STANDING COMMITTEE ON ENERGY

7

(2005-06)

FOURTEENTH LOK SABHA

MINISTRY OF POWER

'Hydro Power – A Critique'

[Action Taken by the Government on the recommendations contained in the Forty Second Report of the Standing Committee on Energy (Thirteenth Lok Sabha) on the subject 'Hydro Power – A Critique']

SEVENTH REPORT

LOK SABHA SECRETARIAT
NEW DELHI

August , 2005/Sravana, 1927 (Saka)

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Presented to Lok Sabha on 19.8.2005

Laid in Rajya Sabha on 19.8.2005

LOK SABHA SECRETARIAT
NEW DELHI

August, 2005/Sravana, 1927 (Saka)

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COMPOSITION OF THE STANDING COMMITTEE ON ENERGY (2004-05)

LOK SABHA

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31. Shri Jesudas Seelam

INTRODUCTION

I, the Chairman, Standing Committee on Energy having been authorised by the Committee to present the Report on their behalf, present this Seventh Report (Fourteenth Lok Sabha) on the Action taken by the Government on the recommendations contained in the Forty Second Report of the Standing Committee on Energy on the subject – 'Hydro Power – A Critique'(Thirteenth Lok Sabha) of the Ministry of Power.

2. The Forty Second Report of the Standing Committee on Energy was presented to Lok Sabha on 23rd December 2003. Replies of the Government to all the recommendations contained in the Report were received on 6th October, 2004.

3. The Standing Committee on Energy considered and adopted this Report at their sitting held on 13th July, 2005.

4. An Analysis on the Action Taken by the Government on the recommendation contained in the Forty Second Report of the Committee is given at Annexure-II.

5. For facility of reference and convenience, the observations and recommendations of the Committee have been printed in bold letters in the body of the Report.

NEW DELHI;
July 15, 2005
Asadha 14, 1927 (Saka)

GURUDAS KAMAT,
Chairman,
Standing Committee on Energy.

CHAPTER-I

REPORT

This Report of the Committee deals with the Action Taken by the Government on the recommendations contained in the 42nd Report (13rd Lok Sabha) of the Standing Committee on Energy on the subject 'Hydro Power- A Critique' of the Ministry of Power which was presented to the Lok Sabha on 23rd December, 2003.

2. Action taken notes have been received from the Government in respect of all the 69 recommendations contained in the Report. These have been categorized as follows: -

(i) Recommendations/Observations which have been accepted by the Government: Sl No.1,3,4,7, 9, 11,13, 18, 19,20,21,24,27,29, 33,34,40,42,44,46,47, 48, 49,50, 51,53, 54, 55,56,57,62,63,64,66,68 and 69

(ii) Recommendations/Observations which the Committee do not desire to persue in view of the Government's replies:
Sl No. 2,6, 8, 14,16, 17, 22,23, 25,28,30,31,32,35,36,39,43,45,58,65 and 67

(iii) Recommendations/Observations in respect of which the replies of the Government have not been accepted by the Committee:
Sl No. 15, 37, 38 and 52

(iv) Recommendations/Observations in respect of which the final replies of the Government are still awaited:
Sl No. 5,10,12,26,41,59,60 and 61

3. The Committee desire the final replies in respect of recommendations for which only interim replies have been given by the Government ought to be furnished to the Committee within 3 months.

4. The Committee also desire that utmost importance should be given to the implementation of recommendations accepted by the Government. In case, where it is not possible for the Government to implement the recommendations in letter and spirit for any reasons, the matter should be reported to the Committee in time with reasons for non-implementation.

5. The Committee will now deal with action taken by the Government on some of their recommendations.

A. SURVEY & INVESTIGATION OF NEW PROJECTS OF DAMODAR VALLEY CORPORATION (DVC)

(Recommendation Sl. No.4, Para No. 2.42)

6. 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 by Damodar Valley Corporation (DVC) for execution, the Committee were constrained to note that no budgetary allocations were provided to start these projects. Taking into consideration, the adverse thermal & hydel mix ratio in the Eastern region, the Committee had recommended that the Government should take up all these new schemes at the earliest. At the same time, the Committee desired to know the present status of the new schemes identified by DVC.

7. The Government in their reply have inter alia stated that in the re-assessment studies of hydro electric potential of the country carried out by CEA during 1978-1987, two schemes mentioned above namely Boro (500 MW) in West Bengal and Lugupahar (2800 MW) in Bihar were identified. However, DVC entrusted the work of investigation and preparation of pre-feasibility report for integrated development of Damodar basin to CWC only in August, 2001 with a special emphasis on the following hydro electricity projects: -

Balpahari Dam with hydro electric project
Bermo Pump storage Project
Bokaro Reservoir (including Lagu Pahar Pump Storage Scheme)

8. CWC had earlier submitted an estimate of Rs. 400 lakhs for the above work, which was accepted, in principle, by the DVC. After several interactions between DVC and CWC, officials of CWC visited the proposed sites in October, 2003. In December, 2003 CWC submitted a revised estimate of Rs. 10.88 crore for the survey and investigation work of (i) Balpahari Dam, (ii) Bermo Pump Storage Scheme and (iii) Boro-Konar Pump Storage Scheme. The work of Logu Pahar was not covered in the estimate furnished by CWC, as the proposed site could not be visited by the team during their visit in October, 2003 owing to local disturbances.

9. CWC has been requested to submit their revised estimates for the pre-feasibility study of Balpahari Dam only and other schemes have been excluded from the purview of the study by CWC.

10. The Committee are constrained to note that although , DVC entrusted the work of investigation and preparation of pre-feasibility report for integrated development of Damodar basin to CWC in August, 2001 with a special emphasis on the Balpahari Dam with hydro electric project, Bermo Pump storage Project, Bokaro Reservoir (including Lagu Pahar Pump Storage Scheme) and CWC had earlier submitted an estimate of Rs. 400 lakhs for the work which was accepted, in principle, by the DVC; the estimates were revised to Rs. 10.88 crore in December, 2003 by CWC without assigning any reasons thereof. The Committee cannot but deplore the delays already committed in negotiating with CWC for award of the survey and investigation of these projects and feel that 5 to 8 years that have been projected for preparation of Detailed Project Reports of the above referred new projects of the Damodar Valley Corporation is unduly a long period to carry out Survey and Investigation activities. The Committee strongly urge the Government to ensure that CWC should carry out the Survey and Investigation including DPR of these already delayed projects within 3 years as per the revised outlays. The Committee would await the action taken by the Government in this regard.

B. Pump Storage Scheme (PSS)

(Recommendation Sl. Nos. 5 & 12, Para Nos. 2.43 & 2.50)

11. The Committee had taken strong note of inaction on the part of the Government in not harnessing the Pump Storage potentials although these were treated essential in optimizing energy generation from base load thermal stations and in meeting peak load and system contingencies. The Committee had observed that only 2.45% of total identified potential of 94,000 MW Pump Storage Schemes had been harnessed and another 2.5% were under construction. The Committee were of the view that a new programme/action plan should be launched, exclusively for PSS, so that the vast untapped potential be exploited expeditiously.

12. In their reply, the Government have inter alia informed the Committee that Pumped Storage Scheme work on the principle of surplus power available during the off-peak period being used to pump water from a reservoir at a lower height to a reservoir at a higher level. During peak hours the water in the higher reservoir is used to generate power thereby increasing the available peaking power in the grid. The cost of peaking power obtained through the pumped storage scheme is high as it includes the cost of the power (off-peak), losses in transmission and in the pumping operations (of the order of 30%)and the cost of operations of the pumped storage schemes. The Indian Power Industry has not enhanced sufficiently to have a high enough differentiation in price between peak and off-peak power to allow commercial operation of pumped storage schemes. As a result, in spite of best efforts, the Tehri Pumped Storage Scheme which is sought to be set up on commercial lines has not yet fructified since the beneficiary States are unwilling to offer off-peak power at low prices (marginally above the cost from thermal units) and purchase the peaking power at rates including the cost as explained above.

13. According to reassessment study of H.E. potential of the country carried out by CEA during 1978-87, 56 Nos. pumped storage schemes with probable aggregate installed capacity of 94,000 MW were identified. At present, 8 no. of pumped storage schemes with installed capacity of 2854 MW are under operation. This works out to 3.04% of the total installed capacity as per CEA studies. At present 3 no. of pumped storage schemes with total installed capacity of 1950 MW are under construction. This works out to 2.07% of the total installed capacity as per CEA studies.

14. In addition, one scheme, namely Tehri St. II Uttaranchal with an installed capacity of 1,000 MW has been accorded TEC by CEA and is awaiting investment decision.

15. The Ministry of Power also mentioned that pumped storage schemes might also involve environmental/forest hindrances similar to conventional hydro electric project. The Ministry further informed that since Pumped Storage Schemes stabilize the grid, increase the efficiency and reliability of thermal plants by sharing peak and fluctuating load, the operation of pump storage projects need to be rationalized to give a proper weightage for these factors and also for the prime power available during peak demand from pumped storage projects. The weightage to the following factors would be quite justified considering that Pumped Storage Project will obviously be costly as the fuel cost would be added for pumping which would be about 50% of total cost of energy, besides lower efficiency in pumping mode etc.: -

(i) Weightage for stabilizing grid and frequency variation in the entire system and thus saving infructuous power consumption,
(ii) Weightage for optimum utilization of thermal Plants and ensuring effective fuel economy,

(iii) Increasing longevity and reducing damage to the thermal plants and
(iv) For assuring industrial growth by providing stable & reliable power.

16. By giving weightage to the above aspects, the PSS may become economical and reasonably comparable with other modes of feasible Peaking Power.

17. According to the Ministry of Power, in Eastern and Western regions of India, where hydro capacity compared to thermal is very small (about 15%) the induction of more and more pumped storage plants would need specific consideration. In these regions, due to less demand during off-peak hours, thermal plants are forced to operate at part loads causing considerable efficiency loss and reduced PLF. The operation of pumped storage plants would provide much needed load in the off-peak hour to enable efficient operation of thermal plants and provide premium peaking power during peak hours.

18. The Committee are unhappy to note that although there are proved advantages of hydel power generated by Pump Storage Scheme (PSS) such as stabilizing grid and frequency variation, optimum utilization of thermal plant, reducing damage to the thermal plant and assuring industrial growth, etc., no action plan has been prepared/launched exclusively for Pump Storage Scheme in spite of vast untapped potential of 94,000 MW and the Committee's recommendation thereto. The Committee are further constrained to note that although the Government have analysed various facts such as (i) Stabilizing grid and frequency variation in the entire system and thus saving infructuous power consumption, (ii) Optimum utilization of thermal Plants and ensuring effective fuel economy, (iii) Increasing longevity, etc., no action has been initiated on the Committee's recommendation to draw an action plan for tapping the huge Pump Storage capacity. The Committee do not concur with the view of the Government that there is less demand in the Eastern and Western regions and as such proposal would need specific consideration only in these regions. The Committee, therefore, reiterate their earlier recommendation that such an action plan for PSS be prepared considering the advantages of PSS and the Committee be immediately apprised of the same.

C. Contingency Plan for Hydel Projects affected by Natural Calamities.

(Recommendation Sl. No. 10 &15, Para No. 2.48 &3.15)

19. The Committee were distressed to note that the cost of Nathpa Jhakri Hydro Electric Project (now SJVNL) in Kinnaur district of Himachal Pradesh had been raised from Rs. 1678.02 crore to 7686.31 crore. This project was delayed from 1996-97 to 2003-04. The Committee had observed that consequent on being affected by flood on 01.08.2000, the restoration of infrastructual works in dam and intake areas, desalting chamber and power house were completed. Diversion tunnel was reported to be made operational again on 18.9.2002 after repair of coffer dam. As regard to the cost escalation of Nathpa-Jhakri Hydro electric Project, the Committee were further perturbed to note the cost escalation which was about Rs. 6000 crore and the project was delayed by seven years. The Committee were not convinced with the reply of the Government that flash floods on 1st August, 2000 had 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, had been neglected and no precautions were taken. The Committee had felt that both CEA and CWC owe an explanation for this and the Government should fix the responsibility in the matter. The Committee, therefore, recommended 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 along with the steps taken to avoid such recurrence in future.

20. The Government in their reply have stated that the Naptha Jhakri Project got delayed due to the following reasons:

(i) Massive rock slides in July, 1993 and March, 1996 at the Dam site and their consequent removal.
(ii) Consequent increase in the length of the diversion tunnel from 400 meter to 700 meter.
(iii) Strengthening of both the right & left banks of rivers Satluj with cable anchors.
(iv) Emergence of shear Zones at Nugalsari, Sholding, Manglad and Rattanpur eneds.
(v) Presence of hot water springs and extremely hot working temperature in the HRT at Wadhal Downstream
(vi) Massive floods in August, 1997 and 1st August, 2000.

All the units of Nathpa Jhakri have been commissioned during 2003-04.

21. About the reasons for delay and time & cost overruns, the Committee have been informed that these are being looked into by the Standing Committee of the Ministry of Power in which the representatives of CEA, CWC, Planning Commission, etc. are also members. The responsibility for lapses, if any, on the part of any organization or individuals will be fixed by the said Standing Committee.

22. As regard to the practices established and various BIS codes on the subject matter of design of various water resources projects the Government have informed the Committee that CWC follows the world over established practice. According to the Government, the unprecedented and extreme natural calamities, that too at construction stage, would cause certain damages. However, prudent project management and timely actions by the project authorities would help in minimising the extent of damages. Further, a suitable flood forecasting system is being planned in Satluj basin for the operation stage. Bhakra Beas Management Board (BBMB) is also participating in the project named, Hydrology Project, Phase-II which is being undertaken by the Ministry of Water Resources. Scope of the proposal is indicated as under:

(i) Installation of Telemetry System in the catchments of Sutlej and Beas rivers for improvement of water management through effective early flood warning system with the help of automatic sensors and satellite based data communication system. The main objective of the scheme would be to have following inputs on real Time basis:-

- Discharges in the river Beas and Sultej upstream Bhakra, Pandoh and Pong Dams.
- Rainfall in corresponding runoff in the Beas and Sutlej Catchments.
- Rainfall and corresponding runof in the Sutlej catechment
- Atomospheric temperatures in the catchments
- Relative humidity
- Wind Velocity (Speed and Direction)

(ii) Estimation and forecasting of rainfall & snowfall and corresponding runoffs.

(iii) Installation of state-of-art automatic electronic gauge recorders at various gauge discharges sites on rivers/channels downstream of Dams along with Real Time Data Communication System.

(iv) Setting up a Central Control Room at Nangal for real time display of observed data of catehcments dams and various rivers/ channels.

23. The Committee are dismayed to note that although there has been continuous problem of the Nathpa Jhakri Hydro Electric Project being hit by the flash floods in 1997, 2000 and 2004; no concrete action was taken to probe the matter in spite of this Committee's earlier recommendations. The Committee had desired an explanation from CEA and CWC who were associated with technical and civil aspects of the project, but no action seems to has been taken. It is only now that the Standing Committee of the Ministry of Power have been constituted to identify the reasons for delay and time & cost overruns, in which the representatives of CEA, CWC, Planning Commission, etc. are also members. The responsibility for lapses, if any, on the part of any organization or individuals is reported to be fixed by the said Standing Committee. The Committee has yet to submit a Report. The Committee deplore the delay in investigation being carried out and strongly recommend that the Committee constituted for the purpose by the Government should identify the lapses and fix the responsibility of the organization/individual within the next 3 months and apprise the Committee of the action taken in this regard. The Committee would also like to know the lacuna with the Detailed Project Report (DPR) of the said project, if any, and would like to know the steps taken to formulate contingency plan to check such incidents as regard to this project and all other major ongoing Hydel Projects.

24. The Committee do not accept the reply of the Government that the practice well established world over on the design of various Water Resources Projects is being followed by Central Water Commission(CWC). The Committee feel that the principal consultant i.e. Central Water Commission which in the present case of Nathpa Jhakri Hydro Power Corporation (NJHPC) (now SLVNL Project) was associated with the design of civil component of the project cannot absolve itself of the responsibilities by merely stating that prudent project management and timely action by the project authorities could have helped in minimising the extent of damages as CWC had not addressed itself to the issue during designing of Civil component of the proejct. The Committee, therefore, strongly urge the Government that designing of civil component of Hydro projects for which CWC / Ministry of Water Resources are associated with should plan elaborate steps to minimise the extent of damages during natural calamities. Although, the Committee appreciate the flood forecasting system that is being planned in Satluj basin and also an Hydrology Project, Phase II, where Bhakra Beas Management Board (BBMB) is also participating, the Committee feel that these issues should have been addressed while finalising the Detailed Project Report of a hydel project. The Committee expect that due care will be taken in all the future projects to avoid devastating losses due to flood or other natural calamities. The Committee would await the action taken by the Government in this regard.

D. Need to setup single window clearance for Hydel Project

(Recommendation Sl.No. 26, Para No. 5.90)

25. The Committee had noted that various authorities such as the Central Electricity Authority, the Ministry of Finance, Ministry of Environment and Forests, etc. had been involved in the appraisal of a hydro power project before it was certified for development. The Committee desired that there was a need to have a single window dispensation/authority so that a project be cleared without much hassles. In this context, the Committee had recommended 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 to private developers. The Techno-Economic, MoEF and CCEA clearances be given within 1, 2 and 2 months respectively. The Committee had also recommended that Ministry of Power should work out a shelve of hydel projects cleared from all the angles. MoEF should also be involved in the appraisal process. The Committee further observed that the Government 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, had desired 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 would ensure that the Hydro-Electric Projects were appraised from environment and forest angles expeditiously. The Committee would like to be apprised of the action taken in this regard.

26. Regarding environmental clearances, the Government have stated that it is proposed that the MOEF would initially prescribe the Terms of Reference (TOR) for carrying out the Environment Impact Studies (EIA)/EMP studies. This will ensure that the parameters for the preparation of documents are fixed initially. There would be no scope for asking for additional details or new information once the TOR has been agreed to. The revised procedure when implemented would ensure that there is no delay in carrying out environmental appraisal once the documents are prepared conforming to the TOR.

27. As regard to forestry clearance, the Government have informed as under:-

> 'The 'Land' is a State subject and hence it is the State/UT Government who first decide on the possible utilization of forest land for non-forestry purpose. The project proponents may take up essential studies in advance which are in the interest of conservation of forests and environment, prior to submission of the project to the State/UT Government.When the State /UT Governments recommend the project, the Central Government considers it in a time bound manner under the provisions of the Forest (Conservation) Act, 1980.A time limit of 210 days has been prescribed for the State Governments/ UTs to process the forestry clearance cases at their various levels and forward it to Central Government for their consideration".

28. The Committee note that the Government is revising the existing procedure as regard to environmental clearances to ensure that there is no delay in carrying out environmental appraisal once the documents are prepared comforming to the Terms of Reference (TOR). However, the Committee find that the reply of the Government is silent about single window dispensation/ authority to clear hydel projects without much hassles. The Committee reiterate their earlier recommendations and would appreciate if the environmental studies, about the various probable sites identified by the Ministry of Power for the projects are carried out by the Ministry of Environment and Forests themselves in advance. This will guide the entrepreneurs to straight away carry out various environmental works as and when they approach the Ministry for clearances to set up the project at an identified place. At the same time, the Committee also desire 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 Committee would like to know the action taken by the Government in this regard.

