

42

STANDING COMMITTEE ON ENERGY (2003)

THIRTEENTH LOK SABHA

MINISTRY OF POWER

HYDRO POWER – A CRITIQUE

FORTY - SECOND REPORT

Presented to Lok Sabha on **23.12.2003**

Laid in Rajya Sabha on **23.12.2003**

**LOK SABHA SECRETARIAT
NEW DELHI**

December, 2003/ Pausa, 1925(Saka)

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COMPOSITION OF THE STANDING COMMITTEE ON ENERGY (2003)

LOK SABHA

- | | | | |
|----|-----------------------------------|---|-----------------|
| - | Shri Sontosh Mohan Dev | - | Chairman |
| 2. | Shri Basudeb Acharia | | |
| 3. | Shri Prasanna Acharya | | |
| 4. | Shri Prakash Yashwant Ambedkar | | |
| 5. | Shri Vijayendra Pal Singh Badnore | | |
| 6. | Shri Jagmeet Singh Brar | | |
| 7. | Shri Lal Muni Chaubey | | |
| 8. | Shri Bal Krishna Chauhan | | |

9. Shri A.B.A.Ghani Khan Choudhury
10. Shri Bikash Chowdhury
11. Shri Laxman Giluwa
12. Dr. S. Jagathrakshakan
- *13. Shri Rattan Lal Kataria
14. Shri P.R.Khunte
15. Shri Arun Kumar
16. Shri K. Muraleedharan
17. Shri Ali Mohmad Naik
18. Shri Ravindra Kumar Pandey
19. Shri Dalpat Singh Parste
- **20. Shri E. Ponnuswamy
21. Shri Amar Roy Pradhan
22. Shri B. Satyanarayana
23. Md. Shahabuddin
24. Shri Raghuraj Singh Shakya
25. Shri Chandra Pratap Singh
26. Shri Tilakdhari Prasad Singh
27. Shri Shibu Soren
28. Shri B. Venkateswarlu
29. Prof. Ummareddy Venkateswarlu
30. Prof. Rita Verma

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* Nominated to the Committee w.e.f 20.11.2003 **vice** Shri Subodh Mohite, M.P.

** Nominated to the Committee w.e.f. 30.4.2003 **vice** Shri Manoj Sinha, M.P.

RAJYA SABHA

31. Shri Devdas Apte
32. Shri Santosh Bagrodia
33. Shri Jayanta Bhattacharya
34. Shri Dara Singh Chauhan
35. Shri Aimaduddin Ahmad Khan (Durru)
- *36. Shri Ramachandra Khuntia
- **37. Shri Bimal Jalan
38. Shri Ajay Maroo
39. Shri B.J.Panda
40. Shri Matilal Sarkar
41. Shri Gaya Singh
42. Shri Veer Singh
43. Shri D.P.Yadav
44. Vacant

45. Vacant

SECRETARIAT

- | | | |
|----|--------------------|------------------------|
| 1. | Shri John Joseph | - Additional Secretary |
| 2. | Shri P.K.Bhandari | - Director |
| 3. | Shri R.S.Kambo | - Deputy Secretary |
| 4. | Shri P.C.Tripathy | - Assistant Director |
| 5. | Shri Arvind Sharma | - Committee Officer |

-

* Nominated to the Committee w.e.f 27.7.2003

** Nominated to the Committee w.e.f. 26.9.2003

Composition of the Sub-Committee on Power of the Standing Committee on Energy(1998-99)

- | | | |
|-----|----------------------------|-------------------|
| | Shri K.Karunakaran | - Chairman |
| 2. | Shri Basudeb Acharia | - Convenor |
| 3. | Dr. H.Lallungmuana | |
| 4. | Smt. Sukhda Mishra | |
| 5. | Shri Vilas Muttemwar | |
| 6. | Shri Ravindra Kumar Pandey | |
| 7. | Shri Amar Roy Pradhan | |
| 8. | Shri Braj Mohan Ram | |
| 9. | Dr. Jayanta Rongpi | |
| 10. | Shri Francisco Sardinha | |
| 11. | Shri Th.Chaoba Singh | |
| 12. | Shri Chandramani Tripathi | |
| 13. | Shri Shailendra Kumar | |
| 14. | Shri S.Agniraj | |
| 15. | Shri Jalaludin Ansari | |
| 16. | Shri Ghulam Nabi Azad | |
| 17. | Shri E.Balanandan | |
| 18. | Shri Brahmakumar Bhatt | |

Composition of the Sub-Committee on Hydel Power of the Standing Committee on Energy(1999-2000)

- Shri Sontosh Mohan Dev** - **Chairman**
 - Convenor
2. Shri Basudeb Acharia
 3. Shri Prasanna Acharya
 4. Shri Brahamakumar Bhatt
 5. Shri A.B.A.Ghani Khan Choudhury
 6. Shri Manohar Kant Dhyani
 7. Shri Sanat Kumar Mandal
 8. Shri K.Muraleedharan
 9. Shri Amar Roy Pradhan
 10. Shri Harpal Singh Sathi
 11. Shri Manoj Sinha
 12. Ven'ble Dhamma Viriyo

**Composition of the Sub-Committee on Hydel Power of the
Standing Committee on Energy(2001)**

- Shri Sontosh Mohan Dev** - **Chairman**
 - Convenor
2. Shri Basudeb Acharia
 3. Shri Prasanna Acharya
 4. Shri Brahamakumar Bhatt
 5. Shri A.B.A.Ghani Khan Choudhury
 6. Shri Manohar Kant Dhyani
 7. Shri Sanat Kumar Mandal
 8. Shri K.Muraleedharan
 9. Shri Amar Roy Pradhan
 10. Shri Harpal Singh Sathi
 11. Ven'ble Dhamma Viriyo

**Composition of the Sub-Committee on Hydel Power of the
Standing Committee on Energy(2002)**

- Shri Sontosh Mohan Dev** - **Chairman**
 - Convenor
2. Shri Basudeb Acharia
 3. Shri Bal Krishna Chauhan
 4. Shri A.B.A.Ghani Khan Choudhury
 5. Shri Laxman Giluwa
 6. Shri P.R.Khunte
 7. Shri Kripal Parmar
 8. Shri B.Satyanarayana

**Composition of the Sub-Committee 'C' on Hydel Power of the
Standing Committee on Energy (2003)**

- Shri Sontosh Mohan Dev** - **Chairman**
 - Convenor
2. Shri Basudeb Acharia
 3. Shri Prakash Yashwant Ambedkar
 4. Shri Vijayendra Pal Singh Badnore
 5. Shri A.B.A. Ghani Khan Choudhary
 6. Shri Laxman Giluwa
 7. Shri P. R. Khunte
 8. Shri Ali Mohmad Naik

9. Shri Ravindra Kumar Pandey
10. Shri B.Satyanarayana
11. Shri Tilakdhari Prasad Singh
12. Shri Santosh Bagrodia
13. Shri Dara Singh Chauhan

INTRODUCTION

I, the Chairman, Standing Committee on Energy having been authorised by the Committee to present the Report on their behalf, present this Forty-Second Report on the subject "Hydro Power – A Critique". The Standing Committee on Energy(1998-99) had selected the subject "Hydro Power – A Critique" and entrusted the same to the Sub-Committee on Power for examination and Report thereon. The Sub-Committee could not finish the task and their unfinished work was entrusted to the subsequent Sub-Committees on Hydel Power of the Standing Committee on Energy pertaining to the years 1999-2000, 2001, 2002 and 2003.

2. The Sub-Committee on Hydel Power of the Standing Committee on Energy (1999-2000) took oral evidence of the representatives of the Ministry of Environment and Forests on 17.2.1999 and Duncan North Hydro Power Company Limited and Ballarpur Industries on 17.8.2000. The Sub-Committee on Hydel Power of the Standing Committee on Energy (2003) also took oral evidence of the representatives of the Ministry of Power on 23.4.2003, 15.9.2003 and 24.11.2003, Brahmaputra Board, Central Water Commission, Narmada Control Authority, Sardar Sarovar Project Authority and Ministry of Water Resources on 3.7.2003, Ministries of Home Affairs, Road Transport & Highways, Finance, North-Eastern Council, North-Eastern Electric Power Corporation, Planning Commission on 15.9.2003 and Ministry of Environment and Forests on 24.9.2003 and 24.11.2003.

3. The Standing Committee on Energy (1999-2000) held informal discussions with the representatives of North-Eastern Council, North-Eastern Electric Power Corporation, Governments of Mizoram and Manipur, Brahmaputra Board on the subject during their study tour to Kolkata, Agartala, Guwahati, Shillong and Silchar during February, 2000. The Standing Committee on Energy (1999-2000) also held informal discussions with the representatives of Bhakra Beas Management Board and erstwhile Nathpa Jhakri Power Corporation on the same subject during their study tour to Chandigarh and Shimla during June, 2000. The Sub-Committee on Hydel Power of the Standing Committee on Energy (1999-2000) further held informal discussions with the representatives of Tehri Hydro Development Corporation on the same subject during their study tour to Tehri during November, 2000. The Sub-Committee on Hydel Power of the Standing Committee on Energy (2001) also held informal discussions with the representatives of Damodar Valley Corporation, National Hydro-electric Power Corporation and Government of Sikkim on the subject during their study tour to Kolkata, Asansol and Gangtok during October, 2001. The Standing Committee on Energy (2002) further held informal discussions with the representatives of Damodar Valley Corporation and Government of West Bengal on the subject during their study tour to Kolkata, Bangalore and Chennai during December, 2002. The Standing Committee on Energy (2003) further held informal discussions with the representatives of Tehri Hydro Development Corporation, National Hydro-electric Power Corporation, Jammu & Kashmir Energy Development Agency, Governments of Uttaranchal and Jammu & Kashmir on the subject during their study tour to Tehri, Leh, Srinagar and Jammu during June, 2003. The Standing Committee on Energy (2003) also held informal discussions with the representatives of North-Eastern Electric

Power Corporation, Damodar Valley Corporation, on the subject during their study tour to Varanasi/Singrauli, Kolkata, Bhubaneswar, Chennai and Mumbai during October, 2003. The Committee wish to express thanks to these organisations for furnishing the requisite information as desired by the Sub-Committee/Committee.

4. The Committee wish to thank in particular the representative of the Ministries of Power, Water Resources, Home Affairs, Road Transport & Highways, Finance, Environment and Forests, Brahmaputra Board, Central Water Commission, Narmada Control Authority, Sardar Sarovar Project Authority, North-Eastern Council, North-Eastern Electric Power Corporation, Planning Commission, Duncan North Hydro Power Company Limited and Ballarpur Industries, who appeared before the Sub-Committee for oral evidence and placed their considered views before the Sub-Committee.

5. The Sub-Committee on Hydel Power and the Standing Committee on Energy considered and adopted this Report at their sittings held on 18th December, 2003.

6. The Committee place on record their appreciation for the work done by the Sub-Committee on Power of the Standing Committee on Energy pertaining to the year 1998-1999 and Sub-Committee on Hydel Power of the Standing Committee on Energy pertaining to the years 1999-2000 to 2003.

NEW DELHI;
December 22, 2003
Pausa 1, 1925 (Saka)

SONTOSH MOHAN DEV,
Chairman,
Standing Committee on Energy.

CHAPTER-I

Introductory

1. Power is a critical infrastructure for both economic growth as well as poverty alleviation and employment generation. The Committee observe that the Ministry of Power has given a major thrust for accelerated

development and restructuring of the power sector to make it vibrant enough to cater to the needs of all the sections of society. The Ministry of Power has set an agenda of providing 'Power for all by 2012'. As per the targets set by the Ministry of Power, all villages are to be electrified by 2007 and by 2012 all households are to be provided access to electricity. Rural electrification is now treated as a basic minimum service under the 'Pradhan Mantri Gramodhaya Yojana (PMGY) from the year 2001-02. It is proposed to cover all the 62,000 villages that can be electrified through grid connectivity, during the 10th Plan. The balance 18,000 remote villages are to be electrified through the use of Non-conventional technologies. With a view to achieve this target, a comprehensive and holistic approach to power sector is reported to be envisaged for providing reliable, uninterrupted quality power supply to all by the Government.

2. The overall generation in the country has increased from 301 billion units during 1992-93 to 515.3 billion units during 2001-02. Thus, during the period of 8th and 9th Plans, the overall generation increased by 39% and 22.55% respectively. Despite this growth, demand for power remained on higher side in comparison to its supply, leading to shortages in power availability in the country.

3. The Committee observe that power generation resources are unevenly distributed in the country. Hydro resources are mainly located in the Himalayan region and coal in Eastern and Central India. Optimum and economic utilization of these resources requires inter-regional transmission of power from generation centres to load centers. The concept of a strong inter-connected "National Power Grid" across the country is, therefore, of crucial significance. The present inter regional power transfer capacity is of about 8,000 MW which is reported to be enhanced to 23,500 MW by the end of the 10th Plan.

4. The Committee have been apprised that to meet the projected power requirement by 2012, an additional capacity addition of 1,00,000 MW is required in the next two Five Year Plans. A capacity of nearly 41,110 MW is targeted to be set up in the 10th Plan and the remaining in the 11th Plan with a stronger focus on hydro power. The Central Sector would contribute 22,832 MW, the State Sector 11,157 MW and Private Sector 7,121 MW in the 10th Plan. The Ministry of Power have informed that during the 10th Plan, a capacity of 2,958 MW has already been commissioned, projects of above 19,500 MW are already under construction and projects of 11,159 MW aggregate capacity have the requisite approvals. Adequate financial resources have been mobilized for the purpose during the 10th Plan period. During this plan period, the outlay for power sector is 25,000 crore and as much as Rs.17,000 crore allocated to hydel sector of which Rs.14,000 to NHPC alone.

5. Although, reforms in the power sector were initiated in 1991 by liberalizing generation, but owing to non-availability of security of payments from the State Electricity Boards(SEBs) and their poor financial health, the capacity addition through private sector has been far below expectations. Therefore, a commercially viable distribution is thus necessary to sustain investment in generation and transmission. For attaining this objective, comprehensive reforms of the SEBs have been undertaken. SEBs of Orissa, Haryana, Andhra Pradesh, Karnataka, Rajasthan and Uttar Pradesh, Madhya Pradesh, Uttaranchal and Delhi have been unbundled. The distribution business has been privatized in Orissa and Delhi. To rationalize the tariff fixation mechanism, the Central Electricity Regulatory Commissions(CERC) has been set up by Central Government and State Electricity Regulatory Commissions(SERCs) have been set up in 21 States. SERCs of 15 States have issued tariff orders.

6. Commenting upon advantages of hydro power, Ministry of Power in a note stated that Hydro power is a renewable, economic, non-polluting and environmentally benign source of energy. Hydro power stations have the inherent ability for instantaneous starting, stopping, load variations etc. and help in improving reliability of

power system. There is no fuel cost during the life of the station on hydro power generation is a non-consumptive use of water. The benefits of hydro power as a clean, environment friendly and economically attractive source of energy have now been sufficiently recognized. The need for its accelerated development also comes from its capability of enhanced system reliability and economics of utilization of resources. However, the cost of security, roads, Rehabilitation and Resettlement (R&R), catchment Area Treatment, free power to States, transmission cost etc., have made the hydro electric projects unviable.

7. The Committee find that Hydro Policy was announced by the Government in August, 1998 on hydro power development incorporating several enabling steps and measures. The Hydro Policy lays emphasis on basin-wise development, evolving consensus on inter-state issues, mitigation of geological risks, simplified procedure for transfer of clearances, promoting joint venture arrangements etc. Some of the measures announced by Government of India have already been introduced which include simplified procedures for transfer of Techno-Economic Clearances, Streamlining of clearance process and introduction of Three-Stage Clearance approach for development of hydro projects in Central Sector/Joint Ventures etc. However, the development of hydel power is yet to pick up.

8. With a view to prioritize the large number of identified schemes to harness vast untapped hydro resources in order of their attractiveness for implementation, ranking studies were carried by CEA in October, 2001 and 399 schemes were prioritized under categories A, B & C. Category A schemes were considered more attractive than Category 'B' schemes. The studies were carried out in consultation with Ministry of Environment & Forest, Central Water Commission, Geological Survey of India, National Remote Sensing Agency, Survey of India, etc. The Ranking Study gives inter-se-priorisation of the projects which could be considered for further implementation including their survey & investigation so that hydro power development is effected in an appropriate sequence. To give impetus to the exploitation and development of hydel power further, the Hon'ble Prime Minister dedicated to the Nation, 50,000 MW initiative, under which 162 projects, spreading over 16 States and amounting to 50,500 MW have been identified and Central Government will invest for preparing feasibility reports, DPRs, etc. The Committee have examined in detail the exploitation of Hydro Power in the country and gone into various problems/hindrances in tapping the hydel potential in the country. These issues have been discussed in the subsequent chapters.

CHAPTER-II

Hydro –Electric Potential and Present Status

2.1. As per the assessment made by the 15th Power Survey Committee in July, 1995, the peak demand at the end of 9th Plan period would be 95757 MW and the energy requirement at bus bars have been assessed at 570 billion KWh. As per the projections of 16th Electric Power Survey (EPS), the peak demand and energy requirement at the end of 11th Plan (2011-12) would be 1,57,107 MW and 975 BU respectively. Based upon feasible capacity addition of 41,110 MW during 10th Plan, perspective planning studies carried out for 11th Plan have indicated a tentative capacity addition requirement of about 67,000 MW comprising 23,000 hydro, 38,000 MW thermal and 5,900 MW nuclear to meet in full the demand projections of 16th EPS, assuming renovation, modernization and life extension of older plants as in built activity in the planning exercise. The projections on all India basis and region wise for the last year of each five-year plan upto the end of 11th Plan are as under: -

Power Demand Projections:

Region	Energy Requirement (Mkwh)			Peak Load (MW)		
	2001-02	2006-07	2011-12	2001-02	2006-07	2011-12
	End of 9 th Plan	End of 10 th Plan	End of 11 th Plan	End of 9 th Plan	End of 10 th Plan	End of 11 th Plan
Northern Region	181649	254161	350185	31735	44009	60077
Western Region	176732	239731	320956	28430	38538	51562
Southern Region	134671	178690	234164	21975	29070	37996
Eastern Region	68243	96884	135049	11846	16722	23228

N-E Region	8148	12062	17553	1722	2527	3661
A&N Islands	180	295	475	41	67	108
Laksha- dweep	27	40	58	8	11	15
All India	569650	761863	1058440	95757	130944	176647

2.2. As per the projections made by CEA, anticipated supply position by the end of 10th & 11th Plan will be as under: -

Installed capacity at the end of 10th Plan

Region	Installed Capacity (in MW)			
	Hydro	Thermal	Nuclear	Total
Northern	24153.10	30128.41	2335.00	56616.51
Western	8451.38	43814.86	186.00	54126.24
Southern	11602.69	25879.85	3350.00	40832.54
Eastern	5800.22	18973.68	-	24773.90
N. Eastern	2526.69	1177.24	-	3703.93
TOTAL	52534.08	119974.04	7545.00	180053.12

Installed capacity by end of 11th Plan

Region	Installed Capacity (in MW)			
	Hydro	Thermal	Nuclear	Total
Northern	32653.10	40128.41	4335.00	77116.51
Western	12201.38	54814.86	3860.00	70876.24
Southern	18602.69	30129.85	4290.00	53022.54
Eastern	8300.22	24473.68	-	32773.90
N. Eastern	3776.69	1427.24	-	5203.93
TOTAL	75534.00	15097.04	12485.00	238993.12

2.3. Asked about the potential and status of development of hydel projects in the country, the Committee have been informed that the first systematic and comprehensive study to assess the hydro-electric resources in the country was undertaken during the period 1953-1959 by the Power Wing of the erstwhile Central Water and Power Commission on the basis of prevailing technology of hydro construction and the constraints imposed by topographical and hydrological considerations etc. These studies placed the economical utilizable hydro power potential of the country at 42100 MW at 60% load factor (corresponding to an annual energy generation of 221 billion units).

2.4. The re-assessment studies of hydro-electric potential of the country, completed by Central Electricity Authority in 1987, have however, placed the hydro power potential at 84044 MW at 60% load factor. The Committee have further been apprised by the Ministry of Power that a total of 845 hydro-electric schemes have been identified in the various basins which will yield 442 billion units of electricity. With seasonal energy, the total energy potential is assessed to be 600 billion units per year. In addition, the reassessment studies have also identified 56 sites for Pumped Storage Schemes (PSS) with total installation of about 94,000 MW. The hydro potential of 84044 MW at 60% load factor when fully developed would result in the installed capacity of about 1,50,000 MW on the basis of probable average load factor.

2.5. The Great Indus, the Ganga and the Brahmaputra rivers with their innumerable tributaries originating from the Himalayas constitute about 70% of the country assessed hydro power potential. The peninsular plateau, flanked on one side by the Eastern Ghats and on the other side by the Western Ghats is a receptacle of enormous hydro power. The basin-wise estimated hydro potential and probable installed capacity are given below:

Basin/River	Potential at 60% Load Factor	Probable Installed Capacity (MW)
Indus	19988	33832
Ganga	10715	20711
Central Indian rivers	2740	4152
West-flowing rivers	6149	9430
East-flowing rivers	9532	14511
Brahmaputra	34920	66065
Total	84044	148701 say 1,50,000

2.6. Status of Basinwise and Statewise/ Regionwise Hydro Electric Potential development in the country in terms of potential at 60% load factor is given below:-

(a) STATUS OF H.S. POTENTIAL DEVELOPMENT (BASIN WISE)

BASIN	POTENTIAL ASSESSED AT 60% LF MW	POTENTIAL DEVELOPED AT 60% LF MW	% DEVELOPED	POTENTIAL UNDER DEVELOPMENT MW	% UNDER DEVELOPMENT	% UNDER DEVELOPMENT + UNDER DEVELOPMENT	CEA CLEARED POT. AT 60% LF MW	% CEA CLEARED POT.	% TOTAL
INDUS	19988.00	3273.68	16.38	1545.88	7.73	24.11	443.52	2.22	26.33
GANGA	10715.00	1909.08	17.82	1382.55	12.90	30.72	272.67	2.54	33.26
CENTRAL INDIAN RIVERS	2740.00	687.02	25.07	1318.17	48.11	73.18	412.45	15.05	88.23
WEST FLOWING RIVERS	6149.00	3685.50	59.94	52.53	0.85	60.79	457.30	7.44	68.23
EAST FLOWING RIVERS	9532.00	4073.23	42.73	245.40	2.57	45.31	237.15	2.49	47.79
BRAHMAPUTRA BASIN	34920.00	670.50	1.92	291.75	0.84	2.76	1152.50	3.30	6.06
ALL INDIA	84044.00	14299.02	17.01	4836.28	5.75	22.77	2975.58	3.54	26.31

(b) STATUS OF HYDRO ELECTRIC POTENTIAL DEVELOPMENT

(STATE
WISE)

As on 01.04.2003

State	Potential assessed at 60% LF (MW)	Potential Developed at 60% LF (MW)	% developed	Potential Under Development at 60%LF (MW)	% under-development	% of potential dev'ped + under dev'ment	CEA cleared schemes potential at 60%LF (MW)	% CEA cleared schemes
WESTERN								
Andhra Pradesh	7487.00	515.00	6.88	387.33	5.17	12.05	330.10	4.41
Chhattisgarh	11647.00	2108.40	18.10	1046.88	8.99	27.09	74.08	0.64
Goa	922.00	656.33	71.19	135.00	14.64	85.83	39.33	4.27
Karnataka	64.00	51.67	80.73	11.67	18.23	98.96	0.00	0.00
Kerala	291.00	192.67	66.21	0.00	0.00	66.21	0.00	0.00
Madhya Pradesh	9341.00	831.68	8.90	1326.17	14.20	23.10	171.00	1.83
Uttar Pradesh	403.00	345.73	85.79	0.00	0.00	85.79	0.00	0.00
Total	30155.00	4701.48	15.59	2907.05	9.64	25.23	614.52	2.04
EASTERN								
Assam	2774.00	623.10	22.46	1021.55	36.83	59.29	400.28	14.43
West Bengal	409.00	145.15	35.49	110.67	27.06	62.55	0.00	0.00
Madhya Pradesh	2460.00	1129.77	45.93	186.83	7.59	53.52	0.00	0.00
Orissa	36.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5679.00	1898.02	33.42	1319.05	23.23	56.65	400.28	7.05
NORTHERN								
Chhattisgarh	2909.00	1405.45	48.31	0.00	0.00	48.31	37.82	1.30
Karnataka	4347.00	2322.83	53.44	101.28	2.33	55.77	204.33	4.70
Madhya Pradesh	2301.00	1125.50	48.91	52.53	2.28	51.20	242.63	10.54
Tamil Nadu	1206.00	946.50	78.48	112.95	9.37	87.85	31.33	2.60
Total (SR)	10763.00	5800.28	53.89	266.77	2.48	56.37	516.12	4.80
SOUTHERN								
Andhra Pradesh	478.00	75.17	15.73	20.50	4.29	20.01	190.50	39.85
Goa	60.00	44.78	74.64	0.00	0.00	74.64	0.00	0.00
Karnataka	1983.00	1108.78	55.91	31.17	1.57	57.49	0.00	0.00
West Bengal	1786.00	91.33	5.11	0.00	0.00	5.11	111.50	6.24
Madhya Pradesh	1283.00	57.50	4.48	104.00	8.11	12.59	256.67	20.01
Total (ER)	5590.00	1377.57	24.64	155.67	2.78	27.43	558.67	9.99

State	100%	60%	30%	15%	7.5%	3.75%	0%	0%
Andhra Pradesh	1070.00	121.67	11.37	23.58	2.20	13.57	0.00	0.00
Assam	9.00	8.50	94.44	0.00	0.00	94.44	0.00	0.00
Bihar	1176.00	73.17	6.22	42.50	3.61	9.84	0.00	0.00
Chhattisgarh	351.00	111.67	31.81	90.83	25.88	57.69	0.00	0.00
Goa	1040.00	81.83	7.87	0.00	0.00	7.87	0.00	0.00
Himachal Pradesh	26756.00	124.83	0.47	0.00	0.00	0.47	743.50	2.78
Jharkhand	1455.00	0.00	0.00	30.83	2.12	2.12	142.50	9.79
Total	31857.00	521.67	1.64	187.75	0.59	2.23	886.00	2.78
INDIA	84044.00	14299.02	17.01	4836.28	5.75	22.77	2975.58	3.54

2.7. From the above, the Committee observe that the maximum hydro potential available in Arunachal Pradesh is 26,756 MW at 60% load factor, followed by Himachal Pradesh at 11,647 MW at 60% load factor. The potential in other States is relatively less.

2.8. Further, the maximum exploitation has been achieved in west-flowing rivers of South India at 59.94% (3685.5 MW out of 6149 MW at 60% L.F) and the least development is in respect of Brahmaputra Basin at 1.92% (670.50 MW out of 34920 MW at 60% L.F.) though this basin has the maximum potential. On all-India basis, as on 1.4.2003, the hydro electric schemes in operation account for only 17.01% and those under execution for 5.75% of the total potential at 60% load factor. Thus, the bulk of the potential (77.24%) remains to be developed.

2.9. As regard to the advantages of hydel power over other forms of power. NHPC in a written reply submitted to the Committee has informed as under:-

“Hydro power has several inherent advantages which make it the most preferred form of electric power. These are as follows:

- i. It is a renewable source of energy-thus saves scarce fuel reserves.
- ii. It is non polluting and hence environment friendly.
- iii. It is a reliable energy source- with approx. 90% availability.
- iv. It is long Life – the first hydro project completed in 1897 is still in operation. Normal life is 50 years with possibility of further life extension with minimal renovation.
- v. Cost of Generation and cost of operation and maintenance are lower than the other sources of energy.
- vi. Ability to start and stop quickly and instantaneous load acceptance/ rejection make it suitable to meet peak demand and for enhancing system reliability and stability.
- vii. Have higher efficiency (About 95% to 98%) compared to thermal (35%) and gas (42% to 43% in case of combined cycle and 28% to 30% in case of open cycle).
- viii. Cost of generation is free from inflationary effects after the initial installation.
- ix. Storage based hydro schemes often provide attendant benefits of irrigation, flood control, drinking water supply, navigation, recreation etc.
- x. Being labour intensive, provide employment opportunities.
- xi. Being located in remote regions, lead to development of interior areas (road/ rail communication, tele communication, medical facilities, educational facilities, industries, better standard of living”.

2.10. Further enquired about the ideal thermal hydro mix and the justification thereof NHPC has informed the Committee as under:-

“As per the system studies conducted by CEA, India as a whole should have an ideal thermal hydro mix of 60:40. The power mix of country is determined by the sources it has. A country like India which is endowed with coal as well as hydro resources has to evolve an optimum power mix from the view point of healthy power system operation on one hand and environmentally sustainable development on the other. One of the important aims of optimization of thermal hydro mix is that the system should have mix of plant characteristics capable of meeting load demand fluctuations economically. It may be mentioned here that thermal as well as nuclear power plants perform best when they are fully loaded and act as base load station. Whereas hydro, including pumped storage capable of storing off peak energy for its reuse during the peak demand, as complementary peak characteristics. These can be started and stopped quickly to meet the non continuous type of load hydro plants designed for low head factor and peaking operation can thus make a major contribution to the overall economy of generation. As 40% of the total demand in India occurs as peak demand and since hydro plants are best suited to meet this requirement, the ideal thermal hydro mix should be 60:40”

2.11. Enquired about the reasons for adverse thermal hydro ratio in the country, NHPC in written note stated as under:-

1. Lack of emphasis on hydro in the policy making machinery, particularly while allocating financial resources on advance action for benefits in the subsequent plan.
2. Lack of modern planning and construction techniques resulting in long gestation period.
3. Large surplus staff on completion of construction.
4. Virtual absence of private sector in hydropower development, defying competitive progress in this sector.
5. Dependence on neighbouring countries in implementing hydro schemes on international rivers i.e. Pancheswar etc.
6. Lack of thrust for investigation of prospective schemes.
7. Requirement of long transmission lines to evacuate power from remote areas to the load centres.
8. River water disputes : Inter –State and those with the neighbouring countries.
9. Emergence of Environmental / ecological awareness / apprehensions
10. Geological surprise, particularly in Himalayan belt causing hazards and it times calling for design changes at construction stage, resulting in time and cost over-runs.
11. Location of Hydro sites in sensitive border areas”.

2.12. Asked about the steps taken to achieve ideal ratio, NHPC informed the Committee as under:-

- “1. Government of India came up with hydro policy in the year 1998 for accelerated development of hydro projects in the country.
2. Announcement of Mega Power Policy wherein hydro project with capacity of 500 MW and above will be given special preference like custom duty exemption, deemed export benefit etc.
3. To take up survey and investigation of hydro projects in a big way so that bankable DPRs can be formulated for speedy development of hydro projects.
4. Private sector participation in development of hydro potential.

5. Taking up disputed inter-states projects by neutral agency like NHPC in the Central Sector”

Ongoing hydro schemes

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2.13. During the 10th Plan, hydro capacity of 14393.2 MW has been programmed for addition in the Central, State and private sectors. To achieve this, 35 Hydro Electric Projects aggregating a net capacity of 13294 MW are already under execution in Central, State and private sectors. Details of these schemes are as under:-

	Projects	Units	Capacity	No. of Projects	No. of Units	MW capacity
Northern	-	-	-	-	-	-
Central	8	32	5470	9	35	5390
State	4	15	1300	5	17	1114
Private	3	7	570	3	9	770
Sub-total	15	54	7340	17	61	7274
western						
Central	1	8	1000	3	-	1557
State	4	15	1660	5	22	1795
Private	1	10	400	1	10	400
Sub-total	6	33	3060	9	32	3752
Southern						
Central						
State	5	22	915	6	29	1158.2
Private						
Sub-total	5	22	915	6	29	1158.2
Eastern						
Central	2	7	1410	4	-	1710
State	2	4	210	1	2	150
Private	-	-				
Sub-total	4	11	1620	5	2	1860
Northern						
Central	3	6	175	2	3	85
State	2	4	184	3	6	264
Private						
Sub-total	5	10	359	5	9	349
Grand Total	35	130	13294	42	133	14393.2

2.14. Summary of the above referred ongoing Hydro Electric Schemes (excluding renewables under MNES) as on 1.4.2003 is given below:-

Region	Central Sector	State Sector	Private Sector	Total
	Capacity in MW (No. of projects)	Capacity in MW (No. of projects)	Capacity in MW (No. of projects)	Capacity in MW (No. of projects)
Northern	5470.00 (8)	1300.00 (4)	770.00	7540.00 (15)

Western	1000.00(1)	1760.00(4)	400.00(1)	3160(6)
Southern	Nil	1665.00(5)	Nil	1665.00 (5)
Eastern	1410.00 (2)	210.00	Nil	1620.00 (4)
North-Eastern	175.00 (3)	184.00 (2)	Nil	359.00 (5)
Total	8055.00 (3)	5119.00(17)	1170.00 (4)	14344.00 (35)

* The Ministry of Power have informed the Committee that out of the 14344 MW, 1050 MW already have been rolled / commissioned as per details given below:-

Name of the project	Unit No.	Cap. Rolled / commnd. (MW)
Sardar Sarovar	2	50.00
CHPC, Gujarat 5x50	3	50.00
Srisaillam LBPH	1	150.00
Andhra Pradesh	2	150.00
6x150 MW	3	150.00
	4	150.00
	5	150.00
Baspa-II (private)	1	100.00
Himachal Pradesh	2	100.00
3x100 MW		1050.00
Total		13294.00

2.15. Enquired about the status of ongoing H.E. Projects in the country which will benefit during the 10th plan and beyond the Committee have been apprised by the Ministry of Power of the following information:-

Name of project/ State/District Inst. Cap.(MW) Date of Sanction	Cost (Rs Cr.) Original Latest	Comm. Sch. Original Latest	Present Status	Reasons for Delay	Reasons for cost overruns
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TRIAL SECTOR

Dhauliganga – I (NHPC) Uttaranchal Pithoragarh 4x70 08.04.91	<u>601.98</u> 1578.31	<u>1998-99</u> 2004-05	Forest and defence land acquired. Private Acquisition land is under acquisition. All major works of Private awarded. NHPC has signed agreements for land . the major work packages as under: Lot 1- (Civil works) on 28.2.2000 Lot-2-(Civil works) on 25.2.2000 Lot-3-(E & M Works) on 15.2.2000 Lot-4-(Hydro-mech.Works) on 1.2.2000 River diverted through diversion tunnel on 21.04.2001. 53.15% spillway excavation completed. 92.13% excavation of HRT completed. Excavation of transformer cavern and desilting basin I & II completed. 71.96%		-General price escalation.
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tail race open excavation completed. Unit-4- Installation and matching of spiral casing sleeve in progress.

Unit-3 Erection of spiral casing is in progress.

