refer Para no 6.6.4.4 (b) of Report-10 of 2010-11</i>)	Management stated (September 2013) that with a view to bring improvement, this has been made part of Balance Score Card of all units for the year 2013-14.	While we appreciate the action taken by Management, Management has not intimated about the targets fixed to avoid delays in vendor registration. Further, Management was requested to provide the Balance Score Card (BSC) of all units for the year 2013-14, which is yet to be provided (September 2013).

7	<p>Deficiency in Vendor Data Base and Non Updation</p> <p>Following deficiencies were pointed out in the Audit Report:</p> <ul style="list-style-type: none"> • Placement of purchase order on vendor which was not listed in Product Material Directory (in Transmission Business Group), • Material code wise registration of vendors not being allotted for different size/ capacity within the same material category (Haridwar, Hyderabad and Tiruchirappalli) and • Revision of supplier list required to be undertaken once in three years was not being done (PSWR Nagpur) • Centralised vendor database should be made more comprehensive and integrated, so as to enable monitoring of vendors' performance, <p><i>(Refer Para no 6.6.4.5 (c) & (d) and Recommendation no 6.3 of Report-10 of 2010-11)</i></p>	<p>Management stated (September 2013) that supplier registration system is being developed for centralised web based and planned for hosting by Dec. 2013, which will ultimately lead to centralised vendor database management system in a phased manner.</p>	<p>Audit would verify action taken in due course..</p>
8	<p>Delay in Tender Processing</p> <p>As per policy (Clause IS), the units should evolve and fix norms for purchase lead time (i.e. from the date of indent, raising enquiry, order placement and receipt of material) for different types of materials/ component depending on the complexity of the product. No such norms had been fixed by units except Trichy where targets of 60 days to 120 days for conversion of purchase requisitions into purchase orders had been fixed. Management in their action taken note (May 2011) stated that above provision of purchase policy have been reiterated to the units during the Material Head Meeting and units have also been communicated to initiate the time scale mapping of purchase indent (PI) to purchase order (PO) conversion. Audit however, observed that no effect was visible as review of the data of Project</p>	<p>Management stated (September 2013) that considering the importance, target for conversion of purchase indent to purchase order within 75 days has been taken for materials in MOU 2013-14 and is being monitored regularly.</p>	<p>While we appreciate the action taken by Management, Management was requested to provide the Balance Score Card (BSC) of all units for the year 2013-14, which is yet to be provided (September 2013).</p>

	<p>Engineering Management unit, relating to 1949 purchase orders placed during the year 2010-11 revealed that in 802 purchase orders (valuing more than Rs ten lakh) the conversion of PI to PO took more than 90 days. Hence, BHEL needs to evolve and fix norm for purchase lead time. (Refer Para no 6.6.5.1 of Report-10 of 2010-11).</p>		
9	<p>Non Placement of Repeat Order</p> <p>In Haridwar unit an extra expenditure of ₹ 29.09 crore was pointed out due to non placement of repeat order (as per policy) for four products (covering six selected purchase orders valuing ₹ 139.06 crore). As no specific reply was given by the management in their ATN (May 2011) issue is still to be addressed by the management (Refer Para no 6.6.5.3 of Report-10 of 2010-11).</p>	<p>Management stated (April 2013) that repeat order cannot be placed as a matter of routine. It is guided by the prevailing market conditions.</p>	<p>The reply is to be viewed against the fact that the audit observation was made on the basis of clause of Repeat order in the existing purchase policy. Management action is required to be taken as per provisions in the existing policy.</p>
10	<p>Placement of Purchase Order beyond the Delivery Dates</p> <p>Audit had observed 310 purchase orders (55 in Hyderabad unit, 77 in Trichy unit, three in PSWR Nagpur, five in PEM Noida and 170 in Bhopal) were placed by these units beyond delivery schedule indicated in the indent raised as well as schedules committed to the customers resulting in payment of liquidated damages. Management in their ATN (May 2011) repeated the reply furnished in January 2010 which was duly considered in the report. Management, however, further stated that introduction of ERP implementation across BHEL will provide for common platform for monitoring project schedule and material planning more accurately. Since ERP is yet under implementation the improvement envisaged by the management can be viewed after its implementation. (Refer Para no 6.6.5.4 of Report-10 of 2010-11).</p>	<p>Management noted (April/September 2013) the audit observation.</p>	<p>ERP system is still under implementation in BHEL. Hence, same can be reviewed only after its implementation.</p>