E. Need to off-load indirect cost components on hydel project

(Recommendations Sl.No. 37& 38 Para Nos. 63& 64)

29. The Committee had observed 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 was a need to accelerate development of identified hydro power schemes in the country. At the same time, the Committee found that many of the hydel projects were located in troubled areas and infested by militancy and terrorist activities. The Committee were of the view that maintaining law and order being the responsibility of the Government, there was 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 Committee opined that recurring expenditure incurred on security, once a hydel project goes on stream should to be charged on the project developer. In the absence of such a change, the Committee felt that a large number of the hydel power projects would become unviable. This had 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, had recommended 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.

30. On cost of access roads being included in the project cost, the Committee had found that hydroelectric projects which generally appeared to be in remote, inaccessible locations had either substandard roads or no access roads. In order to develop the project, main trunk roads had to be either laid afresh or widened and improved to reach the project site. The Committee were constrained to note that although the project authorities were bound to be liable for compensation for land and property which was 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 was being given to State throughout the life of the project. The Committee also felt 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 were also included in the capital cost of the project, the provision of 12% free power, needed reconsideration as the provision did not apply to thermal power projects. The Committee were of the considered view that although economics should be one of the prime guiding philosophy, while determining tariff and production cost, the states be pursued to forgo the provision of 12% free power for initial some years so as to make the projects economically viable.

31. In their reply, the Government have inter-alia stated that the Ministry of Power had mooted a proposal for off-loading cost of security and other indirect costs including highways/ road from the project cost in remote and disturbed areas. The note was circulated to other Ministries for their comments. The proposal did not find favour with the other Ministries including Planning Commission, Ministry of Finance and Ministry of Home Affairs who have all not agreed to the proposal and maintained that these costs be borne by the project only. The proposal is being further pursued with the Stake holders for acceptance. Ministry of Finance are of the view that all components which are directly related to the project have to be a legitimate charge on the project budget. These include R&R costs, security costs and flood mitigation measures, etc. At best, security costs should be borne by the State Government which benefits from the project.

32. The Comments of different Ministries / Department are as under:-

Ministry of Finance, Department of Expenditure

"Alternate highways development due to submergence of a highway as a direct consequence of a project as in the case of 'Tipaimukh' project has to be an integral part of the total project cost and must be included accordingly".

Planning Commission

"Planning Commission has consistently maintained that all costs such as roads, mitigation of environmental or ecological damage, security, R&R etc. are directly resulting from the project should be included in the project cost. This is in accordance with the best international accounting practice and will preclude development of uneconomic and unsustainable site based on erroneous or incomplete cost numbers'.

Ministry of Road, Transport and Highways

We have no comments on the loading or otherwise of the cost of alternative highway development on the power component cost of a hydro electric project as long as specific funding is provided for such highway development.

The Ministry has no objection to the proposal of special Government loans having low interest rates and long moratorium periods.

33. The Ministry of Power further informed that they are also pursuing with the State Governments to agree to stagger the 12% free power keeping it low in the initial year and raising it gradually to 12% in order to keep the initial tariffs viable. However, the State Governments are yet to agree to the proposal even on a case by case basis. However, the Government of J&K has agreed to forego its share of 12% free Power from Baglihar H.E. Project and the Government of Madhya Pradesh has also agreed to forgo its share of 12% free Power from Indira Sagar and Omkareshwar H.E. Projects. The Ministry of Power is reported to be taking up the matter with concerned State Governments on case to case basis wherever necessary.

34. The Committee are unhappy to note that although hydro power projects besides generating electricity, also benefit flood moderation, irrigation and development of backward regions including North-Eastern Region in terms of not only developing inaccessible locations, but also help in economic upliftment of the people of the region and the state, no incentives have been given to these projects. The Committee are further constrained to note that undesirable components are loaded over the project cost making the project unviable. The Committee are not convinced with the Government's reply that construction of highways, providing security etc. are the direct components which should be levied on the project cost while determining tariff. Further, taking into account the present system of allowing a State to draw 12% free power, the Committee recommend that this should be done away with in a phased manner and the States be pursued not to claim the same to make the projects viable. At the sametime, the Committee feel that maintaining law and order, being the responsibility of the Government, there was 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. The Committee also opine that recurring expenditure incurred on security, once a hydel project goes on stream may be charged on the project developer. Taking note of the fact that a huge sum of money in released to States affected by heavy flood / draughts, the Committee feel that construction of dam and increasing storing water capacity would not only help in generating electricity but would also help in curving huge losses incurred due to heavy floods or draughts. The Committee therefore, reiterate their earlier recommendation to off-load indirect cost components of construction of highways, security etc. as these hydel projects not only benefit the backward region/ States which need immediate industrial/ economic development but also help in controlling other problems caused by natural calamities like draughts and floods. The Committee, therefore, stress the need to take necessary steps in this regard and apprise the further action taken thereon.

F. Delay on Account of Acquisition of Land

(Recommendation Sl. No. 41. Para No. 67)

35. The Committee had observed that one of the causes that retarded early execution of a hydel project was delay on account of acquisition of land. The process of land (both private and Govt.) acquisition for a project differed from State to State as per Land Acquisition Act. 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 had further found that delay often takes place due to certain reasons such as deciding the title holder, classification of land and fixation of compensation. The Committee observed that the land records were not properly maintained and updated by the revenue authority, sometimes same land existed in the name of more than one person. There was no standard for fixation of rate of land, land owners often accept compensation under protest and then move the court. The Committee had recommended 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 no time should be wasted in deciding the title holder. The procedure for fixation of compensation for land should also be streamlined. The Committee had also desired that in order to mitigate the problems encountered while acquiring land, the Government should amend Land Acquisition Act and include hydro power projects in the priority list and the State Governments 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, the Committee had recommended that Special Courts be constituted.

36. In their reply, the Government have stated that the recommendations of the Committee have been forwarded to the State Governments, the Department of Land Resources, Ministry of Rural Development and the Ministry of Environment and Forest for implementation.

37. The Committee find the reply of the Government as evasive as it had not reflected the follow-up action taken by them on one of important hurdles of land acquisition in execution of hydel projects. Taking a strong note of the casual manner in which such an important issue have been dealt by the Ministry of Power, the Committee feel that since the issue require simultaneous action by several Ministries/Departments and the State Governments, the Ministry of Power should come with a concrete proposal highlighting the difficulties faced by different hydel power projects due to delays in land acquisition. In this regard, the Committee would like to emphasize the recommendations made by them such as more flexibility should be given to the Project Authorities to acquire land by negotiations, the land records should be updated and computerized so that no time should be wasted in deciding the title holder, and the procedure for fixation of compensation for land should also be streamlined. The Committee also reiterate their earlier recommendation that in order to mitigate the problems encountered while acquiring land, the Government should amend Land Acquisition Act and include hydro power projects in the priority list and the State Governments be persuaded to provide land to the project authority in an agreed time frame to facilitate shifting of Project Affected Persons (PAPs) and in order to expedite the outcome of land disputes, pertaining to power projects, 'Special Courts' be constituted. The Committee would await the action taken by the Ministry of Power in this regard within 3 months.

G. Benefits/Concessions for Hydel Power Projects

(Recommendation No. 47, Para No. 7.23)

38. The Committee had noted that under Mega Power Policy, a hydel project with a capacity of 500 MW was entitled to draw additional benefits of custom duties and local levies and Taxes waiver. In spite of much publicized Mega Hydel Policy, there were reported to be few takers for it and as such it remained on the paper only. The Committee were of the view that for accelerating the pace of hydel development, there was an imperative need to revise the ceiling down-wardly under Mega Power Policy. The Committee, therefore had recommended that all the hydel projects, except small hydel, be extended all the benefits/concessions, available under Mega Power Policy.

39. The Government in their action taken reply have stated that the Ministry of Power had already mooted a revised mega policy cabinet note for relaxing the existing qualifying capacities of 1000 MW for thermal and 500 MW for hydro to 250 MW for both thermal and hydro. The proposal, however did not find favour with the other Ministries when it was sent for their comments.

40. The Committee are dismayed to note that although the Government have planned to achieve 50,000 MW of additional power by the end of 11th Plan period, the incentives such as benefits/concession in custom duties and local levies/taxes on project components are being denied for projects even up to 250 MW resulting in low investments in new power schemes. The Government have not given the reasons as to why the proposal mooted for relaxing the existing qualifying capacities of 1000 MW for thermal and 500 MW for hydro to 250 MW each did not find favour with other Ministries. The Committee would, therefore, like to know the details of the proposal mooted by the Ministry of Power to revise the Mega Power Policy and the reasons for its rejection. At the same time, the Committee again recommend that the Government should pursue to extend all possible benefits/concessions to all hydel projects.

H. Pre-feasibility Report of Hydel Project by Brahmaputra Board

(Recommendation Serial No. 52, Para No.8.22)

41. While observing poor industrialization, comparatively less population and the potential being far in excess of the local need in the North-Eastern Region, the Committee were constrained to note that although Ministry of Power had initiated generation of 50,000 MW of hydro power and has identified 162 projects, the agencies actually involved had not been entrusted to prepare the pre-feasibility reports of the projects. Thirteen projects such as 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 had been entrusted to either Water and Power Consultancy Services(India) Limited or National Hydroelectric Power Corporation for preparing pre-feasibility Reports. The Committee failed to understand as to why the original Survey & Investigation agencies had not been associated with preparation of the Pre-Feasibility Reports(PFRs) of these projects when they had already done a lot of work in the field. Taking note of the factual position, the Committee strongly urge the Government to immediately associate Brahmaputra Board or MSEB, as the case be, to submit the Pre-Feasibility Reports(PFR) of most of the projects under their investigation, which were in a very advanced stage and they should be given added responsibilities.

42. In this connection, the Government have inter-alia stated that 162 schemes spreading in 16 states with aggregating capacity of over 50,000 MW have been considered for preparation of PFRs. The studies / PFRs for all 162 schemes have been completed. National Hydro-Electric Power Corporation, WAPCOS, North-Eastern Electric Power Corporation, Satluj Jal Vidyut Nigam and a number of State Power Utilities have been associated to complete these feasibility studies. As a follow up of completion of PFRs action has been initiated for preparation of DPRs of attractive sites through these agencies.

43. The Committee cannot but deplore the way the Government have furnished vague and incomplete reply to their recommendation. The reply of the Government is silent on the Committee's observation that although thirteen projects such as 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 ; work for preparing per-feasibility Reports had been entrusted to either Water and Power Consultancy Services(India) Limited or National Hydroelectric Power Corporation. The Committee failed to understand as to why the original Survey & Investigation agencies had not been associated with preparation of the Pre-Feasibility Reports(PFRs) of these projects when they had already done a lot of work in the field. The Committee, therefore, reiterate their earlier recommendation to associate the agencies which had carried out S&I for these projects with work relating to preparation of pre-feasibility reports. The Committee would also like to know the reasons as to why these agencies have not been associated while pre-feasibility reports of these projects and these were entrusted to other agencies.

I. Revamping Brahmaputra Board

(Recommendation Serial No. 54 Para No. 8.24)

44. The Committee were 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, received only Rs.99 crore during the last five years which were just sufficient to cover the salary part of staff. The Committee were of the view that for improving hydel share in the country, more and more organizations should 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 had, 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 was also capable of executing hydel power projects survived entirely on Government of India's budgetary support. The Board was not receiving adequate funds. Taking into consideration, the technical infrastructure and manpower available with the Board, the Committee had recommended that the Government should make available sufficient funds to Brahmaputra Board so that it could prepare DPRs and they should also be allowed to execute hydel power projects.

45. In their reply the Government have inter-alia stated that many steps and measures have been taken to boost Hydro Power Development. Hydro Power Corporations in the central sector and the joint sector (Central and State) viz., National Hydro –electric Power Corporation (NHPC), North- Eastern Electric Power Corporation (NEEPCO), Nathpa-Jhakri Power Corporation (NJPC) now SJVNL and Tehri Hdyro Development Corporation (THDC) have been created. Besides, NTPC has also been authorised to take up hydro projects. Narmada Hydro Development Corporation (NHPC), a joint venture of NHPC and Government of MP has been constituted to implement Indira Sagar (1000 MW) and Omkareshwar (560 MW) HE projects. The 50,000 MW Hydro-electric Initiative was launched by Hon'ble Prime Minister which covers preparation of PFRs for 162 hydro-electric projects spreading in 16 states. Preparation of PFRs of 162 schemes with aggregate capacity of 47,930 MW has since been completed. National Hydro-Electric Power Corporation, WAPCOS, North-Eastern Electric Power Corporation, Satluj Jal Vidyut Nigam, HPSEB, UJVNL and KPCL were associated to complete these feasibility studies. These feasibility studies were being coordinated, monitored and appraised by the Central Electricity Authority. As a next step the preparation of DPRs for 77 low tariff hydro electric schemes from these PFRs has been entrusted to the above agencies and also to NTPC and THDC.

46. The Government further informed that at present, the Brahmaputra Board is investigating and preparing DPRs for 11 projects in the North-Eastern Region with installed capacity of 11,451 MW. The Brahmaputra Board is also considering a proposal for revamping the Board so that they can borrow money from the market and take up hydro projects in future. An outlay of Rs. 414 crore has been made for Brahmaputra Board for the X Plan of which Rs. 102 crore is for the continuing scheme for survey and investigation and balance of Rs. 321 crore for execution of projects. All the mega projects being investigated by Brahmaputra Board for hydel power development require huge investment for execution of such projects. In the changing scenario, if Bharhamaputra Board is to enter into construction activities of hydro electric projects with hydel power as major component, the Bharhmaputra Board would be seriously handicapped to execute such projects for want of funds. For undertaking such activities the possible way out is to arrange the funds by way of borrowing money from the market. The construction of multipurpose projects with hydro-power as a major component would also help in realizing the identified hydropower potential in the region and earn revenue for repayment of borrowed loan. For borrowing money, necessary amendments in the related provisions of the Brahmaputra

Board Act will have to be made. Brahmaputra Board has already initiated action to revamp the Board by way of redrafting the Brahmaputra Board Act. The revamping proposal after approval by the Brahmaputra Board and Ministry of Water Resources will be submitted for consideration and approval of the Parliament.

47. The Committee are happy to note that the Brahmaputra Board is investigating and preparing DPRs for 11 projects in the North-Eastern Region with installed capacity of 11,451 MW. The Brahmaputra Board is also considering a proposal for revamping the Board so that they can borrow money from the market and take up hydro projects in future. Further, the Government have informed that Brahmaputra Board has already initiated action to revamp the Board by way of redrafting the Brahmaputra Board Act. The revamping proposal after approval by the Brahmaputra Board and Ministry of Water Resources will be submitted for consideration and approval of the Parliament. Taking into account the technical infrastructure available with the Brahmaputra Board, the Committee recommend that the revamping proposal after approval by the Brahmaputra Board and Ministry of Water Resources should be submitted in a fix time frame for consideration and approval of Parliament. The Committee would like to know the present status of revamping proposal.

CHAPTER II

RECOMMENDATIONS/OBSERVATIONS WHICH HAVE BEEN ACCEPTED BY THE GOVERNMENT

Recommendation (Serial No. 1, Para No. 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.

Reply of the Government

The share of hydro power in the total installed capacity, which was 33% at the start of First plan in 1951, rose upto 46% by the end of Third Five Year Plan, reached to a maximum of 50.62% in 1963 and thereafter experienced a steady decline and at present accounts for 26.6% of the total capacity. In absolute terms the hydro development, since Independence has however, experienced a steady rise from a meager 508 MW in 1947 to 29625 MW as of now. Since Thermal Power has lower risk and lower gestation period and is not site specific, its development has been more as compared to hydro development

The optimum hydro-thermal power mix required for proper management of demand/supply of electricity depends on the load pattern of the system and available power generation resources. A power system having peak load to base load ratio of about two would need a higher hydro-thermal power mix than system having a ratio of 1.5. Further, if gas based peaking plants are available in the system then a lower hydro-thermal may fulfill the requirement of the system effectively.

The constraints which have affected hydro development are technical (difficult investigation, inadequacies in tunneling methods), financial (deficiencies in accessing long term financing), tariff related issues and managerial weaknesses (poor contract management). The hydro projects are also affected by geological surprises (especially in the Himalayan region where underground tunneling is required), inaccessibility of the area, problems due to delay in land acquisition, and resettlement of project affected families, law & order problem in militant infested areas etc.

With the targetted capacity addition of 14,393 MW during 10th Plan, the hydro capacity share may go up to 28% from the present level of 26.6% and will be around 30% if the capacity addition of about 67,000 MW materializes during 11th Plan. Accelerated hydro power development can result in improved hydro share in the overall installed capacity in the country.

Out of 14,393 MW of programmed hydro capacity addition during 10th Plan, Central Sector and State Sector are expected to contribute 8742 MW and 4481 MW respectively and the balance 1170 MW by the Private Sector. Sanctioned and ongoing schemes under implementation will also enable a capacity addition of 6998 MW during the 11th Plan, of which 3690 MW, 1786 MW and 1522 MW will be the contribution of Central Sector, State Sector and Private Sectors respectively. Based on demand forecast, a hydro capacity addition of about 23,500 MW would be required during 11th plan presuming that all the capacity addition envisaged for 10th plan is fully realized.

The Government of India has set the following objectives for accelerating the pace of hydro power development:

To boost the Hydro Power Development in the Country, a 50,000 MW Hydro Initiative was launched by the Hon'ble Prime Minister in May 2003. The following other steps are also being taken:

- Preparation of bankable Detailed Project Report (DPR), based on a detailed survey to avoid geological uncertainty.
- Contract monitoring, as distinct from project monitoring is being emphasized.
- Land acquisition and infrastructure development are to be settled and completed before the start of the project.
- The preliminary ranking study of the remaining hydro potential sites of all the basins in the country has been completed by the CEA, detailed ranking study and preparation of detailed feasibility report based on economic viability is being done.

In addition, the following steps have also been taken to expedite hydro projects:

- A national rehabilitation policy has been prepared by the Department of Rural Development which will reduce time in settlement of R&R Packages to Hydro Projects.
- Clearances for priority projects have been streamlined by introducing three stage clearances procedure.
- Approval procedures have been simplified.
- Facilitation of early financial closure of projects through a concerted approach (comprising the Central Govts. / State Govts., Indian financial institutions, private sector promoters) towards multilateral agencies and other international funding sources.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Serial No.3, Para No. 2.41)

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.

Reply of the Government

PFRs of 162 hydro electric schemes with total installed capacity of 47,970 MW have been prepared . Hydro electric schemes identified in Arunachal Pradesh, Himachal Pradesh and Uttaranchal are as follow :

State	No.	Estimated Installed Capacity
Arunachal Pradesh	42	27293
Himachal Pradesh	15	3,328
Uttaranchal	33	5282
Total	90	35,903

The estimated installed capacity of 35,903 MW in these three states works out to about 75% of the total capacity of 47970 MW. Regarding viability of addition of more than 25,000 MW hydro capacity in the state of Arunachal Pradesh serving peak and frequency support needs of the rest of the country in the context of missing transmission links in NER and absence of national grid etc., it may be mentioned that transmission system for evacuation of power from these schemes shall be finalized at the time of preparation of DPR. Further, interaction with Power Grid Corporation of India Ltd., (PGCIL) has also taken place in regard to transmission of power from North Eastern Region to other regions of the country.