Chamera St.II (NHPC) H.P/Chamba 3x100 18.05.99	<u>1684.02</u> 1684.02	<u>2004-05</u> 2004-05	The project is being implemented on turn-key Basis. Agreement between NHPC and consortium (M/s Indo Canadian Hydro Consortium, New Delhi, Lead by M/S Jai Prakash Industries Ltd.) was signed on 18.7.99. Diversion tunnel excavation and concreting completed. Dam excavation and concreting is in progress. Excavation of HRT and TRT completed. Concreting of HRT is in progress. Widening of surge shaft is also completed. Benching of desilting chamber I & II is in progress. Concreting of stilling basin is in progress. HM and E&M works are in progress. Efforts are being made to commission the project ahead of shedule in 2003-04.	
Dulhasti(NHPC) J&K/Doda 3x130 12.7.89(Bilateral)	<u>1262.97</u> 3559.77	<u>1994-95</u> 2003-04	Diversion Tunnel completed. Excavation and concreting of Dam and PH is completed. Works of Desilting Basin, HRT and Tail Race Tunnel are in progress. The TBM suffered extensive damage as it buried under debris due to sudden rock burst on 21.02.2000 and it is irreparable, U/S tunneling is now being done by DBM. 95.92% overall excavation of HRT completed. Erection of 130T capacity EOT crane completed. Excavation of pressure shaft, expansion gallery, surge tank and draft tubes completed. Erection and supply of hydro electro-mech. equipment completed.	-Geological problems -Exchange rate -Law and order variation -General contractual problems. -Suspension of work -General price escalation.
Purulia PSS (NHPC) W.B./Purulia 4x225 09.02.94 (Joint Venture)	<u>1456.56</u> 3188.90	<u>2002-03</u> 2006-07 (critical)	OEFC loan agreement signed in March, 95. An MOU was signed on 25.5.2001 between Govt. of W.B. and NHPC with a joint venture company namely NPSDC. CCEA clearence for joint venture is awaited. Infrastructural works in progress. Tecno-commercial evaluation completed. For Hydro-Mechanical equipment letter of award placed on Mitsubishi Heavy industries Ltd. (MHI) land. on 30.03.2001, Detailed engineering work is in progress. For civil works, due to filing of writ petition by two bidders the case got delayed and finally letter of	-Loan agreement -General price escalation. -Delay in placing order for civil works due to litigation. -Delay in availability of additional forest land.

award placed on M/S Taisai Corporation on 27.06.2001. Date of commencement is 1.8.2001. Key activities started on 12.03.2002 and in progress. For Lot 6.1 (Pump, turbine , Generator motor of other PH auxiliaries) Letter of Award placed on Mitsui & Co. Ltd. Zero date is 12.09.2002. Model test for pump turbine completed. For Lot 6.2 (GIS substation , Gen.Tr) Pre-qualification evaluation is approved by Board on 29.08.2001. Concurrence received from JBIC on 26.9.2001. Evaluation of techno-commercial bids is completed and approval by the TECOM on 24.10.2002 Lot 6.3. (400 Kv XLPE cables) JBIC concurrence obtained on 15.01.2002. Pre-qualification bids published.

<p>Teesta St.-V (NHPC) Sikkim/East Sikkim 3x170 11.02.2000</p>	<p><u>2198.04</u> 2198.04</p>	<p><u>2006-07</u> 2006-07</p>	<p>Both diversion tunnel have been completed ahead of schedule. Construction power for the project has been taken up on deposit basis with the sikkim Govt.. Heading & benching excavation and lining work of DT- I & II has been completed. HRT heading excavation has been started. Surge shaft excavation in progress. TRT open excavation completed. TRT II & III excavation has been started. Hydro-mechanical works and Electro-mech. works awarded in November, 2001.</p>	
<p>Loktak D/S (NHPC) Manipur/Tamonglong 3x30 30.12.99 (Works on the project are held up)</p>	<p><u>578.62</u> <u>578.62</u> (incl.IDC)</p>	<p><u>2006-07</u> 2008-09</p>	<p>Development of infrastructure facilities at the project was in progress. The desired progress at working site is not possible unless the State Govt. provides requisite security. MOP has asked Govt. of Manipur to explore the possibilities of booking the expenditure of roads etc. of the project in other heads of the state so as to reduce the expenditure of the project. NHPC have expressed their views that under the prevalent circumstances, it may perhaps be required to take a decision regarding continuing the project in view of resulting increased cost of generation.</p>	
<p>Parbati St. II (NHPC) H.P./Kullu 4x200 11.09.2002</p>	<p><u>3919.59</u> 3919.59</p>	<p><u>2009-10</u> 2009-10</p>	<p>Infrastructural works are in progress. Civil works of Diversion Tunnel started.</p>	
<p>Indira Sagar (NHDC)</p>	<p>1190.12 3527.54</p>	<p>1997-2000 2004-06</p>	<p>State Govt. have handed over -R & R problem. construction of project to Narmada -Project finance.</p>	<p>-While in state sector,</p>

M.P./Khandwa (Govt. 8X125 sanction on 06.09.89 28.03.02) (Joint Venture)			Hydro Electric Development Corpn. a joint venture of Govt. of MP and NHPC with effect from 01.09.2001. Civil works for HRC Completed and for dam, PH,& TRC are in progress. Order for procurement of EOT crane issued on M/s Mukund Ltd. Mumbai. EOT crane has been delivered at site and erection work is in progress. Order for TG equipment placed on BHEL in Feb.97 . Hydro-Mechanical works of Main Dam, Diversion Tunnel, Intake, Draft Tube and Turbine Equipment are in progress. Work progressing well now.	slow progress due to Fund constraints. -R & R problems.
Nathpa Jhakri (NJPC) H.P./Kinnaur 6x250 05.04.89	<u>1678.02</u> 7666.31	<u>1996-97</u> 2003-04	Consequent on flooding on 01.08.2000 the restoration of infrastructural works in dam and intake areas, desilting chamber and power house have been completed. Diversion tunnel made operational again on 18.9.2002 after repair of coffer dam. 98.82% dam concreting has been completed. HRT heading and benching excavation has been completed. 80.03% invert and 98.44% overt concreting has been completed. Both EOT cranes made operational. Restoration/Repair of submerged equipment/generating units almost completed. Unit 6 rotated on 30.12.2002 (Not taken into capacity addition due to water conductor civil works not completed.) Unit-5 boxed up. Erection of TG equipment for unit 1 to 4 is at various stages. Erection work of GIS-I and GIS-II has been completed. All Generators Transformers have reached at site. 16 nos. transformers pre-commissioned oil filling in progress in 18 th no. transformer. Restoration works of turbine has almost been completed for units 1,2,3 & 4 and all 6 nos. MIV have been erected. Butterfly valves 1&2 have been erected and No. 3 is under erection. All Draft tube gates and hoists have been erected. Erection works of 420 kV bus duct for all units completed. Erection work of gates and hoists is in progress. All Units are now scheduled to be commissioned by 12/2003 and efforts are being made to rotate/commission Units 5&6 by March, 2003, completion of Desilting chamber No.4 is scheduled by 03/03.	Delay in award of civil Exchange rate variation. General price escalation. Geological problem encountered in de-silting chamber.

Tehri St.I(THDC) Uttaranchal/ Tehri Garhwal 4x250 02.06.72(4x150 MW) PIB-23-01-92 CCEA 15-03-94.	<u>3391.40</u> 5690.64	<u>1997-99</u> 2002-04	Work on dam nearing completion, only 22m height balance out of 260.5m to be raised. Works of coffer dam and diversion tunnels completed. Contracts for supply of E/M equipments awarded to consortium of Russian/Ukranian firms and ABB (Germany) in 4/97. The civil works of Main Dam, Spillways, HRT, Power House and TRT are in progress. Status of erection of units are as under:- U 4: Boxed in March,2003 U 3: Erection of operating mechanism turbine taken up. U-2 :Erection of spiral casing and hydraulic testing completed, concreting in progress. U-1:Erection of DT and stay ring completed.	-Award of major civil works. -Rehabilitation. -Uttarakhand agitation. -Acquisition of Land. -Closure of Diversion Tunnels T1 & T2. -Acquisition of Asena Quarry for Rip-Rap material. - Agitation over R&R issues.	-Change of capacity -General price escalation.
Koteshwar Dam and HPP (THDC) Uttaranchal./ Tehri Garhwal (4x100) 10.04.2000	<u>1301.56</u> 1301.56 (Incl. IDC)	<u>2005-06</u> 2005-06	Govt. sanction accorded on 10.04.2000. Infrastructural works are in progress. Diversion tunnel daylighted on 26.9.2001. Civil package awarded in September, 2002. Electro-Mechanical package awarded in March,2003.		
Tuirial (NEEPCO) Mizoram/Aizwal 2x30 07.07.98 (CCEA)	<u>448.19</u> 448.19	<u>2005-07</u> 2006-07	Pre-construction work completed. Infrastructure works in progress. Project area and some submerge area land has been acquired. Taping of 11 Kv line completed and charged. One No. DG set hired and commissioned. Tenders issued for all the major packages. LOI for Lot-I, Lot-II & III issued and work is in progress. Technical bid for Lot IV opened and re-tendering restored. LOI for Lot-V has been awarded to BHEL on 26.09.02. Construction of 132 KV SC transmission line is in progress.	-Delay of award of major civil works.	
Kopili Stage-II (NEEPCO) Assam/N.C. Hills 1x25 27.07.99 (CCEA)	<u>76.09</u> 99.35 (Comp. Cost)	<u>2001-02</u> 2003-04	Work orders for Package I & II (Civil works) issued to M/S GSJ Envo. On 01/10/99 and M/S P.Das on 07.06.2000 respectively. The works under these packages are in progress. For package-III, TG sets have been ordered on BHEL and 100/25T EOT crane ordered on M/s WMI, Mumbai, Supply is in progress. LOI issued to M/S PES Eng. Pvt. Ltd. on 22.06.2001 for erection, testing & commissioning of TG set. LOI for switchyard placed on M/S PSC Engineering on 19.09.2002.	Delay in awards of major civil works.	
Kol Dam (NTPC)	<u>5340.07</u> 5340.07	<u>2008-10</u> 2008-10	Consultant appointed for engineering cum project management. Infrastructure and		

H.P./Bilaspur (Comple-tion
4x200 cost)
29.10.2002

diversion tunnel works are in progress. Award
of civil works are anticipated by Nov., 2003.

WTESECTOR

RTHERN REGION

<p>Baglihar - I J & K /Doda <u>3x150</u> 450 Jan., 1998</p>	<p><u>3810.00</u> 3810.00</p>	<p><u>2004-05</u> 2004-05</p>	<p>The project has been sanctioned by state Govt. of J&K. Civil and Hydro-Mechanical works have been awarded to M/s JIL and E/M works to consortium of M/S Siemen AG, Hydro Vevy Siemen India. Diversion works of river have completed. 82% excavation of dam completed. Excavation of HRT, Machine hall and transformer hall completed. Concreting of Dam foundation is in progress. Excavation of surge shaft is in progress.</p>
<p>Larji H.P./Mandi 3x42 14.01.2000 (CEA)</p>	<p><u>796.98</u> 908.64</p>	<p><u>2002-03</u> 2004-05</p>	<p>HPSEB had proposed some changes in - Delay in award of -General the scope of this scheme and revised DPR civil works. price was submitted to CEA in March 1999. - Delay caused for escalation Fresh TEC has been accorded by CEA on following route of ICB 14.01.2000. 86% excavation & 37% for award of TG sets. concreting of barrage completed. - Rock fall in PH. Excavation of Diversion tunnel and pressure shaft completed. Excavation of Surge shaft descending chambers and PH in progress. HRT has been daylighted & concreting is in progress. The E/M works including supply , erection & commissioning of turbine, generator, auxiliaries & transformers awarded to BHEL on 15.02.2001. EOT Crane in the service bay has been erected. The erection of Draft tube is in progress.</p>
<p>Maneri Bhali-II Uttaranchal/ Utterkashi 4x76 21.02.2000 (TEC)</p>	<p><u>1249.18*</u> 1249.18 *(Compl. Cost)</p>	<p>2003-05 2005-06</p>	<p>The Govt. of U.P. had assigned the construction to UP Jal Vidyut Nigam Ltd. in Jan., 2000 & TEC was also transferred to UPJVNL. CEA has accorded revised TEC to UPJVNL on 21.02.2000. The Project is now to be executed by Uttaranchal Jal Vidyut Nigam. The status of works is as under. 100% excavation & 83% concreting for barrage achieved. Excavation & concreting for HRT, intake, surge tunnel, penstock, PH partly completed. The works on the project by the contractors are to be commenced from 01.11.2002. Placement of order for TG sets is in final stage. De-watering of excavated</p>

tunnel is in progress.

<p>Lakhwar vyasi 140.97 Uttaranchal/Dehradun 1446.00 3x100+2x60 Jan,1976 (works on the project are held up)</p>	<p>1989-90 11th Plan</p>	<p>At present the works are at stand still due to fund constraints. Executing agency yet to be decided. The status of works is as under. 65% land acquired, contract for Vyasi & Lakhwar dams, intake, Power tunnel, Lakhwar U/G PH, Hathiari PH, HRT etc. awarded in 7/87. 100% excavation of heading portion of TRT & 98% excavation for Vyasi Hathiari HRT completed. LOI for TG sets for both PHs placed on BHEL in June, 1991 but cancelled in 1995.</p>	<p>-Works held up due to fund constraints. -General price escalation.</p>
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STERN REGION

<p>Sardar Sarovar 1551.86 Guj./M.P./Mah./ 5502.00 Bharuch (6x200+5x50) (Joint project of Guj/MP./Mah. In ratio of 16:57:27) 05-10-88</p>	<p>1994-96 2002-07 (U-2&3 of CHPH spun on 4.9.2002</p>	<p>87.27% concreting of main dam completed. CHPH: Erection, Testing & Pre-commissioning checks of all five units of spillway blocks completed. Unit 2 & 3 spun on 4.9.2002. RBPH: 98.6% open excavation, 92% under ground excavation & 78.44% concreting of power house completed. Excavation and steel lining of all six nos. pressure shafts completed and bulk head installed. Erection of penstock gates is nearing completion and erection of hoist for penstock gates is in progress. Supreme Court has given verdict on 18.10.2000 to raise dam upto 90 m and thereafter with the clearance of NCAs' Rehabilitation Sub-Group. The dam works completed up to 95m and further will be raised to 100 m on getting clearance from Relief and Rehabilitation Sub Group & Environmental sub Group. Supply of TG Sets is almost completed Erection of draft tube liner of Unit-1 to 6 completed. Erection of spiral case and stay ring of Unit-1 completed. Concreting of DT liner for Unit-1 completed, Unit-2 &3 is nearing completion in progress for unit-4&5. EOT crane of RBPH commissioned in service bay and load tested at site.</p>	<p>-Stay by Supreme Court on construction of main dam for raising height. -R & R Problem. -Cancellation of W.B. loan. -Increase in R & R scope. -General price escalation.</p>
<p>Madhikheda, 177.38 MP/Shivpuri 169.17 2x20 11.05.01</p>	<p><u>10th plan</u> 2004-05</p>	<p>The project has been sanctioned by State Govt. on 11.05.2001 for 2 units of 20 MW each. All civil works awarded. Excavation of approach channel, HRT, Surge Shaft, Pressure shaft of P.H. completed. Lining of HRT is in progress. Earthmat in P.H. laid & zero level concreting commenced. LOI for</p>	

TG sets issued to BHEL on 6.2.2002. LOI for erection, testing and commissioning of TG set also issued to M/s BHEL.

Bansagar Tons PH IV M.P./Rewa Satna 2x10 31.07.92	41.88 133.10	1996-97 2004-05	Jhinna head regulator works have -R&R problem of -Slow completed. Order for PH civil works oustees of Bansagar progress due awarded. Excavation of PH pit & TRC dam. to fund completed after laying of ground mat at -Delay in finalisation constraints. zero level and first stage concreting upto of executing agencies. EL 311.75M completed. Completion of -Raising of dam upto dam upto FRL 341.46m including erection FRL. of gates of Bansagar Dam by June, 2004 is necessary for commissioning of the project as per schedule. LOI for TG sets issued to BHEL on 19.12.2001. LOI for erection, testing and commissioning of TG set also issued to M/s BHEL.	
Ghatghar PSS Mah./Thane 2x125 11.08.92	485.96 1184.60	1995-96 2004-05	Works of approach tunnel to TRT, -Low priority by -Low priority by Approach tunnel, Link tunnel, State Govt. by Verification Tunnel, Construction of -Delay in land State Govt. adit, Central drift to machine Hall and acquisition. resulting Transformer Hall completed. Excavation -Delay in award in delay and of TRT completed and for Tail Surge is of Roller compacted general in progress. Civil works of upper intake concrete dam and PH price structure, pressure shaft of power house works. escalation. awarded to M/S Patel Eng. and PES (Joint Venture) on 06.06.2000. Excavation of Pressure shaft is also in progress. The order for roller compacted concrete dam issued to M/s Patel Engg. Works on 03.11.2001 and works are in progress. TG sets ordered on M/s NISSHO IWAI corporation Japan. Model test on the pump turbine model conducted and report approved. 85% main plant equipment received at site. Order for 2 nos. EOT crane 150/30 T issued on 29.9.2001 and for 90/10 T for transformer-cum-BFV hall is issued on 7.9.2001. Order for 30T crane placed on M/s KM Engg.. 30T EOT crane Commissioned. Order of erection testing and commissioning of T.G. sets placed on M/S BSES Ltd. Mumbai. Unit Erection: Unit-1: Erection of Draft tube completed and concreting upto EL 256M around DT also completed. Unit-2 : Zero stage concreting completed. Fabrication of embeded piping around DT is in progress.	

UTHERN REGION

Priyadarshni Jurala/A.P./	<u>547.00</u> 547.00	2006-07 (2-units)	Global tenders are called for turn-key execution of the project. Opening of
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Mehboob Nagar 6x39.1 24.05.2002		11 th Plan (4-units)	Technical bids are in progress.	
Srisailam LBPH A.P./Karnool 6x150 01.09.86	<u>418.00</u> 2620.00	<u>1993-95</u> 2000-04	All Civil works of HRT, Pressure shaft, Penstock, TRT and surge chamber completed. Unit-1: Rolled on 30.03.2001 and commissioned on 26.04.2001. Unit-2: Unit Rolled on 29.10.2001 and commissioned on 12.11.2001. Unit-3: Rolled on 29.03.2002 and commissioned on 19.04.2002. Unit-4: Rolled on 26.11.2002 & commissioned on 29.11.02 Unit-5 : Rolled on 20.03.2003 & commissioned on 28.03.03 Unit-6: Conc. of spiral casing is in progress.	-Delay in award of -General price excavation . -Delay in civil works -Variation in of HRT & TRT on a/c exchange of revision of rates by rates. -Strike by contractor from Feb.,95 to Aug. 95.
Almatti Dam Ktk./Bagalpur 1x15+5x55 08.03.2002	<u>674.38</u> 674.38	<u>2004-06</u> 2004-06	Power house excavation completed and concreting are in progress. Fabrication and erection of penstocks are in progress. LOI issued for EOT crane, steel plates liners and E&M equipment.	
Pykara Ultimate T.N./Nilgiri 3x50 01.08.88	70.16 373.06	<u>1994-95</u> 2003-04	Gate shaft, HRT, Surge shaft completed. P.H & pressure shaft works in progress. TRT is through and lining completed. Orders for Generator Transformers and 220 KV cables placed. EOT crane erected. TG equipment erection is in progress	-Delay in award of works of TRT and access tunnel. -Delay in finalisation of tenders for TG equipments .
Bhawani Kattalai Barrage I to III T.N./Nammakal 3x2x15 07.01.1997	<u>241.82</u> 143.53 (PH-I)	<u>2004-05</u> 2004-05	Power house civil works are in progress. LOI issued for TG sets and power cables. Specification for power house superstructure is under finalisation.	

SERN REGION

Balimela Extn. Orissa/Koraput 2x75 18.07.92 (for 2x60 MW)	<u>200.09</u> 200.09	<u>2004-05</u> 2005-07	M/s LMZ, Russia are the turnkey contractors. Works yet to start. The contractor has requested M/s OHPC to split the contract into indigenious and imported supply and services components. The approval from Govt. of Orissa is still awaited by M/s OHPC. Conditional forest clearance from MOEF received. Interstate clearance from CWC awaited.
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Balimela Dam Toe Ori./Koraput 2x30 26.02.77 (Works on the project are held up)	<u>17.77</u> 69.301	<u>1982-83</u> 11 th plan	Excavation of PH was held up since Nov,84 due to objection from Govt. of Orissa. Govts. of AP & Orissa have now decided for execution of project by OPCL as an IPP. PPA and DPR being examined by GRIDCO. After concurrence on DPR and PPA is received, the project works would commence after finalising the implementation schedule and financial tie up. M/s BHEL & M/s MECON appointed for assessing the cost of existing equipments and works at site, their report is awaited.	-Interstate disputes. -General Price escalation.
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RTH-EASTERN REGION

Karbi Langpi (Lower Borpani) Asm/Karbi Anglong 2x50 24.09.79	<u>36.37</u> 470.86	<u>1985-86</u> 2004-05	94% excavation., 34% conc. & 97% slush clearance for dam completed. HRT,HP tunnel & penstocks work completed. TG sets received at site. The erection of BF valve and portion of TG equipment completed. 60% erection of control panels , 10% cabling works ,70% sw.yd. foundation work, 85% transformer and 30% sw.yd. equipment erection completed. Due to poor performance in joint sector the contract was cancelled and Govt. of Assam handed over the project to ASEB for execution as per Supreme Court's verdict of January, 1999. Preperation of inventory of the assets taken up. Execution of balance works has started. Funds are being tied up with PFC.	-Frequent change of contractor for dam works. -Delay in completion of Dam. -Frequent change of executing agency. -Funds constraints. -Law & order problem	-General price escalation due to non-completion of dam.
Myntdu Meghalaya/ Jaintia Hills 2x42	<u>363.08</u> 391.33	<u>2006-07</u> 2006-07	Forest clearance awaited. Study of Geo-hydrological and Infra-structural works in progress.. The tender for construction of road will be floated shortly. Construction of approach road(10.4 Km.) from pderynbakep village to dam site has been taken departmentally. Administrative approval for construction work accorded on 29.5.2002. Tender for civil works expected to be floated by October 2003 and for E&M parts by September 2003.		

VATE SECTOR

Baspa St.II HP./Kinnaur 3x100 29.04.94(CEA cl.) 16.01.98 (TEC	949.23 949.23	<u>2001-02</u> 2003-04 (2 Units Advanced to 2002-03)	The agreement for implementation of the project was signed with M/s.Jai Prakash Industries, New Delhi in Oct.92, PPA was signed in 6/97, TEC cleared by CEA in favour of M/s.JPI but later on transferred in favour of JHPL. All major Civil works have been completed. Contract agreement	-Flash flood in July/August 2000.
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revalidated)

for TG sets signed with M/S Seimens, AG Germany. Unit-1 rotated on 24.10.03 & Unit-II rotated on 08.02.03.
Erection of Unit-3 nearing completion.
Erection of GIS & 41 MVA GT completed.

DhamwariSunda/H.P/Shimla 2x35/ 06.07.2001(TEC)	<u>439.96</u> 439.96	<u>2006-07</u> 2006-07	H.P Govt. signed IA with M/s Harza Engg. Company, USA on 17.10.96. Later on it was proposed to change the name of executing agency to M/s Dhamwari Power company Ltd., New Delhi. The F.C is expected by March, 2003. Forest clearence and environmental clearane attained. Land acquisition is in progress. The company has selected M/S MWH Energy & Infrastructure Inc. as consultant for taking up job of preparing tender documents. The company is also pursuing for signing PPA & financial closure.
Vishnu Prayag Uttaranchal/ Chamoli 4x100 30.06.97 (TEC)	<u>1614.66</u> 1614.66	<u>10th Plan</u> 2006-07	TEC has been cleared by CEA in 6/97. The -Financial closure. project is being executed by M/S Jai Prakash Power Venture Ltd., New Delhi. Infrastructure works completed. Contract for Supply of TG sets have been awarded to a consortium of Alstom Power hydraulic & Alstom Power Hydro. and civil works & Hydro – Mechanical equipment have been awarded to M/s JIL. M/s JPVL has requested for grant of extension up to 31.03.2003 for firm financial closure. Excavation works of HRT, Pressure shaft, PH,TRT etc. are in progress.

NEW HYDRO SCHEMES

2.16. The Committee have also been informed that CWC is the principal consultants associated with the design of the civil component of Nathpa Jhari H.E. Project and has representation of Member (D&R) in the Board of Directors of SJVNL. CWC was associated with the assessment of flood damages along with CEA and the Project Management.

2.17. The Committee have been informed that CEA has identified a total of 168 hydro schemes for benefits during 11th and 12th Plan with capacity addition of about 20,000 MW and 26,500 MW respectively during above Plan period. In addition 158 hydro schemes aggregating to 45208 MW are presently under Survey & Investigation on the information furnished by the project authorities / SEBs / CPSUs.

2.18 The Ministry of Power have informed the Committee that in the hydro policy declared by the Government, stress has been laid on the necessity of carrying out of investigations of potential hydro sites on an advanced scientific basis. Funding agencies like World Bank and ADB have shown their interest towards funding the survey and investigation for hydro –electric projects for which concerted efforts would have to be made towards availing the funds. It has also been proposed in the hydro policy that new hydro-electric projects will be taken by CPSUs/ SEBs for investigations, updation of DPRs, obtaining the necessary clearances and pre-construction activities. Since the private sector has been hesitant and cautious to invest in hydro-electric projects it has been suggested to the Committee that the projects could be offered to the private sector for execution on ‘stand-alone’ basis or for joint venture participation with CPSUs/ SEBs. This would encourage participation of private sector in the development of hydro potential.

2.19 To expedite the hydro development and to reduce time and cost overrun the Government has approved a Three Stage Clearance procedure for hydel projects to be executed by CPSUs in consultation with Ministry of Finance and Ministry of Environment and Forests. By now, 22 schemes with more than 25,000 MW capacity have been proposed under this clearance procedure.

Hydro Electric Project under three stages clearance

2.20 For expediting hydro developments, the Committee have been apprised that Ministry of Power vide their letter No. 16/31/2000 – DO(NHPC) dated 8th June, 2001 have circulated three stage development procedure of new hydro electric projects in Central Sector. The procedure is summarized below:-

In Stage-I

2.21 In Stage-I, an expenditure up to Rs. 10 crore on survey, investigation and preparation of pre-feasibility report for hydro electric projects will be sanctioned by Ministry of Power subject to condition that the proposed hydro electric project is figuring in the five year plan or long term hydro electric power development plan. If the expenditure is more than Rs. 10 crore, the same would be considered by the Committee of PIB (CPIB). The activities under Stage-I shall be completed within one year from the date of sanction.

In Stage –II

2.22 All cases of Stage –II, where the estimates of cumulative expenditure including Stage-I exceeds Rs. 10 crores, will be considered by Committee of PIB(CPIB). Proposals costing Rs. 20 crores and more will require the approval of Finance Minister. While those involving a cost of over Rs. 50 cores will require the approval of Cabinet/ CCEA. Project which have been found to be commercially viable and have obtained site clearance from Ministry of Environment & Forests would be considered for Stage –II development.

2.23 Stage –II development would involve preparation of DPR, pre-construction works, development of infrastructure facilities and land acquisition etc. The activities under Stage-II shall normally be complete within one and half years from the date of sanction.

In Stage –III

2.24 Stage- III would required approval of PIB/ CCEA for investment decision in respect of construction of the project. The approval of the PIB/ CCEA would be sought after Environment & Forest clearances have been obtained from MOEF and TEC from CEA.

2.25 In view of Ministry of Power's letter No. 16/31/2000- DO (NHPC) dated 8th June, 2001 regarding three stage development procedure of new hydro –electric projects in Central Sector for expediting hydro developments, CEA is involved in examination of commercial viability, estimates for Stage-I and Stage-II activities, in addition to techno-economic appraisal of the hydro electric schemes in Central sector.

2.26 Enquired about the Status of proposals of Hydro Electric Schemes received under three Stage Clearance, the Ministry of Power have informed the Sub-Committee as under:-

(i) HE Projects submitted for Stage-I Clearance

Cost estimates for Stage-I activities for 11 HE Schemes with an aggregate installed capacity of 17999 MW have been cleared by CEA and two HE Schemes with an aggregate installed capacity of 150 MW are under examination in CEA.

(ii) HE Projects submitted for Commercial Viability

Commercial Viability has been accorded by CEA to 16 HE Schemes with an aggregate installed capacity of 10666 MW. Commercial viability for one scheme viz. Bav St –II (2x25 MW) is under examination in CEA. One scheme viz. Farakka Barrage (3x25 =75 MW) was examined in CEA and not found commercially viable.

(iii) HE Projects submitted for Stage- II Clearance

2.27 Cost Estimates for Stage –II activities of 14 HE Schemes has been cleared by CEA for with an aggregate installed capacity of 10801 MW and one HE Scheme viz. Nimoo Bazgo (3x15 MW) is under examination in CEA.

2.28 With an objective of executing the feasible balance hydro power projects in the country in a systematic manner, Ministry of Power apprised the Committee that CEA has completed an exercise to carry out Preliminary Ranking Study of all the undeveloped hydro sites in the country. Based on the preliminary Ranking Study, about 400 schemes with an aggregate installed capacity of about 1,07,000 MW have been prioritised in all the six River Systems of the country.

The Committee have been informed by Damodar Valley Corporation (DVC) that new hydel schemes have been identified for development. These are Boro-Konar Hydel, Bermo Hydel Project, Balpahari Dam & Hydro Electricity Project, and Lugu Pahar Hydro Electric Project. However, no budget allocations have been made for all these schemes so far.

Ranking Studies by CEA

2.29 A step ahead of the ranking studies, the work relating to preparation of Pre-Feasibility Reports (PFRs) has already been initiated by Central Electricity Authority in consultation with Central Water Commission, Geological Survey of India, Survey of India etc. and 162 hydro schemes (About 50,000 MW) capacity have been selected. Various CPSUs and some state agencies have been selected for this purpose.

2.30 As about the present process of clearance of hydroelectric project, the Committee has been informed by the Ministry of Power in a note as under:-

“Technical examination of Hydro-electric /multipurpose project reports is interactive exercise and involves various disciplines like hydrology, Civil design, electrical designs, geology, etc. The detailed project (DPRs) are examined in specialised formations in CEA and Central Water Commission with a view to finalised the features of the projects based on the optimal plan development of water resources and also considering techno-economic feasibility and requirements of system”

Pumped Storage Schemes

2.31 The development of pumped storage schemes attracted attention in recent past because of their important role in optimizing energy generation from base load thermal stations and in meeting peak load and system contingencies. The Ministry of Power informed the Committee that in the reassessment studies CEA acknowledged the need for identifying PSS sites and identified 56 sites for Pumped Storage Schemes (PSS) with total installed capacity of about 94,000 MW. Presently, 8 PSS with an aggregate installed capacity of 2304 MW are in operation. 3 PSS with total capacity of 2650 MW are under construction and another PSS with installed capacity of 1,000 MW have been approved by CEA for implementation.

WORLD SCENARIO IN HYDRO DEVELOPMENT

2.32 According to available estimates, the exploitable global hydro power potential is of the order of 15000 billion units (kWh) annually. The economically exploitable hydro potential of India is about 4% of the global hydro potential but nevertheless rank 5th in the world.

2.33 About the world wide hydropower situation, the Committee have been informed that the installed capacity is of the order of 6,60,000 MW. The hydro projects under construction are of the order of 1,26,000 MW and unharnessed potential is of the order of 15,00,000 to 20,00,000 MW. The percentage distribution of installed capacity, under development and undeveloped potential amongst various continents are as under:

Continent	Installed Capacity (%)	Potential under-development (%)	Undeveloped Potential (%)
Asia	32	62	47
Europe	25	17	5

North America	24	1	6
South America	16	18	25
Africa	3	2	17

2.34 Asked about substantial Hydro share of Power, the Committee have been informed of the following countries having hydro share ranging from 62% to 100%.

	Name of Country	% share of Hydro in Total Capacity
1.	Bhutan	100.00
2.	Congo	100.00
3.	Paraguay	100.00
4.	Zambia	99.89
5.	Nepal	85.70
6.	Zaire	99.70
7.	Norway	99.60
8.	Ghana	97.00
9.	Uganda	98.80
10.	Honduras	90.00
11.	Burundi	100.00
12.	Rwanda	97.70
13.	Cameroon	97.41
14.	Tanzania	87.00
15.	Brazil	96.00
16.	Albania	96.40
17.	Canada	62.00

2.35 The Committee observe that there are countries like Norway, Switzerland and Brazil where share of hydro capacity in the total installed capacity is of the order of 99% , 85% and 95% respectively. Bhutan, Congo, Paraguay have 100% hydro power in their countries. Hydro share in Canada is of the order of 62% while in France it is 14%. As against these, the hydro share in India is less than 25%.

2.36 A comparative position of Hydro Development in India, neighboring countries and some other countries as furnished to the Committee by Ministry of Power in a note are as under:-

Sl.No.	Name of the Country	Total Potential (MW)	Potential in for Harnessing (MW)	so Under Installation (MW)	Planned (MW)	Names of Some Important Projects under Constructions (MW)
1.	India	1,48,700	24,332	11,959	20,000	Nathpa Jhkari 1500 Tehri (St-I) 1000, Koldam 800 Parvati-II 800, Indira Sagar 1000, Ranjit Sagar 600, Dulhasti 390

	Pumped Storage	94,000	2308	2500	1000	Sardar Sarovar
2.	China	2,90,000	56,000	50,000	80,000 Xiluodu, 14,400 Xiangjiaba 6,000	Three Gorges- 18200 Ertan – 3300, Xiaolangdi –1800
3.	Japan	24,840	21,522 22,885 (PSP)	666 5,420 (PSP)	6,596(PSP)	Oktyadanu-560 Kazybigawa ((PSP) – 1600 Kannagawa-2700
4.	Iran	16,000	2,500	7,500	3500 Rudbare 1000 Lorestan Bakhtiari 1500	Karun –2000 Masjed-e Solyeman 1000 Sooshatar –2000 Karun 4 –1000
5.	Bhutan	16,000	355	1,088	Not available	Tala – 1020, Kurichu-45, Basochhu-23.8
6.	Nepal	43,442	296	204	Pancheswar 4,000	Kali Gandaki-144 Khimti Project –60
7.	Turkey	34,862	10,108	3,938	19,443	Birecik-672, Deriner-670, Barke-510, Obruk-203, Batman –198
8.	Pakistan	24,000	4,836	1,634	13,313 Kalabagh 2400 , Basha 3360, Neelam Jhelum 696	Chashma-184 Ghazi Barothan-1450

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Small Hydro Potential

2.37 The Committee have been apprised that in the studies carried out by CEA during 1988-96 for assessment of Small Hydrel Potential (SHP) up to 15 MW installed capacity, the Small hydrel potential of the country was assessed as 6782 MW from 1512 schemes. The development of Small Hydro Potential up to 25 MW capacity is in the purview of the Ministry of Non-Conventional Energy sources.