11	<p>Post Award Relaxation of Delivery Period</p> <p>In Bhopal, Hyderabad, Nagpur, Transmission Business Group New Delhi and Trichy Units, there were delays in delivery by the suppliers and in 237 cases delivery period agreed as per purchase orders was subsequently relaxed up to a maximum of 20 months which led to delay in supplying of materials to the customers. Management in their ATN (May 2011) intimated that extension of delivery is granted only on case to case basis after analyzing the production/project requirements. Reason for delay, however, needs to be monitored through Budget and Moving Ahead through Performance (MAP) so as to arrest the avoidable delays. <i>(Refer Para no 6.6.5.7 of Report-10 of 2010-11).</i></p>	<p>Management stated (September 2013) that punitive action for two consecutive delays by the supplier has been proposed in the revised draft guidelines on suspension of business dealing, which is under approval.</p>	<p>Action is yet to be taken since the proposed revised draft guidelines on suspension of business dealing are under approval.</p>
12	<p>Non Adherence to Rotation Policy in Sensitive Departments</p> <p>As per Corporate guidelines, employees should be transferred from sensitive areas after four years. These guidelines are yet to be implemented due to non identification of sensitive areas as same is under progress as per latest ATN (October 2011). <i>(Refer Para no 6.6.6 of Report-10 of 2010-11)</i></p>	<p>Management stated (September 2013) that action is under progress (likely by Dec 2013)</p>	<p>Final corrective action on this is still awaited.</p>

Annexure VI
(Referred to in Para No. 7.2)

List of Technical Collaborators Agreements / Memorandum of Understandings

Sl.No.	Name of Technical Collaborator	Date of Agreement and its present validity	Name of Product Covered	Number of Products covered
1	M/s Vogt Power International Inc., USA	8 November 1988 and valid upto March 2017	For Manufacturing of Natural Circulation Waste Heat Steam Generator	1
2	M/s Siemens AG, Germany	August 1976 and valid upto September 2021	For Manufacturing of Steam Turbines and Generators	2
3	M/s. General Electric Co., USA	July 1986 and valid upto October 2016	For Manufacturing of Various Models of Heavy Duty Gas Turbines	1
4	M/s Alstom, France	27 October 2005 and valid up to 26 October 2020.	For Manufacturing of Once Through Boilers and Pulverisers for Power Plants with Supercritical parameters	2
5	M/s Mitsubishi Heavy Industries Ltd.	31 May 2007 and valid upto May 2017	For Manufacturing of various types of Pumps	1
6	M/s Sheffield Forge Masters International Limited (SFIL)	5 February 2010 and valid upto February 2020	For forgings upto 500 metric tonne ingot weight to meet the requirement of large rotor forgings upto 1000 MW rating and matching generators.	1
7	M/s NP, Italy	15 June 2010 and valid upto June 2020	For Manufacturing of Centrifugal Compressors only	1
8	M/s National Oilwell Verco (NOV), USA (MOU)	22 May 2010 and valid upto May 2013	For manufacture of Oil Rigs	1
9	M/s. Flender, Germany (MOU)	30 October 2004 and valid for five years	For technical assistance in manufacturing of Bevel Planetary Gear Boxes for pulverisers and Bowl Mills	1
10	M/s TLT Gmbh, Germany	19 th April 2002 and valid upto May 23 rd 2020.	For Manufacturing of Variable pitch Axial Flow Fans for FD, PA, ID and Dry Scrubber application	1
11	M/s Metso Automation Inc. Finland.	18 th December 2000 and valid to September 2019	For Manufacturing of New Generation C&I Automation Platform	1
12	M/s GE India Industrial Private Limited, India	November 2010 and valid upto November 2017	For Manufacturing of Water Treatment Equipment	1