The Hydro potential available in North-eastern region especially Arunachal Pradesh can be fully exploited and made use of for meeting energy/power requirements of the country. For enabling this, transmission system would be needed so that power from the hydro projects in North-eastern Region could be evacuated to pooling points in the NER and there on transmitted to other regions where bulk power requirement exists. The transmission system planning for the National Grid is being carried by CEA as nodal agency in coordination with all the stakeholders e.g. PGCIL, NHPC, NEEPCO and also the State Utilities. The various transmission lines and grid substations which would collectively form the National Grid, are being planned as evacuation system for new generation projects as well as, as system strengthening schemes for the various regions for enabling increased trade in electricity across regions. The development of National grid network is being programmed in a phased manner to match with commissioning of generation projects. Additional transmission capacity is also being provided in the regional networks of Northern, Western and Southern grids for import of power. This additional transmission capacity in the regional networks would help in reducing incremental transmission requirement for hydro projects in North Eastern Region/ Arunachal Pradesh, which in turn enhance the commercial viability of the hydro projects. Present inter-regional power transfer capacity of transmission system is about 8000 MW and this would be increased to about 30,000 MW by 2011-12.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Serial No. 4, Para No. 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.

Reply of the Government

In the re-assessment studies of HE potential of the country carried out by CEA during 1978-1987, two schemes mentioned above namely Boro (500 MW) in West Bengal and Lugupahar (2800 MW) in Bihar were identified.

DVC was entrusted the work of investigation and preparation of pre-feasibility report for integrated development of Damodar basin to CWC in August 2001 with a special emphasis on the following hydro electricity projects.

1. Balpahari Dam with hydro electric project
2. Bermo Pump storage Project
3. Bokaro Reservoir (including Lagu Pahar Pump Storage Scheme)

CWC had earlier submitted an estimate of Rs. 400 lakhs for the above work which was accepted, in principle, by the DVC.

Subsequently DVC requested CWC to take up the investigation work of Boro-Konar Pump Storage scheme also.

After several interactions between DVC & CWC officials, a team of CWC official visited the proposed sites in October 2003.

In December 2003 CWC submitted a revised estimate of Rs. 10.88. Crores for the survey and investigation work of 1. Balpahari Dam, 2. Bermo Pump Storage Scheme & 3. Boro-Konar Pump Storage Scheme.

The work of Logu Pahar was not covered in the estimate furnished by CWC, as the proposed site could not be visited by the team during their visit in October 2003 owing to local disturbances.

Time required by CWC for study & investigation work including preparation of DPR is 5 years. In case Logu Pahar scheme is included, further 3 years will be required. The revised estimate of CWC is under consideration of DVC.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Comments of the Committee

(Please see para 10 of Chapter I of the Report)

Recommendation (Serial No. 7, Para No. 2.45)

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 projects 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 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 centre 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 the 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.

Reply of the Government

After the announcement of Govt. of India's Hydro Power Policy in 1998, the following initiatives have also been taken:

i) Transfer of TEC

CEA has evolved modalities for simplified transfer of TEC of hydro electric projects already cleared by CEA. Now TEC could be accorded in the name of another agency. As per the simplified procedures, TEC has been transferred in favour of the new executive agencies for the following 8 hydro electric projects during the period 1999-2004 :-

		Old Agency	New Agency
1.	Shrinagar (330 MW)	State	DNHPCL
2.	Kol Dam (800 MW)	State	NTPC
3.	Parbati-II (800 MW)	State	NHPC
4.	Indira Sagar (1000 MW)	State	NHDC
5.	Omkareshwar (520 MW)	State	NHDC
6.	Priyadarshini (Jurala) (221.4 MW)	State	APGENCO
7.	Jalaput Dam (18 MW)	State	OPCL
8.	Shrinagar (330 MW)	DNHPCL	AHPCL

ii). Three Stage Development Procedure for Hydroelectric Projects in Central Sector

Ministry of Power in consultation with MOF and MOEF brought out three stage development procedure of new hydro-electric projects in Central Sector for expediting hydro development.

The procedure is summarized below :-

Stage-I

In Stage-I, an expenditure upto Rs. 10 crs. 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 crs., 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.

Stage-II

All cases of Stage-II, where the estimates of cumulative expenditure including Stage-I exceeds Rs. 10 crs.,, will be considered by Committee of PIB (CPIB). Proposals costing Rs. 20 crs. and more will require the approval of Finance Minister. While those involving a cost of over Rs. 50 crs. 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 and Forests would be considered for Stage-II development.

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 completed within one and a half years from the date of sanction.

Stage-III

Stage-III would require 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.

50,000 Mw Hydro-Electric Initiative

To give necessary fillip for development of hydro sector, Central Electricity Authority in the year 2001-2002 completed Ranking Study to determine the inter-se priority of balance hydro electric schemes for taking up their development in appropriate sequence. The schemes considered attractive in the Ranking Study have now been taken up for the purpose of preparation of Preliminary Feasibility Reports (PFRs).

The 50,000 MW Hydro-electric Initiatives was launched by Hon'ble Prime Minister on 24.05.2003 which covers preparation of PFRs for 162 hydro-electric projects spread in 16 states with aggregate capacity of over 50,000 MW. National Hydro-Electric Power Corporation, WAPCOS, North-eastern Electric Power Corporation, Satluj Jal Vidyut Nigam and number of State Power Utilities were associated to complete these feasibility studies. These feasibility studies were being coordinated, monitored and appraised by the Central Electricity Authority. The preparation of Feasibility Reports of 162 H.E schemes with an aggregate installed capacity of 47970 MW has since been completed .

The initiative has evoked interest in the country as also in the international community with regard to enormous potential opportunities to the equipment suppliers, construction agencies, financers and prospective independent power producers.

The PFRs will provide useful information to prospective developers for taking up detailed Survey & Investigation and DPR formulation and facilitate the accelerated

development of balance Hydro Electric Potential in the country. This is considered essential to generate a shelf of project which could be taken up for execution during 11th and 12th Plan and beyond. Implementation agencies viz. PSUs, State Utilities and other organizations will be identified later to develop these projects.

DPR Preparation

As a follow up of preparation of PFR, it is proposed to take up preparation of DPRs for 73 attractive schemes with first year tariff less than Rs. 2.50 /kwh.The aggregate installed capacity of these schemes is about 33000 MW.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No.9, Para No.2.47)

The Committee are not satisfied with the present system of project implementation by NHPC and other hydel power PSUs including, THDC, SJVN 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.

Reply of the Government

These CPSUs are presently making all out efforts to execute every project as per schedule. Recently Chamera-II project of NHPC was dedicated to the Nation by Hon'ble Prime Minister ahead of schedule. All the six units of 250 MW each of Nathpa Jhakri project have been successfully commissioned by SJVNL. The Tehri project is also scheduled for completion during current/ next year. There appears generally no delay on the part of CPSUs in issues such as finalizing loan agreement, placing of orders etc. Where ever feasible, they take action concurrently to save time. Tendering and Pre-bid qualification process are initiated as soon as the project is Techno-economically cleared, and the work is awarded as soon as the CCEA approval is conveyed. However, some times there occurs delay in clearance from MoEF which consequently delays the investment decision.

Purulia Pumped Storage Scheme is under execution in State Sector and is being implemented by WBSEB. Hence, the delays in loan finalization and in award of work are attributable to the State Government. NHPC has signed the MOU in May 2001 for forming a Joint Venture Company to execute this project in Joint Sector with Government of West Bengal. The Pre-PIB Meeting was held on 15.02.02 and the proposal was recommended in the meeting subject to fulfillment of certain conditions like TEC from CEA, routing of JBIC loan through Government of West Bengal without any change and signing of PPA with Government of West Bengal for off peak power as well as sale of power. CEA informed vide letter-dated 28.06.2002 and 16.10.2003 that TEC for this project is not required, as there is no major change in the scope of the project. PPA was signed amongst NHPC, WBPDCL & Government of West Bengal for supply of off peak power to Purulia Project. Another PPA was signed on 2.8.03 among NHPC, WBSEB and Govt. of West Bengal for purchase of entire power from the project by West Bengal. The proposal was discussed in PIB Meeting held on 24.03.2004. PIB proposed change in equity pattern, raised the issue of "in principle" approval of Planning Commission and routing

of JBIC Loan. NHPC has submitted the reply to the observations of Planning Commission vide letter dated 9.8.04. NHPC has already communicated their views on the issues raised in PIB minutes vide letter dated 23.7.04 and also pursued the matter with Govt. of West Bengal for early resolution. Ministry of power is also vigorously pursuing Govt. of West Bengal to resolve various issues as per observations of PIB so that PIB meeting can be convened again and investment decision can be expedited.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Serial No. 11, Para No.2.49)

The Committee have observed delayed execution of several hydel projects both in Central, State and Joint Venture Projects such as Tehri St.-I (4x250 MW) and Sardar Sarovar (6x200+5x50 MW) have been delayed on account of legal hurdles as well as R&R problems. Baglihar Project in Jammu & Kashmir, Lakhwar Vyasi in Uttaranchal have been delayed due to fund constraints, etc. Due to general price escalation, the cost of Lakhwar Vyasi has gone from Rs. 140.9 crores during 1989-90 to Rs. 1446.00 crores during 11th Plan. The Committee feels 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 is 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, desires 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 is of the 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.

Reply of the Government

i). Three Stage Development Procedure for Hydroelectric Projects in Central Sector

Ministry of Power in consultation with MOF and MOEF have brought out three stage development procedure of new hydro-electric projects in Central Sector for expediting hydro development.

The procedure is summarised below :-

Stage-I

In Stage-I, an expenditure upto Rs. 10 crs. 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 crs., 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.

Stage-II

All cases of Stage-II, where the estimates of cumulative expenditure including Stage-I exceeds Rs. 10 crs., will be considered by Committee of PIB (CPIB. Proposals costing Rs. 20 crs. and more will require the approval of Finance Minister. While those involving a cost of over Rs. 50 crs. 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 and Forests would be considered for Stage-II development.

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 completed within one and a half years from the date of sanction.

Stage-III

Stage-III would require 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.

The three stage development procedure is applicable for the projects executed under Central Sector only.

ii) Hydro Electric Schemes for which CEA accorded Commercial Viability

CEA has accorded commercial viability for 20 hydro electric schemes aggregating to an installed capacity of 12426 MW between 2001-02 and 2004-05 (upto Sept., 2004). Details of these schemes are given at **Annex-2.49A.**

Commercial viability for none of the hydro electric schemes is under examination of CEA. One hydro electric scheme viz. Farakka Barrage HEP (75 MW) in West Bengal was found commercially un-viable.

iii) Cost Estimates for Stage-II activities cleared by CEA

CEA has cleared cost estimates for Stage-II activities for 19 hydro electric schemes aggregating to an installed capacity of 12636 MW. The details of these schemes are given at **Annex-2.49B.**

Cost estimates for Stage-II activities for no hydroelectric scheme is under examination.

iv) Hydro Electric Schemes Accorded TEC by CEA

Central Electricity Authority has accorded techno-economic clearance to 26 no. of hydro-electric schemes with an aggregate installed capacity of 10808.90 MW which are likely to give benefit during 11^{th} Plan and beyond..

The details of these schemes are given at **Annex-2.49C.**

v) Hydro Electric Schemes under Examination in CEA

One hydro-electric scheme namely Athirappilly with an installed capacity of 163 MW is under examination for TEC in CEA.

vi) Hydro Electric Schemes returned to Project Authorities for resubmission

81 hydro-electric schemes with an aggregate installed capacity of 21194.6 MW were returned to project authorities for resubmission after compliance of comments/requirements of CEA/CWC. The details of these schemes are given at Annex-2.49D.

vii) Lakhwar Vyasi Project (3x100+2x60=420 MW), Uttaranchal

The project was accepted by Planning Commission for an estimated cost of Rs. 140.97 crs. without TEC of CEA vide letter dated 09.01.1976. The administrative approval was accorded by Govt. of U.P. vide letter dated 24.01.1979.

The project has now been allocated to NHPC. The viability or otherwise of the project in view of high indicative tariff is being looked into.

50,000 Mw Hydro-Electric Initiative

To give necessary fillip for development of hydro sector, Central Electricity Authority in the year 2001-2002 completed Ranking Study to determine the inter-se priority of balance hydro electric schemes for taking up their development in appropriate sequence. The schemes considered attractive in the Ranking Study have now been taken up for the purpose of preparation of Preliminary Feasibility Reports (PFRs).

The 50,000 MW Hydro-electric Initiatives was launched by Hon'ble Prime Minister on 24.05.2003 which covers preparation of PFRs for 162 hydro-electric projects spread in 16 states with aggregate capacity of over 50,000 MW. National Hydro-Electric Power Corporation, WAPCOS, North-eastern Electric Power Corporation, Satluj Jal Vidyut Nigam and number of State Power Utilities were associated to complete these feasibility studies. These feasibility studies were being coordinated, monitored and appraised by the Central Electricity Authority. The preparation of Feasibility Reports of 162 H.E schemes with an aggregate installed capacity of 47970 MW has since been completed .

The initiative has evoked interest in the country as also in the international community with regard to enormous potential opportunities to the equipment suppliers, construction agencies, financers and prospective independent power producers.

The PFRs will provide useful information to prospective developers for taking up detailed Survey & Investigation and DPR formulation and facilitate the accelerated development of balance Hydro Electric Potential in the country. This is considered essential to generate a shelf of project which could be taken up for execution during 11^{th} and 12^{th} Plan and beyond. Implementation agencies viz. PSUs, State Utilities and other organizations will be identified later to develop these projects.

DPR Preparation

As a follow up of preparation of PFR, it is proposed to take up preparation of DPRs for 73 attractive schemes with first year tariff less than Rs. 2.50 /kwh.The aggregate installed capacity of these schemes is about 33000 MW.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Serial No. 13, Para No. 2.51)

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 had 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 perspective plan in each state. The following financial support is extended.

State / 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

The State of Chattisgarh 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 except 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.

Reply of the Government

Following the recommendations of the Standing Committee on Energy in its Thirty-Third Report and as stated in the Action Taken Statement by the Ministry of Non-Conventional Energy Sources (MNES) submitted on 5th December, 2003, by the MNES 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 Standing Committee on Energy has taken note (in para 2.51 of its 42nd Report) of the action taken by the MNES. The MNES is pursuing the mater with States so that the aforesaid scheme is grounded and new potential SHP sites are identified.

Chattisgarh has completed the task with the help of the Alternate Hydro Energy Centre (AHEC), Roorkee and over 100 new sites have been identified in the State. Work in J&K and Uttaranchal is in progress, whereas Punjab likely to initiate it soon. As a follow up of meetings with various States, Jharkhand, Karnataka, Maharashtra, UP, Kerala and Andhra Pradesh have expressed interest and are preparing proposals under the scheme. In addition, a modeling exercise has been completed for a part of Nagaland to identify potential SHP sites. After the model is validated, it is propose to extend this exercise to the entire N.E. Region.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Serial No.18, Para No. 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 cavern 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.

Reply of the Government

The features of the hydro-electric projects, being site-specific, depend on the geology, topography and hydrology at the site. The construction time of a hydro project is greatly influenced by the geology of the area and its accessibility. Most of the hydroelectric projects in India are located in geologically complex Himalayan terrain. As the project components of such superstructures are to be located on rock and soil, which are heterogeneous in nature, thorough geological investigation of the project area is the basic requirement from concept to commissioning of the project. Even when extensive investigation using new techniques of investigations are undertaken an element of uncertainty remains in the subsurface geology and

the geological surprises during actual construction which could cause time and cost overruns, cannot be completely ruled out. Therefore, it is essential that state of the art investigations and construction techniques are adopted to minimize the geological risks as well as the overall gestation period of hydel projects.

TECHNOLOGY INNOVATIONS IN INVESTIGATION

Prior to construction of hydroelectric projects, it is imperative to carry out certain investigations which form the backbone of optimization of project layout and cost estimation. Modern techniques to accelerate the investigations as well as to minimize surprises during the construction, are now adopted. These techniques are being used for Topograhic survey, hydrological observations and Geotechnical investigations. Some are described as under:

Surface Geological Exploration

Surface Geological Mapping

Large scale geological mapping with intensive field traverses by experienced engineering geologists is carried out wherein detailed delineation of bed rock and overburden characteristics are made and picked up systematically on contour plans or survey sheets. The kind of survey is carried out in detail for all the important components of the projects like dam, tunnels, channels, powerhouse complex, tailrace system, reservoir etc. This is done using detailed topographic map on which ground geological details are transferred with the help of survey instruments.

Once the database is created, the next step is to carry out rockmass classification which has proved to be a very useful practical engineering tools, not only because it provides a starting point for the design of tunnel support but also because it forces users to examine the properties of the rockmass in a systematic manner. The rock mass is being classified as per the International Standards which becomes the basic quantitative parameter for further designing of hydro power project components. The engineering judgments which can be made as a result of the familiarity and understanding gained from this systematic study are as useful as any of the calculations associated with the classification systems. Of a number of classifications available worldwide for assessment of rockmass, the widely used are RMR system by Bieniawski (1976) and Q-system by Barton, Lien and Lunde (1974). These classifications include information on the strength of the intact rock material, the spacing, number and surface properties of the structural discontinuities as well as allowances for the influence of subsurface ground water, in situ stress and the orientation and inclination of dominant discontinuities. The RMR methodology is being adopted widely in view of its simplicity in collection of data and interpretation. Assessment of rockmass carried out based on surface data is further supplemented by sub-surface data obtained through drilling & drifting before it is finally used as design parameter.

Now a days, the rockmass involved at all the project components are subjected to this kind of classification and their percentage of occurrence especially for underground structures are helpful in quantity estimation of support system and for adopting methodology of tunneling in systematic manner.

Use of Space Technology for Regional Geological Assessment

Space technology using satellites and aerial photography are used by the international experts or by expert organizations, for faster results in terrain mapping and scientific assessment

of the ground conditions especially for inaccessible regions. Image analysis of satellite digital data and creating spatial geo-reference information of terrain provides basis to address the regional geology faster than the traditional method at comparatively comfortable cost. Remote sensing analysis is used for preparation of different thematic maps comprises of lineament pattern, geomorphic characteristics, lithological and structural details etc. Experience shows that macro level evaluation of the terrain in respect of geological features with certainty for firming up project components may not be possible in this technique owing to small scale. However, these studies are quite effective during reconnoitory and preliminary stages of investigations of the project, being quick and handy especially for identifying the tectonic features. In case the area of survey is hazardous because of steep topography or remote location, the interpretation of aerial photography or satellite imagery with the help of geological data in the neighbourhood and other suitable means may be an effective substitute.