2.38 The Committee have been informed by Ministry of Non-Conventional Energy Sources that out of the total potential of 15,000 MW, sites aggregating to 10,171 MW had been identified by CEA, Alternate Hydro Energy Centre(AHEC) and State Governments and only 1,320 MW could have been exploited so far. To a

recommendation of the Standing Committee on Energy in the 26th Report (Thirteenth, Lok Sabha) that the Government should formulate an action plan so that the remaining sites could be identified expeditiously and the Government should chalk-out a time bound programme to harness the estimated potential on priority basis, The Ministry of Non-Conventional Energy Sources, in their Action Taken reply, submitted in June, 2002 have stated that the installed capacity of small hydro power projects up to 25 MW station capacity has now increased to 1438 MW. There was a capacity addition of about 89 MW during 2000-01 and 75 MW during 2001-02. Ministry of Non-conventional Energy Sources is aiming towards identification of all viable potential small hydro sites by the end of 10th Five Year Plan. One of the objectives of the 10th Plan is to 'strengthen resource assessment programme and create SHP data base on GIS platform, for the country'. In order to achieve this, following steps have been taken (i) All the State Governments have been requested to draw a comprehensive action plan in order to assess the full SHP potential in their States. They have been requested to prepare a comprehensive list of potential SHP sites with a view to harness the potential on priority basis. The Ministry have offered to provide partial financial support for this activity. The Ministry have already received proposals for preparing Master Plans for the States of Chattisgarh and Kerala. (ii) As part of the UNDP-GEF Hilly Hydro Project implemented by MNES, State-of-the-Art techniques have been developed to identify potential sites using topographic maps, satellite images, flow data of major rivers etc. This has already been applied for identification of potential sites in the Himalayan and Sub-Himalayan States (13 States are covered). The State of Himachal Pradesh has further developed this model and a detailed GIS data base has been prepared on all small hydro potential sites. This work has been done at Alternate Hydro Energy Center (AHEC), IIT, Roorkee. AHEC, Roorkee has been asked to prepare a proposal to further strengthen the data base for the entire country. (iii) A joint meeting between Ministry of Power and Ministry of Non-conventional Energy Sources was held on 3rd May, 2002 to discuss the strategy and action plan for the development of mini/ micro/ small hydro projects. Hon'ble Union Minister of Power and Minister of State for Non-conventional Energy Sources were present in the meeting. The meeting was also attended by Ministry of Water Resources, CEA, CWC, NHPC, NTPC, NEEPCO, REC. The CPSUs have been asked to extend all possible help to the States for accelerated development of SHP potential in the country and to work out feasibility of all the identified SHP projects within a time bound manner.

2.39 The Committee find that hydel power share to the total installed capacity, stood at 38%, at the time of Independence. It continued to rise and reached a level of 50.62% in the year 1962-63 and thereafter there has been a steep decline in its share and reached a dangerous level of 25% in the year 2002-03. In this context, the Committee would like to point out that as 40% of total demand in the country occurs as a peak demand and since hydro-stations are best suited to meet this demand, the ideal thermal hydel mix ratio of 60:40 is required to be maintained. Further, in spite of setting up of Central Hydro-Corporations like NHPC, NEEPCO, THDC, SJVNL, the development of hydel sector, has been lopsided, surprisingly, the programmes and policy framework chalked out to boost hydro power resources, do not paint a rosy picture, as the hydel share in the 10th Plan, is further moving southward. The Committee, therefore, desire that Government should review their policy/programmes etc., so that hydel potential, is exploited expeditiously and the country is able to achieve 60:40 thermal hydel mix in the near future.

2.40 The Committee are glad to note that the Ministry of Power has set an agenda of providing 'Power for all by 2012' and as per the present target 50,000 MW of Hydro Power is targeted

to be generated by 2012 against the total additional capacity addition targets of 1,00,000 MW. The Committee are, however, unhappy to note that only 14393 MW of hydel power is estimated during the 10th Plan period although about 13294 MW of this hydel power is likely to be generated from the ongoing 35 hydro electric projects as 1050 MW of power has already been commissioned. From the state-wise figures of status of Hydro electric potential development, the Committee observe that although Punjab, Haryana, Uttar Pradesh, Tamil Nadu, Tripura have got about 80% and above of the available potential hydro power developed in their states, states like Jammu & Kashmir, West Bengal, Sikkim, Manipur, Nagaland have less than the 10% development of the assessed potential. The Committee are distressed to note that although CEA have cleared schemes of 242.63 MW in Kerala, only 2.28 MW of hydel potential is under development in the State. Similarly, for Jharkhand, West Bengal, Sikkim, Arunachal Pradesh and Mizoram, the CEA have cleared hydro power schemes of 190.50 MW, 111.50 MW, 256.67 MW, 743.00 MW and 142.50 MW and the hydel potential under development is reported to be 4.29 MW, 8.11 MW, 0.0 MW and 2.12 MW respectively. The hydro power schemes under execution account for 5.75% of the total assessed potential. The Committee, cannot but deplore the way in which hydel power generation targets have been fixed during 10th plan as against the total targets of 50,000 MW to be achieved by the end of 12th Plan and would like to know the reasons for this slow development in some of the States. At the same time, the Committee would like to know the steps taken by the Government for speedy implementation of hydel power projects in these States. The Committee take a strong note of the fact that although CEA has identified a total of 168 hydro schemes for benefits during 11th and 12th Plan with capacity addition of about 20,000 MW and 26,500 MW, respectively, during above Plan period and in addition to this, 158 hydro schemes aggregating to 45208 MW are presently under Survey & Investigation based on the information furnished by the project authorities / SEBS/ CPSUs, the work on hydro power schemes, is moving at snail's pace. The Committee recommend that Central Government should take pro-active action to ensure that the planned schemes, are executed as per their targeted schedules.

2.42 Taking note of the new hydro schemes such as Boro-Konar Hydel, Bermo Hydel Project, Balpahari Dam & Hydro Electricity Project, and Lugu Pahar Hydro Electric Project identified, the Committee are constrained to note that no budgetary allocations have been provided to start these projects. Taking into consideration, the adverse thermal & hydel mix ratio in the Eastern region, the Committee recommend that the Government should take up all these new schemes at the earliest. At the same time, the Committee desire to know the present status of these new schemes identified by DVC.

The Committee find that in the recently announced 50,000 MW Hydro Initiative, 162 projects have been found to be viable. This has been categorized under 'A' and considered to be most viable projects. Further, as much as 75% of this potential is spread over in the State of Arunachal Pradesh, Himachal Pradesh and Uttaranchal, with Arunachal Pradesh alone accounting for over 50% of the total of these category 'A' projects. The Committee are apprehensive of the viability of these 25,000 MW hydro capacity in the State of Arunachal Pradesh serving the peak and frequency support needs

of the rest of the country especially in the context of missing transmission links in North-Eastern region and also absence of National Grid. The Committee desire that this needs to be examined. The Committee, therefore, caution the Government and desire that while exploiting the Hydel potential in these States, an action plan may be drawn, for laying of associated transmission lines so that power generated is evacuated.

2.42. The Committee take strong note of inaction on the part of Government in not harnessing the Pump Storage potentials of the fact that these are essential in optimising energy generation from base load thermal stations and in meeting peak load and system contingencies. As on date, only 2.45% of total identified potential of 94,000 MW Pump Storage Schemes have been harnessed and another 2.5% under construction. The Committee are of the view that since Pump Storage Schemes are relatively free from the environmental & forest hindrances which a green field hydel project is subjected to, a new programme/Action Plan/scheme be launched, exclusively for PSS, so that the vast untapped potential is exploited expeditiously. The Committee would like to be apprised of the action taken by the Government in the matter.

2.43 The Committee observe that re-assessment studies of hydro-electric potential of the country, completed by Central Electricity Authority in 1987, have placed the hydro power potential at 84044 MW at 60% load factor. The Committee have further been apprised by the Ministry of Power that a total of 845 hydro-electric schemes have been identified in the various basins which will yield 442 billion units of electricity. With seasonal energy, the total energy potential is assessed to be 600 billion units per year. In addition, the reassessment studies have also identified 56 sites for Pumped Storage Schemes (PSS) with total installation of about 94,000 MW. The hydro potential of 84044 MW at 60% load factor when fully developed would result in the installed capacity of about 150000 MW on the basis of probable average load factor. However, the Committee are dismayed to note that the present Hydro potential developed at 60% load factor is only 14299.02 MW against the total assessed potential of 84044 MW at 60% load factor which accounts for only 17.01% of the total. As regard to basin-wise hydel potential developed, the Committee are further perturbed to note that although in case of western flowing rivers and east flowing rivers, 59.94% and 42.73% of assessed hydro-electric potential has been developed, it is 1.92% , 16.38% and 17.82% for Brahmaputra, Indus and Ganga Basins, respectively. The development of these basin has still not been geared up and only 0.84%, 7.73% and 12.90% of the Brahmaputra Basin, Indus and Ganges basins respectively are reported to be under development. The Committee fail to understand as to why the Government have not planned the development of Hydro schemes in these three basins and desire that a separate perspective plan be drawn for development of Mega Hydro Power Schemes in these three basins for implementation in the next two plan periods. The Committee would like to emphasise that Central Government should set up River Basin Authorities, for these three basins, on the lines of Narmada Authority, for the development of hydro-potentials in these River Basins. The Committee would like to be apprised of the action taken in this regard.

2.44 The Committee find that Government have come up with hydro policy in the year 1998 to accelerate development of hydro projects in the country with mega power benefits of custom duty exemption, deemed export benefit etc. to hydro project with capacity of 500 MW and above. In addition to this, steps like private sector participation, formulation of bankable DPRs etc., have also been taken by the Government. The Committee are however, dismayed to note that these initiatives have not yielded the desired results owing to lack of modern planning, construction and indigenous machinery in the country, surplus staff on completion of projects, virtual absence of private sector, long transmission lines to evacuate power from remote areas to load centres etc. The Committee cannot but deplore the way the Government have executed the hydro policy and stress that concrete steps need to be taken by the Government to overcome such constraints which have hampered the acceleration of development of hydro power in the country. The Committee, therefore, desire to be apprised of the action taken in this regard at the earliest.

2.45 While examining status of ongoing Hydro Electric Project in the country, the Committee have noted serious lapses on the part of executing as well as coordinating agencies resulting in huge cost and time overruns of hydro projects. The Committee note that for Dhauliganga –I (NHPC) project in the Central Sector the ongoing cost of Rs. 601.98 crore has been revised to Rs. 1578.31 crore and the commissioning schedule delayed by about six years. The reasons for delay is reported to be acquisition to private land. Further, as regard to Dulhasti (NHPC) project, cost estimated at Rs. 1262.97 crore in 1994 –95 has been revised to Rs. 3559.77 crore with target of completion by 2003-04. The reasons for delay are reported to be geographical problem, law and order problem etc. The present status of Purulia 4x 225 MW Pump storage scheme in West Bengal further indicate that the cost has been revised from Rs. 1456.5 crore with targets of completion during 2002-03 to Rs. 3188.90 with revised completion targets at 2006-07. Regarding status of Purulia Pump Storage Schemes, the Committee have been informed that OECF loan agreement was signed in March, 95. An MOU was signed on 25.5.2001 between Govt. of W.B. and NHPC with a joint venture company namely NPSDC. CCEA clearance for joint venture is awaited but the infrastructural works at site is in progress. The reasons for delay are reported to be -Loan agreement with OECF signed after one year of sanction, delayed in placing order for civil works due to litigation, delay in availability of additional forest land.

2.46 The Committee are not satisfied with the present system of project implementation by NHPC and other hydel power PSUs including THDC, SJVP etc. The Committee feel that issues which delay in finalising loan agreement, placing of orders, procurement of forest land etc. as in the case of Purulia, Pump Storage Schemes only indicate the lack of seriousness on the part of the executing agencies. The Committee, therefore, recommend the Government that in the present case of Purulia Pump Storage where project cost has increased by more than Rs. 1700 crore and the project is delayed by about four years, there is a need to fix the responsibility at higher level. The Committee also desire that necessary PIB clearances should be sought immediately. The Committee desire to know the action taken by the Government in this regard.

2.47 The Committee are further distressed to note that the cost of Nathpa Jhakri Hydro electric project in Kinnaur district of Himachal Pradesh has been raised from Rs. 1678.02 crore to 7686.31 crore. This project has been delayed from 1996-97 to 2003-04. The Committee observe that consequent on flooding on 01.08.2000 the restoration of infrastructural works in dam and intake areas, desilting chamber and power house have been completed. Diversion tunnel was reported to be made operational again on 18.9.2002 after repair of coffer dam. All Units are now scheduled to be commissioned by 12th December, 2003 and efforts are being made to rotate/commission Units 5&6 by March, 2003, completion of Desilting chamber No.4 was scheduled by 03/03. As regard to the cost escalation of Nathpa-Jhakri Hydro electric Project, the Committee are further perturbed to note the escalation which is about Rs. 6000 crore and the project has been delayed by seven years. The Committee are not convinced with the reply of the Government that flash floods on 1st August, 2000 have caused severe damage to the project as this apprehension was raised by the Standing Committee on Energy during their study visit to the project during May-June, 2000 and the project authorities failed to take timely action. The Committee failed to understand as to why technical and civil aspects being looked after by Central Electricity Authority and Central

Water Commission, have been neglected and no precautions were taken. The Committee feel that both CEA and CWC owe an explanation for this and the Government should fix the responsibility in the matter. The Committee, therefore, recommend that DPRs cleared by CEA and civil work carried out under supervision of CWC should be examined thoroughly and minutely and the lacuna in the clearance system should be brought to the notice of the Committee with the steps taken to avoid such recurrence in future.

2.48 The Committee have observed delayed execution of several hydel projects both in Central, State and Joint Ventures Project such as Tehri St. I (4x250 MW) and Sardar Sarover (6x200 +5x50) have been delayed on account of legal hurdles as well as R&R problems. Baglihar in Project Jammu & Kashmir, Lakhwar Vyasi in Uttranchal have been delayed due to fund constraints etc. Due to general price escalation, the cost of Lakhwar Vyasi has gone from Rs. 140.9 crore during 1989-90 to Rs. 1446.00 crore during 11th Plan. The Committee feel that in spite of three stage clearance procedure in vogue for hydel projects to be executed by CPSUs in consultation with Ministry of Finance and Ministry of Environment and Forests, only 22 schemes with more than 25 MW capacity have reported to be proposed under the three stage clearance procedure. The Committee are of the view that hydro power is a renewable, economic, non-polluting and environmentally benign source of energy which needs to be encouraged. Further, as against 168 hydro schemes identified by CEA during 11th and 12th plan and 158 hydro schemes aggregating 45208 MW are under Survey & Investigation, only 11 Hydro Electric schemes with an aggregate installed capacity of 17999 MW have been cleared by CEA whereas two Hydro Electric schemes with an aggregate installed capacity of 150 MW are under examination by CEA. The Committee cannot but deplore the way that hydel projects are planned and executed. The Committee, therefore, desire that ranking studies by CEA should immediately be followed by the three stage clearance procedure to boost the hydro-electric development in the country. The Committee are of view that an action plan should be drawn by the Government / CEA to take necessary steps to ensure completion of the identified hydro schemes in a time bound manner and the Committee to be apprised of the action taken in this regard.

2.49. Taking into account the world scenario in Hydro Development, the Committee find that countries like Bhutan, Congo, Paraguay have 100% hydro power in their countries and share of hydro capacity in the total installed capacity of Norway, Switzerland and Brazil is of the order of 99%, 85% and 95% respectively. As against this, the hydro power share in India at present is less than 25%, in spite of their repeated recommendations to raise the share and attain optimal thermal hydel mix ratio of 60: 40. From the present status of potential being harnessed, the Committee are dismayed to note that although some important projects to harness hydro potential totaling 20,000 MW have reported to be planned, the

pump storage scheme which have a total potential of 94,000 MW, only one project, Sardar Sarovar of 1000 MW capacity has been stated to be planned for execution. The Committee, therefore, cannot but deplore the way Pump Storage Schemes are being developed for tapping the desired potential and feel that there is total lack of thrust for developing hydro schemes. The Committee, therefore, urge that Government should to take all necessary steps for speedily development of Hydro Schemes including Pump Storage Schemes, draw a perspective Plan to implement them and apprise the Committee of the action taken thereon.

2.50 Taking into consideration the huge gap between the potential and actual harnessing of small hydel capacity, the Standing Committee on Energy in their 33rd Report on Action Taken by the Government on the recommendations contained in their Report on the subject, “Small Hydro Power Programme – An Evaluations” had recommended identification of sites and formulation of time bound programme, to exploit them. Taking note of the steps taken by Ministry of Non-Conventional Energy Sources such as persuading the State Governments to draw comprehensive action plan to assess the potential, Central PSUs to extend all possible help to States, partially financing by MNES, etc., the Committee opined that MNES has merely passed on the onus to the State Governments and Central power PSUs to take appropriate action. The Committee did not approve of this half-hearted approach of the Government and had recommended that Ministry of Non-Conventional Energy Sources together with CEA should undertake survey of all the river / canal basins and identify the potential sites. A ranking study was also suggested to be undertaken for prioritizing the identified sites. The Committee note that recommendation of the Committee has been accepted by the Ministry of Non-Conventional Energy Sources in their action taken statement submitted on 5th December, 2003. MNES have stated that keeping in view the recommendation of Standing Committee, detailed discussions were held with the Hydro Division of Central Electricity Authority (CEA) to take up identification of more potential sites suitable for small hydro development in various states. CEA had mentioned that for the identification of sites they depend on the Investigation Divisions of various State Electricity Boards (SEBs). Under these circumstances, the involvement of SEBs needs to be increased. Keeping this in view, the Ministry has launched a

new scheme from 2003-04 to provide financial support for identification of new sites and preparation of a perspective plan in each state. The following financial support is extended:-

States/ UTs	Assessment of total potential in the State, Preparation of Perspective Plan and Identification of upto 50 new sites	Identification of more than 50 new sites
	50% of Proposed Cost Limited to:-	

N.E. Region, Sikkim, J&K, H.P. & Uttaranchal (Special Category States)	Rs. 22.50 lakhs	Rs. 30.00 lakhs
Other States /UTs	Rs. 15.00 lakhs	Rs. 22.50 lakhs

- 2.51. The State of Chattisghargh has already taken advantage of the above scheme and with the involvement of Alternate Hydro Energy Centre (AHEC). IIT Roorkee. They have already identified over 100 new sites in the State. Proposals have also been received from the States of Uttaranchal and J&K. In order to identify new potential sites in the North-Eastern States, the Ministry has given financial support and equipments to the Renewable Energy Wing of the Assam State Electricity Board to identify new sites. In addition to this NHPC and NEEPCO have also launched efforts to identify new sites. The Committee are happy to note the acceptance of their recommendation and expect the Government to take necessary steps to ensure that the above steps do not go haywire and the scheme become fully successful and operational in all states.

Chapter-III

Role of Central Water Commission (CWC) in the Development of Hydro Power

3.1. Resource assessment work of hydro development comes under the purview of CEA. The inputs are essentially in the form of water availability studies. The Committee have been informed that CWC/Ministry of Water Resources is continuously observing hydrological data on various rivers/basins, and this data is available in the form of water year books for practically all the river basins. During preparation of DPR, hydrological and hydro-meteorological data collected by CWC/Ministry of Water Resources for various basins of the country are fully utilized. In respect of details of collection of hydro-meteorological data, Central Water Commission/Ministry of Water Resources maintains 953 sites through out India to collect the hydrological data of all the river basins. The details are given below:-

(i)	Gauge sites	- 300 nos.
(ii)	Gauge and discharge sites	- 242 nos.
(iii)	Gauge, discharge and water quality sites	- 117 nos.
(iv)	Gauge, discharge & silt sites	- 40 nos.
(v)	Gauge, discharge, silt and water quality sites	- <u>254 nos.</u>
	Total	- <u>953 nos.</u>

3.2 In addition there are sites maintained by the State Governments for use in resource assessment. About achievements of CWC/Ministry of Water Resources in development of hydro power generation and the deficiencies if any noted in the policies/plans and programmes, the Committee have been informed by Ministry of Water Resources that assessment of the hydel potential available and exploited in the country is made by CEA/Ministry of Water Resources while CWC renders necessary assistance in respect of civil components. Total assessment of they hydro power potential in terms of installed capacity has been assessed as 1,50,000 MW. Out of which 26,910 MW has been developed so far. CWC/Ministry of Water Resources contribution to the design consultancy for different Hydro-electric Projects has been of the order of 35% of the potential developed.

3.3. General pitfalls in implementation of hydro power projects are the issues like inter-State matters, environment and forests aspects investigation in difficult area, shortage of funds, Rehabilitation and Reclamation (R&R) issues, geological surprises, training and development, etc.

The Committee have been informed that survey and investigation of hydroelectric projects/multi-purpose have been carried out by Central Water Commission/Ministry of Water Resources in India and for neighbouring countries. Normally time taken for carrying out survey and investigation including preparation of DPR is 5 to 10 years. The time take in investigations vary due to insufficient hydrological data for various studies, remoteness of area, geological conditions, alternative studies for various components of the projects and local conditions, etc.

3.5 Ministry of Water Resources informed the Committee that the time taken for survey and investigations for some of the projects have extended beyond scheduled time. The main reasons for time and cost over run can be attributed to:-

- (a) Insufficient basic hydrological data required for input of design of structures and power potential studies.
- (b) Geological surprises met during the course of investigations necessitating additional sub surface explorations.
- (c) Remoteness of areas – interior, lack of basic infrastructure facility, health hazards, snow bound, tough hilly terrain, etc.
- (d) Study of suitable alternative sites of project component for optimization.

3.6 Asked about the details of actions/steps taken by CWC/Ministry of Water Resources to improve the hydrological and other scientific data collections and other survey and investigation means, the Committee have been apprised by the Ministry written reply as under:-

“Under the hydrology project (being implemented with World Bank Loan assistance in peninsular India along with State agencies and CGWB), CWC/Ministry of Water Resources has upgraded 284 (254 existing and 30 new) sites by providing state-of-the art equipment like electro-magnetic current meter, propeller type current meter, acoustic Doppler current profiler, motorized boats and launches, autographic water level recorders, etc.collection of data. Computer hardware and software have been provided to all sub-divisional, divisional, circle and chief officers for data analysis, processing, validation, storage and dissemination. Protocols have been developed for transmission and validation of the hydrological data from one office to the other. Standardized procedure has been developed for collection, collation, processing, validation, storage and dissemination of data which is being followed by all the States and Central agencies in the peninsular region. The States involved in the project are Andhra Pradesh, Chhattisgarh, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa and Tamil Nadu. Five regional office of CWC – Bhubaneshwar, Hyderabad, Coimbatore, Nagpur and Vadodara are involved in the implementation of the project.

Project have been developed for inter-agency validation of data of the different State agencies and of CWC/Ministry of Water Resources to check any inconsistency of data validated by the individual organization separately. After inter-agency validation, the data will be stored in the data storage centre as an authentic data for dissemination to the users for development of any water resources project.

After completion of the hydrology project in the month of December, 2003, the catalogue showing the meta data of all the agencies implementing the hydrology project will be available in a web site, which can be browsed by any user for getting the hydrological data for their use from the data collectors.

The above system will improve the reliability of assessment of water availability for all water resource development projects.

For survey & investigations latest survey instruments are being used. Improvement in terms of accuracy, quality, automation and production capability has been achieved by deploying state of art survey instruments like ‘total stations’, electro plainmetres, digitized cameras, computers, scanners, plan printers, etc.”

3.7 Asked about the monopoly of CWC/Ministry of Water Resources to do the design consultancy works as assigned to it through competitive biddings, the Ministry of Water Resources informed the Committee in a written reply as under:-

“CWC/Ministry of Water Resources has been associated with almost all the hydroelectric projects in the country and has built up expertise out of intensive activity during the last 5 decades. Being a Government organisation the consultancy charges are raised on man-days spent on designs and preparation of specification and construction drawings of projects. At number of times the consultancy has been taken up through competitive bidding. It may be indicated here that the local consultancy charges for any project (are much less than) the commercial charges for the works when done through private or international agency.

The design consultancy for Hydroelectric projects are being taken up by WAPCOS through National/International bidding. CWC/Ministry of Water Resources helps WAPCOS in the design consultancy work, like preparation of technical specification, issue of specification and construction drawings, etc. The experience is thus shared between the two organizations. CWC/Ministry of Water Resources engineers are also deputed to work in WAPCOS in various fields depending upon the type of work/consultancy required; thus helping WAPCOS in their commercial activity as well”.

3.8 **CWC/Ministry of Water Resources is the principal consultants associated with the design of the civil component of Nathpa Jhakri Hydroelectric project and has representation of Member (D&R) in the Board of Directors of SJVNL. CWC/Ministry of Water Resources was associated with the assessment of flood damages along with CEA and the project management.**

3.9 **Asked about the steps that have been by CWC to ensure that other projects are not affected due to natural calamities like flood/earthquake, etc., the Committee have been informed by Ministry of Water Resources that in normal course, the project components are always safeguarded against normal natural calamities like flood and earth-quake, etc. The measures adopted depend on the importance factor and nature of the components (like permanent and semi-permanent). All the components are designed for earth-quake as per standard norms, procedures and codes. Safeguarding the structure against maximum probable flood/natural calamities is done as per established procedures, adopted in design.**

3.10 **The Committee note that for multi-purpose projects in inter-State rivers, clearance of CWC/Ministry of Water Resources is mandatory. Examination /clearance by CEA is limited to power component. However, for single purpose, hydroelectric projects techno-economic clearance is accorded by CEA for which civil aspects are examined by CWC. Clearance of multipurpose project is given by CWC. However, during examination of the project, the aspect of power generation including electro-mechanical equipment is examined in CEA. Similarly, for single purpose hydro-electric project, clearance is accorded by CEA but during examination, hydrology, civil design, inter-State matters, civil estimates, etc. are examined in CWC/Ministry of Water Resources and CEA. There is very good coordination between the two organizations at all levels. Chairman, CEA takes frequent review meetings for expediting techno-economic clearance.**

3.11 According to Ministry of Water Resources/CWC monitors the implementation of selected multipurpose which are of national importance to ensure timely completion. A list of projects having hydro-electric power components is enclosed at (Annexure 15.1). In so far as hydro-electric projects are concerned, the monitoring is done by CEA.

3.12 The following are the factors affecting the progress of multi-purpose projects (including those having hydro-electric power component).

- paucity of fund
- deficiencies in contract documents
- land acquisition
- legal problems
- labour problems
- law and order problems
- rehabilitation and resettlement
- inadequate investigation, planning and design
- non-transfer of forest land
- frequent changes in scope
- lack of knowledge on latest technical know-how
- shortage of construction materials
- little mechanization
- poor co-ordination amongst implementing agencies
- non-availability of appropriate equipment and spares.

3.13 At time, hydro projects have derated by CEA owing to low discharges of water. As CWC conducts hydrological studies of the projects, enquired as to how problem of derating can be overcome, the Committee have been informed as under:-

“The hydrological studies are carried out in CWC/Ministry of Water Resources as per the guidelines for preparation of detailed project reports of irrigation and multipurpose projects published by the Ministry of Water Resources 1980. As per Annexure-IV Chapter 2, the following is the minimum data requirements for simulation and for development of variability of inputs resources.

Type of project	Minimum length of data for simulation
Diversion projects with or without pondage	10 years
Within the year storage projects	25 years
Over the year storage projects	40 years
Complex system involving combination of one or more of above	Depending upon predominant element

Hydrological studies at times are carried out with limited/scanty data. This limited data do not reflect the complete hydrological cycle of the basin or the effect of changes in rainfall pattern, if any, or the upstream development”.

3.14 The Committee find that CWC/Ministry of Water Resources is continuously observing hydrological data on various rivers/basins, and this data is available in the form of water year books for practically all the river basins. During preparation of DPR, hydrological and hydro-meteorological data collected by CWC/Ministry of Water Resources for various basins of the country are fully utilized. The Committee have been apprised that in respect of details of collection of hydro-meteorological data, Central Water Commission/Ministry of Water Resources maintains 953 sites through out India to collect the hydrological data of all the river basins. The Committee find that a major role of CWC is by way of contribution to the design consultancy for different Hydro-electric Projects which has been of the order of 35% of the potential developed. The Committee, however, are not satisfied with the reported normal time of 5-20 years for carrying out Survey and Investigation (S&I) including preparation of Detailed Project Report (DPR) by Central Water Commission (CWC). The reasons forwarded by the Ministry of Water Resources from time and cost overrun of S&I such as insufficient basic hydrological data required for input of design of structures and power potential studies. Geological surprises met during the course of investigations necessitating additional sub surface explorations. Remoteness of areas – interior, lack of basic infrastructure facility, health hazards, snow bound, tough hilly terrain, etc. etc. also does not sound convincing to the Committee as such data is already available with Ministry of Water Resources/CWC. in the form of water year books. The Committee, however, appreciate the new initiative taken by the Government by providing state-of-the art equipments, following standardized procedure for data collection, dissemination of the data to users and its availability on web site and feel that these steps will at least now reduce the total time take in carrying out Survey and Investigation (S&I) activities and preparation of DPR. The Committee would like to know the impact of these steps assessed by the Government on the new schemes identified for Survey and Investigation (S&I).

3.15 The Committee note that CWC/Ministry of Water Resources has been associated with almost

all the hydroelectric projects in the country and has reportedly built up expertise out of intensive activity during the last 5 decades. Being a Government organisation the consultancy charges are raised on man-days spent on designs and preparation of specification and construction drawings of projects. However, as a number of occasions, the consultancy has been taken up through competitive bidding. It has been brought to the notice of the Committee that the total consultancy charges for any project (are much less than) the commercial charges for the works when done through private or international agency. Further, The design consultancy for Hydroelectric projects are being taken up by WAPCOS through National/International bidding. CWC/Ministry of Water Resources helps WAPCOS in the design consultancy work, like preparation of technical specification, issue of specification and construction drawings, etc. The experience is thus shared between the two organizations. The Committee have been informed by Ministry of Water Resources that in normal course, the project components are always safeguarded against normal natural calamities like flood and earth-quake, etc. The measures adopted depend on the importance factor and nature of the components (like permanent and semi-permanent). All the components are designed for earthquake as per standard norms, procedures and codes. Safeguarding the structure against maximum probable flood/natural calamities is done as per established procedures, adopted in design. Taking note of the fact that CWC/Ministry of Water Resources is the principal consultants associated with the design of the civil component of Nathpa Jhakri Hydroelectric project and has representation of Member (D&R) in the board of Directors of SJVNL, the Committee can not but deplore the casual reply of the Ministry of Water Resources as regard to steps taken by CWC to ensure that projects are not affected due to natural calamities.

3.16 The Committee have been apprised that there is very good coordination between the two organizations i.e. CEA and CWC. Chairman, CEA takes frequent review meetings for expediting techno-economic clearance. Although, for multi-purpose projects in inter-State rivers, clearance of CWC/Ministry of Water Resources is mandatory. Examination /clearance by CEA is limited to power component. However, for single purpose, hydroelectric projects techno-economic clearance is accorded by CEA for which civil aspects are examined by CWC. Further, Clearance of multipurpose project is given by CWC. However, during examination of the project, the aspect of power generation including electro-mechanical equipment is examined in CEA. Similarly, for single purpose hydro-electric project, clearance is accorded by CEA but during examination, hydrology, civil design, inter-State matters, civil estimates, etc. are examined in CWC/Ministry of Water Resources and CEA. The Committee are however, distressed to note the derating of hydro-electric project by CEA due to low discharge of water although CWC who have conducted hydrological studies. The Committee are not satisfied with the reply of Ministry Water Resources that Hydrological studies at times are carried out with limited/scanty data and this limited data do not reflect the complete hydrological cycle of the basin or the effect of changes in rainfall pattern, if any, or the upstream development and recommend that proper care should be taken to carryout hydrological studies so as to overcome the problem of derating of hydro potential of the projects at the time of execution. The Committee would like to know the present of system of Hydrological

studies carried out in other countries and the steps taken by the Government to overcome the reported problem.

3.17 The Committee find that at times hydel projects have derated their capacity owing to low discharge of water. This problem is acute in Jammu & Kashmir and North Eastern region of the country. It has been brought to the notice of the Committee that when the hydrological studies are reviewed with the availability of additional data over and above the additional study, the hydrological parameter has got changed. This may be both on the positive side as well as negative side. Considering the importance of hydrology, in project planning and their operations, the Committee suggests that arrangement for collection, processing and publication of data needs to be strengthened. Wherever necessary, advance action should be taken for setting up of proper hydro metric stations for specific project planning. The Committee are not satisfied with the reply of the Ministry of Water Resources that hydrological studies at time are carried out with limited / scanty data and this limited data do not reflect the complete hydrological cycle of the basin or the charges in the rainfall pattern if any or the upstream development. The Committee feel that the projects based on such studies are bound to cause difficulties later on. The Committee, therefore, recommend that Ministry of Water Resources and CWC have to take responsibility for the information provided and should be accountable to the developers of the projects especially when it is in the private sector.

3.18 The Committee find that so far the development of hydro electric projects have been on good sites where no major problems from geological and other technical considerations have been met. As a development of hydel sector is to continue, there is no other position, but to exploit the difficult geological and terrain conditions. This is true for Himalayan and North Eastern Region. The designs are, therefore, challenging and are to be based “as we proceed with the investigations”. In this context, the Committee desire that new innovations should be attempted especially for projects located in the regions having poor rock strata/parameters. Innovations in regard to foundation treatment, stability of the caverns in undergrounds projects, etc. are thrust area where R&D is required. The Committee desire that the Government should encourage PSUs to undertake these R&D activities to the maximum extent.

CHAPTER -IV

FINANCING OF HYDRO PROJECTS

4.1 The Hydroelectric Projects are characterized by high capital costs, long gestation period and are located in areas where access is difficult. Construction costs of these projects are also dependent on accuracy of investigation, particularly with respect to the geological features of the terrain where the project would be located. In order to harness the considerable Hydroelectric potential in the country, a three-stage approval system has been designed, which is suitable to the needs of these types of projects. It permits pre-investment expenditure in project preparation, prior to the actual execution of the project. This process permits a larger level of delegation to the implementing agency and also larger amounts can be committed at pre-investment stage for Hydroelectric projects. The salient features of this process are as under:-

- (i) Appraisal and approval of expenditure upto Rs.10 crore can be made by the administrative Ministry/Department on survey, investigation, pre-feasibility studies.
- (ii) All pre-investment proposals above Rs.10 crore have to be appraised by a Committee of Public Investment Board (CPIB)
- (iii) Approval of pre-investment proposals above Rs.10 crore – as per the latest delegation, all such proposals costing less than Rs.50 crore can be approved by the administrative Ministry. Proposals costing between Rs.50 crore and less than 100 crore can be approved by administrative Ministry in consultation with the Finance Ministry.
- (iv) After the preparatory work is complete, the project is brought before the PIB which is the appraising forum for such projects for investment approval, in respect of projects costing Rs.200 crore and above. After recommendation of PIB, the proposal is placed before the Cabinet / CCEA for approval if the project cost is Rs.100 crore and more.

4.2 Asked about the delegation of Financial Powers for setting up of Hydroelectric power projects, the Committee have been informed by Ministry of Finance that the position with regard to the approval of expenditure for setting up of Hydroelectric power projects was modified on 18.9.2000 which is as follows:-

“Expenditure upto Rs.10 crore on survey, investigation and preparation of pre-feasibility report for HE projects will be sanctioned by the administrative Ministry / Department concerned subject to condition that the proposed HE project is figuring in the five year plan or long-term HE projects plan of that Ministry / Department.

Expenditure above Rs.10 crore on preparation of DFR / DPR including pre-construction works, development of infrastructure facilities and land acquisition based on the clearance from Ministry of Environment and Forests (MoEF) and after establishing the commercial viability of the project will be considered by the Committee of Public Investment Board . However, proposals upto Rs.100 crore can also be considered by CPIB on the basis of site clearance by MoEF and commercial viability established through a feasibility report, but without the Techno Economic Clearances by CEA and environment clearance by the MoEF. All such proposals costing Rs.20 crore and more will require Finance Ministry’s approval and proposals costing over Rs.50 crore will require approval of the Cabinet/CCEA as per the present practice”.

4.3 The time frame for appraisal of projects /schemes and delegation of powers for approval forum are given at Annexure-I and II.

4.4 Taking into account the need to prioritize the projects/schemes and take-up only such projects/schemes which are financially and economically viable and have higher returns and strengthened decision making process for investments to meet the challenges of the competitive economic environment, the following guidelines/financial limits for appraisal and approval of public investments / expenditure are being prescribed by the Ministry of Finance in their Memorandum dated 18th February, 2002:-.

Appraisal of Plan schemes/projects:-

	Financial limits of Plan scheme / project	Appraisal Forum
(a)	Upto Rs.5.00 crore	Ministry / Department concerned, in normal course
(b)	Above Rs.5.00 crore but less than Rs.25 crore	Standing Finance Committee of the Department concerned under the Chairmanship of Secretary with Financial Adviser and Joint Secretary / Director of the concerned division as members with provision for inviting representatives of the Planning Commission, Department of expenditure and any other Department that Secretary or Financial Adviser may suggest
(c)	Rs.25 crore and above but less than Rs.100 crore	Department Expenditure Finance Committee (EFC). Departmental EFC will be chaired by Secretary of the Administrative Department. It will include the Financial Adviser, as the

- Member Secretary, and the representatives of Planning Commission and Department of Expenditure as members
- (d) Rs.100 crore and above but less than Rs.200 crore Main Expenditure Finance Committee (EFC). Main EFC will consist of Secretary (Expenditure) who will chair the meeting, Secretary (Planning Commission) and Secretary of the Administrative Departments. Financial Advisor will be the Secretary of this EFC.
- (e) Rs.200 crore and beyond Public Investment Board (PIB) / Main EFC chaired by Secretary (Expenditure). Projects / schemes where financial returns are quantifiable will be considered by PIB, others by the EFC.
- (i) It is clarified that SFC / EFC / PIB will be the appraisal forum for any scheme / project. Their recommendations will require approval of competent authority.
- (ii) In respect of Scientific Ministries / Departments, the appraisal forum (EFC) will continue to be chaired by the concerned Administrative Secretary irrespective of the outlay.
- (iii) Navratnas and Miniratna PSUs have enhanced powers for taking investment decisions as per guidelines issued by the Department of Public Enterprises. This delegation will be continued.
- (iv) For schemes / projects involving setting up of new Autonomous Organisations, EFC will be chaired by Secretary (Expenditure) irrespective of their outlays or nature of the Ministry / Department.
- (v) Specific approval of Department of Expenditure for creation of new posts in relaxation of standing economy orders will be necessary irrespective of the recommendations of EFC / PIB.
- (vi) At present all projects being posed to PIB are considered in the pre-PIB meeting. Pre-PIB process in respect of projects with outlay upto Rs.500 crore has been dispensed with and the proposals will be considered by PIB directly.

4.5 Authority for approval

(a) Original cost estimates

Project / scheme Outlay	Approval Authority
Less than Rs.50 crore	Minister in-charge of Administrative Ministry
Rs.50 crore and above but less than Rs.100 crore	Minister of Administrative Ministry and the Finance Minister
Rs. 100 crore and above	Cabinet / CCEA
Proposals for new autonomous organizations	Cabinet / CCEA

irrespective of outlay

(b) Revised Cost Estimates

(b) (1) RCE cases less than Rs.100 crore

- (i) RCE cases with outlay of less than Rs.100 crore arising due to change in statutory levies, exchange rate variations and price escalation within the approved project time cycle and the cases involving further cost increase upto 20% can be approved by the authority as per (a) above in consultation with the Planning Commission.
- (ii) Labour component of the project cost may be updated using the average (of 12 months) of consumer price index for industrial workers.
- (iii) For all other components of costs, except labour, the average (of 12 months) of wholesale price index for all commodities may be used.
- (iv) RCE cases involving increase of more than 20% after excluding the increase due to change in statutory levies, exchange rate variations and price escalation within the approved project time cycle will require appraisal at the forum as elaborated above.

(b) (2) RCE cases of Rs.100 crore and above:

- (i) Revised Cost Estimate (RCE) which arises entirely due to change in statutory levies, exchange rate variations and price escalation within the originally approved project time cycle will be approved by the administrative Ministry / Department concerned in consultation with the Planning Commission.
- (ii) The first RCE, which is upto 10% of the originally approved cost estimates (after excluding the increase within the originally approved project time cycle due to three factors mentioned in (i) above will be approved by the Administrative Ministry in consultation with the Planning Commission.
- (iii) First RCE, which exceeds 10% but are upto 20% of the originally approved cost estimates (after excluding increase within originally approved project time cycle due to three factors mentioned in (i) above shall be appraised by the Planning Commission and will be approved by the Administrative Minister and the Finance Minister.
- (iv) First RCE which exceeds 20% of the originally approved cost estimates (after excluding increase within originally approved project time cycle due to three factors mentioned in (i) above due to reasons such as time overrun, change in scope, under estimation, etc., shall be posed to EFC / PIB for appraisal and thereafter to CCEA for approval.
- (v) Second or subsequent RCE less than 5% of the latest approved cost (First or previous RCE) (after excluding increase due to changes in statutory levies, exchange rate variation and price escalation within the existing approved project time cycle) will be appraised by the Planning

Commission and decided with the approval of the Administrative Minister.

- (vi) Second or subsequent RCE involving increase of 5% or more of the latest approved cost (First or previous) (after excluding increase due to the changes in statutory levies, exchange rate variation and price escalation within the approved project time cycle) will require appraisal by EFC / PIB and approval of the CCEA.
- (b) (3) Criterion for appraisal forum and level of authority for approval of RCE will be cost overrun and not time overrun.
- (b) (4) The existing procedure prescribe that RCE cases should be decided by the same authority, which had approved the original proposal notwithstanding any subsequent delegation of powers. This applies to RCE cases of the Ministries as well as Navratna and Miniratna CPSUs also even though they have powers, subject to certain conditions, to decide new investments. It is now decided that powers for deciding RCE cases are delegated to the authorities as per powers for fresh approvals.
- (b) (5) Where the revised / firmed up cost estimates of scheme / exceeds limits of competent authority who approved the original cost of the scheme, the approval of higher competent authority will be obtained.
- (b) (6) While processing the RCE cases the contents of Planning Commissions's D.O. No.O-14015/2/98-PAMD dated 19.8.1998 regarding consideration of cost & time overruns and fixation of responsibility by the Standing Committee may be kept in mind.

4.6 **Expenditure on pre-investment activities etc.**

(a) The delegation of powers for sanctioning pre-investment activity like preparation of Detailed Feasibility / Project Reports will be as follows:

Expenditure / Financial Limit	Appraisal / approval authority
Upto Rs.200 crore for preparation of DFR and pre-investment activities (including detailed study for preparation of feasibility report but excluding land acquisition / infrastructure facilities) subject to availability of budget / plan funds	Secretary, Ministry / Department concerned
Proposals of PSU upto Rs.10 crore for preparation of DFR and pre-investment activities excluding land acquisition / infrastructure facilities, if not, funded from budget and PSU is profit making	Ministry / Department concerned
All other cases	Appraisal by Committee of PIB (CPIB) and approval by the authority as per para 3(a) above

(b) For projects of Ministries of Coal and Road Transport & Highways expenditure on pre-investment

activities beyond Rs.20 crore only will require consideration by Committee of PIB.

(c) The delegation of powers to Ministry of Power to sanction estimates for pre-construction works and for development of infrastructure facilities in respect of Hydro Electric Project will be governed by the Ministry of Power letter No.16/31/2000-DO (NHPC) dated 8.6.2001.

4.7 Ministry of Finance have further informed that delegation of financial powers will be exercised only where necessary / requisite funds are available in the Annual Plan and the Five Year Plan outlay as per phasing of the project / scheme. The powers will further continue to be governed by procedural and other instructions issued by Government from time to time like general economy instructions, etc.

4.8. **Costing of the project / scheme**

(a) The cost of the proposal will be inclusive of all components under which expenditure is required to be incurred (like revenue, capital and loans, etc.). At present, the costing of the project is done at constant prices. It has now been decided to make it obligatory for the Department to compute the project cost both on constant prices and completion cost basis so that Internal Rate of Return / ERR can be calculated for both scenarios.

(b) The completion cost may be worked out by taking into account the average rate of inflation in the following manner:-

- i) Labour component of the project cost may be updated using the average (of 12 months) of consumer price index for industrial workers.
- ii) For all other components of cost, except labour, the average (of 12 months) of wholesale index for all commodities may be used.

4.9 The Ministry of Finance (Department of Expenditure) have informed that no hydro power project in the Central sector is delayed due to fund constraints. The Central public sector outlay for hydro power development has been enhanced from Rs.12,306 crore during the 9th Plan to Rs.25,839 crore during the 10th Plan. Similarly, budgetary support has been raised from Rs.9284 crore during 9th Plan to Rs.17,511 crore during the 10th Plan. Also, at the stage of PIB it is ensured that project finance is tied up. That precludes the possibility of delay on account of fund constraints.

4.10 Asked about the steps that have been taken by the Ministry of Finance to ensure regular and adequate funds for timely commissioning of hydel power projects, the Committee have been apprised as under:-

“Sectoral as well as project-wise allocation of funds is in the domain of Planning Commission. In order to ensure that the projects do not suffer on account of lack of funds, at the time of PIB appraisal, care is taken not only to look into the viability as well as the cost estimates of the project, but care is also taken to see that funds are tied up. Thereafter, it is the responsibility of Ministry of Power and the implementing agency to ensure that funds flow to the project remains smooth”.

4.11 Enquired about the utilization of funds by Ministry of Power, the Ministry of Finance has informed as under:-

Year	Budget Estimates	Revised Estimates	Actual Expenditure	(Rs. in crore)	
				% Utilization of	w.r.t. RE
1999-2000	9600.27	8049.92	7641.81	94.92	
2000-2001	9720.18	8365.38	6553.38	78.34	
2001-2002	11065.28	10960.28	9925.45	90.56	

4.12 About bilateral aid and financing with multilateral lending agencies for hydel power projects during 2002-2003, the Ministry of Finance informed the Committee in a written reply as below:-

Sl.No.	Name of the project	Executing Agency	Funding Agency	RE	(Rs. in crore)	
					Utilization	
1	Dhauligaga 280	NHPC	JBIC	196.00	191/75	
2.	Turial 60 MW	NEEPCO	JBIC	20.00	25.30	
3.	Purulia PSS 900 MW	WBSEB	JBIC	104.00	129.94	
4.	Ghatghar PSS 250 MW	ID GOM	JBIC	154.26	164.00	
5.	Srisaïlam LB 900 MW	APGENCO	JBIC	60.95	57.04	

(in respect of Ghatgar and Srisaïlam, the external assistance has ceased w.e.f. 20.1.2003 and 16.2.2003 although these projects are still ongoing.)

4.13 Enquired about the normal time taken by PIB for clearing investment proposal of the project and CCEA approval of projects costing Rs.100 crore and more which are submitted to it after completion of preparatory works, the Ministry of Finance (Department of Expenditure) informed that the project of Rs.100 crore and above are brought before the EFC / PIB. PIB clearance on the basis of last five years data, shows a time taken between 1-5 weeks for majority of the cases. The existing guidelines for time taken for holding the PIB is 5 weeks as the stipulated time limit. The delays normally are on account of project being brought before PIB not fully prepared in terms of tying up of funds, environmental / forest clearances, non-tying up of commercial arrangements or revised costs not fully firmed up or responsibility for time and cost over run not fixed.

4.14 Asked about the views of Ministry of Finance on the need to streamline the system, so as to speed up the financial appraisal by single empowered agency having members from Planning Commission, Ministry of Finance, etc., the Committee have been informed in a written reply as under:-

“Govindarajan Committee found that a major lacuna in the project cycle was inadequate project preparation. Accordingly, the guidelines for formulation, appraisal and approval for Government funded projects have been substantially revamped. These guidelines lay considerable stress on project preparation and time limits for various approvals have been specified. Even today, there is one appraising forum for hydel projects where all analysis is integrated i.e. PIB. CEA is more of internal mechanism for Ministry of Power to look at the project technically. Planning Commission provides the major appraisal input to PIB. After PIB, approval goes up to Cabinet for sanction. The existing system for appraisal and approval is satisfactory”.

Outlays for Hydro Projects

4.15 Outlays provided for Hydro Projects in the Central sector during the 10th Plan period are reported to be as under:-

Sl. No.	Name of the organization	(Rs. in crore)		
		10 th Plan outlays (approved)	Annual Plan (2002-2003) (approved)	Annual Plan (2003-2004) (approved)
1.	NTPC (hydro)	4543.00	296.23	303.57
2.	NHPC	32226.00	2925.89	3269.72
3.	THDC	3646.50	1139.80	924.29
4.	SJVN	3254.00	653.00	758.05
5.	NEEPCO	2528.51	207.10	214.49
	Total(% of outlay)	46198.01	5222.02 (11.30)	5470.12 (11.84)

4.16 On funding pattern/foreign investment in the hydel sector the Committee have been informed by the Ministry of Power that the approved pattern of financing of hydroelectric projects was 50% by way of equity and 50% by way of loan with equity to come first. This pattern of financing was made applicable to all the projects of NHPC except Salal Stage-I project, which was handed over on agency basis. Even though the sanction of the NHPC projects was on 1:1 debt equity ratio basis, the approved pattern of financing was continued only upto 1985-86. During 1986-87 and thereafter NHPC was required to resort to market borrowings in addition to budgetary support which was reduced on account of budgetary constraints of the Ministry of Power. Consequent to the award of contract for Chamera Stage-I project in 1984, NHPC started receiving direct foreign loan from the year 1984-85 as part of the loan component. A debt equity ratio of 70:30 has also been envisaged in financing of some of the NHPC projects.

4.17 At present, four hydroelectric projects of NHPC have been / are being funded through foreign investment. They are : Chamera Stage-I, Uri, Dulhasti and Dhauliganga Stage-I. The amount of foreign grant / loan for these four projects are as under:

Sl. No.	Project	Estimated completed cost (Rs. in crore)	Foreign* Agency	Parties	Nature of financing	of Foreign finance	component of	Rate of interest
1.	Chamera-I	2114.02	CIDA	Govt. of Canada of GOI NHPC /	Grant	114.75	M.CS	-
2.	Uri	3300.00	EDC	EDC	Loan	213.12	M.CS	9%
			SIDA	Govt. of Sweden and GOI	Grant	700.00	M.SEK	-
			BITS	-do-	Soft loan	765.00	M.SEK	-
						157.0	M.CHEF	-
			ODA	Govt. of UK & GOI	Grant	17.15	M.GBP	-
			ABSEK	NHPC / ABSEK	Export credit	413.0	M.SEK	4.5%
						190.07	190.07	4.5%

			NIB	NHPC/NIB	Export credit	414.81	M.SEK	4.5%
			SCMB	NHPC/SCMB	Loan	31.84	M.GBP	8.3%
3.	Dulhasti	4248.4	French Govt.	French Govt to GOI	Grant	190.0	M.FRF	-
			French Treasury	French Treasury to GOI	Soft loan	942.60	M.FRF	-
			CCDF					
4.	Dhauliganga-I	1779.46	OECE	NHPC/CCDF NHPC / OECE	Loan Tranche -I Tranche-II	942.60 5565.0 16316.00	M.FRF M.YEN M.YEN	8.3% 2.3% 2.3%

*

CIDA	-	Canadian International Development Agency
EDC	-	Export Development Corporation of Canada
SIDA	-	Swedish International Development Agency
BITS	-	Swedish Commission for Technical and Economic Corporation
ABSEK	-	A.B. Sevonsk Export
NIB	-	Nordic Investment Bank
SCMB	-	Standard Chart Merchant Bank
CCDF	-	Credit Commercial De France
OECE	-	Overseas Economic Cooperation Fund, Japan

4.18 Further, the funding pattern for private power projects including hydro projects is governed by the Government of India resolutions dated 22.10.1991 and 13.10.1998 which stipulates the following:

- (i) Debt – equity ratio shall be at least 80:20
- (ii) Promoters equity shall not be less than 11% of capital cost.
- (iii) Regarding borrowing from IFI, there would be no bar to the extent of domestic debt raised by a project developer, subject to the need of maximizing financing from external sources and prudential norms exercised by IFI's allowing a higher domestic debt component for projects which are developed based on indigenously sourced plant and equipment would be more desirable.
- (iv) 100% foreign equity can be permitted.

The Committee have been informed that for most of the projects debt-equity ratio is selected as 70:30 in view of the insistence of Indian Financial Institutions.

4.19 The Committee note that as usual finance is the most critical factor in infrastructure development. Financiers regard power plants as one of the most complex of infrastructure projects to finance because of the extensive network of agreements and interlocking arrangements which need to be put in place and reflected in contractual obligations. Even of power projects, hydro projects are regarded by many financial institutions as especially complex because they have (i) high up front construction costs due to the need for dams (ii) long lead times(with consequent long loan terms) and (iii) long working life of the projects. Taking note of the three stage approval system designed for execution of hydro electric projects in the country, the Committee are satisfied to note that the system permits pre-investment expenditure in

project preparation, prior to the actual execution of the project. The Committee are glad to note that Ministry of Finance have finalized certain guidelines for delegation of financial power that include Appraisal of plan, authority of approval, expenditure limit on pre-investment activities, costing of project/scheme etc. for setting up hydro electric power projects and these have been revised time and again. The Ministry of Finance have informed the Committee that no hydro power project in the Central sector is likely to be delayed due to fund constraints. The Central public sector outlay for hydro power development has been enhanced from Rs.12,306 crore during the 9th Plan to Rs.25,839 crore during the 10th Plan. Similarly, budgetary support has been raised from Rs.9284 crore during 9th Plan to Rs.17,511 crore during the 10th Plan. Also, at the stage of PIB, it is ensured that project finance is tied up which precludes the possibility of delay on account of fund constraints. The Committee further observe that sectoral as well as project-wise allocation of funds is in the domain of Planning Commission. In order to ensure that the projects do not suffer on account of lack of funds, at the time of PIB appraisal, care is taken not only to look into the viability as well as the cost estimates of the project, but it is also taken to see that funds are tied up. Thereafter, it is the responsibility of Ministry of Power and the implementing agency to ensure that funds flow to the project remains smooth. The Committee find that although Ministry of Finance have stated that the present system for appraisal and approval is satisfactory, delays normally are on account of project being brought before PIB not fully prepared in terms of tying up of funds, environmental / forest clearances, non-tying up of commercial arrangements or revised costs not fully firmed up or responsibility for time and cost over run not fixed. The Committee, therefore, recommend that the Ministry of Power should take necessary steps to overcome the above constraints and lay considerable stress on project preparation. The Committee feel that Ministries of Power and Finance should help the promoters in preparation of DPR, etc. instead of merely putting objections in the project reports and delay the implementation of the project. The Committee feel that power delegated to the Ministry/Department concerned is too meager. For instance, projects/plan of Rs.5 crore investment is appraised by the concerned Department/Ministry. Above Rs.5 crore but less than Rs.25 crore, the appraisal forum is Standing Finance Committee of the Department, chaired by Secretary of Department concerned. The projects requiring investment of above Rs.25 crore but less than Rs.100 crore, the appropriate appraisal authority is Department of Expenditure, Financial Committee, chaired by Secretary of Administration Department and including Financial Adviser, as member Secretary and representative of Planning Commission and Department of Expenditure as members. Moreover, the approval authority for project of less than Rs.50 crore is Minister in-charge, for project outlay of Rs.50 crore and above and less than Rs.100 crore, the approval authority is Minister in-charge and Finance Minister. The project above Rs.100 crore approved by cabinet/CCEA. The Committee, therefore, recommend that delegation of powers to Ministry of Power needs to be enhanced suitably. Otherwise all the major projects would have to undergo appraisal by cabinet/CCEA, causing inordinate delay. The Committee also take a strong note of the fact that at only 11.30% and 11.84% have been approved for the annual plans of 2002-03 and 2003-04 by NTPC, NHPC, THDC, SJVN and NEEPCO against the approved outlay of Rs. 46198.01 crore and would like to know the reasons for low outlays for the first two years of the 10th Plan.

4.20 The Committee have also observed the funding pattern/foreign investment in the hydel sector which have allowed debt equity ratio of 80:20. The Committee observe that resource crunch and inadequacies in funding hydro electric projects have been the main causes for decline in the hydro development. In this context, the private sector option and attracting foreign investment offer new hope for reviving and accelerating hydro development. Taking into account that the international experience of attracting private investment in hydro power has not been encouraging and the Government move to extend several incentives for attracting private investment for hydro development, the Committee feel that while the private sector option should be pursued vigorously, a judicious mix of both private and public sector options be evolved for ensuring maximum thrust in accelerating hydro development. To have additional resource mobilization for investment in hydel power schemes, the Committee recommend that the Government may create a special dedicated fund for providing finances for hydro power

development, both in the public and private sectors, through an institution on the pattern of a Finance Corporation. The fund for this institution can be raised internally through a cess on electricity sales, from international financing institutions and from public through-tax-free bonds and debentures. Further, most of the bilateral and multilateral funding may be earmarked for hydro-electric projects. The Committee would like to know the action taken by the Government on the above suggestions of the Committee.

CHAPTER-V

ENVIRONMENT AND FOREST CLEARANCES

One of the factors which often retards the quicker execution of hydro projects is the grant of clearances/ approvals by various authorities. The Ministry of Environment and Forests (MoEF) is the nodal agency which is responsible for according two of these clearances viz. environment and forest clearances. The procedure involved in the grant of environment and forest clearances is as under:-

ENVIRONMENT CLEARANCE

5.2 Environmental Impact Assessment/ Environmental Clearance has become statutory from 27.1.1994 in respect of 30 different activities including River Valley & Hydroelectric Projects. From June 2002, a hydroelectric project with an investment of more than Rs. 100 crores is required to obtain environmental

clearance from the Government of India. Clearance of hydroelectric projects is done in two stages- (i) site clearance for undertaking investigation & survey and (ii) environmental clearance.

Procedure for Site Clearance

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5.3 At the stage of site clearance, Project Authorities have to furnish information in a questionnaire. Along with the questionnaire, the following information is also required to be furnished:- :

- (i) Topographic Map of the project area (1:25,000)
- (ii) Map covering 7 kms radius indicating main features such as ecologically sensitive areas, archeological sites, etc.
- (iii) Indication of areas undergoing submergence.

5.4 The proposal is examined in the Ministry and after obtaining clarifications/ supplementary information, site clearance is accorded.

Public Hearing

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5.5 Public Hearing has been made mandatory under EIA Notification since April 10, 1997 which has to be completed within 60 days after submission of documents by the project proponent to the State Pollution Control Board. Dates for Public Hearing are published in two local newspapers and suggestions/ comments of the public invited within 30 days from the date of publication. Composition of Public Hearing Panel consists of the District Collector or his nominee, representatives of State Government/ Local Bodies and three senior citizens. Summary of the Public Hearing Proceedings are submitted alongwith the project documents for environmental clearance.

Procedure for Environmental Clearance

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5.6 Project proposals alongwith application form in Schedule II of EIA notification duly signed by the Project Proponent are submitted to the Ministry for environmental clearance accompanied by the following documents:

- (i) Details of Public Hearing
- (ii) EIA/ EMP Report
- (iii) Duly filled in Questionnaire
- (iv) Application form as per Schedule II of EIA notification
- (v) Feasibility Report

5.7 The Ministry of Environment & Forests have constituted an Expert Committee for River Valley and Hydroelectric Projects. The Committee is chaired by a non-official and comprise experts in various fields and representatives of non-Governmental Organizations.

5.8 Environmental considerations in hydroelectric projects generally include- Impact of the project on flora and fauna, Impact on aquatic life & river hydrology, Rehabilitation of displaced persons, Public Health Impacts, Disaster Management & Catchment Area Treatment. The Expert Committee examines the proposal and supplementary information/ clarifications are obtained from the Project Authority as may be needed. The Committee may decide to send a Sub-Group to visit the site, if necessary. Based on the recommendations of the Expert Committee, the proposal is processed for approval or rejection. Assessment of the project is completed within 90 days from the receipt of complete information and a decision conveyed within 30 days thereafter. In cases where forest land is involved, environmental clearance is issued after obtaining forest clearance under the provisions of Forest Conservation Act, 1980.

5.9 As regards the constitution of the Expert Committee, a representative of MoEF stated during evidence as under: -

“There are five Expert Committees constituted for river valley. We have a separate Committee for industrial sector projects. So, we have separate Committees. These Committees had been constituted in such a way that all the expertise required for appraising the broad impact of environment on a particular sector of projects are available within these Committees. For example, the hydro-power Expert Committee has been constituted with people of R&R experience, with people having expertise in catchment area and so on. Likewise, all aspects relating to appraisal of environment clearances are reflected in the membership of the Committee. So, the expertise available to these Committees is adequate to take care of environmental impacts of the different categories of projects.”

5.10 When asked about the criteria for selection of members of the Expert Committee, a representative of MoEF deposed before the Committee as under: -

“The Environmental Impact Assessment Notification 1994 requires that the Ministry will constitute Expert Committees. It mentions expertise.”

5.11 Elucidating further, the representative of MoEF stated during evidence as under: -

“The criterion itself has not been laid out... It is based on the experience of people who have been in this field over a period of time.”

5.12 When asked as to who makes the assessment of work done by NGOs for selection into the Expert Committee, a representative of MoEF replied during evidence as under: -

“The assessment is done by the Ministry as a whole taking inputs from various sources. It is because, these Committees have been functioning since 1994. So, there is an Impact Assessment Division in the Ministry. They notify the Impact Assessment Agency. So, officers in this Division have been handling these matters, as also the NGOs who have been working in these areas for a long time. So, it is by way of personal knowledge and the work done in the field. These factors are taken into account, although there is no laid down criteria that this would be the yardstick, and so on.”

Monitoring

5.13 The implementation of conditions stipulated for environmental clearance is monitored by the concerned Regional Office of the Ministry of Environment and Forests. Project Authorities submit six monthly reports on the progress of implementation of environmental safeguards. Regional Offices undertake periodical visits during the construction and operational stages of project implementation.

5.14 To a query as to whether site visits in connection with environmental clearance should be completed within a specified time period from the date of submission of application, MoEF, in a written reply, stated as under:-

“The visit to project sites is undertaken only wherever found essential. Time limits to conduct site visits cannot be prescribed but generally a sub-group of the Expert Committee undertakes the visit as soon as possible”.

5.15 When asked to give reasons as to why time limit to conduct site visits cannot be prescribed, MoEF, in a written reply, stated as under:

“The site visits of the Sub-Committee is decided by the EAC, only if found essential. In case of such a decision, the visit of the Sub-Committee is generally organised in the shortest possible time (about a month). In exceptional cases as in Loktak Downstream HEP, Manipur the site visit could not be undertaken for nearly 3 months because of the law & order situation prevailing there.”

5.16 The Public Sector Undertakings under the Ministry of Power were asked as to whether site visits are completed within the specified time periods and if not, what are their suggestions to ensure that such visits are completed within the stipulated time. In reply, DVC stated as under: -

“Site visits in connection with environmental clearance are generally undertaken by MoEF long after the date of submission of application which causes unusual delay in obtaining MoEF clearance for the project. Site visits, if essential, may be got conducted by MoEF within one month from the date of submission of the application for environmental clearance.”

5.17 To the same query, NHPC replied as under:

“Site visits in connection with site clearance/environmental clearance was undertaken by MoEF, four to five months after the date of submission of application, in case of NHPC projects during the last five years. Site visits, if essential, may be got conducted by MoEF within a month of the submission of the environmental proposal.”

5.18 In this connection, SJVNL replied as under:

“Generally there are delays in this regard. The main difficulties are with regard to constitution of teams. Simpler teams with members who can spare time would expedite matter. Photographs and films of inaccessible areas or aerial surveys can be used for inaccessible areas. The site visits are basically project specific. The visit is co-related with respect to factors like availability of other nodal agencies members, completion of basic requirement enumerated in the questionnaire, remoteness of the locations etc. It is suggested that the site visit may be done immediately on receipt of the information enumerated in the questionnaire and clearance from the State Pollution Control Board.”

5.19 To the same query, NEEPCO replied as under:

“Before issuance of Stage-I&II site clearance by MoEF, site visits should be undertaken and views of committee members forwarded so that the same are incorporated in the EIA/EMP Report. In one of our projects (Tuivai HEP, Mizoram) the visits by the Expert Committee members were not arranged in time, as a result issuance of clearance got delayed considerably. For expeditious processing of cases and monitoring of environmental clearances of projects, MoEF may constitute Regional committees of experts in 5 or 6 regions of the country, who may be empowered to accord clearances of projects not involving critical areas. Only in case of highly environment sensitive projects, the central committee of experts be involved in the process of clearance.”

5.20 When asked as to how much time is taken by the Expert Committee in making recommendations on a hydro project and how many meetings of the Committee are held to decide on a project proposal, MoEF, in a written reply, stated as under:-

“Generally, project proposals placed before the Expert Committee are decided in one or two meetings. Site visits are undertaken, wherever necessary, to appreciate ground realities. Preliminary scrutiny by MoEF enables appreciation of all environmental issues in the first meeting itself except those that are brought up during field visit whenever undertaken”.

5.21 In this connection, a representative of MoEF stated during evidence as under: -

“...we had issued instructions to the Expert Committees that as far as possible, the environmental clearance proposals received should be decided upon in not more than maximum of two sittings of the Committee.”

5.22 MoEF were asked to give the number of meetings the Expert Committee had held to decide on each hydro project proposal pertaining to the last 2 years and the current year. In reply, MoEF have furnished the following details:

Hydroelectric Projects considered by EAC during 2001-03

Sl. No.	Name of the project	No. of times considered by the EAC
Year 2001		
1.	Bhilangana HEP (11 MW), Uttaranchal	1
2.	Kameng HEP (4x15 MW), Arunachal Pradesh	3
3.	Kuttiyadi Extension HEP (2x50MW), Kerala	In house
4.	Parbati –II HEP (4X200 MW), Himachal Pradesh	2
5.	Nagarjuna Sagar Tail Pond HEP(2x25 MW), Andhra Pradesh	In house
6.	Alamatti Dam Power House (290 MW), Karnataka	1
7.	Myntdu (Leishka) HEP (2x42 MW), Meghalaya	4
8.	Samal Barrage HEP (20 MW), Orissa	1
9.	Tuivai HEP (3x70 MW), Mizoram	4
10.	Neogal HEP (2x7.5 MW), Himachal Pradesh	1
Year 2002		
11.	Kumbhe HEP (10 MW), Maharashtra	1
12.	Mahatma Gandhi HEP (20 MW), Karnataka	2
13.	Kal HEP (15 MW) , Maharashtra	2
14.	Varahi Tail Race HEP (22.5 MW), Karnataka	1
15.	Kashang HEP (66 MW), Himachal Pradesh	2
16.	Uhl HEP Stage-III (100MW), Himachal Pradesh	2
Year 2003		
17.	Bairobi Dam & HEP (2x40 MW), Mizoram	1
18.	Sewa HEP Stage-II (120 MW), Himachal Pradesh	2
19.	Teesta Low Dam Stage-III, (132 MW), West Bengal	1
20.	Lower Subansiri (2000 MW), Arunachal Pradesh	2
21.	Kollimalai HEP (20 MW), Tamilnadu	2
22.	Pallivasal HEP(2x30 MW), Kerala	1

5.23 To a query as to whether all issues pertaining to a project should be raised/decided in the first meeting of the Expert Committee, DVC, in a written reply, stated as under:

“Yes, all the issues should be raised/decided in the first meeting of the Expert

Committee. Supplementary information, if felt necessary during discussion, can be furnished at the earliest and the clearance should be issued thereafter within the stipulated time frame and no second meeting should be held. It is also felt that clearance should not be held up due to minor issues.”

5.24 To the same query, NHPC replied as under:

“Yes, all the issues should be raised/decided in the first meeting of the Expert Committee.”

5.25 In this connection, SJVNL replied as under:

“The Expert Committee constituted for environmental impact assessment comprises about fifteen members representing different areas like ecology, environmental health, social sciences, flora fauna conservation and other environmental factors. They should come well prepared and make attempt to clear the issues in the first meeting only. For this there should be clear rules as to how to decide if there is no consensus.”

5.26 To the same query, NEEPCO replied as under:

“Yes. Generally Expert Committee members send their observations at different times all of which are to be clarified by the project authority for getting the clearance. In case, these observations are received in one communication, considerable time can be reduced. Clearance of projects should not be hold up on minor issues.”

5.27 THDC replied to this query as under:

“Yes, the supplementary information can be furnished, if required, and clearance should be issued thereafter within stipulated time frame.”

5.28 When asked as to whether MoEF raises queries/ seeks clarifications from project authorities in piecemeal, MoEF, in a written reply, stated as under:-

“Clarifications have to be obtained from the project authorities wherever the information is incomplete, questionable or dubious. Project Authorities should furnish complete information so that seeking additional information from project authorities could be avoided. Information sought by the Expert Committee is referred to the project authority. In case the response is found inadequate, further clarifications are asked for”.