In India, aerial photographs are available with Survey of India and can be obtained on payment after getting requisite permission. Since it takes a long time to get security clearance before acquiring it, especially for restricted areas where normally most of the hydro projects are located, use of photographs is generally not always possible. Fresh aerial photography can also be got done on special request but it is too expensive when small area is involved. Whereas, in case of satellite imagery, a series of remote sensing images of a site, taken at various times, can be obtained from National Remote Sensing Agency (NRSA), Hyderabad on payment.

Sub-surface Geological Exploration

Subsurface explorations *viz.* geophysical survey, exploratory drilling, pitting, trenching and test tunnels/drifting add further details about the site. The initial geological mapping helps in deciding the areas required to be explored in details.

Use of Geophysical Techniques/Equipments for Sub-surface Exploration

This is an indirect method of subsurface investigation technique and has the benefit of covering large areas at small cost. At times this technique can locate features that might be missed by conventional drilling. Geophysics is used as first step in exploration process thus guiding placement & depth of exploration holes. On its own results obtained through these technique are not to be taken as end product but needs checking by direct methods like drill holes and drifts. Out of the several methods of geophysical survey, seismic refraction, tomography and resistivity based surveys are widely used in the investigation of hydropower projects. Some latest geophysical equipments available are detailed as below:

48-channel (Terraloc Mk-6) and 24-channel (Terraloc Mk-3) seismographs for seismic refraction/reflection studies in land and water covered areas.
Seismic Tomography system with sparker source along with latest 2D and 3D softwares for seismic tomographic scanning between drillholes, shafts and tunnels.
3D borehole geophone system for in-situ S-wave measurements in drillhole.
2-Channel Seismograph for determining seismic velocity in drift and tunnel.
Sonic Viewer 170 with P&S transducers for ultrasonic measurements of insitu and core sample.
SAS-4000 Terrameter with imaging system, SAS-300C Terrameter with latest software RES2DINV & RES3DIN for resistivity sounding and 2D/3D resistivity imaging for subsurface exploration.
DS 667 Seismograph with relevant software for vibration monitoring studies for optimum blasting design.

Inclinometer system with relevant software for slope monitoring studies.

Drilling

This is a direct method of subsurface investigation technique & essential tool in the investigation work and is extensively used. Rock cores are recovered through diamond drilling. There are ample diamond rotary drilling machines available in the country in Govt as well as private agencies to undertake required drilling for the investigation of hydroelectric projects. The rock cores recovered from drilling are geologically logged in a format and used as one of the basic inputs. Some of the rock samples are subjected to rock mechanics testing. In addition to this the water permeability tests are conducted through these holes. On an average 1000mts to 3000mts of cumulative length drilling encompassing all the project component area is done for medium to large dam projects so as to minimize grey area.

Exploratory Excavations

Test pits, test trenches, and exploratory tunnels provide access for larger-scaled observations of rock mass character, for determining top of rock profile in highly weathered rock/soil interfaces, and for some in-situ tests which cannot be executed in a smaller borehole.

a. Test pits and trenches: In weak or highly fractured rock, test pits and trenches are constructed quickly and economically by surface-type excavation equipment. Final excavation to grade where samples are to be obtained or in-situ tests performed are done carefully. Test pits and trenches are generally used only above the ground-water level. Exploratory trench excavations are often used in fault evaluation studies. An extension of a bedrock fault into much younger overburden materials exposed by trenching is usually considered proof of recent fault activity.

b. Exploratory tunnels / Drifts. Exploratory tunnels/ drifts permit detailed examination of the composition and geometry of rock structures such as joints, fractures, faults, shear zones, and solution channels. They are commonly used to explore conditions at the locations of large underground excavations and the foundations and abutments of large dam projects. They are particularly appropriate in defining the extent of marginal strength rock or adverse rock structure suspected from surface mapping and boring information. For major projects where high-intensity loads will be transmitted to foundations or abutments, tunnels/adits afford the only practical means for testing in place rock at locations and in directions corresponding to the structure loading. The detailed geology of exploratory tunnels, regardless of their purpose, are mapped carefully. The cost of obtaining an accurate and reliable geologic map of a tunnel is usually insignificant compared with the cost of the tunnel. The geologic information gained from such mapping provides a very useful additional dimension to interpretations of rock structure deduced from other sources. A complete picture of the site geology is achieved only when the geologic data and interpretations from surface mapping, drillings, and pilot tunnels are combined and well correlated. When exploratory tunnels are strategically located, they are often be incorporated into the permanent structure. Exploratory tunnels are used for drainage and post-construction observations to determine seepage quantities and to confirm certain design assumptions. On some projects, exploratory tunnels are used for permanent access or for utility conduits. The drifts/ test adits specially located in dam abutments and underground caverns are used for conducting in-situ rock mechanics testing to find out mechanical properties of rock/shear parameters.

Seismological Studies

Seismic motions cause earthquakes of various magnitudes and intensities with varying effects. A detailed account of neo-tectonic activity, seismotectonic status and seismic history of the area is compiled from field surveys and literature with the help of specialized organizations, viz., India Meteorological Department (IMD) and Department of Earthquake Engineering, IIT - Roorkee. The safe seismic design parameters, in terms of Maximum Credible Earthquake (MCE) and Peak Ground Acceleration (PGA) for major civil structures are derived and got approved by National Committee on Seismic Design Parameters (NCSDP).

Rock Mechanic Testing

Rock mechanic testing is a part of geotechnical investigation to obtain different physical & mechanical parameters of the rock associated with project construction. Generally, these tests are conducted in the field and also on the rock samples in the laboratory. Properties of intact rock, such as unconfined compressive strength, modulus of elasticity, specific gravity, water absorption, durability, shear and compressional seismic velocities and rockmass properties such as compressive and shear strength elastic parameters & compressional wave velocities etc. are determined. Services of reputed Govt. organizations like Central Soil and Material Research Station (CSMRS), New Delhi, Central Mining Research Institute (CMRI), Dhanbad, and National Institute of Rock Mechanics (NIRM), Karnataka are availed regularly and such tests are done at each and every project. Results of these tests are used for reliable design of foundation, slopes stability and underground openings.

INNOVATIONS IN MATERIALS TECHNOLOGY

Latest category of materials such 13.4 Cr. Ni stainless steel for turbine runners, Teflon bushings with steel backings for wicket gates bushes, Cupro-Nickel alloys for heat exchangers of generator air coolers are being used in the Hydro-electric plants. Hard coatings for underwater turbine parts are also being developed to minimize damage due to silt in silt laden projects in Himalayan region.

TECHNOLOGICAL INNOVATIONS IN CONSTRUCTION

The major concern often discussed as regards hydro development in the continued adoption of obsolete , primitive and cumbersome construction technologies and practices.

Simplified, time saving, innovative and more efficient construction techniques adopted in recently completed hydroelectric power projects would provide great help in planning and execution of future hydro projects .

Geological surprises/uncertainties or difficulties are encountered often during construction of hydroelectric projects. There are instances of delayed project construction owing to severe geological problems during tunneling, instability related problems in slopes and underground powerhouse caverns etc. during construction. In order to minimize such problems, the investigations are being planned wherein major part of the tunnel alignments & powerhouse complex are now a days brought more towards the valley side so that geological predictions made from the surface data are more reliable. It helps in approaching the main tunnel through shorter and many number of construction adits. It also help in overall faster construction of the

project. All the underground powerhouse complexes are intensively explored through drifts through out its length and adequate number of in-situ rock mechanic tests are got done to avoid any major surprises during the construction stage. In way, all the major components of the projects envisaged during DPR stage are thoroughly subjected to surface and subsurface exploration methods explained above. It is to understand the geological set up and its implication, layout and design of the project.

PLAN FOR ADOPTING NEW TECHNOLOGY

The new areas of Technology upgradation concerning the Power Sector has been identified and stated in the National Perspective Plan for R&D in Indian Power Sector which has been prepared by a Standing Committee on R&D headed by the Chairman, CEA. The scheme in regard to the Hydro electric sector as derived from the National Perspective Plan broadly covers taking up R&D and acquiring new technology in the following areas:

A Electric & Mechanical Equipments

i) Adjustable speed generating units for pumped storage and conventional hydro electric plants
ii) Development of new materials and alloys including hard coatings for turbine runners and other underwater parts.
iii) Split runners for hydro generating units.
iv) Self lubricated thrust bearings for hydro turbines
v) On-line monitoring devices for hydro generating plants
vi) High efficiency runners
vii) Assessment of residual life and life extension of Hydro generators and transformers.

B) Civil Engineering/Construction

- The large size underground caverns, acquisition of the new technology would enhance significantly the reliability, efficiency and trouble free operation of the new as well as existing Hydro Power Stations.
- Investigation of Hydro Power Projects.
- Numerical 3D modeling & structural non-linear analysis of fill & concrete dams under seismic conditions
- Arch Dams
- R.C.C. dams
- Instrumentation in Hydro Power Projects
- Polymer trash racks for extreme cold situations and trash raking machines at inlet of water intakes
- Suitable lining material for head race tunnel at higher velocities to reduce size of tunnels.

Out of the above areas, R&D work in the following areas is being taken up on priority.

i) Hard coatings for under water turbine parts - Lead agency : NHPC in association with BHEL.

ii) Development of new materials and alloys for underwater turbines parts - Lead Agency: National Metallurgical Laboratory, Jameshdpur.

iii) Field trials of new developed materials/alloys/hard coatings at HE Projects - Lead agency : NHPC

iv) Development of Technology for Design & Construction of Roller Compacted concrete Dams - Lead agency : CSMRS in association with TIFAC & CWC.

Highly skilled and trained manpower in various disciplines like geology, hydrology, electrical mechanical and civil engineering, is the biggest asset for speedier development of hydro power in today's time. Through transfer of technology programme, engineers of the Central Electricity Authority, Central Water Commission and Geological Survey of India have acquired latest / modern know-how in the planned engineering design and monitoring of Hydroelectric Power Projects.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Serial No. 19, Para No. 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 delayed due to fund constraints. The Central public sector outlay for hydro power development has been enhanced from Rs.12,306 crore during the 9^{th} Plan to Rs.25,839 crore during the 10^{th} Plan. Similarly, budgetary support has been raised from Rs.9284 crore during 9^{th} Plan to Rs.17,511 crore during the 10^{th} 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 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 DPRs, 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 10t^{h} Plan.

Reply of the Government

(a) Fund Flow :

Ministry of Power and its PSUs, in close coordination, are trying their best to manage smooth flow of funds for projects through budgetary support and market borrowings, both domestic and external, as per the requirement. Ministry of Power also takes up the issue of budgetary support and market borrowings with MoF and Planning Commission as and when desired by PSUs.

(b) Investment Approval :

. Ministry of Power normally takes up the issue of delegation of powers from time to time with MoF and latter has been delegating the powers on occasions. For example, vide OM dated 18th February, 2002, MoF delegated powers to the Ministry for sanctioning pre-investment activities like preparation of detailed feasibility / Project Reports. For preparation of DFR and pre-investment activities an amount upto Rs. 2 crores subject to availability of budget plan funds can be approved by Secretary of the Administrative Ministry concerned. Proposals of PSUs upto Rs.10 crore for preparation of DPR and pre-investment activities excluding land acquisition/ infrastructure facilities if not funded from the Budget and the concerned PSU is a profit making one, it can be approved by the Minister of the concerned Ministry. For Hydro-electric projects, powers were delegated to Ministry of Power vide letter No.16/31/2000-DO(NHPC) dated 8th June, 2001, empowering to accord sanction of expenditure upto Rs.10 crore for Stage-I on survey, investigation and preparation of Feasibility Report. All cases of Stage-II where the estimates of cumulative expenditure including Stage-I exceeds Rs.10 crores will be considered by the Committee of PIB (CPIB). Proposals costing Rs.20 crore and more will require FM's approval while those involving a cost of over Rs.50 crore will require the approval of the Cabinet/ CCEA. Stage-III would require the approval of PIB/ CCEA for investment decision in respect of construction of the project. The issue of expenditure on pre-investment activities/ preparation of DPRs in case of transmission projects was also taken up with MoF and consequently powers were delegated to Ministry of Power vide letter No.1(1)/PF.II/2002, dated 23.09.2002 to accord approval to proposals of POWERGRID upto

Rs.10 crore for preparation of DFR and pre-investment activities including land acquisition/ infrastructure facilities if not funded from Budget and PSU is profit making and where the generation project associated with the transmission project has been granted investment approval. Financial & Operational autonomy was given to profit making public sector undertakings – miniratnas vide O.M.No.11(36)/97-Fin. dated 9th October, 1997. In addition to the above, Ministry of Power, in accordance with the guidelines of DPE, allowed the sanction of Stage-II activities by NHPC Board of Directors upto Rs.50 crore. This delegation, issued vide D.O. No.F 28012/8/2002-Fin dated 29th January, 2003 has helped in accelerating the process of Stage-II activities for new projects. The Ministry of Power has taken up the issue of enhanced delegation of powers with the Ministry of Finance. A proposal of this Ministry is under discussion by the Committee of Secretaries.

(c) The reason why low outlays have been approved for the first two years of the 10th Plan for NTPC, NHPC, THDC, SJVN and NEEPCO is that the demand for funds depends on the construction schedule of the projects. The details of low outlay, corporation-wise are as under :

NHPC

Major reasons for less utilization of funds during the first two years of the Tenth Five Year Plan are delay in the following clearances/ activities as envisaged during finalisation of outlay for Tenth Five Year Plan were due to non-settlement of issues including environmental, geological and commercial – certain projects could not be approved by the competent authority during the first two years as a result of which the outlays for both the years were revised at the early stage. These projects are :-

(a) Purulia Pump Storage
(b) Kishanganga
(c) Parbati-III
(d) Chamera-III

In addition it was decided that for survey & investigation of new schemes, NHPC will not utilize the budgetary support of the Govt. instead it will conduct these activities from its internal resources.

THDC

An amount of Rs.3646.50 crore has been allocated to THDC in the Tenth Plan. Actual utilization in 2002-03 is Rs.920.02 crore and Rs.560.04 crore during 10 months of 2003-04 so THDC has utilized 40.58% of Tenth Plan Provision during one year and ten months. The utilisation of funds was contingent upon the approval of revised cost estimates of Tehri Stage-I project. Due to reasons beyond the control of the Ministry, RCE could not be approved resulting in lesser outlays.

SJVN

The last unit of Nathpa Jhakri project was commissioned in the month of May, 2004. The requirement of budgetary support from the Govt. of India was not necessary as SJVN was able to raise adequate loans to fund the remaining activities of the project during the first two years.

NEEPCO

Plan outlay in the Annual Plan 2002-03 and 2003-04 were low since investment decision for other new projects, as anticipated, could not be obtained. There has been delay in tying up of various issues required for investment decisions.

The projects which could not get approval during the first two years are Tipaimukh HEP, Tripura Gas Based Project and Kameng HEP.

In case of Tipaimukh HEP, various factors loaded on to the project cost like security cost, cost of diversion of national highways and flood moderation has resulted in making the tariff unviable.

Tripura Gas Based Project was reconfigured from 500 MW to 280 MW due to less availability of gas resulting in delayed approval of the competent authority.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Serial No. 20, Para No. 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 access 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.

Reply of the Government

With the enactment of the new Electricity Act, there has been a renewed interest by the private sector in investment. It may be mentioned that with open access having been allowed, there is no difficulty in good projects having moderate and attractive tariff to starve of funds. In fact, a mega project of 1000 MW, namely, Karchamwangtoo HEP is close to achieving financial closure – which is a private sector project.

With regard to public sector projects, it has been the endeavour of the Govt. to ensure that no projects lack due to non-availability of funds – either equity by way of budgetary support from Govt. of India or loan funds. Further Power Finance Corporation (PFC) and Rural Electrification Corporation (REC), which are sector-specific development financial institution

dedicated to power sector, for ensuring that loan funds are provided to the projects in a time-bound manner.

As regards state sector projects, as and when the State Govt. requires assistance, Centre has stepped in so as to ensure that the project implementation continues as scheduled. Examples of state sector projects where the Govt. has provided help recently are Baglihaar HEP and Purulia Pump Storage Project. In addition to the above, PFC has set up an India Power Fund, which is a venture capital fund to provide the last mile equity to various projects.

It is, therefore, felt that there is no problem in so far as providing finances for hydro power development is concerned provided that the tariff of the project is good and it is saleable. In view of the above there is no proposal before the Govt. to create a special dedicated fund for hydro power development.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 21, Para No. 5.85)

By far the most formidable element which retards the faster execution of hydro projects is the delay on account of permission to obtain clearances and approval from the Ministry of Environment & 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/developmental 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.

Reply of the Government

A. Environmental clearance

The concerns expressed on account of time and cost overruns due to the delay in environmental and forestry clearances have been carefully examined by the Ministry of Environment & Forests. The clearances are mandatory in nature and the procedures for obtaining clearances are revised from time to time keeping in view the mandatory responsibilities, transparency, accountability and requirements of all the stakeholders involved. As per the mandatory requirements, environmental assessment of the project has to be completed within a period of 90 days from the receipt of complete information from the project authorities and a decision conveyed within 30 days thereafter. The current environmental clearance procedures are being closely reviewed to avoid delays and at the same time to bring objectivity in appraising proposals referred to the Ministry for environmental clearance.

The Ministry of Environment & Forests has undertaken an exercise for reengineering of environmental clearance process with a view to make it more effective and time bound. The proposed reengineering process would include various steps including screening, scoping, public consultations, appraisal and post project monitoring. Presently, the revised environmental

clearance process is being deliberated upon intensively within the Ministry. After intra-Ministerial discussions, discussions will be held with the concerned Ministries/Departments and Industry Associations. On completion of the consultations with all the concerned stakeholders, a draft notification would be issued subject to its approval by the Government.

B. Forest clearance

- Forests are the precious natural resource base of our country and contribute to national GDP by about 2.3% besides providing livelihood to millions of people, fresh and pollution free environment. Forests are precious because they support agriculture of the country by maintaining the nutrient cycle in the soil and influence local rains. Forests prevent floods, drought and desertification. Forests are rich source of bio-diversity, flora & fauna. There is huge biodiversity in our forests for which there is great demand in global market and forests are the good source of foreign exchange through eco-tourism, export of bamboo, handicraft, and non-timber forest products including medicinal plant products. It is very difficult to assess the actual value of the forests due to their intangible benefits and there is a need to conserve the natural forests and forest land to the greatest extent.

- While diverting forest land for Hydro projects, the whole forest area goes under submergence and the forest is lost for ever. Due to loss of this forest cover, the extent of damage caused to the agriculture, livelihood of the people and the environment cannot be always measured in monetary terms. The question of inter-generational equity is also very important as no monetary value can be attached to the loss of forests for the future generations.

- Forest (Conservation) Act, 1980 is a regulatory Act and has significantly contributed in the conservation of the national heritage of the country.

- Ministry of Environment & Forests has already fixed a time frame for the processing and disposal of the project proposals through Forest (Conservation) Rules, 2003 framed under Forest (Conservation) Act, 1980. To simplify the procedure, these rules have been amended further in 2004. As desired by the Standing Committee on Energy, a time limit of 90 days has been fixed for the Central Government to take a decision on the forest clearance.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 24, Para No. 5.88)

The Committee find that where any hydel project involves diversion of forests 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 the 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, concur with the view 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.

Reply of the Government

- Supreme Court vide their order dated 14.2.2000 in Civil Writ Petition No.202 of 1995 prohibited the removal of diseased, dying or wind fallen trees, drift wood and grass etc. from any National Park or Sanctuary.
- Supreme Court vide their order dated 13.11.2000 in Civil Writ Petition No.337 of 1995 ordered that there should be no de-reservation of forest, sanctuary and national park area.
- Supreme Court vide their order dated 9th May, 2002 in Civil Writ Petition No.337 of 1995 ordered that no permission under Section 29 of the Wild Life (Protection) Act should be granted without getting the approval of the Standing Committee.
- After the order dated 13.11.2000, the user agencies and the State Governments started filing affidavits in the Supreme Court requesting for permission to divert the area for developmental projects.
- Such diversion cases were referred to the Standing Committee for Indian Board for Wildlife for its opinion. The opinion/ recommendations of the Standing Committee were placed before the Supreme Court and in most of the cases, the recommendations have been accepted.
- However, the Supreme Court also referred some diversion proposals to the Central Empowered Committee for its opinion.
- Ministry of Environment and Forests had requested the Supreme Court for deleting the word "forests" from their order dated 13.11.2000 in Civil Writ Petition No.337. The Supreme Court has rejected the same on 9.2.2004.
- A National Board for Wildlife has been constituted under the provisions of the Wild Life (Protection) Act, 1972. The National Board is a statutory body under the Chairmanship of Prime Minister. The Board is primarily responsible for promoting the conservation and development of wildlife and forests in the country. It consists of experts from Government Organizations, Non-Governmental Organizations, eminent Conservationists, Ecologists and Environmentalists. The Board is competent to take decision regarding diversion proposals.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 27, Para No. 5.91)

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 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 Certificate 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 directed 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.

Reply of the Government

At present, the appraisal of project proposals for environmental and forestry clearances are being simultaneously processed, however, the environmental clearance is issued after forestry clearance has been accorded. The recommendation would be appropriately incorporated in the revised environmental clearance procedures under review.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 29, Para No. 5.93)

The Committee have been informed that a World Bank Study aimed at bringing in reforms in the environment and forest clearance procedures underway. They have also been informed that the said studies 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.

Reply of the Government

The World Bank study is restricted to the reengineering of the environmental clearance procedures. The specific recommendations of the Committee have been communicated to the World Bank Consultant for suitably incorporating them in the revised Environmental Clearance procedures. Presently, the revised environmental clearance process is being deliberated and after consultations with all the concerned stakeholders, the revised procedures would be notified subject to its approval by the Government.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 33, Para No. 5.97)

It has been brought to the notice of the Committee that the preparation of the Catchment Area Treatment (CAT) Plan is being routed through the State Government which has made the entire process as 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 works 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 & Forests should review the works/items included under the 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.

Reply of the Government

- Ministry has taken note of the concern shown by the Committee for arbitrariness in the manner the Catchment Area Treatment Plan is prepared/ processed at the level of the State Government and all types of works/ expenditure items are included in the Plan..

- Ministry has also noted the decision of the Committee that the Ministry should review the work/ items included the CAT/CA proposals, the cost norms and the percentage of cost admissible under overheads and miscellaneous activities.
- As desired by the Committee, these items will be reviewed at the level of Ministry and the action taken intimated in due course.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 34, Para No. 5.98)

The Committee finds 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 is 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 Afforestaton 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 utilization 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.

Reply of the Government

- For the proper utilisation of funds Compensatory Afforestation, Catchment Area Treatment Plan, Wildlife Management Plans, Bio-diversity Conservation Plans etc, and their monitoring, an authority namely Compensatory Afforestation Fund Management and Planning Authority (CAMPA) has already been constituted vide order dated:23-4-2004 published in Official Gazette in accordance with an order dated 30/10/2002 of the Hon'ble Supreme Court in Writ Petition (C) No. 202 of 1995.
- The User Agency shall deposit the funds with CAMPA which will not be a part of the Consolidated Funds of India. This fund will directly be released by the CAMPA to the implementing agency in the field for the execution as per the schemes submitted by the State / UT Governments.
- CAMPA will have independent monitoring system.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 40, Para No. 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 the 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.

Reply of the Government

The National Policy on resettlement and rehabilitation for project affected families has already been formulated and notified by the Department of Land Resources, Ministry of Rural Development. The policy essentially addresses the need to provide succor to the assetless rural poor and support the rehabilitation efforts of the poorer sections of project affected families, small and marginal farmers, SC/ST and women who have been displaced. Besides, it seeks to provide a canvas for an affective dialogue between the project affected families and the administration for resettlement and rehabilitation. The intention is to impart greater flexibility for integration and negotiation so that the resultant package gains all round acceptability in the shape of a workable instrument providing satisfaction to all Stake holders.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 42, Para No. 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 break up of Stage-I, II and III could be 6 to 4 & 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, 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.

Reply of the Government

Three stage development procedure in respect of new hydro electric projects in Central Sector has been formulated in consultation with MOF/MOEF with effect from June 2001. The same is given as under.

Stage-I : Expenditure on survey and investigation and preparation of pre-feasibility reports for H.E. Schemes will be sanctioned by Ministry of Power subject to the condition that proposed H.E. Project is figuring in Five Year Plan or Long-term hydro electric power development plan.

Stage-II : Stage-II development involves preparation of DPR, pre-construction work, Development of infrastructure facilities and land acquisition etc. The amount

is to be sanctioned by Committee of PIB/CCEA for the project which have been found to be commercially viable and have obtained site clearance from MOEF.

Stage-III: This would require approval of PIB/CCEA for investment decision in respect of construction of H.E. Schemes.

The features of the hydroelectric projects, being site specific, depend on the geology, topography and hydrology at the site. The construction time of a hydro project is greatly influenced by the geology of the area and its accessibility. Even when extensive investigations using new techniques are undertaken an element of uncertainty remains in the subsurface geology and the geological surprises during actual construction, which could cause time and cost overruns, cannot be completely ruled out. It is essential that state-of-the art investigations and construction techniques are adopted to minimise geological risks as well as the overall gestation period of hydro projects.

The cost escalations on account of inadequacies in the survey & investigation and uncertainties in constructing civil works in difficult geological terrains have contributed to certain misgivings and misapprehensions regarding hydro power development. There is an urgent need to give due attention on the survey & investigation and analysis of geological, geo-morphological, geo-electrical, hydrological data etc. at the time of preparation of a DPR itself in order to minimise the impact of risks. It is, therefore, necessary to expedite survey and investigations with the latest state of the art technology and prepare a shelf of projects for execution. The quality of DPRs should be of high standard which should infuse confidence in the national/international developers to take up the execution of projects without loosing time in rechecks etc.

MOWR/ CWC have issued guidelines for preparation of DPRs of irrigation and multipurpose projects which specify the extent of detailed surveys and investigations to be carried out for preparation of DPR. These guidelines are to be followed by various agencies involved in preparation of DPR. The DPRs are to be prepared strictly as per guidelines and required investigation would be of high quality and bankable.

In addition, a National Rehabilitation Policy has been prepared by the Department of Rural Development and the policy will be implemented uniformly for Hydel Projects which will reduce time in settlement of R&R Packages for Hydro Projects. Contract monitoring, as distinct from project monitoring is being emphasized.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 44, Para No.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 organizations. 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 organization 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.

Reply of the Government

The recommendations of the committee were forwarded to GSI, Survey of India, NHPC, WAPCOS, CWPRS, all CPSUs and to the State Governments.

The GSI, Survey of India, NHPC, WAPCOS CWPRS and CPSUs have intimated that consultancy is being provided by them to Private Sector also. Separate consultancy wings have been established by various CPSUs and consultancy is being provided by them to Private Sector also.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No.46, Para No.7.22)

In the case of MoU route, the Committee further observe that the purchaser (Licenser) may solicit developers for prequalification and selection 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 cautions and more demanding in view of the risks involved which is understandable. At the same time, the Committee feel that the initiative will have to come from both sides. While the Government should recognize that private investment against risks involves a price – excessiveness of depending on the nature and intensity of the risk whereas the private sector 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. 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 reason 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 buildings and installation of generating equipment;**

(ii) Projects at the toe of existing dams; and

(iii) Run-of-rivers schemes involving minimum underground works.

Reply of the Government

Hydro Projects to the private sectors are allocated by the respective State Governments and the suggestions of the Committee have been conveyed to the State Governments for appropriate action.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No.47, Para No.7.23)

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. Inspite of much publicized 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 any imperative need to revise the ceiling downwardly under mega power policy. The Committee, therefore, recommend that all hydel projects, except small hydel, be extended all the benefits/concessions, available under Mega Power Policy.

Reply of the Government

This Ministry has already mooted a revised Mega policy cabinet note for relaxing the existing qualifying capacities of 1000 MW for Thermal and 500 MW for Hydro to 250 MW each. However, the proposal did not find favour with the other ministries when it was sent for their comments. The same is being pursued for acceptance.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Comments of the Committee

(Please see para 40 of Chapter I of the Report)

Recommendation (Sl No.48, Para No. 7.24)

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.

Reply of the Government

To accelerate the development of hydro power, private developers have been given a number of incentives to participate in the development of hydro sector. The role and activities of the existing institutions in the public sector has not only been continued but they have been encouraged to make joint ventures with state utilities. The shining example of this is

Omkareshwar being executed by NHDC (A joint venture of NHPC and M.P.Govt.). In addition to this, NTPC has also been mandated to participate in the field of hydro Power development and Kol dam H.E. project (800 MW) is under execution by them. In addition to this, Loharinagpala H.E.project (520 MW) and Tapovan Vishnugad (360MW) in Uttaranchal have been awarded to NTPC for implementation. Vishnugad Pipalkoti (340MW) in Uttaranchal has been awarded to THDC for implementation. Rampur (400 MW) in Himachal Pradesh is proposed for implementation by SJVNL. To accelerate the hydro power development, outlay for central sector projects has been increased.

Under 50,000 Mw hydro initiative, 162 schemes spreading in 16 states with aggregate capacity of over 50,000 MW have been considered for preparation of PFRs. National Hydro-Electric Power Corporation, WAPCOS, North-Eastern Electric Power Corporation, Satluj Jal Vidyut Nigam and number of State Power Utilities have been associated to complete these feasibility studies. As a follow up of completion of PFRs, action has been initiated for preparation of DPRs of attractive sites through these agencies.

Hydro Electric Projects in Private Sector (after Government of India's Power Policy announced in 1991)

The Status of hydro electric schemes in Private Sector, after Government of India's power policy announced in 1991 to encourage greater investment by private enterprises in power sector, is given below :-

a). Projects Already Commissioned

Three hydro electric projects aggregating to 399.5 MW viz. Tawa HEP (2x6.75=13.5 MW) in Madhya Pradesh, Malana HEP (2x43=86 MW) in Himachal Pradesh and Baspa St-II HEP (3x100 MW) in Himachal Pradesh have been commissioned.

b). Cleared by CEA

Following seven Projects with total installed capacity of 2410 MW have been cleared by CEA :-

i) Maheshwar (10x40 MW), M.P.
ii) Vishnuprayag (4x100 MW), Uttaranchal
iii) Dhamwari Sunda (2x35 M W), H.P.
iv) Shrinagar (4x82.5 MW), Uttaranchal
v) Allain Duhangan (2x96 MW), H.P.
vi) Jalaput Dam Toe (3x6 MW), Orissa/A.P.
vii) Karcham Wangtioo (4x250 MW), H.P.

c). Under Examination

- Nil -

d). DPRs Taken Back in State Sector

DPRs of 4 Hydro Electric Projects with aggregate installed capacity of 728 MW have been taken back in State Sector. These schemes are :-

i) Uhl St-III (2x50 MW), H.P.
ii) Hibra (3x77 MW), H.P.

iii) Karbi Langpi (2x50 MW), Assam
iv) Upper Krishna (4x70+1x7=297 MW) (Almatti)

{DPR for Cascade Scheme of Upper Krishna (810 MW), for which In-Principle Clearance was accorded by CEA under Upper Krishna (1107 MW = 297 MW Almatti + 810 MW Cascade Scheme) was not received in CEA}.

The details of the above hydro electric schemes are given at **Annex-7.24.**

Three Stage Development Procedure for Hydroelectric Projects in Central Sector

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 for expediting hydro development. The procedure is summarised below :-

Stage-I

In Stage-I, an expenditure upto Rs. 10 crs. 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 crs., 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.

Stage-II

All cases of Stage-II, where the estimates of cumulative expenditure including Stage-I exceeds Rs. 10 crs.,, will be considered by Committee of PIB (CPIB). Proposals costing Rs. 20 crs. and more will require the approval of Finance Minister. While those involving a cost of over Rs. 50 crs. 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 and Forests would be considered for Stage-II development.
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 completed within one and a half years from the date of sanction.

Stage-III

Stage-III would require 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.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 49, Para No. 7.25)

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 every 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 utilize 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.

Reply of the Government

Steps taken for promoting Hydel Projects in NE Region:

i) Entrusting of Hydro Projects to Power Corporations

Govt. has taken many steps and measures to boost Hydro Power Development in NE region. Hydro Power Corporations in the Central Sector viz,. National Hydroelectric Power Corporation (NHPC), North-Eastern Electric Power corporation (NEEPCO) are being actively involved in investigation and implementation of HE projects in the Region. In Arunachal Pradesh, NHPC has been entrusted with the responsibility of developing HE Projects in Subansiri, Siang and Dibang basins, while development of hydro projects in Kameng basin has been entrusted to NEEPCO. These steps are likely to give greater thrust to the development of hydropower in the Region. Some of the major projects being developed by NHPC in the N.E. Region include Loktak D/S (90 MW), Siang Upper (11000 MW), Siang Middle (1000 MW), Siang Lower (1600 MW), Subansiri Upper (2000 MW), Subansiri Middle (1600 MW), Subansiri Lower (2000 MW). The projects being developed by NEEPCO include Tipaimukh MPP (1500 MW) and Tuirial (60 MW) etc.

ii) Ranking Studies by CEA

Ranking Studies were carried out by Central Electricity Authority in Oct. 2001, for expediting hydro power development in a systematic manner from the balance hydro potential sites for all the basins in the country by prioritising them for development in order of their attractivnes and grading them in A, B and C categories. Based on the preliminary Ranking Study, 399 schemes in all the six river systems of the country with an aggregate installed capacity of about 106,910 MW have been prioritized for development in a phased manner which includes 145 nos. of schemes with aggregate installed capacity of 57370 MW in NE region as per details given below:

Sl No	State	Category A		Category B		Category C		Total	
		Nos.	MW	Nos.	MW	Nos	MW	Nos	MW
1	Arunanchal	31	5047	55	38999	3	5080	89	49126
2	Assam	3	247	3	108	1	33	7	388
3	Manipur	3	135	5	335	3	1771	11	2241

4	Meghalaya	2	178	16	1316	4	665	22	2159
5	Mizoram	0	0	3	194	3	1870	6	2064
6	Nagaland	2	111	4	251	4	1030	10	1392
7	Tripura	0	0	9	0	0	0	0	0
Total		**41**	**5718**	**86**	**41203**	**18**	**10449**	**145**	**57370**

iii) 50,000 MW Hydroelectric Initiative

Govt. launched '50,000 MW Hydro Electric Initiative' under which preliminary Feasibility Reports (PFRs) in respect of 162 Hydro Electric Projects having aggregate installed capacity of 50,000 MW were to be prepared by different agencies in the Central/ State Sector. Under the above programme, PFRs in respect of 62 schemes with an aggregate installed capacity of 30456 MW have been prepared as per details given below in N.E. region:

S.No	Name of State	No. of schemes	Installed Capacity (MW)
1	Arunachal Pradesh	42	27293
2	Manipur	3	362
3	Meghalaya	11	931
4	Nagaland	3	370
5	Mizoram	3	1500
	Total	62	30456

Of the above, NHPC has prepared PFRs in respect of 25 HE Projects (17403 MW) in Arunachal Pradesh while WAPCOS have prepared PFRs for 19 projects (8393 MW) in the region. In addition, NEEPCO has prepared 18 no. of PFRs (4660 MW) in the Region.

Out of the above, 25 schemes with an aggregate installed capacity of 22,339 MW, of which first year tariff has been found less than Rs. 2.50/kwh, have been considered for preparation of DPRs.

iv) Power Evacuation

CEA has worked out a master plan for development of transmission system for evacuation of power from hydro projects in North Eastern Region in a coordinated manner. The detailed planning and implementation programme of the transmission system associated with specific hydro projects and the transmission system beyond pooling points which would form the National Grid is being worked out to achieve the development as per the master plan. In the process, necessary coordination with POWERGRID, NHPC, NEEPCO and other stake holders including the State Utilities is being done by CEA.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 50, Para No. 7.26)

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 Purulia Pumped Storage, THDC and NJPC (now SJVNL) are some of the shinning 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 the 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) in 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.

Reply of the Government

Inter- State Aspects and Policy on Hydro Power Development : Substantial power potential has remained locked up and many mega hydel projects could not be taken up for implementation, even though these projects are well recognised as attractive and viable, because of unresolved Inter- State issues. Govt. of India recognises the need for evolving an approach to ensure that the available hydro electric potential is fully utilised without prejudice to the rights of the riparian States as determined by the Awards of the Tribunals/ Agreements arrived at among the party States for a given river basin with regard to water sharing. The selection and the design of the project would be based on integrated basin wise studies, so as to arrive at an optimal decision and care will be taken that such projects do not in any way prejudice the claims of the basin States or affect the benefits from the existing projects. A consensus would be evolved amongst the basin States regarding the location of such projects, basic parameters involved and mechanism through which each project would be constructed and operated.

As far as possible, it may be preferable to take up simple run of the river schemes that do not involve any major storage or consumptive uses.

Ministry of Power is taking steps along with Planning Commission to evolve an approach for taking up projects affected by the inter- State aspects. At the first instance, simple run of the river projects would be taken up in the Cauvery basin and also Kishau Dam projects.

To harness the hydropower potential of Cauvery River in the stretch between existing Shimha Power House of Karnataka and Mettur reservoir of Tamil Nadu and with the consent of Government of Tamil Nadu and Karnataka, NHPC has been requested to initiate action for preparation of DPRs for four projects viz. Shivasamudram & Mekadatu projects of Karnataka and Rasimanal & Hogenekkal Projects of Tamil Nadu_ on the Cauvery river between Krishna Raj Sagar (KRS) dam and Mettur Dam. NHPC have indicated the total installed capacity of these projects as 1150 MW.

Status of Hydroelectric Schemes Involving Inter-State Aspects -All India Position

33 hydro electric schemes aggregating to 6750 MW are affected due to Inter- State issues. Status-wise details on these schemes are summarized below:

Schemes	No. of Schemes	Capacity (MW)
Sanctioned Schemes	2	62
CEA Cleared Schemes	2	140
Schemes Under Examination	-	-
Schemes Returned for Resubmission	29	6548

Total	33	6750

Brief details of interstate aspects involved are given at Annex-I

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 51, Para No. 7.27)

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.