5.29 In this connection, a representative of MoEF stated during evidence as under: -

“..our effort has been to get back to them at one go and not ask for information in piecemeal. . . Our effort has always been to ask for all the information at one go. It may have happened that in some cases they

have asked for information at more than one go. That also becomes unavoidable because the Ministry does not have all the expertise required in that. That is why they have constituted these Expert Committees.”

5.30 When asked to specify reasons for asking too minute details from a power developer and whether MoEF or their agencies should conduct the requisite studies instead of the power developer, MoEF, in a written reply, stated as under:-

“The Ministry of Environment & Forests cannot take on itself the job of proponent as well as approving authority. It is incumbent on the part of the project authority to furnish all necessary information based on detailed survey and supporting studies. Information / clarifications required from State Governments/ Agencies of the State and Central Governments are called for and obtained directly by MoEF”.

5.31 In this connection, the Secretary, MoEF stated during evidence as under: -

“...one of the important issues in reform and re-engineering of the environmental and forest clearance processes is that we should not seek information from the project proponents which is either in the public domain or which is with public agencies, because it is easier for one public agency to obtain information from another agency than for an individual project proponent. So, this is one of the issues that we are sensitive to. That needs to be addressed in the process of re-engineering the environment clearance procedure.”

5.32 When asked to give justification for asking the project developer to carry out EIA/ EMP studies instead of MoEF themselves as these studies basically relate to technicalities of environment and forest, MoEF, in a written reply, stated as under:-

“It is incumbent on the project authority to carry out the environment related studies for the project. Environmental protection and management hold key for the longevity of hydroelectric projects. It is not feasible or desirable for MoEF to undertake EIA studies”.

5.33 When asked as to whether MoEF at times ask for certain additional studies to be carried out which are not specified in MoEF’s proforma/ guidelines and whether they had asked for carrying out capacity study in case of Teesta V project which was not in the proforma / guidelines, MoEF, in a written reply, stated as under:-

“Stipulation of additional studies is made in specific projects, where they are found essential. In the case of Teesta basin where a large number of hydroelectric projects are proposed, it was necessary to have a Regional study carried out to evaluate the long term impacts of large scale development projects on the ecological integrity and sustainability of such proposals. It may be noted here that some of the proposed projects are in North Sikkim which is a bio-diversity hot spot”.

5.34 The Public Sector Undertakings under the Ministry of Power were asked as to whether MoEF seek too many and too minute details while appraising a project and whether all the studies mentioned in the questionnaires should be conducted by the project proponent or MoEF should get the same conducted and charge the requisite amount from the project proponent. In reply to this query, the Damodar Valley Corporation (DVC) informed the Committee as under: -

“Information being sought by MoEF in the questionnaire is felt essential for proper assessment of the feasibility of the project and to get all required data from the environment angle. However, item Serial no. XIV (ground water) in the questionnaire for environmental appraisal may be deleted as the same is not relevant for thermal power plants. Studies of Flora/Fauna, Wildlife, Prominent features of the area covering 25 KM radius may be conducted by MoEF through Forest Department or reputed Government Institute, etc. and requisite fee for the above studies may be reimbursed from the project proponent at actual basis.”

5.35 To the same query, the National Hydro-electric Power Corporation (NHPC), *inter alia*, replied as under: -

“As per EIA Notification dated 27th January, 1994 site clearance is required for hydropower projects before initiating any investigation & surveys. MoEF has started giving site clearance in two stages, for which two separate questionnaires have been prescribed. This has made the entire process very cumbersome and time consuming. EIA studies should be got conducted by the project proponent. However, MoEF should furnish a list of consultants/institutes whose EIA reports would be considered of the desired standard.”

5.36 In this connection, the Satluj Jal Vidyut Nigam Limited (SJVN Limited) have stated the following in a written reply: -

“The information being sought by MoEF in the questionnaire is essential for proper assessment of the feasibility and to get all required parameters from the environment angle. The items mentioned in the questionnaire forms part of the enactment Environmental Protection Act, 1986 which has a legal sanction. However, It is true that MoEF seeks too much information. We feel in respect of areas from Item No. IX to XIII, XV to XXIII, XXVI to XXVII, XXXI & XXXII of environment clearance questionnaire and item No. IX to XI and XVI, XVIII to XX of site clearance questioner should be the domain of MoEF and rest of the areas should be assessed directly by the project proponent.”

5.37 To the same query, the North-Eastern Electric Power Corporation (NEEPCO) has replied as under: -

“The items in the questionnaire are too lengthy and repetitive in nature e.g. item No.

IX appears both in Stage-II and final clearance form. Some of the details in the final form may be deleted, which may not be relevant for hydro projects. Often the Expert Committee tends to probe in depth into each item, advising a number of sub-studies, causing increased cost and time overruns. As suggested, the related studies may be conducted by MoEF and the charges for the same can be paid by the executing agency. This will not only reduce the time but will also ensure the quality thereby facilitating early clearance of projects by MoEF.”

5.38 In this connection, the Tehri Hydro Electric Development Corporation (THDC) has replied as under: -

“It may be expedient to get the studies conducted by MoEF regarding flora/fauna & wildlife, assessment of Catchment Area Treatment done from its expert institutions under its administrative control viz. Botanical Survey of India, Wildlife Institute of India, Forest Survey of India, etc. and the requisite amount be charged from the project proponents.”

5.39 When asked as to whether in case of Teesta Stage V Project, the Wildlife Conservation Plan was got prepared by the Wildlife Division of Sikkim Forest Department which was not accepted by MoEF and whether MoEF have prepared and circulated the names of Institutes whose studies they consider authentic for getting EIA/EMP conducted, MoEF, in a written reply, stated as under:-

“MoEF have not prepared or circulated names of Institutions / Consultants for getting EIA studies conducted. Such studies are required to be prepared as per MoEF’s guidance manual and be comprehensive to address all aspects contained in the questionnaire. Hence, accreditation of Consultants is not considered necessary. When reports/ studies do not address relevant issues adequately, the Expert Committee at times suggests an appropriate Institution”.

5.40 When asked as to whether MoEF propose to create a data bank of their own containing detailed information about flora, fauna, etc. so that reliable data can be gathered from one place, MoEF, in a written reply, stated as under: -

“Institutions and Agencies specialised in various aspects of environmental protection are already functioning under the aegis of the Ministry of Environment and Forests. They are, to name a few: Botanical Survey of India, Zoological Survey of India, Forest Survey of India, GB Pant Institute of Himalayan Environment and Development, Salim Ali Centre for Ornithology and Natural History (SACON), Indian Institute of Forest Management, Wildlife Institute of India. The project authorities are always advised to approach the concerned agencies for obtaining detailed and reliable data.”

5.41 To a query as to whether MoEF insist for providing detailed information with respect to alternative sites also while according environmental clearance even when the project

developer certifies that the proposed site is the only technically feasible one, MoEF, in a written reply, stated as under:-

“Examining possible alternatives prior to final selection is inherent in the environmental assessment process itself. This is necessary to minimize adverse environmental impacts and evolve environmentally sustainable alternatives. This is particularly so in the siting of projects with a view to avoiding irreversible environmental impacts. It is often the case that the project authorities have a single solution syndrome”.

5.42 When asked as to whether instead of the present procedure under which various stages of environmental clearances are undertaken seriatim, MoEF should take up a such activities in parallel, MoEF, in a written reply, stated as under:-

“It is in the interest of the Project that the Project Authorities work out the sequence of operations using modern techniques such as CPM/PERT to plan completion of activities in the minimum possible time. Along with the detailed project preparation, taking up EIA studies would not only save time but also help incorporate environmental concerns in the project formulation stage itself”.

5.43 To the same query, DVC has replied as under:-

“Yes, it is essential to make activities in parallel. Minimum 3-4 months is required by the State Pollution Control Board for issuance of clearance after undergoing all formalities like publication of Public Hearing notice in news- papers, conducting Public Hearing, etc. Simultaneously, application to MoEF may be submitted for their scrutiny and processing so that project proponent can reply to their queries, if any, at an early date. ultimately, total time taken for getting all statutory clearance may be reduced. In such cases, MoEF clearance can be issued immediately after receipt of clearance from the State Pollution Control Board.”

5.44 In this connection, SJVNL has replied as under:-

“Yes, it would be better to take activities in parallel. It is felt that MoEF should act as a central nodal agency for the purpose of granting environmental clearance. As a time saving measure MoEF may directly deal with State Forest Department, State Pollution Control Board and project proponent agency for getting the desired reports from such agencies expeditiously.”

5.45 To the same query, NEEPCO has replied as under:-

“Stage-I & II site clearance may be clubbed together for taking up S&I works of a project, after which the final clearance can be processed incorporating EIA/EMP reports to reduce the time.”

5.46 THDC has replied to this query as under: -

“The application for forest clearance can be processed by Forest Wing of MoEF and that of environmental clearance by the Impact Assessment Division separately as parallel activity. Both Wings being part of MoEF, co-ordination can be down to cut done time for simultaneous processing for issue of clearance.”

5.47 In this connection, a representative of MoEF added during evidence as under: -

“...Earlier we had been insisting on No Objection Certificates from the Pollution Control Boards, prior to receiving applications. After the No Objection Certificates only, we were processing them. To enable parallel processing, we said we do not insist on No Objection Certificates. At the beginning, we would be able to examine the proposals, namely prior to taking them to the Expert Committees, we will have No Objection Certificates in place, it is because the Pollution Control Boards issue No Objection Certificate after conducting Public Hearing. So, it was coming in the way, and initially certain time was taken in conducting Public Hearing. Then they obtain No Objection Certificates from the Pollution Control Boards. Then they come to the Ministry. Then we start examining them. To cut short that time, we said that we do not insist on No Objection Certificates at the beginning, but they should provide us with No Objection Certificates prior to the consideration by the Expert Committee.”

5.48 When asked as to what problems were being faced in obtaining site and environment clearances, DVC, in a written reply, stated as under: -

“After submission of application, obtaining environment and forest clearances from MoEF has been found to be time consuming. To simplify the procedure and reduce the time gap, following suggestions are proposed: (i) Time limit specified in the FIA Notification dated April 10, 1997, the assessment by MoEF to be completed within 90 days and the decision conveyed within a maximum of 30 days thereafter, should be strictly adhered to. (ii) MoEF may seek additional information after going through the detailed proposal. However, for expeditious issuance of environmental clearance, it is suggested that during the interaction across the table, all possible queries should be discussed in detail up to the satisfaction of the ECT members and then the formal clearance may be issued within 30 days after the date of discussion.”

5.49 To the same query, the SJVNL has replied as under: -

“ The problems faced in obtaining site and environmental clearance to Hydel Projects are mainly due to the following reasons : (a) Multiplicity of agencies from whom clearances are required (b) Too much information sought (c) Lack of survey reports or data through secondary sources (d) Lack of clarity about the requirement of the project clearing authorities. Due to the above reasons the entire process takes a long time. The process flow chart provided in the enactment for the purpose of obtaining environmental clearances has significantly dealt with the formalities required to be followed by the different agencies like MoEF, Pollution Control Boards, State Forest Department, etc. It is felt that specific time frame is required to be stipulated so that unavoidable bottlenecks can be avoided. It is

also felt that an appraisal committee comprising the senior officials of various agencies be constituted to review the process as mentioned in the flow charts and sort out the problems, if any, being faced by the project proponent concerned.”

5.50 To the same query, NEEPCO has replied as under: -

“Obtaining site and environmental clearances of hydro projects has been found to be a time-consuming affair. It is suggested that the procedure may be simplified in getting Stage-I, II site clearance and final clearance of a hydro project by reducing the time gap. Before carrying out S&I work, the MoEF stipulates e.g. to examine viability of alternative sites, topographic map of the area indicating the features within 7KM radius of the project site and capital investment of the project, etc. This cannot be ascertained before carrying out S&I works, which is contradictory to the procedure of issuing clearance.

As regards the Stage-I (site) clearance, the Secretary, Ministry of Power stated during evidence as under: -

“We get Stage-I clearance from the Ministry of Environment and Forests... except for sensitive areas, which have been identified, perhaps this procedure could be simplified. Since they are not doing any construction work, should they really require this type of Stage-I environmental clearance? Or, should we be allowed to go ahead with it? Even if they keep the system of getting permission, could it be an auto route, an automatic permission for conducting surveys and investigations?”

5.52 Commenting on the delays that are taking place in getting the environmental clearance, the Secretary, MoEF stated during evidence as under: -

“...we are very sensitive to this issue of time delays in the environmental clearances of projects. It also very frequently leads to serious cost overruns, besides non-realisation of plan objectives and non-realisation of downstream economic aspects. This problem is not confined to the hydroelectric projects, though hydroelectric projects are certainly a very prominent case in point.”

5.53 The Committee have been informed by MoEF that the Cabinet Committee on Economic Reforms have asked them to review the procedures relating to environment and forest clearances and that there is a World Bank Technical Assistance underway. In this connection, the Secretary, MoEF stated during evidence as under: -

“The Cabinet Committee on Economic Reforms has tasked us to thoroughly review our environment and forest clearance procedures with a view to embodying the best prudent international practices. There is a World Bank Technical Assistance, which is underway. It is close to completion. It is addressing this very issue of revision and reform of our environmental clearance procedures to address the questions of time overruns, cost overruns, etc.”

5.54 As regards the areas covered by the World Bank Studies, the Secretary, MoEF deposed before the Committee as under: -

“Very briefly, I can just indicate the areas covered by this World Bank Study. The first component is the review of the environmental clearance processes, the second component is the preparation of national EIA guidance and sectoral EIA manuals, the third component is the pilot EIC, that is, Environmental Information Centre, the fourth component is the web management of environmental clearance processes and the final component is intended to train the staff at the State and the Central Government levels on the reforms/procedures.”

5.55 Elucidating further, the Secretary, MoEF added during evidence as under: -

“Certainly we are very conscious of the fact that there is both the scope and need to improve the environment and forest clearance processes. We have also given a commitment to the Cabinet Committee on Economic Reforms to undertake serious re-engineering of these processes...we are going to discuss with the World Bank their interim findings so far. They are not presenting their final report as yet. So we will review the state of their study but our understanding is that the study is at a fairly advanced stage.”

FOREST CLEARANCE

5.56 Clearance from the Ministry of Environment & Forests is required for projects requiring diversion of forest land for non-forestry purposes. MoEF have informed the Committee that about 45 lakh hectares of forest land was diverted for non-forestry purposes between 1950 and 1980.

5.57 “Forest” was brought under the Concurrent List of the Constitution of India in 1977 from the State List. In 1978, the Union Government suggested the States to seek concurrence prior to diversion of more than 10 hectares of forest land. However, diversion continued unabated. Therefore, in 1980, an Ordinance was issued for regulating diversion/de-reservation of forest land for non-forestry purposes which was later converted into Forest(Conservation) Act with effect from 25.10.1980.

Procedure for clearance under FC Act, 1980

5.58 The procedure laid down for forest clearance under the Forest Conservation Act, 1980 is as

under: -

- (a) For diversion of forest land for non forestry purposes under section- 2 of Forest (Conservation) Act, 1980, the State Government is required to submit proposal in a proforma prescribed under rule 6 of Forest (Conservation) Rules, 2003.
- (b) In case forest area involved is only up to 5 hectares in extent, the proposals are submitted directly to the Regional Chief Conservator of Forests (Central) at Chandigarh, Bhopal, Bangalore, Bhubaneswar, Shillong and Lucknow who are competent to finally decide all such proposals (except for mining and regularisation of encroachments).
- (c) Proposals involving 5-40 hectares of forest land are also submitted to the concerned Regional Offices where these are processed, alongwith mining and regularisation of encroachments proposals involving forest land upto 5 hectares, in consultation with State Advisory Group comprising members from various Departments of the State (i.e. Forest, Revenue, Finance, concerned user Department). Such proposals after processing are sent to the Ministry for final decision.
- (d) All proposals involving more than 40 hectares of forest land are submitted directly to the Ministry at New Delhi.
- (e) After receipt of proposal, it is scrutinised in the Ministry in terms of its completeness in meeting the requirement of provisions of guidelines framed under Forest (Conservation) Act, 1980.
- (f) Any missing information or further clarification is sought from the State Government.
- (g) Once the proposal is complete in all respects and the forest area involved is more than 100 hectares, Regional Office carries out a site inspection and sends a report on a prescribed format with specific recommendations.
- (h) After receipt of site inspection report, it is further scrutinised and in case any new fact is brought out in the report which requires further clarification or information from the State Government, it is called for.
- (i) After receiving complete information, the proposal is discussed in the Forest Advisory Committee which is a statutory body constituted under section – 3 of Forest (Conservation) Act, 1980. The Committee consists of: -
 1. Director General of Forests, Ministry of Environment and Forests- Chairperson.
 2. Additional Director General of Forests, Ministry of Environment and Forests- Member.
 3. Additional Commissioner (Soil Conservation), Ministry of Agriculture- Member
 4. Three eminent experts in forestry and allied disciplines (non-officials) - Members
 5. Inspector General of Forests (Forest Conservation), Ministry of Environment and Forests- Member Secretary

5.59 As per the laid down procedure, the Committee shall have due regard to all or any of the following matters while tendering its advice on the proposals referred to it, namely:-

- (1) Whether the forest land proposed to be used for non-forest purpose forms part of a nature**

reserve, national park, wildlife sanctuary, biosphere reserve or forms part of the habitat or any endangered or threatened species of flora and fauna or of an area lying in severely eroded catchment;

- (2) Whether the use of any forest land is for agricultural purpose or for the rehabilitation of persons displaced from their residences by reason of any river valley or hydro-electric project;
- (3) Whether the State Government or the other authority has certified that it has considered all other alternatives and that no other alternatives in the circumstances are feasible and that the required area is the minimum needed for the purpose; and
- (4) Whether the State Government or the other authority undertakes to provide at its cost for the acquisition of land of an equivalent area and afforestation thereof.

5.60 While tendering the advice, the Committee may also suggest any conditions or restrictions on the use of any forest land for any non-forest purpose which, in its opinion, would minimize adverse environmental impact.

- (j) After obtaining the recommendations of the Forest Advisory Committee, the proposal is put up to the competent authority for final decision.
- (k) If the proposal is approved, it is accorded in-principle approval subject to fulfillment of certain conditions mainly transfer of compensatory afforestation land (non-forest) and fund for raising compensatory afforestation / penal compensatory afforestation.
- (l) Once the compliance report is received in respect of fulfillment of stipulated conditions, final approval is issued under section-2 of Forest (Conservation) Act, 1980.

5.61 To a query as to whether it would be useful to constitute a Committee for forest clearance involving representatives of all concerned Departments of the State and Central Government, MoEF, in a written reply, mentioned as under:-

“Advisory Committee constituted by MoEF under Section 3 of the Forest(Conservation) Act, 1980 comprises experts in various fields like mining, engineering, soil conservation etc., besides forestry. This Committee which meets once in every month examines the proposal and gives its recommendations to MoEF. Setting up of any new Committee is not required. A Monitoring Cell has been created for monitoring the movement of proposals in the State and Central Government level and also to monitor the compliance of the stipulated conditions of the approved cases”.

5.62 To the same query, DVC, in a written reply, stated as under:

“Yes, it will be very much helpful and useful if a Committee is constituted involving representatives of all concerned Departments of both Central and State Government for examination of this proposal within a time bound period. This will reduce considerable time for getting various clearances and cost escalation thereof.”

5.63 In this connection, NHPC replied as under:

“MoEF already has an Advisory Committee constituted under the Forest(Conservation) Act, 1980. Further, in accordance with the time limit specified in the Forest(Conservation) Rules 2003, State Government should send the proposal to Central Government within 90 days of the receipt of the proposal form the user agency.”

5.64 SJVNL replied to this query as under:

“We feel that it will be useful if MoEF takes into consideration the suggestions and feed back by involving representatives of all concerned Departments. If MoEF acts as a nodal agency in the form of a single window and brings all the concerned Departments at one platform, the complaints of delays in case of forest clearances can be eliminated. Therefore, a Committee involving all departments would be useful. But, then this Committee should have clear rules so that a decision is possible even if some members have different views.”

5.65 To the same query, NEEPCO replied as under:

“Yes, it will be very much useful if a Committee is constituted involving both State and Central Government Departments for examination of these proposals. This will reduce considerable time for getting forest clearance.”

5.66 THDC also replied in the affirmative to the same query.

5.67 When asked as to whether, prior to final clearance, MoEF propose to divert forest land for pre-construction activities on the basis of ‘in-principle’ clearance after non-forest land identified for compensatory afforestation has been transferred to the forest department and funds for raising compensatory afforestation deposited by the user agency, MoEF, in a written reply, mentioned as under:-

“On the basis of recommendations of the Advisory Committee, a decision on the project is taken. If the project is approved, the approval order is issued in two stages: Stage-I(in-principle) approval and Stage-II approval. In Stage-I approval, conditions are stipulated as recommended by the Advisory Committee which are required to be fulfilled by the State Government / User Agency. After receipt of compliance report, formal approval (Stage-II) is issued and only then the land is transferred for non-forestry purpose. This Ministry do not propose to divert forest land for pre-construction activities on the basis of in-principle approval as this is a well thought of practice based on past experiences where the user agencies have

not complied with the conditions after getting approval”.

5.68 MoEF were subsequently asked as to whether they have recourse to any avenues to deal with cases of violation of conditions by the user agencies. In reply, they stated as under:-

“MoEF insists on the compliance of all the conditions stipulated by the Central Government while according in-principle and final approvals. Further the compliance of all these conditions is monitored in the field by the concerned Regional Offices of the MoEF. If any discrepancies are found, action is taken under the provisions of the Forest (Conservation) Act,1980.”

5.69 The PSUs under the Ministry of Power were asked as to whether forest land should be diverted by MoEF for pre-construction activities on the basis of ‘in-principle’ clearance after non-forest land identified for compensatory afforestation has been transferred to the forest department and funds for raising compensatory afforestation deposited by the user agency. In reply, DVC stated as under:

“Yes. This can save time as well as project cost and also activities for infrastructural work can be started by the project authority.

5.70 To the same query, NHPC replied as under:

“In order to develop the infrastructure and accelerate the construction of a project in line with the concept of three stage development of hydro power projects. MoEF should approve the forest area required for pre-construction works separately otherwise the purpose of three stage development is defeated. In order to save the time lost in correspondence between the State Government and MoEF may forgo with the two stage forest clearance procedure. Forest clearance may be accorded in one step mentioning therein that the forest area would be diverted by the State Government for project construction, once the cost of compensatory afforestations is transferred by the project proponent to the State Forest Department.”

5.71 To the same query, SJVNL replied as under:

“The proposition will definitely help the project proponents to take up necessary action for tying up finances and other related work connected with the project clearances. The preliminary works can also be started which will help in saving time and cost overrun.”

5.72 In this connection, THDC replied as under:

“Yes. This can save time and infrastructure activities can be started by the project authority.”

5.73 The Ministry of Power have informed the Committee about the creation of a forest bank by

the Public Sector Undertakings dealing with hydro power from which the requisite amount can be debited for the use of forest land for a particular power project. Commenting on this, the Secretary, Ministry of Power stated during evidence as under: -

“...if we create forest banks, it should be easy to do things. NHPC creates forest banks; NEEPCO creates forest banks; NJPC, THDC and NTPC also create forest banks because they are also doing hydro development. They have, in their bank account, several things. Suppose, NHPC Chairman has a plan of generating 5000 MW of power in a certain period. That, on the basis of some rough estimate, amounts to something like 2000 hectares of forest land. By depositing money for forest development, he has enough forest bank created. So, it should become a matter of just routine that since he has already done all this work, what is now required is to do an analysis on a case to case basis. A lengthy procedure need not be there. His forest bank account will be debited by the amount that he is consuming in a particular power project.”

Important conditions for clearance

5.74 The following conditions have been laid down for according forest clearance to hydro projects: -

- (a) One of the important conditions stipulated by the Central Government while approving a proposal is raising of compensatory afforestation.
- (b) Normally compensatory afforestation is stipulated over equivalent non- forest land. However, in the event of non-availability of non-forest land, it can be raised over twice the degraded forest land on submission of a certificate of the Chief Secretary in this regard.
- (c) In respect of all Central Sector projects and certain small development projects, compensatory afforestation can be raised over twice the degraded forest land without insisting on certificate of the Chief Secretary.
- (d) In respect of all medium and major irrigation projects, in addition to compensatory afforestation, a condition of catchment area treatment is stipulated.
- (e) For all cases involving violation of Forest (Conservation) Act, 1980, penal compensatory afforestation over degraded forest land (normally twice in extent) is stipulated.

Time Limits

5.75 To ensure speedy disposal of proposals, specific time limits have been laid down in the guidelines. The State Government should send the proposals to the Central Government within 90 days of its receipt from the user agency. Cases that are complete in all respects shall be disposed of within 60 days by the Central Government.

5.76 If requisite information / particulars are not received form the State Government within a maximum of 90 days, the proposal may be rejected by the Central Government for non-

furnishing of essential information. Such cases could be reopened provided, all the required information have been made available, delay in providing information is satisfactorily explained and there is no change in the proposal in terms of scope, purpose and other important aspects.

5.77 When asked as to how much time is taken to issue forest clearance to a hydro project, MoEF, in a written reply, stated as under:-

“The Forest (conservation) Rules, 2003 have streamlined the procedures for forestry clearance based on past experience”.

Restrictions Imposed on Dereservation of Forests

5.78 The following restrictions have been imposed on the dereservation of forests or use of forest land for non-forest purpose under the Forest (Conservation) Act, 1980 with amendments made in 1988:-

5.79 Notwithstanding anything contained in any other law for the time being in force in a State, no State Government or other authority shall make, except with the prior approval of the Central Government, any order directing:

- (i) that any reserved forest (within the meaning of the expression “reserved forest” in any law for the time being in force in that State) or any portion thereof, shall cease to be reserved.
- (ii) that any forest land or any portion thereof may be used for any non-forest purpose.
- (iii) that any forest land or any portion thereof may be assigned by way of lease or otherwise to any private person or to any authority, corporation, agency or any other organisation not owned, managed or controlled by the Government.
- (iv) that any forest land or any portion thereof may be cleared of trees which have grown naturally in that land or portion, for the purpose of using it for reforestation.

Criteria adopted for deciding a proposal

5.80 There is no fixed criteria for taking a decision on a proposal. However, no forest land is normally diverted for any non-site specific activity. Each and every proposal is considered on its merit alone, wherein, though the likely environmental impacts are of prime concern, due regard is also given to the local developmental needs.

5.81 The Public Sector Undertakings under the Ministry of Power were asked as to whether they were facing any difficulties/delays in obtaining forest clearance for their projects and if so, what are their suggestions to simplify the procedure. In reply, DVC stated as under:

“After submission of the application form to the State Forest Department, they usually take much time for onward submission to MoEF. Cost of forest land has to be paid in addition to equivalent compensatory forest land. It increases the cost of the project. Forest land is not cleared by MoEF even after getting approval from the Forest Department, GoI till environmental clearance for the project is received. Activity wise time should be fixed for both State and Central Governments. If required, a separate group for state and centre may be formed project wise for giving clearance for the forest land.”

5.82 To the same query, SJVNL replied as under:

“Yes, problems were faced in project clearance. Too much information and asking for information again besides time factors were the problems. The suggestion is that for hydro projects which are of a national priority, forest clearance should be given based on available data from Survey of India maps or remote sensing or forest department surveys. It should be time bound. Some yardsticks should be set for size of CAT plan.”

5.83 In this connection, NEEPCO replied as under:

“Yes. After submission of application form to the State Forest Department, they usually take a lot of time for enumeration of trees in the submergence area and accordingly, delays occur in the onward submission to MoEF. In addition to the cost of diversion of forest land to be paid by the project authority, the cost towards enumeration of trees is also charged to the project proponent. It will be useful if a Committee is constituted involving both State and Central Government Departments for examination of the proposal. This will reduce considerable time for getting forest clearance.”

5.84 THDC replied to this query as under:

“MoEF should pursue the State Forest Department for expeditious submission of required information as prescribed in the Forest Conservation Act so that forest clearance can be obtained within the time frame for Stage-II clearance as per hydro policy. The MoEF should approve forest area required for pre-construction works(Stage-II development) separately and the same should be diverted based on in-principle forest clearance itself, so that aim of three stage clearance is achieved.”

5.85 By far the most formidable element which retards the faster execution of hydro project is the delay on account of permission to obtain clearances and approval from the Ministry of Environment and Forests. The Committee have examined in detail the procedure involved in such clearances and *prima facie* are of the opinion that there is an imperative need to thoroughly review the mechanism and procedures which, at present are cumbersome, complicated and very difficult to comply with. The Committee acknowledge the need and concern of MoEF to protect the environment and forests while

appraising and granting approvals for the infrastructural/ development projects including the hydel projects. Sadly, MoEF seem to look at the proposal only with an objective of protecting the interest of the environment and forest at any cost, irrespective of the enormous benefits that may accrue to the entire country from the project. Such lop-sided action on the part of MoEF has at times led to enormous time and cost overruns with no responsibilities fixed at all and thereby making the whole system counter-productive. The Committee, therefore, recommend that MOEF should accord clearances / approvals in a fixed time frame.

5.87 It has been brought to the notice of the Committee that the Ministry of Environment and Forests seek voluminous and too minutes detail from the project proponents prior to according site and environment clearances. They note that MoEF have devised questionnaires which the project proponent have to respond while submitting the application. For instance, existence of National Park, Sanctuary /Tiger Reserves, Buffer Zone of Biosphere Reserve, Habitat for migratory birds, Archeological site, mangroves within 7 km of the project site (item No. IX) Description of fauna –rare and endangered species requiring management, species of economic significance, migratory route of terrestrial Aquatic as well as avi –fauna (item no. XI) are insisted upon for site assessment. Similar minute details are often sought while seeking environment clearance. On the top of it, a large number of studies are required to be got conducted by the project proponent which at times are rejected by MoEF. For instance, the Wildlife Conservation Plan in case of Teesta Stage-V H.E. Project got prepared by the Wildlife Division of Sikkim Forest was not accepted by MoEF on the grounds that the study did not address all the aspects required for the purpose. The details of such minute details sought while according environment and site clearances has been pointed out by various Central Hydel PSUs and are contained in this Chapter. The Committee note that such detailed and not too relevant information are either available within the public domain or with the specialized agencies of MoEF viz. Botanical Survey of India, Zoological Survey of India, Forest Survey of India, etc. The Committee are of the view that by subjecting the project developer to collect such information when these are available with MoEF and their agencies or when such studies can be got conducted through the agencies of MoEF, the Ministry usually end up contributing to cost and time overruns of the project. The Committee, therefore, recommend that MoEF should review/revise their questionnaire required for obtaining environment and site clearances in the light of suggestions made by the Central Hydel PSUs so as to reduce time taken for appraisal of hydel projects. They, at the most, may seek specific information about the project only. They should not insist for

these information/data which are available either with the State Government/Central Government or their agencies. Taking into consideration that studies/survey, etc. at present are conducted by the agencies of MoEF itself, a project developer need not be insisted upon such studies. Instead, MoEF should themselves get such studies/survey commissioned, which are absolutely necessary and appropriately charge on actual basis from the project developers. In this context, the Committee do not concur with the reasoning of MoEF in regard to undertaking Studies/Surveys by them that they (MoEF) cannot take on themselves the job of proponent as well as approving Authority. In this connection, the Committee would like to point out that when project proponent is allowed to reimburse for Catchment Area Treatment Plan and Compensatory Afforestation, there is no rationale of reimbursement method not being made applicable for Survey/Studies including EIA/EMP. The Committee also recommend that MoEF should create a data bank of their own where detailed information about flora, fauna, etc. at various sites can be maintained.

5.88 The Committee note that a hydel project is also required to seek approval from the State Pollution Control Board. The Committee do not approve of the action on the part of the State Pollution Control Board as no hydel plant has been ever reported to cause pollution. Taking into consideration that hydel units do not cause pollution and there is also no consumptive use of water, the Committee recommend that no hydel power proponent be required to obtain approval/clearance from the State Pollution Control Boards. The Committee desire that the Ministry of Power should take up the matter with the concerned State Governments to ensure that this Clearance is not insisted upon. The Committee would like to be apprised of the action taken in the matter.

5.89 The Committee find that where any hydel project involves diversion of forest area falling in National Parks and Sanctuaries, approval of the Standing Committee of the Indian Board for Wildlife and prior permission of Supreme Court is required. The prior permission of the Supreme Court is mandated through its order dated 13.11.2000 in IA No. 2 in Writ Petition No. 337 of 1955. As a result, each and every case is subjected to the scrutiny of the Supreme Court and also Wildlife Board, under the Chairmanship of Prime

Minister. This not only causes undue hardships to a project proponent but also leads to enormous delays in according clearance and consequently cost overruns of the project. The Committee feel that the question of seeking prior permission of the Supreme Court for diversion of forest area does not fall within the Jurisdiction of the Supreme Court as this is an executive / administrative matter of the Union / State Governments and as per the scheme of our Constitution, the Courts have no power to handle such matters. In this context, the Committee feel that there is a need to have this matter reviewed. The Committee, in this connection, concurs with the views of Secretary, Power who during his evidence before the Committee was candid enough to observe that “we should take up this matter with MoEF for seeking review of earlier decisions.” The Committee are of the opinion that there need not be prior permission of the Supreme Court but can be considered by the Wildlife Board. The Committee, therefore, recommend that MoEF should take appropriate action in the matter and they be apprised of the action taken.

5.90 The Committee have been informed that the Ministry of Environment and Forests often raises queries/seeks clarification from the project authorities in piecemeal. This also causes delays. The Committee recommend that MoEF should endeavour to seek all details/clarification about a hydro project from the concerned project authorities in one go.

5.91 The Committee have noted various Authorities such as the Central Electricity Authority, the Ministry of Finance, Ministry of Environment and Forests, etc. are involved in the appraisal of a hydro power project before it is certified for development. The Committee desire that there is a need to have a single window dispensation/Authority so that a project is cleared without much hassles. In this context, the Committee recommend that any hydel project submitted for clearance should receive all the statutory/non-statutory clearances/approvals within six months of submission of the proposal. The certification of commercial viability be given within 15 days especially private developers. The Techno-Economic, MoEF and CCEA clearances be given within 1, 2 and 2 months respectively. The Committee also recommend that MoP should work out a shelve of hydel projects cleared from all the angles. MoEF be also involved in the appraisal process. The Committee further find that the Government have launched 50,000 MW hydro-electric initiative under which work on Feasibility Studies for 162 hydro-electric projects would be taken up by the Central Electricity Authority in association with Central/State Power Utilities as consultants. The Committee, in this context, desire that the Government should involve MoEF in advance for undertaking Impact Assessment Studies of fauna/flora, CAT in various river basins through their own institutional arrangements in a fixed time

frame. This will ensure that the Hydro-Electric Projects are appraised from environment and forest angles expeditiously. The Committee would like to be apprised of the action taken in this regard.