Reply of the Government

The Joint Venture are being allotted / given new hydel sites for development so that the available manpower, infrastructure available and expertise gained by them in execution of previous project could be gainfully utilized. The SJVNL, a joint venture of Govt. of India and H.P. has been allotted Rampur H.E. Project for execution and few more projects are likely to be given to it for execution. Similarly THDC has been allocated execution of Koteshwar HEP (400 MW). The work relating to execution of Tehri Pumped Storage Scheme (1000 MW) has also been entrusted to THDC.

For optimal utilization of the available manpower and infrastructure available with joint ventures, the work relating to preparation of DPRs of few projects under 50,000 MW initiative has also been allocated to them and they have been advised to obtain the consent of the State Governments for carrying out detailed Survey & Investigation and preparation of DPR.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 53, Para No. 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.

Reply of the Government

Presently 3 HE schemes with an aggregate installed capacity of 2125 MW in Brahmaputra and 3 HE schemes with an aggregate installed capacity of 234 MW in Barak valley are under various stages of construction.

Brahmaputra

Scheme	State	IC (MW)
1. Kopili	Assam	25
2. Karbi Langpi	Assam	100
3. Subansiri Lower	Arunachal Pradesh	2000
	Total	2125

Barak

Scheme	State	IC (MW)
1. Turial	Mizoram	60
2. Loktak d/s	Manipur	90
3. Myntdu	Meghalaya	84
	Total	234

Further, one scheme Kamang (600 MW), Arunachal Pradesh in Brahmaputra and 3 schemes in Barak valley namely Tipaimukh (1500 MW) in Manipur, Tuivai (210 MW) in Mizoram & Bairabi (60 MW) in Mizoram have been accorded TEC and are awaiting investment sanction.Bottleneck in development of hydro power in north eastern region includes law and order problem particularly in Manipur and difficult accessibility of the project sites.

To augment hydro power development in Brahmaputra & Barak valleys under "50,000 MW hydroelectric initiative", Preliminary Feasibility Reports. for 55 schemes with an aggregate installed capacity of 29132 MW in Brahmaputra and 17 schemes with an aggregate installed capacity of 2793 MW in Barak valleys have been prepared and action for DPR preparation initiated.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 54, Para No. 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 the 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 organisations 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 / deration 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.

Reply of the Government

Govt. has taken many steps and measures to boost Hydro Power Development. Hydro power corporations in the central sector and the joint sector (central and state) viz., National Hydro-electric Power Corporation (NHPC), North-Eastern Electric Power Corporation (NEEPCO), Nathpa-Jhakri Power Corporation (NJPC) now SJVNL and Tehri Hydro Development Corporation (THDC) have been created. Besides, NTPC has also been authorised to take up hydro projects. Narmada Hydro Development Corporation (NHDC), a joint venture of NHPC and MP Govt. has been constituted to implement Narmadasagar (1000 MW) and Omkareshwar (560 MW) HE projects

The 50,000 MW Hydro-electric Initiative was launched by Hon'ble Prime Minister which covers preparation of PFRs for 162 hydro-electric projects spreading in 16 states with aggregate capacity of over 50,000 MW. National Hydro-Electric Power Corporation, WAPCOS, North-eastern Electric Power Corporation, Satluj Jal Vidyut Nigam, HPSEB, UJVNL and KPCL were associated to complete these feasibility studies. These feasibility studies were being coordinated, monitored and appraised by the Central Electricity Authority .As a next step the preparation of DPRs for 73 low tariff hydro electric schemes from these PFRs have been taken up by the above agencies and also by NTPC and THDC .

At present, the Brahmaputra Board is investigating and preparing DPRs for 11 projects in the North-Eastern Region with installed capacity of 11,451 MW. The Brahmaputra Board is also considering a proposal for revamping the Board so that they can borrow money from the market and take up hydro projects in future.

An outlay of R. 414 crore has been made for Brahmaputra Board for the X Plan of which Rs. 102 crore is for the continuing scheme for survey and investigation and balance of Rs. 321 crore for execution of projects.

All the mega projects being investigated by Brahmaputra Board for hydel power development require huge investment for execution of such projects. In the changing scenario, if Bharhmaputra Board is to enter into construction activities of hydro electric projects with hydel power as major component, the Bharhmaputra Board would be seriously handicapped to execute

such projects for want of funds. For undertaking such activities the possible way out is to arrange the funds by way of borrowing money from the market. The construction of multipurpose projects with hydro-power as a major component would also help in realizing the identified hydropower potential in the region and earn revenue for repayment of borrowed loan. For borrowing money, necessary amendements in the related provisions of the Brahmaputra Board Act will have to be made. Brahmaputra Board has already initiated action to revamp the Board by way of redrafting the Brahmaputra Board Act. The revamping proposal after approval by the Brahmaputra Board and Ministry of Water Resources will be submitted for consideration and approval of the Parliament.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Comments of the Committee

(Please see para 47 of Chapter I of the Report)

Recommendation (Sl. No. 55, Para No. 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.

Reply of the Government

For exploiting the large potential in a short period, the upgradation of the capabilities of the existing organisations will be necessary. WAPCOS has already established a sound base in the design and construction consultancy.

WAPCOS is in the process of taking up the execution of a small project in Afghanistan and could eventually develop the necessary skill base for becoming an executing agency. However, the financial base of the agency needs to be expanded for enabling the agency to handle the massive investments required for the hydro development. The progress in this direction will be made as the agency is already involved with the development of Pre Feasibility proposals and will also be involved with the preparation of a few Detailed Project Reports for some of the more promising schemes studied by them. The role for execution can be considered for some of the projects for which the development plans have been prepared by the agency.

The 50,000 MW Hydro-electric Initiative was launched by Hon'ble Prime Minister which covers preparation of PFRs for 162 hydro-electric projects spread over 16 states with aggregate capacity of over 50,000 MW. WAPCOS were given 71 schemes for preparations PFR which has since been completed.

Recently, WAPCOS has been assigned the work of preparation of DPR of Bichlari (35 MW) H.E. Project in J&K subject to the consent of the State Government.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 56, Para No. 8.26)

The Committee find that inaccurate and unscientific Survey & Investigations have made many of the Detailed Project Reports unreliable. In this context, the Committee desire that accurate, latest and scientific Survey & 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.

Reply of the Government

Generally, hydro schemes are located in remote/inaccessible areas wherein carriage of heavy equipments for S&I poses a great problem. The investigation activities are therefore required to be carried out based on the latest state of art technology using latest/modern instruments.

All state utilities/CPSUs /Organisations are being advised to use modern gadgets and equipments while conducting Survey & Investigation. While clearing estimates of S&I of CPSUs under 3-stage of clearance procedure, efforts are being made to see that the estimates include/use of all modern gadgets and equipments, the state of art technologies such as satellite imageries for the studies of the project area.

Highlights of initiative taken in India by various executing Agencies in this field are given below:

Surface Geological Exploration

Large scale geological mapping with intensive field traverses by experienced engineering geologists is carried out wherein detailed delineation of bed rock and overburden characteristics are made and picked up systematically on contour plans or survey sheets. The kind of survey is carried out in detail for all the important components of the projects like Dam, tunnels, channels, powerhouse complex, tailrace system, reservoir etc.

The rock mass is being classified as per the International Standards which becomes basic quantitative parameters for further designing of hydro power project components.

The Remote Sensing technique involving aerial photographs and satellite imagery are extensively used to understand and assess the overall geological set up of the project area in a faster manner which are otherwise located in far flung areas. Use of this technique is done by the internal experts or the work is got done with the assistance of expert organizations like National Remote Sensing Agency (NRSA), Hyderabad or any other Regional or State Remote Sensing Departments, nearby the respective projects.

Sub-surface Geological Exploration

Geophysical Survey

The geophysical survey is a great aid for sub-surface geological investigation. The following technology/equipments have been acquired in India:

48-channel (Terraloc Mk-6) seismographalong with high resolution seismic tomography, sparker source, high frequency hydrophones and 3D borehole geophones *(ABEM, Sweden)* for Seismic refraction/reflection for land and water covered areas.

SAS-4000 Terrameter with imaging system with latest software RES2DINV and RES3DIN *(ABEM Sweden)* for Resistivity sounding and 2D/3D resistivity imaging for subsurface exploration.

Drilling and Drifting

This is another important technique of sub-surface geological investigation. On an average more than 1000 to 3000 m of drilling and 300 to 500m drifting are being done depending upon the magnitude of the project in a comprehensive 1 ½ to 2 ½ years period. The latest survey equipments like Distomat, Total stations, GPS and state-of-the art drilling equipments are in use.

Seismological Studies

This is an important aspect of any hydroelectric project for its safe design. During the course of investigation, every project is studied geologically and geo-tectonically from this point of view in a systematic manner. Relevant data is collected from India Meteorological Department (IMD), Geological Survey of India (GSI), and systematic studies are carried out for evolving site specific seismic design parameters with the assistance of expert organizations like Department of Earthquake Engineering, IIT, Roorkee; CWPRS, Pune etc. and the seismic co-efficient/parameters are further submitted to National Committee on Seismic Design Parameters (NCSDP) and their approval is obtained before implementation of the Project.

Rock Mechanic Testing

The other important part of geotechnical investigation wherein physical and mechanical properties of rock and soil samples in the laboratory as well as at site (in-situ) are got tested. This requires an expert group. Services of reputed Govt. organizations like CSMRS, New Delhi, CMRI, Dhanbad, and NIRM, Karnataka, availed regularly and such tests are done at each and every project. Results of these tests are used for reliable design of foundation, slopes stability and underground openings.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 57, Para No. 8.27)

The Committee also observe that the North-Eastern Region has one of the lowest pre-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 border 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 or 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.

Reply of the Government

The recommendations of the Committee have been forwarded to Ministry of Surface Transport and Ministry of Heavy Industry. The Ministry of Power is allocating more than 25% of the budget on development of H.E. Projects in N.E. States against the directives of 10%.

The Ministry of Power has also mooted a proposal to stagger the 12% free power keeping it low in the initial years and raising it gradually to 12% in order to keep the initial tariff viable (backending of tariff) during the loan repayment period. The matter is taken up with the State Government on case to case basis. The Government of J&K has agreed to forego its share of 12% free power from Baglihar H.E. Project and Govt. of M.P. has also agreed to forego its free power share in case of Omkareshwar H.E. Project.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 62, Para No. 10.7)

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, Modernisation 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.

Reply of the Government

Renovation and modernization of old power plants in the present scenario of severe resource constraint is considered to be the best option for bridging the gap between the demand and supply of power as R&M schemes are cost effective and quicker than the setting up green field power plants.

Recognizing the benefits of R&M programme, Govt. of India set up a National Committee in 1987 to formulate strategy on renovation and modernization of hydro power plants. Based on the recommendations of the National Committee and subsequent reviews, 55 hydro schemes were identified under Phase-I for implementation of renovation, modernization and up-rating work.

Government of India in its policy on hydropower development declared in 1998 has laid stress on need for renovation and modernization of hydro power plants. Accordingly, Government of India set up a Standing Committee to identify new hydro R&M schemes to be undertaken for implementation under Phase-II. R&M proposals were received from various SEBs/Utilties for consideration of the Standing Committee. These proposals were discussed with the SEBs/Utilities for finalizing hydro renovation, modernization and uprating programme to be undertaken in the next 10 to 12 years by the end of XIth Plan (2011-12).

The National Perspective Plan document for hydro power stations has been prepared by CEA during the year 2000, considering the remaining schemes recommended under Phase-I by the National Committee works on which were either ongoing or yet to be undertaken in the near future and new hydro R&M schemes proposed for implementation under Phase-II. The National Perspective Plan describes the total potential available for additional generation through R&M/Life extension and uprating of old units and the investment requirements during Xth Plan and XIth Plan.

The status of the hydro R&M schemes identified by CEA under the National Perspective Plan (Phase I & Phase II) and not completed till the end of 2001-02 was further discussed with the concerned SEBs/PSUs/PFC while finalizing the Xth & XIth Plan programme. As per the Xth Plan programme, a total of 74 hydro R&M schemes (11 nos. under Central Sector and 63 nos. under State Sector) have been identified for implementation/completion. For the XIth Plan, a total of 31 hydro R&M schemes (2 nos. under Central Sector and 29 nos. under State Sector) have been identified for implementation/completion. The progress of R&M activities during the first two years of the Xth Plan being slow, CEA reviewed the Xth/XIth Plan programme in April/May,2004 by convening meetings of the representatives of concerned SEBs/PSUs/PFC/REC. After taking into consideration the views of the utilities for the delays in completion of the schemes under implementation as well as submission of some new R&M proposals by them, the Reviewed Xth/XIth Plan has been formulated.

As per the Reviewed Xth/XIth Plan Programme, a total of 62 schemes (11 in Central Sector and 51 in State Sector) are programmed for completion during the Xth Plan. 50 Schemes (3 in Central Sector and 47 in Sate Sector) are programmed for completion during the XIth Plan.

Plan wise summary for renovation, modernization, up-rating and life extension of hydro power stations in the country (as on 31.08.2004) is given as hereunder: -

Sl. No	Plan Period	No.of Schemes	Installed Capacity	Cost (Rs. in Crs.)	Benefit (MW)

		Central Sector	State Sector	Total	Capacity (MW)	Actual	Estimated	
1.	UptoVIIIth Plan (Completed)	2	11	13	1282.00	127.37		429.00
2.	IXth Plan (Completed)	8	12	20	4832.10	567.5712		1338.03
3.	Xth Plan							
	i) Programmed	11	51	62	9977.50		2299.487	1516.31
	ii) Completed as on 31.8.2004	2	12	14	1338.80	541.515		393.20
	iii) Balance	9	39	48	8638.70		1757.972	1123.11
4.	XIth Plan (Programmed)	3	47	50	8534.30		2888.63	5315.65

No direct budgetary support has been provided by the Govt. of India for implementation of the Phase-II R&M hydro schemes. There was no budgetary support for R&M hydro schemes under Phase-I as well. The funds for implementation of R&M schemes are generally arranged from PFC & REC and Govt. of India is providing interest subsidy under the Accelerated Generation & Supply Programme (AG&SP). An action plan for assessing the requirement of funds under AG&SP for hydro R&M schemes during the Xth Plan has already been finalised by CEA in consultation with the SEBs/Utilities/PFC.

During the Year 2000-01, under the Govt. of India's Accelerated Power Development Programme (APDP) for hydro R&M schemes, an amount of Rs. 58.99 Cr. as Grant and Rs. 58.95 Cr. as soft loan was sanctioned for implementation of R&M hydro schemes. The Govt. of India has since withdrawn the APDP for hydro R&M schemes.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 63, Para No. 10.8)

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 Crores to accrue a benefit of 3935.50 MW have been identified for implementation during 9th Plan. 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 Crores 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, rockbolts 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.

Reply of the Government

The progress made in respect of R&M hydro schemes during the first year 2002-03 of the Xth Plan programme was vigorously monitored and due to slow progress in some schemes, the programme framed earlier in April, 2002 was reviewed in CEA during the meetings held with the SEBs/PSUs in May, 2003. Based on these discussions, 74 schemes (11 in Central Sector & 63 in State Sector) with a total installed capacity of 8082.45 MW with an estimated cost of Rs.2712.237 Crores to accrue a benefit of 2446.87 MW were finalised for implementation/completion in the Xth Plan. CEA again reviewed the progress of R&M activities of hydro schemes in April/May, 2004 on completion of the first two years of the Xth Plan. The views of the concerned SEBs/PSUs for the delays in completion of the schemes under implementation as well as submission of some new R&M proposals submitted by the SEBs / PSUs were considered and the Reviewed Xth/XIth Plans programme was formulated. A total of 62 schemes (11 in Central Sector & 51 in State Sector) with a total installed capacity of 9977.50 MW with an estimated cost of Rs. 2299.487 Crores to accrue a benefit of 1516.37 MW were finalised for completion during Xth Plan. 50 schemes (3 in Central Sector & 47 in State Sector) with a total installed capacity of 8534.30 MW with an estimated cost of Rs. 2888.63 Crores to accrue a benefit of 5315.65 MW have also been identified for implementation/completion during the XIth Plan.

Some of the suggestions given by the committee such as use of high strength concrete for construction of surface & underground works, high efficiency runners etc. have been already covered in the National Perspective Plan for R&D in Indian Power Sector. Besides these, other areas where R&D/technology up-gradation in Hydro Power generation sector is required which are identified in the Perspective Plan are given below:

R&D / Technology Improvement relating to Electro-Mechanical Plants & Equipments.

i) Hard coatings for turbine runners and other underwater parts.
ii) New materials & alloys for turbines.
iii) High efficiency turbine runners.
iv) Adjustable speed generating units for pumped storage and conventional hydroelectric plants.
v) Split runners.
vi) Self-lubricated thrust bearings for hydro turbines.
vii) On-line monitoring devices for hydro generating plants.

R&D / Technology Improvement relating to Civil Works :

i) Lining material for water conveying tunnels.
ii) Large size underground caverns
iii) Investigation in civil structures of hydro power projects.
iv) Polymer trash racks for extreme cold situations and trash raking machines at inlet of water intakes.
v) Arch dams.
vi) Roller compacted concrete dams.
vii) Instrumentation in hydro power projects.
viii) Numerical 3-D modeling & structural non-linear analysis of fill and concrete dams under seismic conditions.

Action Plan for R&D Schemes

Out of the various schemes listed above, three schemes relating to R&D have been prioritized and are proposed to be implemented by allocating sufficient monitory resources by GOI to organizations in Public Sector & Autonomous bodies like BHEL, CSMRS, NHPC & TIFAC. The Schems are :-

i) Development of hard coatings for turbine runners & other underwater parts.
ii) Development of new materials & alloys for turbine & other underwater parts.
iii) Use of high dose of fly ash in RCC Dams.

The time period for these schemes is 3 to 4 years.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 64, Para No. 10.9)

The Committee also take a strong note of the fact that R&M of hydel plants such as Maithon 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 Committed 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 Subernrekha (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 Subernrekha 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 are completed as per the revised targets. The Committee also recommend that funds should not be the constraints to carryout R&M activities. At the same 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, Modernisation & Uprating works. The Committee desire that the Government should draw up an advance action plan for R&M during 11th Plan.

Reply of the Government

The Maithon (3x20 MW) scheme of DVC was initially posed for Renovation, Modernization, Up-rating & Life Extension (RMU&LE) for all the 3 units during the Phase-I programme. DVC, thereafter, decided to take up the RMU&LE works of one unit (i.e. unit 2) first

alongwith refurbishment of cranes and intake service gates, tailrace gates etc. and to watch the performance of Unit-2 for about 7 months before commencement of the R&M works of Units 1&3. The ongoing RMU&LE works of Unit-2 were programmed for completion by the end of Jan, 2004. The RMU&LE works were completed in May,2004 and this unit was re-synchronized on 30/31-05-2004. But on 1.6.2004, the unit had to be emergency tripped while approaching towards full load due to damage of thrust cum guide bearing. The damaged bearing has been replaced by the re-furbished spare one and the unit is reported to be re-synchronized by 30.09.2004.. For carrying out the RMU&LE works of Units 1&3, the DVC authorities have now proposed to carry out the RLA studies for which NHPC has been engaged as the consultant. The RMU&LE works of U-1&3 are yet to commence and are tentatively scheduled for completion during the year 2007-08.

Certain hydro R&M schemes were originally targetted for completion during the Xth Plan but their completion schedules were changed to XIth Plan based on the detailed discussions held with the concerned SEBs/Utilities at the time of finalizing the Xth Plan programme in April, 2002 and subsequent discussions during May, 2003 and April-May, 2004 duly taking into consideration the changes in the scope of works of such schemes and the work priorities indicated by the SEBs/Utilities.

ADB financing is proposed for the R&M of Poringalkuthu (4x8 MW) scheme and the study report of M/s. Cresil Nexant, the consultant for ADB, is under consideration of the KSEB before finalizing the DPR. This scheme is programmed for completion during the XIth Plan.

Umium St.II (2x9 MW) is a new scheme under Phase-II programme and not under Phase-I. Special Assistance for Project Formulation (SAPROF) study has been conducted by TEPCO& Co. Ltd. Japan under the JBIC grant to ascertain the scope of work. Loan agreement has been signed on 31.03.2004 between JBIC, MeSEB and GOI. Tenders for engagement of consultant are under evaluation. The scheme is programmed for completion by 2008-09 of the XIth Plan. The RM&U works of the Kyrdemkulai (2x30 MW) scheme are proposed to be taken up for implementation by MeSEB after completion of Umium St.II works. The scheme is targetted for completion during the XIth Plan.

The Subernarekha (2x65MW) scheme of Jharkhand was posed for certain R&M works under the Phase-I programme and then the Life Extension works were proposed under Phase-II programme. Inspite of repeated efforts, no information is forth coming from the Project. Hence it appears that the state authorities are not interested in implementing the scheme.

Regarding the Hirakud-I, U-5&6 (2x37.5 MW) scheme of Orissa under Phase-I, the OHPC authorities are proposing to implement the life extension of units and complete the same by the year 2007-08 of the XIth Plan. RLA studies have been completed and the report is expected by end of 9/2004. Offers for engagement of consultant have been invited by OHPC.

No direct budgetary support has been provided by the Govt. of India for implementation of the R&M hydro schemes. The funds for implementation of R&M schemes are generally arranged from PFC & REC and Govt. of India is providing interest subsidy under the Accelerated Generation & Supply Programme (AG&SP). An action plan for assessing the requirement of funds under AG&SP for hydro R&M schemes during the Xth Plan has already been finalised by CEA in consultation with the SEBs/Utilities/PFC.

Advance action in regard to implementation/completion of hydro R&M schemes during the XIth Plan has already been initiated in CEA. A total of 50 existing hydro schemes (3 in Central Sector and 47 in State Sector) with an installed capacity of 8534.30 MW to accrue a benefit of

5315.65 MW at an estimated cost of Rs. 2888.63 Crores (approx.) have been tentatively identified for RMU&LE under this plan.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 66, Para No. 11.12)

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 of the 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 Pardiyar Punna-Puzha (200 MW) Cholatepuzha (60MW) and Nirar Nallar (250MW) Projects. The Committee feel that Central government should intervene more actively and only then it is possible that some inter-state 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.

Reply of the Government

Govt. of India recognises the need for evolving an approach to ensure that the available hydro electric potential is fully utilised without prejudice to the rights of the riparian States as determined by the Awards of the Tribunals/ Agreements arrived at among the party States for a given river basin with regard to water sharing. The selection and the design of the project would be based on integrated basin wise studies, so as to arrive at an optimal decision and care will be taken that such projects do not in any way prejudice the claims of the basin States or affect the benefits from the existing projects.

Ministry of Power is taking steps along with Planning Commission to evolve an approach for taking up projects affected by the inter- State aspects. At the first instance, simple run of the river projects would be taken up in the Cauvery basin and also Kishau Dam projects.

To harness the hydropower potential of Cauvery River in the stretch between existing Shimha Power House of Karnataka and Mettur reservoir of Tamil Nadu and with the consent of Government of Tamil Nadu and Karnataka, NHPC has been requested to initiate action for preparation of DPRs for four projects viz. Shivasamudram & Mekadatu projects of Karnataka and Rasimanal & Hogenekkal Projects of Tamil Nadu_ on the Cauvery river between Krishna Raj Sagar (KRS) dam and Mettur Dam. NHPC have indicated the total installed capacity of these projects as 1150 MW.

A Core Group has been set up by the Ministry of Power under the Chairmanship of Secretary (Power) to develop, construct, operate and maintain hydroelectric projects by National Hydroelectric Power Corporation Limited (NHPC) in the Cauvery Basin. The Group includes representatives from Central Electricity Authority, Ministry of Environment & Forests, NHPC and the concerned Departments of the State Governments of Tamil Nadu and Karnataka.

The NHPC is preparing a plan for optimal utilization of the untapped hydroelectric power potential estimated at 1150 MW of the Cauvery River. NHPC would be prepared to execute the four projects, which would generate cheap power, subject to the Government of Karnataka and the Government of Tamil Nadu coming to a mutually satisfactory agreement on sharing of power from these projects.

A meeting of the Core Group for development of hydro electric project in the Cauvery basin is proposed to be held under the Chairmanship of Secretary (Power) on 27.10.2004.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No.68, Para No.11.28)

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, Beas 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 committees 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 1.50 Million Acre Fee (MAF). It is only now Kishenganga HE 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 observed 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 Projects 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.

Reply of the Government

The Indus River System including its five tributaries, viz. the Sutlej, the Beas, the Ravi, the Chenab and the Jhelum constitute a common river system between India and Pakistan. Development of water resources of this river system for multi-purpose is governed by the Indus Waters Treaty - 1960. As per the Treaty, India has exclusive right to utilise entire waters of the Eastern Rivers, viz. Sutlej, Beas and Ravi. The water resources projects in India on the Western Rivers (i.e. Chenab, Jhelum and Indus) have to conform to the provisions of the Treaty in regard to the Project parameters, consumptive and non-consumptive water areas. The Treaty also places restrictions on the storages that could be created on these rivers.

The Treaty provided for creation of institutional arrangement in the form of Indus Water Commission to serve as a regular channel of communication on all the matters relating to the Treaty. On the Indian side the Commissioner (Indus Waters) in the MOWR is the nodal officer for matters related to the Treaty.

Active efforts are being made for accelerating the development efforts of Baglihar and Kishenganga projects. Interpretation of Indus Treaty in an appropriate manner is being attempted by continuously engaging the counterpart Pakistani agencies in a meaningful dialogue. A senior level delegation recently visited Pakistan and explained the stand of India in the context of the above projects. All help is being provided to the project implementing agencies to facilitate the speedy resolution of issues and execution of the projects.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 69, Para No. 11.29)

The Committee has 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 rivers. 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, Chenab and Indus as 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 suspension would have 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 provisions of Indus Water Treaty, especially in the context of under exploitation and utitlization of water resources in the river system of Indus, Chenab land 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 utilized 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.

Reply of the Government

Presently, 3 HE schemes namely Dulhasti (390 MW), Sewa -II (120 MW) and Baglihar - I (450 MW) are under various stages of construction whereas, 2 no. of schemes namely Kirthai-I (240 MW) and Kirthai-II (360 MW) are under Survey & Investigation.

Exploitation of hydro potential in J&K has also been duly incorporated in the 50,000 MW hydro initiative under which Pre Feasibility Reports for 13 projects in J&K aggregating to an installed capacity of 2675 MW have been prepared.

As regards re-rating/ uprating (RM&U) of existing stations in J&K, it is stated that 5 nos. of schemes of J&K having installed capacity of 855.9 MW are programmed for implementation during Xth Plan. These projects are likely to accrue benefit of 146.63 MW at an estimated cost of Rs. 221.572 Crs. The details of these 5 schemes are given below:

S. No.	Scheme (Inst. Cap. in MW), Ex.Agency	Est. Cost (Rs. Crs.)	Category	Benefits in MW	Status of Works	Year of Comple-Tion
	Central Sector					
1.	Salal, (6x115) NHPC	87.28	R&M + Restoration of Cap.	69 (Rest-oration)	Yet to commence	2006-07
	State Sector					
2.	*Lower Jhelum (3x35), J&KPDC*	65.19	RM&U + Restoration of Cap.	9 (UR) + 25 (Res.)	Ongoing	2004-05
3.	*Chenani(5x4.66),* J&KPDC	23.86	RMU&LE	2.33(UR) 23.3(LE)	Yet to commence	2004-05
4.	*Ganderbal(2x3+2x4.5)* J&KPDC	28.87	RM&LE	15(LE)	Yet to Commence	2004-05
5.	*Sumbal Sindh(2x11.3)* J&KPDC	16.372	RM&U	3(UR)	Yet to Commence	2004-05
	Total (IC 855.9)	221.572		146.63		

Note : R - Renovation, M - Modernisation, U- Uprating, LE- Life Extension

Above measures are likely to improve the power availability in the State.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

CHAPTER III

RECOMMENDATIONS/OBSERVATIONS WHICH THE COMMITTEE DO NOT DESIRE TO PERSUE IN VIEW OF THE GOVERNMENT'S REPLIES

Recommendation (Sl. No. 2, Para No. 2.40)

The Committee are glad to note that the Ministry of Power set an agenda of providing 'Power for all by 2012' and as per the present target 50,000 MW of Hydel 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 14,393 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 low 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 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 26,5000 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 proactive action to ensure that the planned schemes are executed as per their targeted schedules.

Reply of the Government

The Working Group on Power for 10th Plan constituted by Planning Commission in its report submitted in October 2001, has estimated a feasibility capacity addition of 46,939 MW during 10th Plan. This was further discussed in the National Conference on Capacity Addition during 10th Plan and advance action for 11th Plan during July 8-9,2002. The capacity addition during 10th Plan was finalized at 41110 MW which included 18,659 MW from ongoing projects, 9,193 MW from projects cleared by the CEA and 13,258 MW from new schemes. A summary on the feasible capacity addition of 41,110 MW is given below:

Status wise benefits during the Tenth Plan (MW)

Source	Ongoing/ sanctioned schemes	CEA-cleared Schemes	New schemes	Total
Hydro	9,184	3,962	1,247	14,393
Thermal	8,175	5,231	12,011	25,417
Nuclear	1,300	-	-	1,300
Total	18,659	9,193	13,258	**41,110**

Out of the total addition of 41,110 MW envisaged for the Tenth Plan period, Hydro Capacity has been fixed as 14393 MW, the sector-wise breakup is given as under:-

Sector-wise Capacity Addition during the 10th Plan (MW)

Source	Central	State	Private	Total
Hydro	8,742	4,481	1,170	14,393

A major portion of this incremental capacity can materialize only during the later years of the Tenth Plan.

For execution of the projects as per schedule, stronger monitoring mechanism for construction/execution of the hydro projects has been put in place by Ministry of Power / Central Electricity Authority to realize the target set for 10th Plan. Nodal officers for each project have been identified both in the construction stage as well as during execution. Nodal officers are regularly visiting the project sites so as to identify problem areas and also give regular feed back about the progress made and corrective steps to be taken to streamline the execution of the projects.

REASONS FOR SLOW PACE OF DEVELOPMENT

Notwithstanding availability of vast potential and operational advantages, the pace of hydro development in the country has been slow. The hydro share in the total installed capacity at present accounts for only 26.60%. The main reasons for the slow development of hydro power are as under:-

a) Capital intensive nature of projects and longer gestation period:

Hydel projects are comparatively capital intensive. The thermal projects get priority in fund allotments with a view to get early benefits, as the gestation period of thermal plants is comparatively short.

b) Rehabilitation problem

The progress of some of the projects has been severely affected on account of opposition to the construction by environmentalists and project affected people. Sardar Sarover, Indira Sagar, Bansagar Tons and Tehri are some of the hydro projects where the progress has been severely hampered from sustained opposition to project construction. Rehabilitation is becoming a major issue in the implementation of storage-based hydro development and many times, it is one of the main reasons for the delay in the execution.

c) Dearth of Good Contractors:

A matter of concern in the execution of large hydro-electric projects is the dearth of competent and resourceful contractors. This is one of the main reasons for time and cost over-runs of hydro projects.

d) Inter-State Aspects:

A large number of hydro projects having common river systems between adjoining States are held up on account of inter-State aspects. Some of these projects have received the techno-economic clearance of CEA but the investment sanction could not be accorded due to inter states aspects. Many projects have not been accorded CEA clearance on account of interstate issues. This being a contentious matter, the resolution of inter-State issues could be achieved through mutual discussions or by constitution of tribunals acceptable to all so that the attractive projects held up for long could be taken up quickly in the overall interest of the country.

e) Environment & Forest Aspects:

Hydro electric projects involve submergence causing displacement of project area people and often require forest land for their implementation. The impact on ecology, monuments, seismicity, resettlement and rehabilitation, catchment area treatment, flora and fauna are assessed in the environment appraisal of the project. Forest clearance requires compensatory afforestation on the non forest lands. These aspects need to be looked into carefully to avoid undue problems during execution of the projects. The progress of some of the projects has been affected on account of opposition to the construction by environmentalists and project-affected people.

f) Law & Order problems

Disturbed law & order is one of the factors causing delay in project execution and even suspension of work. Some of the hydro-electric projects suffered due to these problems are Dulhasti, Upper Sindh, Doyang, Dhansiri etc.

g) Land Acquisition problems

The problems arising in acquisition of land for hydro- electric project construction are causing suspension and delay in the construction activities. Some of the projects affected by this include Thein Dam, Doyang, Ghatgar PSS etc.

h) Geological Surprises:

The features of the hydro electric projects, being site specific, depend on the geology, topography and hydrology at the site. The construction time of a hydro project is greatly influenced by the geology of the area and its accessibility. Even when extensive investigation using new techniques of investigations are undertaken, an element of uncertainty remains in the sub-surface geology and the geological surprises during actual construction can not be ruled out. It is, therefore, essential that state-of-the-art investigation and construction techniques are adopted to minimise geological risks as well as the overall gestation period of hydel projects.

i) Difficult/ In-accessible Potential Sites:

The untapped resources lie mainly in the hilly states of North and North Eastern Regions which have low power demand and also lack in financial resources, besides countering power evacuation difficulties from North-East Region. Most of the left over sites are difficult sites and need special attention and approach for their development.

STEPS TAKEN FOR INCREASING THE HYDRO CAPACITY

i) Creation of Power Corporation

Govt has taken many steps and measures to boost Hydro Power Development. Hydro power corporations in the central sector and the joint sector (central and state) viz,. National Hydro-electric Power Corporation (NHPC), North-Eastern Electric Power Corporation (NEEPCO), Nathpa-Jhakri Power Corporation (NJPC) now SJVNL and Tehri Hydro Development Corporation (THDC) have been created. Besides, NTPC has also been authorised to take up hydro projects. Narmada Hydro Development Corporation (NHDC), a joint venture of NHPC and MP Govt. has been constituted to implement Narmadasagar (1000 MW) and Omkareshwar (560 MW) HE projects

ii) Policy Liberalisation

To bring in additional resources for the capacity addition in the Power Sector, a policy to encourage greater participation by private entrepreneurs in India and abroad in electric power generation has been announced. Govt. has issued tariff notification for hydro projects incorporating several incentives to private developers which broadly cover incentives for better availability of machines, for generation of extra energy above design energy, compensation for hydrological risks, etc.

iii) Policy on hydro power development

A Hydro Policy has also been announced in Aug.'1998 on hydro power development incorporating several steps and measures. The Hydro Policy among others 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.

iv) Three stage clearance procedure

The Government has also 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. Under Stage-I, the CPSUs will incur expenditure on survey, investigation and preparation of pre-feasibility report. Under Stage-II, the CPSUs will undertake activities relating to detailed investigation and preparation of Detailed Project Report. During this Stage, pre-construction activities and infrastructure development including land acquisition will also be undertaken. Under Stage-III, the investment decision will be accorded after obtaining the approval of PIB/ CCEA.

v) Ranking Study

With the objective of expediting hydro power development in a systematic manner, the Central Electricity Authority undertook a Ranking Study of the balance hydro potential sites for all the basins in the country. The ranking of hydro sites had been carried out, by 2001-02, based on weightage criteria for various aspects involved in the development of hydro schemes. Considering these aspects, the schemes have been graded in A, B and C categories in order of their priority for development.

Based on the preliminary Ranking Study, about 400 schemes with an aggregate installed capacity of about 107,000 MW have been prioritized in all the six river systems of the country. Out of this , 98 schemes with probable installed capacity of 15,650 MW fall under " A" category, 247 schemes with probable installed capacity of 69,830 MW under "B" category and 54 schemes with probable installed capacity of 21,420 MW under "C" category in order of their priority for development.

vi) 50,000 Mw Hydro-Electric Initiative

To give necessary fillip for development of hydro sector, Central Electricity Authority in the year 2001-2002 completed Ranking Study to determine the inter-se priority of balance hydro electric schemes for taking up their development in appropriate sequence. The schemes considered attractive in the Ranking Study have now been taken up for the purpose of preparation of Preliminary Feasibility Reports (PFRs).

The 50,000 MW Hydro-electric Initiatives was launched by Hon'ble Prime Minister in May 2003 which covers preparation of PFRs for 162 hydro-electric projects spread in 16 states with aggregate capacity of over 50,000 MW. National Hydro-Electric Power Corporation, WAPCOS, North-eastern Electric Power Corporation, Satluj Jal Vidyut Nigam and number of State Power Utilities were associated to complete these feasibility studies. These feasibility studies were coordinated, monitored and appraised by the Central Electricity Authority. The preparation of Feasibility Reports of 162 H.E schemes with an aggregate installed capacity of 47970 MW has since been completed.

The initiative has evoked interest in the country as also in the international community with regard to enormous potential opportunities to the equipment suppliers, construction agencies, financers and prospective independent power producers.

The PFRs will provide useful information to prospective developers for taking up detailed Survey & Investigation and DPR formulation and facilitate the accelerated development of balance Hydro Electric Potential in the country. This is considered essential to generate a shelf of projects which could be taken up for execution during 11^{th} and 12^{th} Plan and beyond. Implementation agencies viz. PSUs, State Utilities and other organizations will be identified later to develop these projects.

DPR Preparation

As a follow up of preparation of PFR, it is proposed to take up preparation of DPRs for 73 attractive schemes with first year tariff less than Rs. 2.50 /kwh. The aggregate installed capacity of these schemes is about 33000 MW.