5.92 The Committee note that the activities relating to environment and forest clearances are being undertaken by MoEF in sequence which is often causing undue delays. They recommend that MoEF should carry out such activities in parallel. The Committee are happy to note that a beginning in this direction has been made by MoEF in that earlier they were insisting on No Objection Certificates from the Pollution Control Boards prior to processing the applications. Now, MoEF are not insisting on No Objection Certificate at the beginning but only prior to the consideration of the proposal by the Expert Committee. The Committee direct MoEF to explore other activities which can be taken up in parallel and carry out the same simultaneously which will go a long way in reducing delays. The Committee also recommend that MoEF should consider the feasibility of simultaneous processing of activities relating to both environment and forest clearances.

5.94 The Committee have been informed that site visits are generally undertaken by MoEF long after the submission of application by project proponents. This, in turn, leads to avoidable delays in obtaining the environmental clearance. The Committee, therefore, recommend that such site visits, if considered essential, should be undertaken within one month from the date of submission of application.

5.95 The Committee have been informed that a World Bank Study aimed at bringing in reforms in the environment and forest clearance procedures is underway. They have also been informed that the said study is nearing completion and the interim findings are due shortly. The Committee suggest that the problems faced by the hydel power projects should be brought to the notice of the World Bank team so that the study can be more meaningful.

5.96 The Committee note that forest clearance is accorded to a hydro project in two stages viz. Stage-I (in-principle) and Stage-II (formal). In Stage-I approval, conditions are stipulated which are required to be fulfilled by the State Government /project proponent. After receipt of the compliance report, formal approval is issued and only thereafter the land is transferred for non-forestry purpose. This process, besides causing delays, is also leading to cost overruns. The Committee, therefore, recommend that prior to according formal clearance, MoEF should allow diversion of forest land for pre-construction activities on the basis of in-principle clearance once non-forest land identified for compensatory afforestation has been transferred to the Forest Department and funds for raising compensatory afforestation deposited by the project proponent. This will enable the project proponent to develop the infrastructure and accelerate the project construction work. In this connection, the Committee have been informed about the creation of a forest bank by the Public Sector Undertakings under the purview of the Ministry of Power dealing with hydro power to facilitate instant payment for the use of forest land for development of infrastructure facilities. The Committee desire that the modalities of this issue be finalised by the Ministry of Power in consultation with MoEF. The Committee also recommend that the application for forest clearance be processed by Forest Wing of Ministry of Environment and Forests(MoEF) and that of Environment Clearance by the Impact Assessment Division or any authority which, they deem fit, separately as parallel activity. Both Wings being part of MoEF, better coordination may be done to reduce time for simultaneous processing for issue of clearances.

5.97 The Committee note that the proposals for forest clearance are examined by various agencies at the State and Union Government levels. This is contributing to enormous delays. The Committee, therefore, recommend that a joint Committee be constituted involving representatives of all concerned Departments of both the State and Central Governments to consider proposals seeking forest clearance. With the constitution of such a Committee, all the issues relating to forest clearance of a project can be considered at one place which will go a long way in reducing delays.

5.98 The Committee find that the Action Plans related to Catchment Area Treatment(CAT), Bio-diversity Conservation and Resettlement & Rehabilitation are submitted as a part of the Environment Management Plans for obtaining environment clearance for a hydel project. The plans are discussed at length by the members of the Environment Appraisal Committee(EAC) of the Ministry of Environment and Forests(MoEF) and changes, if any, suggested by the members of EAC are incorporated in the plans. The Committee further find that the Forest Advisory Committee also discusses the same plan and at times their views are different from those of EAC and the project proponent is asked to review the Action Plan. The Committee are of the opinion that once a Technical Committee of Environment Wing of MoEF has already deliberated upon certain management plans, the same plans should be deemed to have been approved by the Ministry and need not be discussed by the other Committee of the Forest Wing of MoEF. The Committee, therefore, desire that there is a need to have a better coordination between the two wings of MoEF so that there is neither any duplication of work nor any undue harassment to the project proponent. The Committee would like to be apprised of the action taken by the

Government in this regard.

5.99 It has been brought to the notice of the Committee that the preparation of Catchment Area Treatment(CAT) Plan is being routed through the State Government which has made the entire process a complicated one. At times, the cost of community halls, rest houses, liaison offices, rural infrastructure development(construction and repair of roads, improvement of religious places, construction of village crematorium) and other infrastructure work are loaded on the project cost under this head. As a result, the cost of the Plan becomes exorbitant. The Committee, therefore, recommend that the Ministry of Environment and Forests should review the works/items included under CAT and Compensatory Afforestation. The Committee also desire that MoEF should fix the norms for arriving at cost on Catchment Area Treatment plan/Compensatory Afforestation schemes by clearly indicating the percentage of cost of actual works to be kept for administrative and other miscellaneous activities. The Committee would like to be apprised of the action taken in this matter.

5.101 The Committee find that loss of original flora and fauna particularly bio-diversity can never be replaced because forest takes thousands of years to grow. However, since development has to take place and hydro projects are to be commissioned, MoEF assign different plans for Compensatory Afforestation and Catchment Area Treatment(CAT). The cost of Compensatory Afforestation and CAT are charged to the project authorities and the State Government is required to undertake the plans for afforestation and CAT and money transferred to the respective State Governments. The Committee find that the States have been unable to meet the projected targets and at times the money transferred to State Governments has been diverted to the general revenue budget of the State. As regards achievement under CAT and Compensatory Afforestation Plan, it may be noted that as against 7 lakh hectares only 4 lakh hectares have been put under Compensatory Afforestation and CAT Plans. Of Rs. 850 crore earmarked to States the utilisation has been only Rs. 500 crore. In this context, the Committee desire that instead of State Governments, MoEF should undertake the Compensatory Afforestation and CAT Plans. In the opinion of the Committee, this will yield better result and there will be no scope for diversion of money by the State Governments transferred to them for Compensatory Afforestation/CAT Plans.

5.102 The Committee find that no minimum qualification has been prescribed for environment consultants preparing the Environment Impact Assessment Study Report on behalf of the project proponent. Often, Environment Impact Assessment is not prepared by competent consultants and even the prescribed forms are not filled correctly. The Committee desire that some minimum qualification should be prescribed for environment consultants so that quality assessment can be carried out by them.

5.103 The Committee find that where forest land is diverted for a Hydel Project premium as well as lease rent @ 10% is charged. The Committee do not approve of charging premium as well as lease rent for diversion of forest land. The Committee, therefore, recommend that the Government should review their policy in the matter.

CHAPTER-VI

PRODUCTION COST OF HYDRO POWER

6.1 Hydro power is a renewable, economic, non-polluting and environmentally benign source of energy. Hydro power stations have the inherent ability for instantaneous starting, stopping, load variations etc. and help in improving reliability of power system. There is no fuel cost during the life of the station on hydro power as in hydel power generation there is a non-consumptive use of water. The benefits of hydro power as a clean, environment friendly and economically attractive source of energy have now been sufficiently recognized. The need for its accelerated development also comes from its capability of enhanced system reliability and economics of utilization of resources. However, the cost of Security, Roads, Rehabilitation and Reclamation (R&R), catchment Area Treatment, free power to States transmission cost, flood moderation etc., have made the hydro electric projects unviable.

6.2 The Committee have been informed by the Ministry of Power and NHPC that possible improvements expediting Hydro development process and reducing cost of hydro power projects can be achieved by taking into consideration the following aspects:-

(a) Cost of Security

Many of the hydro projects in operation and under construction are in troubled areas infested by militancy and terrorists' activities. Elaborate security arrangements are to be made as per norms of security organization viz. Central Industrial Security Forces under Ministry of Home Affairs. Entire expenditure initial as well recurring for the security arrangements is charged to the project which adds to the cost of the project as well as tariff substantially. For instance, in case of Tipaimukh hydel project, the total cost of the project is Rs.3163.86 crore and Rs.280.59 crore, is being incurred on security alone.

(b) Cost of access Roads

Hydroelectric projects are generally in remote, inaccessible locations having either substandard roads or no access roads. In order to develop the project, main trunk roads are either laid afresh or widened and improved to reach the project site. These roads are used by the public and state authorities involved in development of the area. This results in economic benefit to the state due to triggering of economic and commercial activities around the project site. For example 264 km road is being widened and improved for Dhauliganga HE Project in the State of Uttaranchal through Border Roads Organisation (BRO) and cost thereof, which is of the order of Rs. 65 crores is being borne by NHPC.

At Bursar Project in J&K State, 80 km of fresh road is to be built and 30 km of road is to be improved, which is estimated to cost about Rs. 165 crore. The cost of diversion of Road in case of Timpaimukh hydel project is estimated at Rs.105 crore and is included in the project cost.

(c) Rehabilitation & Resettlement

The cost on account of rehabilitation & Resettlement in some of the projects is quite huge. It has been suggested to the Committee that if the cost is borne by the State Government, the capital cost of project can be reduced. However, project would remain liable for compensation for land and property, which is directly attributable to the project, although State Government as per the current practice enjoy 12% free power throughout the life of the project for the distress caused by submergence. On Resettlement and Rehabilitation, the Committee have been informed by National Hydro Electric Power Corporation that a draft Resettlement and Rehabilitation policy for the projects of NHPC has been formulated and the same is under consideration of the Board of Directors. However, in general the rehabilitation package provided by NHPC is as follows:-

Compensation for land, house, shop, property, etc.

- Homestead land
- Land for agriculture wherever possible
- Transportation charges for household items, cattle, etc.
- Solatium charges
- Infrastructural facilities such as approach roads, electricity, water supply, education, medical facility, etc.
- Reconstruction of religious places
- Preference in employment
- Training facilities

NHPC further informed the Committee that although most of the features of the proposed rehabilitation package are the same as compared to the National policy on Rehabilitation and Resettlement, which is yet to be approved by the cabinet, there are some variations due to site specific problems of hydro projects.

(d) Catchment Area Treatment (CAT)

Soil erosion is a natural process. It is caused due to several reasons like climatological anomalies such as droughts followed by flash floods, cloud bursts, avalanches, etc. and other man-made factors like loss of vegetation cover due to uncontrolled felling of trees, heavy pressure on grazing and faulty methods of cultivation. Even though hydro projects do not cause any soil erosion, Ministry of Environment & Forests (MOEF) insists the project authorities to treat the degraded areas in the Catchment. The flood moderation component in projects like Timpaimukh is as high as Rs. 288.76 crore and is loaded on the project cost.

(e) Free Power

It has been stated that free power is to compensate for the distress caused by submergence of cultivable, forest, residential and useful properties, for displacement of persons, loss of livelihood etc. Such a provision does not apply for thermal power and the

12% free power is irrespective of the extent of submergence and displacement. The Committee have been informed that certain State Government are now agreeing to hydel projects in their states without 12% of free power so as to make the states more and more industrious and grow economically. The Baglihar hydel project in Jammu & Kashmir and Purulia pump storage, West Bengal are some of the projects, where State Government have agreed to forgo 12% free power.

(f) Wheeling of power from North-Eastern Region Projects.

Approximately 37% of hydro potential is concentrated in North-Eastern region of the country, where demand of power is too less as compared to the potential. The power would be required to be transmitted to other states, and after adding wheeling charges, the landed cost of power may be high even if the cost of generation of electricity at bus bar is attractive. As regard to transmission charges of the electricity generated by Tipaimukh Hydro-electric project, Manipur, the Secretary, Department of Revenue have informed the Committee during evidence that against the generation cost of Rs.3.08 per unit, the transmission cost of the power through this project will be Rs.1.60 per unit. It has been suggested to the Committee that a policy decision regarding rationalisation of wheeling charges should be done so that landed cost of power is affordable.

6.3 The Committee observe that benefits from hydro power such as clean and environment friendly power with no fuel cost and non-consummative use of water are recognized world over and there is a need to accelerate development of identified hydro power schemes in the country. At the same time, the Committee find that many of the hydel projects are located in troubled areas infested by militancy and terrorist activities. The Committee are of the view that maintaining law and order being the responsibility of the Government, there is an urgent need to amend the present policy of the Government in regard to charging the entire security expenditure from concept and uptill commissioning - on the project cost. However, the recurring expenditure incurred on security, once a hydel project goes on stream should continue to be charged on the project developer. In the absence of such a change, the Committee feel that a large number of the hydel power projects would become unviable. This has become more so important, in view of adverse thermal hydel mix in the country, and untapped hydel potential in Jammu & Kashmir and North-Eastern Region – both the areas under threat of militancy/insurgent activities from time to time. The Committee, therefore, recommend that Planning Commission, the Ministry of Finance and Home Affairs (Internal Security) should allocate separate funds for providing security to these infrastructure projects, including power. The Committee would await the action taken by the Government in this regard.

6.4 On cost of access roads being included in the project cost, the Committee find that hydroelectric projects are generally in remote, inaccessible locations having either substandard roads or no access roads. In order to develop the project, main trunk roads are either laid afresh or widened and improved to reach the project site. These roads used by the public and State authorities involved in development of the area. This results in economic benefit to the State due to triggering of economic and commercial activities around the project site. After construction, these roads are used by the public and other development agencies. The Committee further observe that roads such as 284 kms road being widened and improved for Dhauliganga HE Project in the State of Uttaranchal through Border Roads Organisation

(BRO) and cost thereof, which is of the order of Rs.65 crore is being borne by NHPC. Similarly, for Bursar project in Jammu & Kashmir, 80 km of fresh road is to be built and 30 km of road is to be improved, which is estimated to cost about Rs.165 crore. The Committee feel that since these roads are not specific to the project and serve the public of the State at large, their cost should not be charged to the project cost. The Committee are constrained to note that although the project authorities are bound to be liable for compensation for land and property which is directly attributable to the project and had to bear the cost of development of catchment area, even then as per the current practice, 12% free power is to be given to State throughout the life of the project. The Committee also feel that since development of hydro projects in a State results in economic benefit to the State due to triggering of economic and commercial activities around the project site and R&R, flood moderation costs are also included in the capital cost of the project, the provision of 12% free power need reconsideration as the provision does not apply to thermal power projects. In this context, the Committee would like to bring to the notice of Government, the trend setting examples of Baglihar Hydro-Electric and Purulia Pump storage Hydel projects, whereunder the free component of 12% had to be sacrificed by the State Governments, so as to make them viable. The Committee are of the considered view that economics should be one of the prime guiding philosophy, while determining tariff and production cost. The Committee therefore, recommend that the states may be pursued to forgo the provision of 12% free power for initial some years so as to make the projects economically viable. As explained earlier, free power can be taken up to 12% level over a number of years gradually after the initial few years.

6.5 The Committee find that the wheeling/transmission charges in the North-Eastern Region, is one of the highest due to its geographical disadvantages. Taking into consideration that 37% of total hydel potential exist in the region with practically very low demand, the rationalization of wheeling charges in the region is required. This is one of the reason which has dissuaded many hydro proponents to develop hydel project in the region. The Committee are constrained to note high wheeling charges for projects in North-Eastern such as Tipaimukh where transmission charges are expected to be as high as Rs.1.60 per unit. The Committee are, therefore, of the view that geographical disadvantage should not be a cause of inaction on the part of the Government in not rationalization the transmission/wheeling charges. The Committee, therefore, recommend that Central Government should rationalize the wheeling/transmission charges in North-Eastern Region, so that affordable power is made available across the country. The Committee feel that the Power Grid Corporation should also take minimum margin of profit on their investments in the North-East Region especially during the first few years of the project's life and may increase it gradually over the years when the business picks up. Similarly, PTC, whose business depends solely on the availability of transmission lines, may also be asked to examine the feasibility of investments in such

projects.

- 6.6 The Committee are perturbed to note that many of the hydel projects such as Tehri, Narmada Sarovar, etc. have undergone time and cost-overruns due to unresolved Rehabilitation and Resettlement (R&R) issues the Committee find that National Policy on Rehabilitation and Resettlement (R&R) which was entrusted to Ministry of Urban and Rural Development for several years is still to be concretized even after repeated recommendation made by the Standing Committee on Energy in this regard. The Committee deplore in strongest terms inaction on the part of the Government in not coming with much awaited National Policy on Rehabilitation and Resettlement (R&R). The Committee recommend that the Government should atleast now declare their National Policy on Rehabilitation and Resettlement (R&R) without fail.**
- 6.7 The Committee find that one of the causes which retards early execution of a hydel project is delay on account of acquisition of land. The process of land (both private and Govt.) acquisition for a project differs from State to State as per Land Acquisition Act. It is simple in States like Andhra Pradesh but very difficult and time consuming in the States of North Eastern Region. Acquisition of land for Ranga Nandi Hydro-Electric project of the North-Eastern Electric Power Corporation (NEEPCO) in Nagaland took 5 years which had a deleterious impact on the project cost and tariff. The Committee have further found that delay often takes place in deciding the title holder, classification of land and fixation of compensation. The Committee have also found that the land records are not properly maintained and updated by the revenue authority. Sometimes it is found that the same land exists in the name of more than one person. Besides, there is no standard for fixation of rate of land. Land owners often accept compensation under protest and then move the court. The Committee recommend that in order to expedite the acquisition of land, more flexibility should be given to the Project Authorities to acquire land by negotiations. At the same time, the land records should be updated and computerized so that time is not wasted in deciding the title holder. The procedure for fixation of compensation for land should be streamlined so that it is transparent and unambiguous and not at the whims and fancy of revenue officials. The Committee also desire that in order to mitigate the problems encountered while acquiring land, the Government should amend Land Acquisition Act and include hydro power project in the priority list and the State Government be persuaded to provide land to the project authority in agreed time frame to facilitate shifting of Project Affected Persons(PAPs). In case of project in the hilly States, forest land should be made available by the Ministry of Environment and Forests and the State Government for the construction of project as well as the rehabilitation and resettlement of PAPs. Further, in order to expedite the outcome of land disputes, pertaining to power projects, Special Courts be constituted.
- 6.8 The Committee find that ideally the average time required for Hydro Power Project should not exceed 5 years. This is based on total time of 50 to 80 months from Stage-I through Stage-III followed by actual construction and commissioning time of 42 to 45 months are desirable brake up of Stage-I, II and III

could be 6 to 4 and 6 months respectively. The Committee find that this time schedule is not being reduced because most of the projects are not thoroughly surveyed or are located in inaccessible difficult terrain and typically suffer for R&R, etc. lack of realistic and complete environment social impact assessment, inadequate preparatory and exploratory services, forest clearance, land acquisition problems geological surprises, etc. The Committee are of the opinion that to expedite early execution of hydel projects, bankable Detailed Project Report (DPR) based on our detailed survey should be prepared to avoid geological uncertainties. At the same time, contract monitoring as distinct from project monitoring should be emphasized and land acquisition and infrastructure development be settled and completed before the start of the project.

Chapter –VII

Private Participation & Joint Venture in Hydel Sector

7.1 The Committee have been informed that Hydro electric development has been a close preserve of State Governments which do not have adequate resources to undertake a large programme. State Governments have also been extremely cautious and reticent in permitting the Central PSUs to undertake projects in their territories. Presently, the Central Government consider the Central Projects as regional projects and allocates benefits to all the States in the specific region based on a formula giving equal weightage to Central assistance and electricity consumption. This decision seems to be unpopular with the States in which the hydro potential is concentrated.

7.2 According to the report of Committee on Hydro Power submitted in March,1997, the State Government, desired that the entire power output be allocated to them for disposal (trade) as they wish. The Central Government also does not seem to have unlimited resources to take on a large programme of hydro development. In this context, the decision to induct private sector in power development in general and hydro development in particular has opened a new avenue and hope for reviving and accelerating hydro development.

7.3 In order to bridge the gap between demand and supply, the Committee have been informed that the Government of India initiated reforms in power sector in 1991 and allowed private sector to set up power plants of any size. The response of private sector in hydro power development was lukewarm and cautious. Realising the need of accelerated hydropower development, Government announced 'Policy on Hydro Power Development' in August,1998 with a view to provide necessary impetus for exploiting the vast hydropower potential. Later Government also announced Mega Power Policy in November, 1998. While the new hydel policy emphasis on strengthening the role of PSUs and SEBs for taking up new projects, the huge investments required for the same are difficult to be met through the budgetary support and /or plan assistance of the Government in view of the competing demands from other sectors of economy and as such investment from private investors would be needed to bridge the gap between actual investment required and budgetary support expected from the Government.

7.4 Asked about the international experience in development of Hydro Project by private developers, the Committee have been informed that in recent times, the promotion of Hydro Power by in the private investors is on the increase in countries like Philippines, Nepal, U.S.A, Canada, Pakistan, Turkey, Thailand, Guatemala, Indonesia and Brazil. On the details of problems which are being experienced in estimating completion cost, assessing quantities, sharing of risk, tariff formulation etc., the Committee have been apprised by the Ministry of Power as under :-

“ In the U.S., hydro development in the private sector by individual developers began to receive attention following the 1973 energy shock as a part of their programme of encouraging development of renewable sources of energy. The Public Utilities Regulations Act (PURA) introduced had made it mandatory for power utilities to buy power from power plants based on renewable sources of energy established in their respective areas of operation. The tariff for such transaction would be based on the principle of avoided cost to the utility. It was understood that the small hydro programme based on this concept took off in the 1980s and there was a boom. In this process there was scope and incentive for reducing costs and improving efficiency. Initially, there were anomalies – developers of better sites making more profits than those who were involved with less attractive sites. However, these anomalies seem to have gradually reduced with the general decline in the real cost of electric power which became possible due to selective introduction of competition which in turn led to choice of more economic sources of energy. Development rights for hydro projects in the U.S. were decided mostly on the basis of qualification auctions, the evaluation of bids being done on the basis of their qualification and credibility as developers. This method avoided situations of transfer of sites to other developers for a consideration.

(b) In Philippines, the right to a hydro site was sought to be allocated initially to a bidder, prequalified as a prospective developer, quoting the lowest energy rate for the site. The essential prerequisite for this method is availability of a DPR for each site. In view of the poor response to this method of developer selection, the National Power Corporation (NPC) reported to have made the following changes in the offer:-

- (i) Hydraulic risk will be taken by NPC guaranteeing a minimum off take based on firm energy.
- (ii) NPC will provide access to the site.
- (iii) NPC will cover the cost of transmission for evacuation of power.

(iv) Price for energy purchase will be based on avoided cost and include an allowance for development risk.

7.5 Pakistan is reported to have devised a policy to promote private sector interest in hydro development. Development of 2000 MW in the private sector is proposed in the first phase during the 9th plan (1998-2003). The essential features of the policy are:

- * Encourage raising of project funds without any direct sovereign guarantee of repayment
- * Minimum requirement for equity investment of 20% of the total capital cost of the project.
- * Establishment of a Private Sector Energy Development Fund (PSEDF) with the assistance of the World Bank and multi-lateral lending agencies which may provide upto 30% of the project's capital costs with a variable interest rate and a maturity period of upto 23 years (including a grace period of upto 8 years)
- * Permission to issue corporate bonds
- * Permission to issue shares at discounted prices to allow venture capitalists to achieve higher rates of return in proportion to the risk.
- * Permission to foreign banks to underwrite the issue of shares and bonds by the private power company.

7.6 To a query about the initiatives by Government of India to promote hydel power in the country, the Committee have been informed by the Ministry of Power in a written reply as under:-

“In 1991, Government of India introduced a series of policy initiatives to liberalise the power sector to enable private sector entry and create an environment conducive for attracting investments from foreign sources. The more important among these steps were as under:-

- amendment to the Electricity Statues to enable private sector entrepreneurs to establish generation enterprises not only as licensees but also as generation companies.
- Financial incentives to generation companies in the privates sector such as debt equity ration of 4:1, equity upto 100% for foreign private investment, return of 16% on the equity in the currency of such subscription, dividend balancing by export earnings, liberalised depreciation, a five year tax holiday etc.
- Liberalisation of import of power plant equipment under concessional credit-reduction in import duty.
- Extension of duration of licenses to 30 years from 20 years initially and 20 years from 10 years subsequently
- Increase in the rate of return to 5% instead of 2% above the RBI rate and other incentives to licensees.
- Streamlining the procedures for clearance of projects as required under the statues and exempting projects costing less than Rs. 100 crores from the purview of CEA”.

7.7 The Ministry of Power further informed that the Government of India also issued guidelines for fixation of tariffs for sale of electricity by generating companies as provided under section 43A of the Electricity (Supply) Act. The first set of guidelines was notified on 31st March, 1992. These

guidelines were considered by investors and hydro experts as unattractive and inadequate to attract investment in hydro electric projects which involve greater risks. In the light of concerns expressed, a revised tariff notification was issued on 13.1.95. The main features of the guidelines pertaining to tariff fixation of hydro plants are as under:-

- “A two part tariff comprising a capacity charge to recover the financing charges based on the repayment schedule and interest on outstanding loan as in the approved financial package, depreciation charges and an energy charge to recover operation and maintenance expenses and insurance in addition to return on equity.
- Capacity charge to be recovered on 90% availability with an incentive at the rate of 0.7% return on equity for each percentage point increase in availability.
- Energy charge to be recovered on design energy corresponding to 95% availability in 90% hydrological dependable year
- An incentive for secondary energy above design energy upto a ceiling of 10% return on equity in any year.
- Exemption under deemed generation any energy loss due to reasons beyond the control of the generating company
- The above provisions to be adopted as ceilings for negotiations”.

7.8 The Ministry of Power have informed the Committee that in the initial stages, induction of private sector for hydro development was solicited through the Memorandum of Understanding route for specific projects. Many entities responded and signed MOUs with State Governments. However, many of them did not proceed to obtain even the first stage in-principle clearance. The schemes which have progressed beyond the first stage clearance are indicated below:-

HYDROELECTRIC PROJECTS PROPOSED THROUGH MOU

Sl.No.	Project	Installed Capacity (MW)	Proposer/Developer
1.	Maheswar (MP)	400	Sri Maheshwar Hydrohno-Power
2.	Baspa –II(HP)	300	Jal Prakash Industries Ltd.
3.	Karcham Wangtoo (HP)	1000	JalPrakash Industries Ltd.
4.	Dhamwari Sunda (HP)	70	Dhamwari Power Company
5.	Hibra (HP)	231	Dhamwari Power Company
6.	Allain Duhanagan (HP)	192	Rajasthan Spinning & Weaving Mills Ltd.
7.	Malana (HP)	86	Rajasthan Spinning & Weaving Mills Ltd.

8.	UHL III (HP)	100	Ballarpur Industries
9.	Vishnu Prayag (Uttranchal)		
10.	Srinagar (Uttranchal)	330	Duncan Ind.Ltd.
11.	Upper Krishna Alamatti (Karnataka)	1107	Chamundi Power Corpn.Ltd.

7.9 The Ministry of Power have informed the Committee that as per sections 28 to 31 of the Electricity (Supply) Act, 1948 the projects with investment with a ceiling limit as determined by Government need concurrence of CEA for their implementation. This procedure has been relaxed in respect of projects coming through the competitive bidding route and in such case only projects with an installed capacity exceeding 250 MW only would need CEA's clearance and projects with less capacity can be cleared at the State level. Further as per Government of India notifications dated 31.3.92 and 12.1.95 the financial package and completed costs of the projects need clearance from CEA. Before submitting the proposal to CEA, the proposer (developer –the generating company) has to obtain the permission of the State Government under section 18 of the Electricity (Supply) Act. The CEA is providing the techno-economic clearance and certification of project cost in four distinct steps as follows:

In Principle clearance	On submission of pre-feasibility report
Techno-economic clearance	On submission of DPR and tentative Financial Package
Clearance of Financial Package	On Submission of firm financial package
Certification of completed Cost	On completion of project

7.9 Further, clearances are also required from the Ministry of Environment and Forests as regard to the environmental impact of the project would be within acceptable norms and proposals for compensation / resettlement for the project affected forests, land and people are in conformity with the statutes and guide lines. The techno-economic clearance of CEA is accorded only after the environmental clearances are given by the Ministry of Environment Forests.

7.10 When asked about the role of CEA, in case of private sector hydel power projects, the Committee have been informed that CEA examines the estimated completion cost of the project, financing package, tariff proposals, power purchase agreements and the financial viability of the project. According to the Ministry of Power, presently almost all the projects being posed and considered for development in the private sector are the ones investigated and formulated by the State Electricity Boards or State Government entities and most of them have been cleared by CEA for implementation by the State Government entities in the public sector. They have the benefit of the investigations carried out by the State organisations. The private developers interested in such project face a dilemma in reviewing the adequacy of investigations and

supplementing them with additional investigations. The private sector entities cannot be expected to build a competent investigation, design and engineering organisation based on one or two projects. They presently turn to “free-lancing experts” or independent consultancy organisations that have come up recently. But these facilities are minimal and cannot take care of the large needs that would arise if privatisation catches on. There are no major consultancy organisations in the private sector within the country which can provide all the services that are required. A few foreign consultancy organisations have opened their offices here-but their services are very expensive and they have little exposure to local conditions.

7.11 The Committee have been apprised by the Ministry of Power that the selection of developers for hydro development began with MOU route and the response on the surface was encouraging. However, the procedural wrangles and very high costs quoted by some of the developers had virtually throttled progress. Some unsavory experiences on the thermal projects led to extreme caution on the part of the Governments. The Government of India decided to introduce the competitive bidding route and made it mandatory since 18.2.95. According to Ministry of Power, the MOU route had several advantages. The developer for a specific site can be chosen by the application of rigorous procedures and given the site for development on the basis of a comprehensive MOU based on the site conditions, status of the project and its investigation, availability of infrastructure etc. Thereafter, the site can be handed over to the developer on as-is-where-is basis and left to them for development. The developer can then proceed following transparent procedures. MOU can provide for monitoring of the progress and checks on procedures which will be mainly to make sure that the project is proceeding satisfactory. The one disadvantage is the purchaser (Licensor) having to deal with one entity which may create problems in a democratic set up, even when stringently transparent procedures are followed. One way of taking care of this is to get the developer to use competitive bidding route for deciding the sub contracting for various packages. However, this may not be feasible if the developer is a consortium of civil contractors, equipment suppliers and consulting engineers. In such cases, the only course is to develop mutual trust and confidence.

7.12 Ministry of Power have further stated that the competitive bidding route is more acceptable from the point of view of public accountability. CEA / Ministry of Power have prepared excellent guidelines on the procedure to be followed. For this route to be meaningful the Detail Project Report (DPR) should be prepared first followed by the bidding documents based on DPR. This starts with the promise that the purchaser (licensor) has got prepared a bankable DPR after carrying out adequate investigations. There will still be many doubts and questions on many counts even if the DPR has been prepared by a competent institution and techno economically cleared by CEA. This means that the route will have to take a step by step procedure somewhat on the following lines:-

- Select and short-list prospective developers following a stringent procedure.
- Make available to them the DPR and all project details avoiding disclaimers in so far as data and investigation results and their interpretations are concerned, but indicating limitations, if any.
- Give access to prospective developers to the site and provide them facilities to carry out some check

investigations to satisfy themselves regarding the quality of DPR.

- Call for bids in two stages- the first stage involving the technical aspects and the second stage involving the financial and contractual aspects.
- Ask the bidders to quote strictly the specifications and requirements in the bid documents which will be the main bid and give them an opportunity to bid for alternatives.
- Indicate to them how the bids will be evaluated. The criteria for evaluation would include both non-price and price factors.
- Have a pre-bid conference of bidders to clarify doubts of the prospective bidders.

7.13 According to the Ministry of Power, the evaluation of the bids and a decision thereof can lead to an acceptable contract and a power purchase agreement.

7.14 Taking note of the fact that the prospective investors from abroad feel handicapped in getting various clearances from Government departments as they are not fully acquainted with our system of working, the Committee desired to know the joint venture formed so far to hydel project. In this regard, the Ministry of Power have stated that, formation of joint ventures need not be confined to private sector institutions. Public sector organizations such as NHPC, NEEPCO, NJPC, THDC, BHEL and also State Electricity Boards and power corporations could be encouraged to join such joint ventures with foreign entities. The Government should in such cases provide financial support for equity participation by the Indian entity.

7.15 Asked about the adequacy of frame work of Joint Venture, NHPC in a written reply furnished to the Committee have stated that the framework of joint venture should address to the following points:

1. Whether JV partner can be selected through MOU route or competitive bidding route. In case of competitive bidding what should be the basis of selection i.e. technical and financial suitability or based upon completion cost or it should be tariff based?
2. What will be the parameters of selection of JV Partner?
3. In case JV partner is a civil contractor or equipment supplier, whether they themselves can carry out the work without resorting to any competitive bidding.
4. What should be debt equity ratio? Since PSU is under administrative control of Government, this issue needs to be decided.
5. Whether PSU to be majority stakeholder in the equity or minority shareholder and to what extent.
6. Government of India to provide equity share of PSU as budgetary support.
7. Whether JV partner or its subsidiaries will be allowed to bid for EPC contract or any individual contract package relating to the project?
8. Whether JV Company to obtain Techno-economic clearance as well as approval of PIB and CCEA based upon EPC cost obtained through ICB or it has to estimate cost and obtain its approval before EPC tender is invited?
9. Who will fix the tariff – Central Electricity Regulatory Commission (CERC) or State Electricity Regulatory Commission (SERC)
10. Power Trading Corporation (PTC) to commit to purchase power from JV projects and pay for it. JV Company would sign a Power Purchase Agreement (PPA) only with PTC for this purpose.
11. In case of project becoming unviable or JV has to be dissolved due to the reason that the project is not approved by Government of India or CERC, how to share their losses?

7.16 The Committee have been informed that the IPPs are preferring thermal projects over hydel projects. Since private sector participation in the development of hydro projects is not satisfactory, the Committee have

been apprised of the following main reasons for IPPs for preferring thermal project over hydel projects:-

- (i) High investment cost and low return on investment
- (ii) Difficulties in revenue realisation
- (iii) Peculiar characteristic of hydro power projects
- (iv) Delay in finalisation of PPAs
- (v) Inherent problems of uncertainties in hydro power projects

7.17 The Committee have been further informed that in order to attract investment, Government of India in their hydro policy rationalised various tariff norms which are as follows:-

Premium on peak power tariff to be allowed to be decided by Central Electricity Regulatory Commission

- (a) The normative availability factor reduced from 90% to 85%
- (b) The sale rate of secondary energy kept at the same rate which is applicable for the primary energy.

7.18 NHPC has, however, informed the Committee that in addition to above, even the other existing norms in the present tariff structure are considered inadequate. Actual O&M expenditure varies from 2% to 5% of capital cost as against 1.5% allowed in the tariff norms. The interest on loan is not fully recovered through tariff. The return in hydro is 16% which is same as that of thermal. Normally hydro stations are located in remote areas and therefore, investor feels shy of investing in hydro schemes when he can get the similar return from thermal which are located at better places. The Committee have been informed by NHPC that a mathematical model was prepared on the basis of gestation period of hydro stations and delays so incurred in completion which are beyond the control of the investor and it was observed that if thermal is given 16% ROE, equivalent return on equity for hydro should be allowed as 18 to 19%. In addition some additional ROE should be allowed to compensate for hydro station sites which are in remote areas where political unrest prevails. The NHPC, has suggested that hydro project merits a return of 21 to 23% on equity in addition to other incentives.

- 7.19 The Committee note that the private sector entrepreneurs have been cautious in making their proposals and the regulators and the sanctioning authorities both in the Central and the State Governments have been equally cautious in evolving procedures and evaluating and approving the proposals. The Committee, however, feel that induction of private sector does not mean the end of public sector involvement. The Committee are of the view that the public sector involvement in hydro development should continue and there are types of projects which can be taken up only in the public sector domain. Considering that the public sector has played a major and almost exclusive role in developing hydro power, the world over including the developed countries and the fact that hydro in the privately owned IPP mode is still to catch on, the Committee recommend for a judicious mix of both the options, ensuring maximum thrust for accelerating hydro development. In pursuing the private sector option, the Committee recommend that it is necessary to generate confidence in the prospective entrepreneurs/developers and offer terms and conditions which will be attractive and cover undue risks without jeopardising consumer interests. The Committee desire that the Government should frame guidelines for development of Hydro Projects by Private Producers on the lines prevalent in United State of America whereunder development right are decided mostly on the basis of qualification auctions, the evaluation of bids done on the basis of their qualification and credibility as developer with an objective of encouraging only those entities having experience in hydro development and impeccable track record. The Committee would like to be apprised of the action taken in this regard.
- 7.20 The Committee observe that almost all the projects being posed and considered for development in the private sector are the ones investigated and formulated by the State Electricity Boards or State Government entities and most of them have been cleared by CEA for implementation by the State Government entities in the public sector. They have the benefit of the investigations carried out by the State organisations. The private developers in such a project face a dilemma in reviewing the adequacy of investigations and supplementing them with additional investigations. The Committee opine that the private sector entities cannot be expected to build a competent investigation, design and engineering organisation based on one or two projects. They presently turn to “free-lancing experts” or independent consultancy organisations that have come up recently. In this context, the Committee feels that institutions such as GSI, Survey of India, NHPC, WAPCOS, CWPRS and similar organisations at the State level involved in hydro development can provide consultancy services to the private sector. It is understood that a beginning has already been made by some of the institutions such BBMB, NHPC and WAPCOS. The Committee desire that this should be extended to all the institutions and encouraged by offering incentives – financial and otherwise.

- 7.21 On procedures for selection of project developers in the private sector, the Committee feel that it is in the best interest of the purchaser(licenser){State Government in this case} to choose developers who have undergone and satisfied a rigorous technical and financial prequalification procedure. Since the projects are generally undertaken in a difficult and hostile environment and those involving underground works face uncertainties and involve risks, the Committee feel that for their successful implementation and operation, these projects require specialised resources and skills. The Himalayan terrain presents a tremendous challenge to project developers and unless the developers have the technical ability and the financial and other resources to meet these challenges, the projects may become non-starters. The Committee, therefore, suggest that it is necessary to draw up a comprehensive procedure of a rigorous technical and financial prequalification which the prospective developers will have to go through and satisfy. The Committee would like to know the comprehensive procedure and plan drawn for the purpose.
- 7.22 **In the case of MOU route, the Committee further observe that the purchaser (licenser) may solicit developers for prequalification and select the one considered the most suitable for the specific project using procedures which are transparent. In the case of the competitive bidding route, the purchaser (licenser) may short list prospective developers using the procedure and then seek bids from them. Taking note of the fact that the bidding should be in two stages, the first stage, relating to technical aspects and the second stage relating to prices and contractual**

and financial aspects, the Committee are of the view that on the part of the Government there is certain earnestness and eagerness to make a success of the policies in spite of the criticism it has attracted. The Committee find that the private sector entrepreneurs have been cautious and more demanding in view of the risks involved which is understandable. At the same time, the Committee feel that the initiatives will have to come from both sides. While the Government should recognise that private investment against risks involves a price – the excessiveness of depending on the nature and intensity of the risk whereas the private sector should not ignore the fact that there is public accountability involved which is sacrosanct and cannot be violated ignored. On the choice of projects for the private sector, the Committee note that due to long gestation period and many uncertainties involved, hydro projects, especially mega projects, do not find favour with the lenders. This precisely is the reasons why presently only 2 or 3 large hydro projects are under implementation in the private sector. Therefore, to start with, the Committee recommend that the hydro projects which involve lesser risk element and entail lesser capital investment can be considered for development in the Private Sector. . The Committee observe that there are several categories of projects which can ideally be continued to be taken up in the Public Sector. These are (a) Multi purpose projects (b) Projects involving inter-state issues and in inter-state river systems, (c) Projects involving cooperation with neighbouring countries (e.g. Pancheshwar) and (d) Projects for complementary peaking with regional benefits (e.g. Pumped Storage Schemes) (e) Projects in the North - Eastern Region etc. The Committee feel that the following type of projects may be posed for private sector participation:-

- (i) Extension projects where dam and other major structures have already been constructed and the new works proposed cover mainly power house building and installation of generating equipment.
- (ii) Projects at the toe of existing dams, and
- (iii) Run-of-rivers schemes involving minimum underground works

The Committee note that under mega power policy, a hydel project with a capacity of 500 MW is entitled to draw additional benefits of custom duties and local levies and Taxes waiver In spite of much publicised mega hydel policy, there are few takers for it and as such it remained on the paper only. The Committee are of the considered view that for accelerating the pace of hydel development, there is an imperative need to revise the ceiling downwardly under mega power policy. The Committee, therefore recommend that all the hydel projects, except small hydel, be extended all the benefits/concessions, available under Mega Power Policy.

7.23 The Committee are of the opinion that if hydro power development has to be accelerated the role and activities of the existing institutions in the public sector should not only be continued but enlarged substantially. Given the response of the private sector so far and their

limitations, the public sector option should not be ignored or sidelined in the interest of accelerating hydro power development. The Committee, therefore, feel that enormous expertise available in the public sector institutions cannot easily be replicated in the new private sector institutions and the country should make use of such expertise to accelerate hydro power development.

The Committee find that the major hydro potential concentration is in the North Eastern Region. Almost all of this potential is remaining dormant. However, there is no demand for such a large quantum of Power in the North Eastern Region and even private sector may not be interested in such projects. This potential should be harnessed in a systematic manner for the benefit of the region and the surplus made available to the other regions of the country. In fact, it would be ideal to develop this vast potential to establish energy intensive industries like Aluminum in the region. Moreover, the excess energy can be easily transmitted to other regions if transmission facilities are available. The Committee note that PGCIL is already working on the concept of a national grid. It would therefore be necessary to involve institutions such as NHPC, NEEPCO etc. in the power development programme in the North- Eastern Region. A comprehensive and systematic programme of developing the hydro power projects in the North Eastern Region should be prepared by a group of experts from CEA, NHPC, NEEPCO etc. Simultaneously a programme of developing industrial complexes to utilise the cheap hydro power should also be developed. The Committee is happy to learn that action in this regard has been initiated at Prime Minister's initiative and would like to know the outcome of this initiative so far.

7.24 The Committee are happy to learn that recently hydel power PSUs like NHPC have joined hands with the State Government of Madhya Pradesh and West Bengal and floated Joint Venture. Companies for the execution of hydel projects, Omkeshwar and Puralia Pump storage, THDC and NJPC (now SJVNL) are some of the shining examples of joint ventureship. The Committee welcome, the new move on the part of the Central Government. The Committee are of the view that this is a 'win-win' proposition, both for a state and power PSUs. As the State Government is unable to mobilise, financial resources for the development of hydel power due to resource crunch, the PSUs assist them. In return, the expertise, technology and other resources available with them (PSUs) is put to use most optimally. The Committee find that a large number of hydel projects are languishing on account of non-resolution of inter-state disputes. This has only deprived the State much needed hydel power. The Committee desire that Central Government should take proactive role in persuading the State Governments especially those where inter-state disputes are yet to be resolved for entering into Joint Venture with Central PSUs in hydel sector. The Committee would like to await the outcome of such an exercise by the Central Government.

7.25 The Committee also find that the joint venture projects between the Central Public Sector Undertakings and the State Governments are project specific. Since, most of these projects would be completed in near future, there may arise a situation, where these joint ventures would not be able to meet even wage and salaries bills of manpower, if no further projects are allotted to them. The Committee, therefore, recommend that these joint venture companies should also be allotted/given new hydel sites for development within the same State of their operation, so that the available manpower and infrastructure available with them is optimally used.

CHAPTER –VIII

Development of Hydro Power in North Eastern Region

8.1 The Committee have been informed that hydro power potential of the North Eastern Region is about 40% of the total potential of the country whereas geographical area and population of the region when compared to the country are only 8% and 4% respectively. The Committee have been further apprised that per capita income of the region is also one of the lowest in the country indicating poor economic conditions of the States. The States as such neither have the financial capacity nor the technical manpower needed for major hydro power development. As such, unlike other advanced States of the country which have taken upon themselves the task of development of hydro power, the North Eastern States could not make significant progress in this regard. Because of industrial backwardness of the region, low local demand has also come in the way of hydro power development.

8.2 Asked about the pitfalls noticed in promotion of Hydro Power in the Region, the Committee have been informed that North Eastern Region of India is endowed with about 33,140 MW of hydro power potential as compared to country's total of 84,044 MW at 60% load factor. Out of this huge potential, only 3% has been developed including the ongoing projects.

8.3 The Committee observe that the Brahmaputra is an international river and river Barak is the other major river in the North Eastern Region. The Central Government, in the late seventies, considered it expedient to take under its control the regulation and development of water resources of these two river valleys in a planned manner. For this purpose, by an Act of Parliament in September 1980, the Brahmaputra Board was constituted with effect from 31.12.1981.

8.4 As per the mandate, the Board is to prepare Master Plans for the control of floods and bank erosion and improvement of drainage in the Brahmaputra and Barak valleys. In preparing the Master Plans, the Board has to plan for optimum development and utilization of the water resources of the Brahmaputra and the Barak basins for irrigation, hydro power, navigation and other beneficial purposes.

8.5 The Board is also required to prepare detailed project reports and estimates in respect of the dams and other projects relevant to the Master Plans and to construct, maintain and operate such of them as may be approved by the Central Government.

8.6 The Committee have been informed that the Brahmaputra Board has prepared the Master Plans for the main stem of the Brahmaputra and the Barak river system along with 49 major tributaries of the Brahmaputra. Master Plans of the main stems of the Brahmaputra and the Barak river system have been approved by the Government of India. In addition, 24 nos. of tributary Master Plans have been approved by the Board. In these said Master Plans, the Board has reported to identify all the hydro power potential of the tributary sub-basins based on its own studies and studies carried out by other organizations including Central Electricity Authority. According to Ministry of Water Resources, the documentation and the data base created by the Board in these Master Plans is a very valuable work on which all-future water resources developmental works including promotion of hydro power can be based.

8.7 Asked about the role of the Brahmaputra Board in promoting hydro power in the North Eastern Region, Brahmaputra Board informed the Committee in a note as under:-

“As a part of its water resources development effort, the Board has been engaged in the investigation of hydro power projects for the last 20 years and is one of the pioneer organizations in investigation of hydro power projects in the region. In fact the Board has identified and started investigations of most of the major projects in the region and it is this organisation which has brought the huge untapped water resources potential of the region into the limelight.”

8.8 In view of insufficient funds at the disposal of Brahmaputra Board, the Committee have been apprised that prioritization of projects, have been undertaken. Further, Brahmaputra Board has received only Rs.99 crore during the last five years which were just sufficient to cover the salary part of the staff with a very little amount for taking up investigation of projects.

Identification of Hydro Power Potential of NE Region

8.9 **Brahmaputra Board, in the Master Plan of the main stem of the Brahmaputra prepared in 1986, identified hydro power projects in the Brahmaputra valley with proposed installed capacities totaling to 41,000 MW with a plant load capacity factor of 32 per cent. Similarly, in the Master Plan of Barak river system(1998), Board identified projects with installed capacities totaling to 2,200 MW.**

8.10 **However, as a result of its subsequent investigations since 1986, the Brahmaputra Board identified some more potential sites and revised hydro power potential of the region estimated in 2002 in 49,729 MW as per the break up given below:-**

State	No. of Major Projects	Hydro Potential(MW)	Power
Arunachal Pradesh	120		41,710
Assam	8		362
Manipur	9		1,983
Meghalaya	39		2,372
Mizoram	8		661
Nagaland	20		1,299
Tripura	-		-
Sikkim	10		1,342
Total	214		49,729

8.11 **The Committee have been further informed that apart from the Siang(Dehang), Subansiri, Tipaimukh and Bairabi projects, the Brahmaputra Board has been reported to be engaged in the investigation works of 10 nos. of multipurpose dam projects with a total installed capacity of 11,451 MW as given below:-**

Projects	State	Installed Capacity(MW)
Dibang	Arunachal Pradesh	6,000
Lohit	Arunachal Pradesh	3,000
Noadehing	Arunachal Pradesh	75
Jiadhal	Arunachal Pradesh	50
Kameng	Arunachal Pradesh	1,100
Simsang	Meghalaya	130

Kynshi Stage-I	Meghalaya	460
Kynshi Stage-II	Meghalaya	450
Killing Stage-I	Meghalaya	25
Killing Stage-II	Assam and Meghalaya	150
Kulsi	Assam and Meghalaya	36
	Total	11,451

8.12 The above projects are in various stages of investigation and preparation of DPR by Brahmaputra Board. The DPR for the Dibang project is targeted for completion within the year 2003. DPRs of Lohit, Kulsi, Kynshi Stage-I and Noa-Dehing are also in advance stages of preparation.

8.13 Further, Government of Meghalaya has already accorded 'No Objection Certificate' to the Brahmaputra Board for survey, investigation as well as construction of 4 nos. of project viz. Kynshi Stage-I, Kynshi Stage-II, Killing Stage-I and Killing Stage-II. For other projects, respective State Governments have accorded 'No Objection Certificate' for survey and investigation leading to preparation of DPR.

8.14 On Rehabilitation & Resettlement, the Committee have been informed by Brahmaputra Board in a written note that the projects of the region being located in VIth Schedule States, where most of the land belongs to the individuals, acquiring land for the projects is more difficult. The area being hilly, most of the population is concentrated in the river valleys, which comes under submergence by the proposed reservoirs. Relocation of the project affected people stands in the way of implementation of many of the otherwise attractive projects. This is the main reason for which the original single dam proposals of Siang and Subansiri had to be shelved. For the same reason, the Tipaimukh project on river Barak has also not been able to make much headway even after 6 years of its clearance. Further, there is low coal need and high transmission cost of power in the region. Due to the poor industrialization, comparatively less population, and the potential being far in excess of the local need, the urgency of a fast paced exploitation was not there. The region being far away from the main industrial zones of the country, the high transmission cost has been also a major deterrent for development of hydro power. Brahmaputra Board further informed that the NE Region has been identified as one of the richest area in bio-diversity and many restrictions have been put by the Hon'ble Supreme Court for protection of the environment and forests. Therefore, clearance from the environment angle has been an obstacle in the way of hydro power development. The investigation of the Kameng Dam Project(1100 MW) near Tipi is hindered because of this reason.

8.15 Asked about the remedial measure to speed-up the tapping of Hydro Potential in the region, the Brahmaputra Board informed the Committee of the following steps:-

- (i) The National Grid for transmission of power with adequate capacity should be developed on a priority basis to cater to the need of massive power evacuation from the region to bring down the transmission cost component of the individual projects of the region.
- (ii) The procedures for environmental clearance should be simplified and clearance time reduced for speedier implementation of the projects.
- (iii) To surmount the special technical difficulties of the region, an environment should be created so that the latest technological advancements and technical manpower is easily accessible in the region itself for development of these projects.
- (iv) The Central Government has to provide sufficient funds for hydro power development in

the region. However, of late there has been a marked improvement in this aspect with the entry of major players like NHPC in the field. However, more organizations need to be involved in view of the large potential required to be developed in short span of time. It is felt that existing infrastructure of the Brahmaputra Board should be fully oriented more towards development of hydro power.

8.16 About the actual ground realities of hydro power potentials of the region, Brahmaputra Board informed the Committee as under:-

“In the ranking study carried out in 2002 to fix up *inter-se-priority* of the hydro power projects in the country, Central Electricity Authority identified number of projects in the Debang and Lohit basin in Arunachal Pradesh which were cross checked by the Board on the basis of the actual field conditions on request of the Central Electricity Authority in the meeting held at Itanagar(Arunachal Pradesh) on February, 2002 among Central Electricity Authority, Government of Arunachal Pradesh, Brahmaputra Board, National Hydroelectric Power Corporation, North Eastern Electric Power Corporation and Central Water Commission. The project proposals have been modified on the basis of detailed studies already carried out by the Board and the same has been submitted to the CEA.”

8.17 Brahmaputra Board further mentioned that the Ministry of Power have taken an initiative for generation of 50,000 MW of hydro power and has identified 162 projects and entrusted various agencies to prepare the pre-feasibility report(PFR). However, Brahmaputra Board has not been given any assignment even though many projects in the NE Region is under investigation by the Board, and other agencies as detailed below:-

Discrepancies noted by Brahmaputra Board regarding status of projects

Sl No.	Name of project	Agency entrusted by MoP for PFR	Agency actually involved	Status
1.	Hutong, AP	WAPCOS	Br. Board	Feasibility Stage
2.	Kalai, AP	WAPCOS	Br. Board	Feasibility Stage
3.	Dimwe, AP	NHPC	Br. Board	Feasibility Stage
4.	Sushen, Meghalaya	WAPCOS	MSEB	Under Contn.
5.	Umjaut, Meghalaya	WAPCOS	MSEB	Under Invtn.
6.	Umduna, Meghalaya	WAPCOS	MSEB	Under Invtn.
7.	Kynshi Stage-II, Meghalaya	WAPCOS	Br. Board	Under Contn.
8.	Umium Untru-VI, Meghalaya	WAPCOS	MSEB	Under Invtn.
9.	Nongklait, Meghalaya	WAPCOS	MSEB	Under Invtn.
10.	Mawblei, Meghalaya	WAPCOS	Br. Board	Feasibility stage
11.	Kynshi-I, Meghalaya	WAPCOS	Br. Board	Advance stage of DPR preparation
12.	Um-n-Got, Meghalaya	WAPCOS	MSEB	Under Invtn.
13.	Emini, Amulin, Agoline, Attunli, Emratu, Etalin,	NHPC	Br. Board	Feasibility stage

**Emra-I, Elango, Malinye
and Mithumdon**

8.18 Of the targeted 50,000 MW hydro electric projects to be added by 2012, the Chairman, Brahmaputra Board during evidence before the Committee on 3rd July, 2003 has informed that a list of 162 projects have been prepared by Ministry of Power to take up preparation of prefeasibility report. However, the Brahmaputra Board had prepared detailed project reports on some of these projects listed by Ministry of Power which have been already intimated to the Ministry. Brahmaputra Board is also preparing DPR of 11 hydro projects with a total installed capacity of 11,451 MW which would be assigned to agencies like NHPC, NEEPCO, etc. for execution.

8.19 Asked about the contribution of the North-Eastern Council (NEC) in promoting development of hydel power, the Committee have been informed by NEC in a written reply that they took up Survey & Investigation of Hydro Electric Project, provide funding support for implementation of Hydro Electric Power Projects and construction of power transmission lines. About implementation of generation projects, following are the projects taken up by NEC through NEEPCO: -

- (i) Kopilo HEO (2x50 +2x50 = 150 MW)
- (ii) Ranganadi HEP (3x135 = 405 MW)
- (iii) Doyand HEP (3x25 = 75MW)

8.20 In addition, to the above, the following are the projects implemented through the State Governments: -

- (i) Baramura Gas Thermal Project (6.5 MW)
- (ii) Rokhia Gas Thermal Project (2x8 =16 MW)
- (iii) Baramura Gas Thermal Project (21 MW)

8.21 Along with the addition of capacity generation, a matching transmission system to evacuate excess power outside the region as well as to distribution power efficiently within the region is required. With this in mind, NEC has also responded to be funded many transmission projects all over North-East and has contributed a total of 2079 circuit kilometers of transmission lines at a total cost of 363.07 crore. NEC has also informed the Committee that they have made proposal to fund contribution of about 90 kilometers road for Tipaimukh Hydro-Electric Project way back in July, 2000 which has yet to be considered by the Government/NEEPCO.

8.22 The Committee find that due to poor industrialisation, comparatively less population and the potential being far in excess of the local need, speedy exploitation of hydel power in the North-Eastern Region has not taken place. Besides, the high transmission cost, the Committee note that Rehabilitation & Resettlement is also one of the major problems that stands in the way of implementation of many of the otherwise attractive hydel projects. In view of the above, the Committee recommend the Government to develop on a priority basis the National Grid for transmission of power with adequate capacity to cater to the need of requirement of massive power evacuation from the region to bring down the transmission cost component of the individual projects of the region. In this regard, the Committee further desire that

a perspective plan may immediately be drawn for investment in transmission projects in the North-Eastern Region by the Power Grid Corporation for the next 10 years so as to easily evacuate the power generated. The Committee feel that Power Grid Corporation should atleast provide transmission facilities for these projects in the North East which the Government propose to take up during the 10th & 11th Five Year Plans. In addition the PGCIL should identify and provide trunk routes in the North East in advance. Taking into account the technical difficulties due to the difficult and unaccessible geographical terrain, the Committee would also like to know the details of latest technological advancements and technical manpower for development of these projects. The Committee are constrained to note that although Ministry of Power have initiated generation of 50,000 MW of hydro power and has identified 162 projects, the agencies actually involved have not been entrusted to prepare the prefeasibility reports of the projects. Thirteen projects like Hutong, Kalai, Dimwe in Arunachal Pradesh, Sushen, Umjaut, Umduna etc. in Meghalaya for which Survey & Investigation were carried out by Brahmaputra Board or Meghalaya State Electricity Board have now been entrusted to either Water and Power Consultancy Services(India) Limited or National Hydroelectric Power Corporation for preparing prefeasibility Reports. The Committee fail to understand why the original Survey & Investigation agencies have not been associated with preparation of the Pre-Feasibility Reports(PFRs) of these projects when they have already done a lot of work in the field. Taking the factual position in consideration, the Committee strongly urge the Government to immediately associate Brahmaputra Board or MSEB, as the case may be, to submit the Pre-Feasibility Reports(PFR) of most of the projects under their investigation, which are in a very advanced stage and they be given added responsibilities.

- 8.23 To promote Hydro Power in the NE Region, the Committee have examined in detail the role of Brahmaputra Board. Although, the Government have informed the Committee that enough investments are being made so as to boost the exploitation and development of hydro power in the country, the Committee observe that Brahmaputra Board has not been provided funds to boost the tapping of hydro power in North Eastern region. The Committee find that as per the mandate, the Board is to prepare Master Plans for the control of floods and bank erosion and improvement of drainage in the Brahmaputra and Barak valleys. In preparing the Master Plans, the Board has to plan for optimum development and utilization of the water resources of the Brahmaputra and the Barak basins for irrigation, hydro power, navigation and other beneficial purposes. Further, the Board is also required to prepare detailed project reports and estimates in respect of the dams and other projects relevant to the Master Plans and to construct, maintain and operate such of them as may be approved by the Central Government. Taking note of the fact that the Brahmaputra Board, in 1986 had in their Master Plan of the main stem of the Brahmaputra identified hydro power projects in the Brahmaputra Valley with proposed installed capacities totaling to 41, 000 MW with a plant load capacity factor of 32% and Master Plan of Barak river system(1998), projects with installed capacities totaling to 2,200 MW have been identified, the Committee are unhappy to note that only 3% of the identified potential including the ongoing projects has been developed. The Committee cannot but deplore the way the hydro power potential identified by Brahmaputra Board way back in 1986 and further revised in 2002 that stands out at 49,729 MW have not yet been executed. The Committee, therefore, recommend the Government to take necessary steps to augment Hydro Power development in Brahmaputra and Barak valleys and the Committee be apprised of the action taken in this regard.

8.24 The Committee are perturbed to note that agencies/bodies like Brahmaputra Board

which is preparing DPR of 11 hydro projects with a total installed capacity of 11,451 MW to be assigned to NHPC, NEEPCO, etc. for execution has received only Rs.99 crore during the last five years which is reported to be just sufficient to cover the salary part of staff. What is more sad to know is that the agency has not executed any hydel project since inception, although it is required to do so, as per its mandate. The Committee also note that NTPC a 'navratna' have also forayed into hydel sector and are executing Kol Dam in the State of Himachal Pradesh. NTPC is also in the process of undertaking hydel projects in the State of Uttaranchal. The Committee welcome this move of NTPC in entering into hydel sector. The Committee are of the view that for improving hydel share in the country, more and more organizations need to be involved so that the large hydel potential available in the country could be tapped and projects executed in a shortest span of time. The Committee have, however, noted that Brahmaputra Board which is involved in preparation of Detailed Project Reports for hydro project and control/moderation of floods in Brahmaputra Valley and is capable of executing hydel power projects is surviving entirely on Government of India's budgetary support. The Board is not receiving adequate funds. Taking into consideration, the technical infrastructure and manpower available with the Board, the Committee recommend that the Government should make available sufficient funds to Brahmaputra Board so that it can prepare DPRs and they should be allowed to execute hydel power projects.

8.25 The Committee find that Water and Power Consultancy Limited (WAPCOS) agency of the Ministry of Water Resources have undertaken feasibility study, prepared DPR and are also executing a number of hydel projects in Bhutan. This agency has also been nominated as consultant for preparation of feasibility report/DPR under the 50,000 MW hydel Power initiative. However, the execution of hydel project has not been assigned to WAPCOS in the country although they are undertaking such work in Bhutan. The Committee desire that WAPCOS should be involved in execution of hydel projects. Adequate funds should also be made available to them for the purpose.

8.26 The Committee find that inaccurate and unscientific Survey and Investigations have made many of the Detailed Project Reports unreliable. In this context, the Committee desire that accurate, latest and scientific Survey and Investigation tools/equipments/instruments should be used. Improvement in terms of accuracy, quality, automation and production capability has been achieved by deploying the state of art survey instruments like 'Total' Stations, electro planimetres, digitized cameras, computers, scanners, plan printers etc. Such gadgets and equipments should be used while conducting Survey & Investigation.

8.28 The Committee also observe that the North-Eastern Region has one of the lowest *per-capita* income.

In view of this, the Committee desire that special attention is needed to exploit hydel power potential in the region to make the region self-dependent. The development of hydro power could not be achieved in the region because the demand is low. The demand is low because the Government failed to set up industries in the North-East region and constraints of evacuating power from the region to other power deficit regions pending setting up of proper transmission facilities. This all have resulted in low demand of the power generated/to be generated in the region. This vicious circle thus goes on unabated. It can be broken only with the intervention of the Central Government. As such, the Committee feel there is a need to have a relook and examine the policy in a broader perspective rather than pure economics. The development of hydel power in the North-East Region is likely to have the multiplier effects not only in this region but in the whole country. Moreover, the Hon'ble Prime Minister has already given a direction to all the Ministries/Departments that 10% of their budget should be spent in the North-East Region. The Committee feel that this amount can be spent by various Ministries on the various projects relating to hydel power development in the region and they can take care of subjects like security, diversion of roads, construction of bridges and protection of environment, etc. The Committee also recommend that the Ministry of Power should review the policy of 12% free power to home State. In this connection, the Committee desire that the element of 12% free power be backloaded till the repayment of loan is completed. As such State be pursued to defer 12% free power for some initial period which can later on be brought to 12% level gradually. This will make a number of projects viable. The Committee feel that Union Government have to treat the investments made in the North East Region as an investment for the future which will yield handsome returns later on.

- 8.29 The Committee find that the North Eastern Council (NEC) was set up for the overall development of the region. NEC is funding various infrastructure projects, including power. Taking note of the contribution of NEC in development of hydro power in North-East Region, by carrying out Survey & Investigation, providing funding support for implementation of hydro-electric power project and setting up transmission lines to evacuate power within the region, the Committee appreciate the role of NEC in overall development of the North-East Region. NEC has also informed the Committee that they have made proposal to fund contribution of about 90 kilometers road for Tipaimukh Hydro-Electric Project way back in July, 2000 which has yet to be considered by the Government/NEEPCO. With the helping hand rendered by the NEC for development of hydro projects in the region, the Committee expect that the Government/NEEPCO will at least now consider their (NEC) suggestion. The Committee also recommend that the Government should provide more funds to NEC so that the projects languishing for funds constraints could be executed expeditiously. The Committee would like to await the outcome thereof.

CHAPTER –IX

TIPAIMUKH HYDRO-ELECTRIC PROJECT(1500 MW), MANIPUR

The Committee have examined in detail the implementation of Tipaimukh Hydro Electric Project as a case study.

- 9.1 Tipaimukh Hydro Electric(Multipurpose) Project situated near Manipur-Mizoram border at 500 meter downstream of confluence of river Barak with Tuivai in Churachandpur district of Manipur envisages construction of 162.8m high Rockfill Dam

on River Barak to generate 1500 MW of power with 6 units of 250 MW each having firm power of 434.44 MW. The Committee have been informed that Tipaimukh Scheme was thought of way back in 1954. The project was earlier investigated by the erstwhile Central Water & Power Company and then by Central Water Commission since 1955-56. The first Detailed Project Report(DPR) was ready in 1984, but due to various reasons the execution was held up. Later on at the request of North Eastern Council, Brahmaputra Board prepared the DPR in July 1995 and the Technical Advisory Committee(TAC) of Ministry of Water Resources, Government of India accorded approval in its 62nd meeting. During 1998, Government of Manipur expressed their interest for taking up of the project by NEEPCO. The project was with Brahmaputra Board under Ministry of Water Resources and was transferred to Ministry of Power in accordance with the directives of the Prime Minister's Office in March, 1999. On 14.7.1999, Brahmaputra Board handed over the project to NEEPCO.

9.2 The benefits to be accrued from the project are reported to be as under:-

- (i) Power generated will bridge the demand-supply gap for the State of Manipur and other North Eastern States. The peaking power benefits from the project would go a long way in correcting the adverse Hydro-Thermal mix in the country.
- (ii) Beneficial to the people of Manipur from view point of sustained socio-economic development.
- (iii) The project will help in flood moderation in the downstream plains of Assam.
- (iv) Development of pisciculture, water transportation, tourism and drinking water to the people.

9.3 According to the survey carried out by NEEPCO for rehabilitation & resettlement, it was found that 3(three) villages would be submerged fully and 5(five) villages would be submerged partially in Manipur due to the reservoir. However, land of about 90 villages of Manipur will be affected. The affected people of all the 8 villages submerged will be rehabilitated and resettled at higher places with due compensation. All other villages whose land will be affected will be provided with adequate compensation for land and fruit/crops etc. Only 238 families will have to be relocated.

9.4 Enquired about the present status of the project, NEEPCO has informed the Committee in a written reply as under:-

“(a) Status of MoU and NOC from State Governments:-

- MoU with Government of Manipur signed on 9th January, 2003.
- NOC from the Government of Assam obtained in July, 2002.
- NOC from the Government of Mizoram obtained in August, 2001.

(b) Status of various clearances has been as under:-

- (i) 1st stage site clearance from MoE&F obtained in May, 2002.
- (ii) Funding of the project: Letter of Comfort from PFC obtained.
- (iii) TEC obtained from Central Electricity Authority on 2nd July, 2003.
- (iv) Pre-PIB meeting held on 13th August, 2003.
- (v) Various formalities with regard to obtaining remaining statutory clearances are underway.
- (vi) Preparation of design/tender specifications etc. are underway.
- (vii) Invitation for short-listing of prospective bidders through International Competitive Bidding issued in July, 2003. The last date for sale of bids was 2nd September, 2003. The date of submission and opening of bids was 3rd November, 2003.

(viii) Section 18A of the Electricity(Supply) Act issued in January, 2003.

9.5 Asked about the estimated cost of the project, the Ministry of Finance have informed that Rs.5163.86 crores including an IDC of Rs.757.26 crores is estimated for the project. It further informed that the project is stated to produce power at a tariff of Rs.3.08 per unit(1st Year) and Rs.2.34 per unit(levelised). Since the North Eastern Region is power surplus, the power is to be sold to North/Western constituents through PTC. The project is to be implemented at a debt:equity ratio of 70:30. NEEPCO is required to raise debt of about Rs.3600 crore. The plan outlay for this project is only Rs.250crore(Tenth Plan) while the projected requirement is Rs.1959 crore.

9.6 NEEPCO has informed the Committee that the security problems in and around the project are very serious. Reportedly, there are a large number of various insurgent groups active in the area. Since the project is located on the border of Manipur and Mizoram, it is felt that only dedicated central security forces like Assam Rifles, BSF or CRPF or a combination thereof equipped to fight insurgency are essential for providing security to the officers and staff posted for execution of the project. In terms of the decisions taken by the Ministries of Power, Home Affairs and the Government of Manipur, the security cost was to be included in the project cost on the basis of estimates given by CRPF for raising 4 battalions dedicated to the project over the gestation period. An amount of Rs.280.59 crores has been included in the project cost estimates on account of security aspects.

9.7 During a meeting taken by Secretary(Power) on 2nd December, 2002 it has been resolved that the security issues would be decided in consultation with Ministry of Home Affairs and Government of Manipur at the time of obtaining of CCEA clearance.

9.8 Apart from the cost of security as mentioned above, according to NEEPCO, the following costs are included in the estimated cost of Rs.5163.86 crores.

a)Cost on Flood Moderation	=	Rs.288.76 crores
b)Cost on Diversion of Roads/National Highways	=	Rs.105.00 crores

9.9 The Project Authorities, i.e. NEEPCO on the basis of investigation conducted by Central Water Commission till 1992 had prepared a DPR. In the pre-PIB meeting, it was indicated by NEEPCO that security cost, flood moderation and diversion of roads are being loaded to project cost which has a bearing on increasing tariff.

9.10 The Ministry of Finance have informed the Committee in a note that in view of the above loading, NEEPCO had opined that the tariff is unviable. NEEPCO had requested pre-PIB to impress upon Ministry of Home Affairs and Ministry of Surface Transport to take up the cost relating to security and diversion of National Highway so that the same are not loaded on the project cost. The representative of the Ministry in the pre-PIB meeting stated that in the inter-Ministerial meetings conducted by Ministry of Power, both the Ministries declined the above proposal. Further, Manipur is also unwilling to share the flood moderation cost, which again is being loaded to project cost.

9.11 According to Ministry of Finance, NEEPCO in the pre-PIB meeting also indicated that it has not verified the data collected by Central Water Commission or Brahmaputra Board due to insurgency problems at site. In fact, no officer from NEEPCO has visited that site as yet. Therefore, pre-PIB observed that the DPR is table-top calculation and may not reflect ground realities. NEEPCO also indicated that it would sell the entire power through PTC. However, in the pre-PIB meeting, PTC indicated that the tariff of the project falls outside the comfort zone within which it would be able to sell power to Northern Region/Western Region/Southern Region beneficiaries.

9.12 The Ministry of Finance have further stated that the pre-PIB wanted that Survey and Investigation i.e. stage-I should be intensively done and the responsibility be taken by NEEPCO for

the same to prevent any unusual geological surprises in future. Latest data should be collected for geological and meteorological understanding of the area so as to minimize the geological or meteorological uncertainties and thereby reducing the time and cost overruns. After completion of Stage-I activities, as per the prescribed three-stage clearance procedure for all H.E. project, NEEPCO should come to CPIB for State-II clearance as there is no jurisdiction, given the incomplete investigation, lack of essential infrastructure and absence of immediate commercial viability of the present proposal to seek investment approval straightaway. The pre-PIB, therefore, gave a road-map to NEEPCO to move the project ahead in line with the three-stage approval process of Hydro projects as approved by Government of India.

9.13 On submergence and affect on NH-53 by execution of Tipaimukh project, the Committee have been informed by Directorate General, Border Road Organisation in a written note as under:-

“Road NH-53 from Badarpur in Assam to Imphal in Manipur is maintained and under development to NHDL Standards with Border Roads. When a 161m high dam at Tipaimukh was proposed, it was found that the Dam Reservoir level at 180 meter EL affected NH-53 at two locations at Upper Barak and Makru rivers. The Brahmaputra Board carried out a topo sheet study to realign NH-53 at these two locations i.e. between Km 140 to 147.645 and 188.42 to 191.5. The Brahmaputra Board suggested the following:-

- a) Abandon 93 Km of existing NH-53 and realign NH-53 and new length of this diversion will be 170 Km. The realignment was planned in the upper reaches of river Barak and Makru respectively.
- b) Realign NH-53 so as to cross part of reservoir at about 4.75 Kms and 2 Kms upstream of existing bridges across river Barak and Makru respectively. The reservoir width at these places would be 130 meter and 128 meter respectively. The length of diversions were 22 Km at Barak and 12 Km at Makru & this will result abandonment of 26 Kms of existing NH-53.

9.14 Since National Highways are Ministry of Road Transport & Highways subject, the Ministry had asked Border Road Organisation to examine feasibility of alternative at para (b) above and submit details to Brahmaputra Board for their cost acceptance vide their letter No. RS/NH/23014/2/92/SR dated 22nd May, 1992. After carrying out detailed Reccee, realignment portion proposed by BRO was as under:-

a)	Barak river loop from Km 122.2 to 147.645	-	31.135 Km
b)	Makru river loop from Km 188.42 to 191.5	-	29.165 Km

			60.3 Km

9.15 The rough cost for construction to NH, intermediate width specifications is Rs.28.42 crore at (1992-93 pricing) was indicated to Brahmaputra Board, Guwahati excluding cost of forest clearance, etc. vide HQ CE(P) Sewak letter No.24008/RSTC/Fmn/T-Dam/54/E2 Estg dated 24th March, 1993.”

9.16 Asked about the present position, the Committee have been informed that it was made to understand by NEEPCO that the above proposal was not acceptable to the Government of Manipur due to considerable increase in length between Jiribam & Imphal. When NEEPCO took over the project, a fresh joint survey for realignment of NH-53 was proposed vide NEEPCO letter No.NEEPCO/Tipai/16/2000-01/769 dated 2.2.2001 addressed to Commander 36, BRTF and another letter

No.ED(C)/CF/RCE-9/98-99 dated 15.6.2001 addressed to DG(Road Development) & Additional Secretary Ministry of Road Transport & Highways with a copy to Directorate General Border Roads and others.

9.17 The Directorate General, Border Roads Organisation(BRO) further informed that BRO was ready for joint survey of NH-53, but due to insurgency in the area or other related problems, representatives of NEEPCO & State Government could not reach site and carryout survey. It was later on decided on 20.9.2001 at High Level Meeting at New Delhi that the improvement of NH-53 to (Double Laning) be carried out without considering effect of Tipaimukh dam as final investigations after obtaining required statutory clearance and starting of the project may take a long time. However, it was pointed out by NEEPCO vide their letter No. ED(C)/CF/RCE-9/1164-68 dated 2.6.2002 that joint survey could be done as and when the situation improves. Further, at present the work of Double Laning of NH-53 is in progress. According to Directorate General Border Roads nothing can be committed at this stage on cost and quantum of realignment of NH-53 required to be planned to avoid submergence of the road due to the construction of Tipaimukh dam, till joint survey is completed.

9.18 Asked about the security for Tipaimukh Hydro Electric Project, the Committee have been informed by Ministry of Home Affairs that as far as Tipaimukh Hydro Electric Project is concerned, survey team of CRPF had assessed the requirement of force deployment as three Battalions and 2 Companies, till the work of the project was completed and on completion 2 Battalions And 3 Companies to be deployed on permanent basis. The Ministry have further added that as per the policy of the Government, dedicated security for the infrastructure projects such as hydro electric projects is provided only on payment basis. According to the existing policy the cost for dedicated security has to be met by the Project authorities.

9.19 The Secretary, Ministry of Home Affairs further submitted on the issue of security to hydel projects in insurgency affected States during evidence on 15.9.2003 as under:-

“At the moment, the present policy is that the issue of public order is within the domain of the State Government. In maintaining public order, the Central forces can be deployed within a State on short-term or long-term basis depending upon the requirement placed by the State Government. The present policy is that in the normal course cost, of additional police force is to be charged and is to be paid for by the State which requisitions the force. However, there is an exception to this. In Jammu & Kashmir and in the North East, except Assam, this facility is given without payment. In respect of Assam, the payment is restricted to ten per cent. This is in respect of provision of police for the maintenance of public order. When it comes to individual projects or persons whose security is to be maintained, then the present policy is that it should be paid for by the State or the agency concerned.”

9.20 The witness further added :

“this is the policy which is handed down. It can be changed if the Finance Ministry decides that no charge is to be levied. This is one possibility. The other possibility is, the doner

department may say that for the security related aspects, it will be paying out of its own fund. We do not have any fund. Today there is a policy which says that we should charge. So, I can only find out what are the possibilities. The possibilities are; the Finance Ministry says that from today when this note goes to the Cabinet they can plead for it and the Cabinet can decide that the security given to the projects in the North Eastern States will not be charged. That is possible.”

9.21 The Committee find that Tipaimukh Hydro Electric(Multipurpose) Project situated near Manipur-Mizoram border at 500m downstream of confluence of river Barak with Tuivai in Churachandpur district of Manipur envisages construction of 162.8m high Rockfill Dam on River Barak to generate 1500 MW of power with 6 units of 250 MW each having firm power of 434.44 MW. The Committee are, however, unhappy to note that Tipaimukh Scheme which was thought of way back in 1954 and the project investigated in 1955-56 by the erstwhile Central Water & Power Company and then by Central Water Commission is yet to see the light for execution. The Committee are further perturbed to note that although the first DPR was ready in 1984, but execution of the project could not take place due to one or the other reason. The Committee cannot but deplore the way hydel projects are being executed in the country especially in North-Eastern Region which need special attention due to socio-economic backwardness and geographical alienation from the rest of the country.

The Committee are further perturbed to note the lack of co-ordination amongst various agencies associated with the execution of the ancillary works at and near the project site. As regard to realignment/shifting of NH-53, the Directorate General, Border Roads Organisation(BRO) have informed the Committee that BRO was ready for joint survey of NH-53, but due to insurgency in the area or other related problems, representatives of NEEPCO & State Government could not reach site and carryout survey. The Committee note that on 20.9.2001 at a High Level Meeting at New Delhi, it was decided for improvement of NH-53 to (Double Laning) to be carried out without considering effect of Tipaimukh dam as final investigations after obtaining required statutory clearance NEEPCO, however, vide their letter No. ED(C)/CF/RCE-9/1164-68 dated 2.6.2002 has desired that joint survey could be done as and when the situation improves. Further, the work of Double Laning of NH-53 is reported to be in progress now. According to BRO, nothing can be committed at this stage on cost and quantum of realignment of NH-53 required to be planned to avoid submergence of the road due to the construction of Tipaimukh dam, till joint survey is completed. The Committee are constrained to learn that it was only after 9 months of the High Level Committee meeting

held in September, 2001 which decided for improvement of NH-53 that the NEEPCO had responded for a joint survey in June, 2002. The Committee are, therefore, of the opinion that no seriousness has been shown by the Ministry of Power and NEEPCO in undertaking survey works. The Committee recommend the Government/NEEPCO to take necessary steps and complete the joint survey and investigation of the project.

In regard to about the security for Tipaimukh Hydro Electric Project, the Committee have been informed by Ministry of Home Affairs that a survey team of CRPF had assessed the requirement of force deployment as three Battalions and two Companies, till the work of the project was completed and on completion two Battalions and three Companies to be deployed on permanent basis. The Ministry have further added that as per the policy of the Government, dedicated security for the infrastructure projects such as hydro electric projects is provided only on payment basis. According to the existing policy, the cost for dedicated security has to be met by the Project authorities. The Secretary, Ministry of Home Affairs was candid enough to admit that this is the policy which is laid down and it can be changed if the Finance Ministry decides that no charge is to be levied. According to him, the other possibility is, the donor department may agree for the security related aspects and pay it out of its own fund. The Committee are unhappy to note that the projects which will yield huge benefits to the country are held up due to loading of cost of account of flood moderation, diversion of roads/highways, security, etc. The Committee strongly urge the Government that these factors should be taken care of by the State/Central Government, for development of infrastructure projects in the State affected by insurgency so that cost of delivered power is not higher side and the projects become viable. The Committee also note that the Ministries of Home and Surface Transport have not accepted the request of the Ministry of Power in this regard. The Committee suggest that the Ministry of Power should take up this matter with the highest authorities i.e. PMO, etc. and present this case strongly and ensure that the concerned Ministries participate in the power project. The Committee are of the view that no development project, including Hydel in North- Eastern be allowed to languish an account of security. The Committee, therefore, recommend that the Government should make necessary changes in the present policy for development of projects in the North Eastern Region as well as in the State of Jammu & Kashmir immediate to help their social and economic development as well as exploitation of huge hydro power potential in the area. Taking note of the fact that Tipaimukh project will not only meet the demand supply gap of the State of Manipur and other North Eastern States particularly Barrack Valley of Assam but would also be beneficial to the people of Manipur from view point of sustained socio-economic development and help flood moderation in the downstream plain of Assam, development of pisciculture, tourism, water transportation, drinking water etc., the Committee recommend the Government to take all possible steps immediately to ensure that the project is cleared by PIB and CCEA. The Committee would like to be apprised of the action taken by the Government in this regard within 3 months.

CHAPTER –VII

Renovation, Modernization and Uprating of Hydro Power Schemes

Renovation and Modernization has been recognized world over as a well-proven cost-effective technique for improving the performance/ efficiency of older power plants. The useful life of the plants is increased by R&M and the plants yield benefits in the shortest possible time at a reasonable cost. In view of the persistent poor capacity addition of power because of severe and serious resource crunch, the Committee have been informed by the Ministry of Power that the renovation and modernization programme for hydro power plants which will add additional capacity and generation to the system at a minimal investment, is required to be taken up on priority.

The Committee have further been informed by the Ministry of Power that the Government of India set up a National Committee in 1987 to formulate strategy on renovation & modernization of hydro power plants. Based on the recommendations of the National Committee & subsequent reviews, 55 hydro schemes with an aggregate capacity of 9653 MW were identified under Phase- I for implementation of renovation, modernization and uprating work with an estimated cost of Rs. 1493 crore to accrue a benefit of 2531 MW. The Government of India in its policy on hydro power development declared in 1998 have also laid stress on the need for R&M of hydro power plants by according priority to R&M programme. Accordingly, Ministry of Power set up a Standing Committee comprising members from the Central Electricity Authority (CEA), Power Finance Corporation (PFC), SEBs/ PSUs to identify new hydro R&M schemes to be taken up for execution under Phase-II. The Standing Committee recommended 67 hydro schemes with an aggregate capacity of 10318 MW and implementation of Renovation Modernization and Uprating (RM&U) work under Phase-II with an estimated cost of Rs. 2161 crore to accrue a benefit of 3685 MW.

Taking note of the 11th report (1998-99) submitted to Parliament in March, 1999 by the Parliamentary Standing Committee on Energy whereby the Committee had emphasized the need for well defined National

Perspective Plan for 12 to 15 years for R&M and life extension of power plants, the Committee enquired about the action taken thereon so far. In this connection, the Ministry of Power informed the Committee in a written note as under: -

“Perspective Plan for Hydro R&M schemes has been formulated by CEA in June, 2000 for implementation of the proposals under Phase –II along with the left-out schemes of National Committee (Phase-I) under implementation/ yet to be implemented. The schemes identified by CEA under the national Perspective Plan (Phase I+II)& not yet completed were further reviewed in CEA in consultation with the SEBs, PFC, and PSUs during April, 2002 and at the time when the 10th & 11th Plan programmes were finalized. As per the Programme, a total of 72 schemes (10 in Central Sector and 62 in State Sector) with a total installed capacity of 8088.05 MW with an estimated cost of Rs. 2801.547 crore to accrue a benefit of 2886.82 MW have been identified for 10th Plan and a total of 34 schemes (2 nos. under Central Sector & 32 nos. under State Sector) with a total installed capacity of 4631 MW with an estimated cost of Rs. 2012.65 crore to accrue a benefit of 3935.50 MW have been identified for implementation during 11th Plan. Detailed lists of these schemes are at Annexures I & II”.

The Committee have further been informed that power benefits of 429 MW (from 13 schemes at an expenditure of Rs. 127.3 crore), 1342.08 MW (from 20 schemes at an expenditure of Rs. 575.3 crore) and 323.8 MW (from 8 schemes, including one scheme programmed for 11th Plan but completed during 2002-03 of 10th Plan, at an estimated cost of Rs. 367.9 crore) have been achieved during the 8th, 9th and 10th Plan periods respectively after completion of the RM&U works of hydro power stations.

Since most of the hydro power stations in Central Sector are being run and maintained by the National Hydro Power Corporation (NHPC), the Committee desired to know the steps taken by the NHPC for technology up-gradation of hydel power plants in the country. In this regard, the Committee have been apprised by NHPC of the following steps that have been taken for deployment of introduction of upgraded technology for construction of hydel projects: -

- (i) High capacity construction equipment's i.e. Rock botling jumbos, shotcrete machine commensurate with the six projects of NHPC.
- (ii) Modifications in the layout of dams to handle sediments/silt in the reservoir i.e low level spillways combining the function of flood release and silt management.
- (iii) Use of New materials (high strength concrete, shotcrete, reackbolts etc.) for construction of surface and underground works.
- (iv) Increased flexibility in adaptation of designs of the project with respect to available geological condition e.g. concrete faced rockfill dam with cut-off wall in Dhauliganga because of deep overburden in riverbed and non-availability of core material in the vicinity.

- (v) Engaging internationally renowned consultants and contractors for development of the project.

When enquired about the steps related to deployment of upgraded technology for operation of hydel projects taken by the NHPC, the Committee have been apprised in this regard, in a written note as under:-

- Replacement of conventional excitation system by static excitation system.
- Replacement of all conventional machine governors by electrical governors.
- Installation of high-tech monitoring and analyzing instruments (on-line) viz. Air gap Monitor, Dissolved Gas Analyzers and instruction of precision / modern. Sophisticated tooling for maintenance.
- Experimentation and trial of various type of coating with different process which are resistant to silt abrasion on under water parts.
- Replacement of all of the Top Covers and Bottom Rings of modified designs having liners of 20 mm instead of 12 mm.
- Replacement of Guide vanes with 13/4 stainless steel
- Replacement of Guide vane Bearing bodies with modified design of Cast steel instead of cast Iron.
- Providing Top cover pressure relieving arrangement at design stage.
- Replacement of admiralty brass tubes with Cupro- Nicket tubes in respect of coolers of the machines.
- Up-gradation of drainage and dewatering system and installing submersible pumps.
- Initiation of the process for ascertaining the feasibility of installing SCADA system.

The Committee observe that Renovation and Modernization (R&M) has been recognized world over as a well-proven cost-effective technique for improving the performance/ efficiency of older power plants. The Committee feel that the useful life of the plants is increased by R&M and the plants yield benefits in the shortest possible time at a reasonable cost. Taking note of the recommendations of the National Committee & subsequent reviews, the Committee find that 55 hydro schemes with an aggregate capacity of 9653 MW were identified under Phase- I for implementation. The cost of Renovation, Modernization and Uprating (RM&U) work on these 55 hydro schemes was estimated at Rs. 1493 crore with an expected benefit of 2531 MW i.e. more than 25% of aggregate installed capacity. The Ministry of Power have further informed that a Standing Committee comprising members from CEA, PFC, SEBs/ PSUs to identify new hydro R&M schemes to be taken up for execution under Phase-II has been set up. The Standing Committee had recommended 67 hydro schemes with an aggregate capacity of 10318 MW and implementation of RM&U work under Phase-II with an estimated cost of Rs. 2161.00 crore to accrue a benefit of 3685 MW. The Committee expect that the necessary budgetary support to these R&M Schemes will not be a hindrance for implementation of these schemes. The Committee would like to know the planned allocation of budget for Phase- II, R&M Programme.

Consequent upon the recommendation of Standing Committee on Energy contained in the 11th Report (12th Lok Sabha) on R&M of Power Plants, the Committee are happy to note that “Perspective Plan for Hydro R&M Schemes has been formulated by CEA in June, 2000 for implementation of the proposals under Phase –II along with the left-out schemes of National Committee (Phase-I) under implementation/ yet to be implemented. The schemes identified by CEA under the national Perspective Plan (Phase I+II) & not yet completed were further reviewed in CEA in consultation with SEBs, PFC, PSUs during April, 2002 and at the time of framing the 10th & 11th Plan Programmes. As per the programme, the Committee observe a total of 34 schemes (2 numbers under Central Sector & 32 nos. under State Sector) with a total installed capacity of 4631 MW with an estimated cost of Rs. 2012.65 crore to accrue a benefit of 3935.50 MW have been identified for implementation during 9th Plan. 72 schemes (10 in Central Sector and 62 State Sector) with a total installed capacity of 80,88.05 MW with an estimated cost of Rs. 2801.547 crore to accrue a benefit of 2886.82 MW have been identified for 10th Plan. The Committee have been apprised of by the different hydel project authorities that due to pilling of sediments/silt in the reservoir/dam of various hydro projects, the generation of power as well as turbines have been affected badly. The Committee, therefore, desire that steps such as modifications in the layout of dams to handle sediments/silt in the reservoir i.e. low level spillways combining the function of flood release and silt management, use of new materials (high strength concrete, shotcrete, rebarbolts etc.) for construction of surface and underground works, increased flexibility in adaptation of designs of the project with respect to available geological condition e.g. concrete faced rockfill dam with cut-off wall as in Dhauliganga project because of deep overburden in riverbed and non-availability of core material in the vicinity of the projects, replacement of conventional excitation system by static excitation system, replacement of all conventional machine governors by electrical governors and re-engineering the designs of the turbines, etc. as suggested by the National Hydroelectric Power Corporation (NHPC) for deployment and up-gradation of technology of Hydro Plants in the country are needed to be stepped up. The Committee desire that Ministry / PSUs should draw –up an action plan to implement suggestions referred to above in a time bound manner and the Committee be apprised of the action taken thereon.

The Committee also take a strong note of the fact that R&M of hydel plants such as Maithan which were proposed to be completed in Phase-I, yet not completed and slipped to the phase II. Further, there are certain hydel projects, which have stated to be slipped to 11th Plan from the 10th Plan as originally targeted. The Committee failed to understand how these projects have been reported to be slipped to 11th Plan although there are yet three years left in the 10th Plan. The

Committee are perturbed to note that there are certain hydel schemes of the Phase-I of R&M such as Poringalkuthu in Kerala, Umium St. II and Kyredemkulai in Meghalaya in which even DPRs are yet to be prepared or submitted. Further, for Subernrekna (2x65 MW) project in Jharkhand and Hirakud-I (2x37.5 MW) in Orissa under Phase-I R&M have reported to be slipped from 10th Plan and for Subernrekna project even information is also not forthcoming. The Committee cannot but deplore the lackadaisical approach of the Government/SEBs / Power utilities to carry out the R&M work of hydro projects in a time bound manner and urge the Government to take all necessary steps so that the R&M of all pending projects will be completed as per the revised targets. The Committee also recommend that funds should not be the constraints to carryout R&M activities. At the some time the Committee would like to know the details of allocation of funds to the tune, of Rs. 2801.54 crore required during the 10th Plan to accrue benefits of 2886.82 MW by carrying out Renovation Modernization & Uprating works. The Committee desire that the Government should draw up an advance action plan for R&M during 11th plan.

CHAPTER-XI

Inter-state and International Aspects in Execution of Hydro-electric Projects

INTER-STATE ASPECTS INVOLVED IN EXECUTION OF HYDRO-ELECTRIC PROJECTS

Inter-State aspects in respect of Hydro Projects relating to water disputes, water sharing and submergence of land due to construction of projects are dealt in the Ministry of Water Resources/Central Water Commission(Central Water Commission). Most of the major rivers in India are inter-state in character having catchments/watersheds in two or more States.

Asked about the nature of inter-state aspects involved in these projects, the Committee have been apprised by the Ministry of Water Resources in a note as under:-

- (i) Inter-State Water Disputes

- (ii) Water Availability
- (iii) Power/cost Share Disputes
- (iv) Inter-basin diversion of water
- (v) Submergence of land in non-beneficiary States
- (vi) River stretch forms boundary between the States.

It further adds:- ,

“Inter-State aspects in respect of few projects are being looked into by autonomous Boards among the concerned States with/ without representative of Ministry of Water Resources. Concerned States have also taken initiative in case of few other projects for resolving inter-State aspects.”

Enquired about the steps taken so far through negotiations etc. so that inter-state disputes are resolved for optimum development of water resources, the Ministry of Water Resources informed the Committee as under:-

- (i) Encouraging bilateral/ trilateral agreements among the basin States:
- (ii) Securing basin development through Inter-State Agreement on particular projects.
- (iii) Setting up of Joint Control Boards.
- (iv) Arranging consensus in Zonal Councils on vexed non-technical, administrative issues.

Since water is a State subject, the Committee desired to know the views of Ministry of Water Resources to resolve inter-state water disputes. In this regard, the Committee have been apprised of the following constitutional provisions :

LIST I- Union List

Regulation and development of inter-state rivers and river valleys to the extent to which such regulation and development under the control of the Union is declared by Parliament by law to be expedient in the public interest.

LIST II- State List

Water that is to say, water supplies, irrigation and canals, drainage and embankments, water storage and waterpower subject to the provisions of entry 56 of List I.

The various options (I) Transfer of water from State list to Union list, II) State list to Concurrent list would require suitable constitutional amendment which seems to be difficult proposition under the prevailing circumstances.”

The National Commission for Integrated Water Resources Development Plan (1999) (NCIWRDP) had gone into detail of the Constitutional and legal issues pertaining to the subject “water” and they have concluded that there is no need for any change in the scheme of Constitution and what is needed for the Union Government is to pass laws more effectively under existing provisions of the Constitution to deal with inter-state rivers. Accordingly under entry 56 of Union List, Ministry of Water Resources is making efforts to enact an act for inter-state rivers and river valleys(Integrated and Participatory Management).”

As regard to adjudication of water dispute, the Committee have been apprised of the Article 262

of the Constitution of India. It reads as under:-

“Article 262 Adjudication of disputes relating to waters of inter-state rivers or river valleys.

Parliament may by law provide for the adjudication of any dispute or complaint with respect to the use, distribution or control of the waters of, or in, any inter-state river or river valley. Notwithstanding anything in this constitution, Parliament may by law provide that neither the Supreme Court nor any other court shall exercise jurisdiction in respect of any such dispute or complaint as is referred to in Clause 1)”

Inter-State River Water Disputes Act 1956 was enacted under Article 262. Where negotiations do not lead to fruitful results, the water disputes are referred for adjudication to the Water Disputes Tribunal setup under the Inter State Water Disputes Act 1956. Based on Sarkaria Commission recommendations, necessary Act providing for amendments of the existing Inter State River Water Disputes Act 1956 has been enacted as Inter-State River Water Disputes (Amendment) Act 2002. The amendments include time frame for constitution of the Inter State River Water Dispute Tribunal and also prescribes time limit for the Tribunals to give their awards”.

As per the information furnished to the Committee by Ministry of Power, at present 33 Hydro Electric Projects with a total installed capacity of 6085 MW, which were submitted to Central Electricity Authority are held up due to non-resolution of inter-state aspects. All these schemes were conceived more than 5 years ago.

Asked about the strategy that have been evolved to overcome problems arising out of unresovled inter-state issues, as far as hydel projects are concerned, the Committee have been informed by NHPC as under:-

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“As per policy on Hydropower development, Government has recognised the need for evolving an approach to ensure that the available hydroelectric potential is fully utilised without prejudice to the rights of the riparian states as determined by Awards of the Tribunal/Agreements arrived at among the party states for a given river basin with regard to water sharing. As far as possible, there should be preference to take up the river schemes that do not involve any major storage or consumptive use.

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As per information available with NHPC, projects of 6565 MW are held up on account of interstate dispute out of which projects of 3900 MW are in Southern region. Projects of 1760 MW are in cauvery basin itself.

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NHPC embarked upon interstate project with Cauvery Power project. NHPC studied the proposals of Tamilnadu and Karnataka Governments in this regard. There was a difference of perception between them. NHPC developed alternative proposals and presented to both Governments. The energy contribution as per NHPC proposal was more than that envisaged in Karnataka and Tamilnadu proposal. These proposals were forwarded by

Ministry of Power to respective State Government. A draft MOU for execution of these projects under central sector through NHPC was also prepared. Four hydropower project viz Shivasamudram, Mekadatu, Rasimanal and Hogenakkal making an aggregate capacity of 1150 MW were included in it. In the MOU signed between Government of India and Government of Karnataka, it was stated the NHPC would be prepared to execute the four projects subject to Government of Tamil Nadu and Government of Karnataka coming to a mutually satisfactory agreement on sharing of power from these projects.”

NHPC has further informed the Committee that since the two Governments were not coming to an agreement on sharing of power, NHPC offered to conduct survey and investigation of these projects and prepare DPR in about 2 years by which time it was expected that power sharing agreement would be reached. Ministry of Power requested Tamilnadu and Karnataka Government to convey their consents. Whereas Tamilnadu Government conveyed its consent, Karnataka Government conveyed condition consent. As such NHPC could not take up even this activity so far.

Further, NHPC has reportedly approached Tamilnadu and Kerala Governments to give their consent for execution of Pardiya Punna-Puzha (200 MW), Cholatepuzha (60 MW) and Nirar Nallar (250 MW) Projects. Tamilnadu Government had conveyed their consent but there is no response from Kerala Government. NHPC has informed the Committee that it is also prepared to take up such hydro projects provided State Governments favourably respond to it. Water being state subject, NHPC has no other option but to persuade State Governments.

The Committee observe that several hydro-electric projects have been delayed and held up due to water disputes that have arisen amongst the basin States with regard to the use, distribution or control of the water in respect of these inter-state rivers / river valleys or in the interpretation of the terms of any agreement relating to the use, distribution or control of such water or in the implementation of any such agreement or in the levy or any water rate in contravention of various prohibitions. The Committee are unhappy to note that 33 Hydro Electric Projects conceived more than five years ago with a total installed capacity of 6085 MW are held up due to non-resolution of inter-state aspects. What have further shocked the Committee is that in spite of constitutional provisions of adjudication of disputes relating to waters of inter-state river or river valley through Boards/Tribunals constituted under Inter-State River Water Dispute Act, 1956 and the fact that certain Boards/Tribunals do exist, they have failed to give timely award or got them implemented. It is only in the year 2002, that the Government have enacted Inter-State River Water Dispute(Amendment) Act whereby Water Dispute Tribunals have been asked to work in a time limit for giving their awards. The Committee appreciate this amendment and feel that at least now the hydro projects will not be delayed on account of adjudication of dispute of inter-state rivers and the Tribunals will get their awards implemented within a time limit set for it.

The Committee further observe that the incidence of inter-state disputes are more to be seen in the Southern Region where projects with 3900 MW capacity have been held up. Projects of 1760 MW capacity which have been held-up are in Cauvery basin itself. Although, the Committee welcome the initiative of the Government to enter into MoU with State Government of Karnataka to execute four projects through NHPC subject to mutual satisfactory agreement on sharing of power projects between the party States i.e. Tamil Nadu and Karnataka, the Committee are constrained to note that consents of

one or the other State Government could not be obtained resulting in lack of any activity on the projects so far. The Committee find similar response from Governments of Kerala and Tamil Nadu for execution of Padiyar Punna-Puzha(200 MW), Cholatepuzha(60 MW) and Nirar Nallar(250 MW) Projects. The Committee feel that Central Government should intervene more actively and only then it is possible that some interstate projects can be taken up by NHPC. This would generate confidence in the States concerned of protecting and safeguarding of their interests and benefits. The Committee would await any further action taken by the Government in this regard.

The Committee note that the Government is contemplating to develop various hydro power potential with the neighbouring countries like Nepal, Bhutan, etc. for the mutual benefit of people of both the countries. Pancheswar Multipurpose project aiming at creation of power potential of 5000 MW have been initiated in June, 1997 under Mahakali Treaty. Although, all investigations have reportedly to be jointly completed, Detailed Project Report for the project is yet to be finalized pending resolution of certain issues. The Committee desire that the Government should take necessary steps to resolve all issues relating to Pancheswar project with the Government of Nepal at the earliest. At the same time, the Committee would like to know the present status of Sapta Kosi High Dam multipurpose project for which Rs.30 crore has already been provided in the 10th Plan to carry out joint inspections and preparation of Detailed Project Report. The Committee would also like to know the present status of all projects taken up as Joint Venture with the neighbouring countries with reasons for delay, if any, in the execution of these projects. The Committee also desire that the Government should explore the possibilities of tapping hydel resources in other SAARC countries for the benefit of the region, as a whole.

On hydro power generation in the context of Indus Water Treaty, the Committee observe that under the provisions of the Treaty, India is at full liberty to exploit the water resources of the Eastern Rivers Satluj, Veyas and Ravi including the hydroelectric generation. The treaty entitles to put as many as hydel power projects –either storage or run-of-the-river projects –as possible. As per the available information, against 11,219 MW hydroelectric potential at 60% load factor on the Eastern Rivers, projects having 4500 MW installed capacity have already been completed and projects having 3500 MW installed capacity are in different stages of construction. The Committee are, however, unhappy to note that against expected 8769 MW of power at 60% load factor from Western River, Indus, Jhelum and Chenab, projects with installed capacity of only about 1425 MW (like Salal, Lower Jhelum, Uri) have been completed and projects having installed capacity of about 1290 MW (like Dulhasti, Baglihar, Kishenganga) are in different stages of construction or proposed. The Committee are further perturbed to note that although data of 27 hydroelectric projects on the Western Rivers have been communicated to Pakistan under the provisions of the Treaty, India has so far not constructed any storage work on the Western rivers, although, the treaty permits storage of 2 Million Acre Feet (MAF). It is only now Kishenganga H.E. project on Kishenganga river, a tributary of river Jhelum with a storage of 0.14 MAF is proposed to be taken up. As regards to

difficulties in implementation of hydel projects in Jammu & Kashmir on account of Indus Water Treaty, the Committee observe that although the Treaty provides for either country to seek data of projects proposed to be undertaken by the other, which in its opinion may adversely affect its interest and India as the upstream nation has been under an obligation under the Treaty to provide data of projects proposed to be undertaken on Western Rivers, the Committee are dismayed to note that Pakistani authorities non-cooperative approach ignoring sound engineering economics and practices have stalled the development of 'infrastructure projects in the State. In view of the fact that no formal clearance is required from Pakistan for such projects, yet India's obligations under the Treaty make them a subject of endless debate putting hurdles to implementation. The Committee are of the view that the Government should take immediate necessary steps by invoking the relevant provisions of the Treaty, so that ongoing Baglihar HE Project(450 MW) and Kishenganga HE Project(330 MW) are not further delayed. The Committee, therefore, recommend the Government to take all necessary steps with the State Government of Jammu & Kashmir to commission the Baglihar and Kishenganga prospects which were given cabinet approval, way back in May, 1994. In this context, the Committee recommend that these projects should be treated as Fast Track Projects of national importance and extended benefits/concessions available for a hydel mega project. These projects should now be executed without any further loss of time.

The Committee have been apprised of precarious power situation in the State of J&K, especially winters. As against, the demand of 1615 MW, the availability of power is to the tune of 1010 MW in summer. It drops down to 740 MW during Winters due to low discharge and freezing of the river. State experience shortage of around 800 MW during winters and the available hydel capacity go down by 66%. To meet the peaking demand during extreme winters gas turbines are switched on entailing huge expenditure. During the tour of the Standing Committee on Energy to J&K (Srinagar) in June, 2003, the State Government expressed their reservation over Indus Water Treaty, on the grounds that it puts unreasonable restriction on storage capacity of the rivers system of Jhelum and Chenab Indus s only Run-of-the-rivers – type schemes are permitted. The State Government was of the opinion that had there been no such restriction, as envisaged in the treaty, energy loss to the tune of 15% and 44% in case of Uri and Salal Hydel Projects respectively could have been avoided. Further, because of this treaty, the Tulbal Navigation Lock which is under would suspension had stabilized lower Jhelum Hydro Project & Uri-I, especially during winters. The State also opined that had storage been allowed, the stored flood discharge could have been utilized during winters to meet the peaking demand. The Committee have taken note of the sentiments of the State Government of J&K and desire that Union Government should consider the need to review the provision of Indus Water Treaty, especially in the context of under exploitation and utilization of water resources in the river system of Indus, Chenab and Jhelum. Taking note of under storage of run-of-the-river schemes and also under exploitation of water resources for the generation of hydel power, both in Eastern and Western flowing river system, the Committee recommend that more sites should be surveyed and investigated in these river systems so that full hydel potential is harnessed and new hydel stations set up. At the same time, the Committee recommend that full storage capacity to the tune of 2 MAF, be utilised either by commissioning new hydel stations or re-rating/upgrading the capacity of the existing hydel units. The Committee are of the views that these measures are pre-requisite for exploiting the hydel potential in J&K and also meeting the power demand of the State. The Committee would like to be apprised of the action taken by the Government in the matter.

NEW DELHI
22 December, 2003
1 Pausa, 1925 (Saka)

SANTOSH MOHAN DEV,
Chairman
Standing Committee on Energy