Additional Steps taken for Promoting Hydel Projects in NE Region

Govt. has taken many steps and measures to boost Hydro Power Development in NE region & Sikkim. Hydro Power Corporations in the central sector viz, National Hydro-electric Power Corporation (NHPC) and North-Eastern Electric Power Corporation (NEEPCO) are being actively involved in investigation and implementation of HE projects in the regions. In Arunachal Pradesh which accounts for more than 85% of the identified potential, NHPC have been entrusted with the responsibility of developing HE Projects in Subansiri, Siang and Dibang basins while Kameng basin has been entrusted to NEEPCO which is likely to give greater thrust to the development of hydro power in the region.Out of 162 H.E schemes for which PFRs has been prepared 72 nos. of schemes with aggregate installed capacity of 31925 MW are in NE region and Sikkim as per details given below:

S.No	Name of State	No. of schemes	Installed Capacity (MW)
1	Arunachal Pradesh	42	27293
2	Manipur	3	362
3	Meghalaya	11	931
4	Nagaland	3	370
5	Mizoram	3	1500
6	Sikkim	10	1469
	Total	**72**	**31925**

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No.6, Para No. 2.44)

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 basins 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.

Reply of the Government

The total HE potential of the country has been assessed by CEA at 84044 MW at 60% load factor corresponding installed capacity of about 1,50,000 MW on the basis of probable average load factor. As on 01.09.2004, potential of 15157.73 MW at 60% load factor (18.04% of the assessed potential) has been developed. Further, as on 01.09.2004, in case of West flowing and East flowing rivers 60.24% and 43.02% of the assessed hydro electric potential has been developed. While in case of Brahmaputra, Indus and Ganga Basins, the potential developed is 1.89%, 18.67% and 17.74% respectively. Presently 2.26%, 6.36% and 12.76% of the assessed potential in Brahmaputra, Indus and Ganga basin respectively are under development. Development of hydro electric potential in Indus and Brahmaputra basins has been slow due to law and order, land acquisition problems and long transmission lines. The detailed status of basinwise H.E. potential development is given as below:

Basin	Pot. Assessed at 60 % L.F. MW	Pot. Developed at 60 % L.F. MW	% Developed	Pot. Under development at 60 % L.F. MW	% under Development	% Balance
INDUS	19988.00	3730.85	18.67	1272.22	6.36	74.97
GANGA	10715.00	1901.25	17.74	1366.72	12.76	69.50
CENTRAL INDIAN RIVERS	2740.00	1059.85	38.68	1147.12	41.87	19.45
WEST FLOWING RIVERS	6149.00	3704.17	60.24	40.53	0.66	39.10
EAST FLOWING RIVERS	9532.00	4100.78	43.02	211.07	2.21	54.77
BRAHMAPUTRA	34920.00	660.83	1.89	790.43	2.26	95.85
TOTAL	84044.00	15157.73	18.04	4828.08	5.74	76.22

MEASURES TAKEN FOR DEVELOPMENT OF H.E. POTENTIAL

The following measures have been taken for developing the hydro electric potential :

Preliminary Ranking Studies :

With an objective of expediting hydro power development in a systematic manner, Central Electricity Authority undertook a ranking study of the balance hydro potential sites for all the basins in the country. The Ranking of hydro sites has been carried out based on weightage criteria for various aspects involved in the development of hydro schemes. Considering these aspects, the schemes have been graded in A, B and C categories in order of their priority for development.

Based on the Preliminary Ranking Study, about 400 schemes with an aggregate installed capacity of about 1,07,000 MW have been prioritized in all the six river systems of the country. Out of this, 98 schemes with probable installed capacity of 15,640 MW fall under "A" category, 247 schemes with probable installed capacity of 69,850 MW under "B" category and 54 schemes with probable installed capacity of 21,420 MW under "C" category. The basin wise details of ranking study are given below :

Sl. Nos.	River system	Category A		Category B		Category C		Total	
		Nos.	MW	Nos.	MW	Nos.	MW	Nos.	MW
1.	Indus	11	4088	51	8811	17	6080	79	18979
2.	Ganga	20	2023	54	9616	1	600	75	12239
3.	Central India	3	283	9	1425	1	186	13	1894
4.	East Flowing	11	1412	26	6469	2	88	39	7969
5.	West Flowing	1	35	10	958	14	1508	25	2501
6.	Brahmaputra	52	7800	97	42574	19	12954	168	63328
Total		98	15641	247	69853	54	21416	399	106910

Preliminary Feasibility Report :

The benefits of hydro power as the clean environment friendly and economically attractive have now been sufficiently recognized. With a view to promoting the hydro development on sustainable basis, the 50,000 MW Hydro initiative was launched by the Ministry of Power in May 2003 for preparation of Feasibility Reports for the projects which were identified by CEA in the hydroelectric survey and as well as some schemes identified by State authorities.

With a view to take up the balance hydro electric project in a systematic manner and to create shelf of hydro electric project which could be offered for development to prospective entrepreneurs, the work of preparation of PFRs of hydro electric projects was taken-up by CEA. The PFRs would provide information on Hydro Electric Schemes which are yet to be developed and enable their prioritization for further action for implementation. The PFRs would also provide useful information to prospective developers for taking up detailed Survey & Investigation and DPR formulation. The results of Studies would thus facilitate development of balance hydro electric potential of the country in order of viability / attractiveness.

This is considered essential to generate a shelf of projects which could be taken up during 11^{th}, 12^{th} plans & beyond.

This initiative envisaged preparation of Preliminary Feasibility Reports (PFRs) of 162 Hydro Electric Projects having aggregate installed capacity of 50,560 MW located in 16 States. This work has since been completed. 134 schemes out of 162 schemes with aggregate installed

capacity of about 45,212 MW are located in Brahmaputra, Indus and Ganga basin. The details are given below:

Name of the Basin	No. of Schemes	IC (MW)
Brahmaputra	70	32107
Indus	25	6731
Ganga	39	6374
	134	45212

Survey & Investigation and Preparation of DPR

As a follow up of preparation of PFRs, it is proposed to take up implementation / preparation of DPRs for attractive schemes selected from PFR schemes thereby providing a shelf of projects for execution in the near future. Out of 162 schemes of PFRs, schemes have been selected in the order of their relative attractiveness for taking up of detailed S&I and preparation of DPR/implementation. At first instance, based on their preliminary techno-economic analysis, 73 schemes whose first year tariff works out below Rs. 2.50/kWh have been considered as low tariff H.E. schemes. The aggregate capacity of these projects is likely to be of the order of about 33,000MW which could yield benefits during 11^{th} 12^{th} & 13^{th} plan periods. Out of these 73 schemes, 70 schemes (32000 MW) are located in Brahmaputra, Indus and Ganga basins.

The proposal envisages carrying out detailed survey & investigation and preparation of bankable DPRs in association with other concerned organisations such as CPSUs , State Govts/PSUs/SEBs etc. and have a shelf of the duly investigated projects for offering to the prospective developers. CEA in association with other Government agencies besides providing technical support, would render overall coordination and quality control services for preparation of DPRs.

Implementation of Hydro Projects by Corporations/ State Utilities and State Deptts.

For speedy implementation of hydro projects , many Central/ Joint sector corporations have been created for taking up projects in Indus, Ganga and Brahmaputra basins. In the Satluj sub-basin (Indus basin) , SJVNL (Satluj Jal Vidyut Nigam Limited) has been formed. Similarly in Ganga basin , THDC (Tehri Hydro Development Corporation Ltd.) has been created. Besides, many projects in these basins have also been taken up by NHPC (National Hydro-Electric Power Corporation Ltd). In North Eastern Region (mainly Brahmaputra Basin), Projects are being implemented by NEEPCO (North- Eastern Electric Power Corporation Ltd.) and NHPC. In addition to these, NTPC has also been entrusted with the Hydro Power Development in the country and has taken up a number of projects in these basins.

The Hydro development in the states falling under these basins is also being taken up by State Electricity Boards/ State Power Deptts. etc.

Keeping in view the position explained above, there appears to be no necessity to set up separate River Basin Authorities. However, since the setting up of River Basin Authorities is under the purview of Ministry of Water Resources, the recommendations of the Committee have been forwarded to Ministry of Water Resources also for taking necessary action.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 8, Para No.2.46)

While examining status of ongoing Hydroelectric 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 reason 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 (4 x 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 with signed in March, 1995. An MOU was signed on 25.5.01 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, delay in placing order for civil works due to litigation, delay in availability of additional forest land.

Reply of the Government

DHAULIGANGA HE PROJECT:

1. The reason for delay in execution of the project was paucity of funds in the initial stages. Construction of the project could not be taken up on account of change of policy of financing the public sector power projects.
2. During the period 1991-1994, the debt equity ratio was 3:1 and public sector concerned was to arrange for financing the project at its own strength.
3. A proposal for funding was submitted by Ministry of Finance to Govt. of Japan for consideration of JBIC assistance for the year 1995-96 JBIC loan package. Thereafter the first tranche loan became effective on 23.5.96 and subsequent loans have been arranged for the project..
4. The commissioning schedule of the project is *March, 2005.* The latest sanctioned cost of the project is Rs. 1578.31 cr at Aug. 99 PL. All the units are likely to be commissioned as per schedule.

DHULHASTI HE PROJECT:

1. Due to Law & order problem in Project Area and adverse geological conditions encountered in HRT this project has been delayed.
2. All the project components are since completed except 10586 m long Head Race Tunnel. Excavation of tunnel has been completed and 6588.5 m overt lining has also been done by July 2004.
3. The work is in progress and is expected to be completed by March 2005.

PURULIA PUMP STORAGE SCHEME:

1. The project is under execution by Government of West Bengal. An MOU has been signed between NHPC and GOWB on 25.5.01 to execute Purulia Pumped Storage Scheme through a Joint Venture Company.

2. Possibilities of setting up other Pumped Storage Schemes, through the Joint Venture Company (JVC) in a time bound manner are being explored.

3. The formation of Joint Venture and Revised Cost Estimate of Purulia Pumped Storage Scheme is under consideration of PIB.

4. The meeting for formation of Joint Venture and Revised Cost Estimate for Purulia Pumped Storage Scheme was held on 24.3.04.

5. Action is being taken to resolve the issues raised in the PIB meeting i.e in principle approval of Planning Commission, pattern of routing of JBIC loan and pattern of funding through NHPC before another meeting of PIB is held.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 14, Para No. 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 al the river basins. During preparation of DPR, hydrological and hydro-meterological 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 hydrometerological data, Central Water Commission/Ministry of Water Resources maintains 953 sites throughout 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 hydroelectric 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 basis 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. 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 taken 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).

Reply of the Government

a) Central Water Commission is continuously observing Hydrological data at limited key gauging stations on national network of major rivers, near the origin of the river, near the confluence with major tributaries and at locations where river crosses the state boundaries with

the objective/assessment of national water resource. These data are available / published in water yearbooks. The data so collected is not with respect to any site specific / project specific location/ requirement. When projects are proposed at sites without adequate hydrological data, it requires longer time for hydrological data collection. Generally, water resources projects are in far flung areas which require time for establishment of approaches and basic infrastructure.

c) The state of art data collection, validation and dissemination system under Hydrology Project I has covered Peninsular India excluding Narmada for improving hydrological data status. Other parts of the country still follow the conventional system.

d) In the Hydrology Project- I, the emphasis was on the strengthening of network by the State Water Resources Departments, sustainability of this extended network on long term basis for collection of quality data.

d) The existing key gauging network of CWC is not sufficient for site-specific studies / DPR preparation and project specific observations are required. The time period of DPR preparation can be reduced if a reliable and adequate database for hydrological parameters is built up in advance.

e) The Hydrological parameters are estimated under data constraints and these limitations are brought out in the report. DPRs based upon short-term data needs to be revised during detailed design before construction is taken up. The action taken / compliance of the observations on data collection is known only when the DPR is re-submitted at a later date by the project authorities. In many such cases, the observations are not complied with adequately and again the projects remain under data constraint scenario. To overcome this limitation, a master plan of data collection, which fits into the master plan of the basin as well as catering to the recent Pre Feasibility Studies taken up for 162 hydropower projects, needs to be drawn up and executed. CWC will need appropriate resources for implementing the same.

f) The other reasons attributable to some delays in completion of DPR are inter state and international issues which are to be resolved for finalising the project proposals for DPR and at times, additional investigations need to be taken up for studying other alternate technically sound and economic propositions. This leads to time over run.

g) The quality of DPR is expected to improve with the use of state of the art equipments for topographical survey and hydrological investigations.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 16, Para No. 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 multipurpose 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 by CEA. Similarly, for single purpose hydroelectric 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 hydroelectric 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 of 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 carry out 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 system of hydrological studies carried out in other countries and the steps taken by the Government to overcome the reported problem.

Reply of the Government

a) CWC carries out hydrological analysis using standard procedures. The need for derating could be due to low discharges due to the fact that project planning is carried out with limited/ inadequate data and also due to the reasons as explained in the preceding paragraphs. The hydrological analysis in other countries is by and large on same principles. There is no flaw in the procedures adopted in India but the results depend on the size and quality of data. The problem could be partly overcome if data of sufficient length (of time) is available and the data collection at all project locations is made scientifically. A detailed study of the reduction in water availability will be done if specific cases, where derating has been recommended by CEA, are referred.

Hydrology is a dynamic process. The review of Hydrology becomes vital and necessary under the following circumstances:

i. When new set of data are made available or some extraordinary event (in case of severe flood event) is observed.
ii. There is change in the procedures or due to technological changes.
iii. Impact of man made changes in the basin.
iv. Possible effects of climate changes.

Under no circumstances the hydrological parameters estimated in the project planning stage can be taken as applicable forever. Climatic changes do occur in nature and they are in the early stages of detailed evaluation.

b) Hydrological studies carried out with scanty data do not reflect the complete variability in flows. For example if data length is of 10 years assuming that all the data are acceptable (which is generally not the case) the 90% dependable flow is the ninth value when flows are arranged in descending order. It may so happen that these 10 years are all normal years and no bad hydrological years (sometime consecutive bad years) are reflected in the data. This may lead to over estimation of flows. The case may be otherwise also. A mechanism needs to be in place where on site data collection is made for sufficiently long period before finalising the hydrological parameters. Hydrological data collection must be independent of other investigations and started sufficiently in advance of other activities.

c) Of late, it has been noticed that for fast track clearance of the project, the assurances are provided by the project authorities that the changes/ additional studies suggested by CWC and CEA will be taken care of at the time of detailed designs. Since most of these projects are not designed by CWC/CEA, no feedback is received on whether the required studies have been carried out and the impact of the results on the capacities. Having no

control over the assessment of the detailed designs and studies at the time of implementation of the project, the issues are known only when any issue of need for derating arises. It is felt that a process to this effect is required to be established for avoiding such problems in future.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 17, Para No. 3.17)

The Committee find that at time 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 hydrometric 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 changes 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.

Reply of the Government

a) Strengthening of hydrological network has been done under Hydrology Project Phase I in Peninsular India. As regards the remaining part of the country, the hydrological data falls under the category of classified data. Hydrology Project Phase II for some of the northern river systems is under preparation.

b) As regards impact of hydrological studies on limited or scanty data, this aspect is invariably brought out in the hydrological examination and it is always proposed to start the hydrological data collection so that before formulation of design parameters some additional data is available for firming up the design parameters using project specific data. The feed back mechanism on the compliance of such observations is being worked out.

c) Under Prime Minister's initiative for hydropower, about 162 projects have been taken up for pre feasibility studies. The database available for the projects is not up to the requirements for detailed project reports. It would be prudent to set up modern hydrometric stations for these projects so as to provide much needed database pending formulation of detailed project reports by any agency. In addition, detailed modeling studies in respective design offices have to be launched for hydrological and geo-technical aspects of the projects. CWC would be in position to take up such additional work with strengthening by adequate resources in terms of manpower and funds.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 22, Para No. 5.86)

It has been brought to the notice of the Committee that the Ministry of Environment & Forests seek voluminous and too minute a detail from the project proponents prior to according site and environment clearances. They note that MoEF have devised questionnaires which the project proponents had to respond while submitting the application. For instance, existence of National Park, Sanctuary/Tiger Reserves, Buffer Zone of Biosphere Reserve, Habitat for migratory birds, Archaeological site, mangroves within 7 Kms 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 ground 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 have 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 tie 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, 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 of 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 a 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.

Reply of the Government

A. Regarding environmental clearance

The point regarding seeking minute details which are considered not relevant has been looked into. Detailed exercise has been undertaken to revise the questionnaire proforma. The attempt will be to simplify and collect essential information on the project particulars. Information relevant to the data available with the agencies of the Government will be pooled together. As some of the specialized agencies come under the administrative control of the

Ministry of Environment & Forests, Ministry has now proposed setting up of Environmental Information Centers which will function as Data Bank to collect and disseminate the relevant information required by the project authorities. This would eliminate some of the problems encountered by the project proponents and the consultancy organizations in accessing relevant data. This is in line with the above recommendation that MoEF should create Data Bank for detailed information about flora and fauna, endangered species, etc.

As regards the detailed studies, surveys, etc., the Ministry of Environment & Forests will extend necessary technical guidance and information in framing the scope and terms of references for undertaking the tasks. This would help the proponents to identify competent expertise in the field and commission preparation of focused study on specific aspects.

B. Regarding forestry clearance

- Forests are the complex eco-systems which comprise important flora and fauna, sources of gene pool, micro-habitats, various food chains, nutrient cycles, water cycle etc.
- For the facts stated above, it is necessary to consider some minimum essential detail before according approval for diversion of forest land. However, the information sought is not very cumbersome and it cannot be dispensed with in the interest of environmental considerations.

- As far as the creation of the data bank by the Ministry of Environment & Forests is concerned, the data at the macro level is maintained by the State Forest Departments, Forest Survey of India, Botanical Survey of India, and Zoological Survey of India, which make the part of the report of the project proponents. However, the micro level information can be gathered at the local level only on the case to case basis.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 23, Para No. 5.87)

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 State Pollution Control Boards. The Committee desire that the Ministry of Power should take up the mater 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.

Reply of the Government

Under the provisions of EIA notification, the State Pollution Control Board has been empowered to conduct mandatory public hearing. For this purpose, the Project proponent has to approach the State Pollution Control Board with all the relevant project documents. Pollution Control Board then notifies the date for public hearing in local newspapers. In case of hydroelectric project, approval from State Pollution Control Board is not required. Under the

provisions of the Water (Prevention and Control of Pollution) Cess (Amendment) Act, 2003 dated 17.3.2003, hydroelectric projects are exempt from the levy of Water Cess.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 25, Para No. 5.89)

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

Reply of the Government

A. Regarding environmental clearance

The Ministry has, in its revised EIA procedures, proposed that at the time of Initial Environmental Examination (IEE), the Ministry of Environment and Forests would frame the Scope and Terms of Reference for the EIA/EMP Studies to be submitted by the project proponents. This will ensure that all the necessary information required for environmental clearance would be made known to the project authority at one time.

B. Regarding forestry clearance

- Forest (Conservation) Rules provide a prescribed format for the preparation of project proposals. Normally, the Ministry of Environment & Forests does not seek additional information from the project proponent except in exceptional cases where substantial adverse impact on flora, fauna and environment is apprehended.
- If the project is complete in all respects as per the guidelines issued under the Forest (Conservation) Act, 1980, no further information is normally asked from the User Agency.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 28, Para No. 5.92)

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.

Reply of the Government

A. Regarding environmental clearance

The time limit suggested for undertaking site visits, if considered essential, would be adhered to. This would be incorporated in the environmental clearance procedures now under review.

B. Regarding forestry clearance

- For the purpose of forestry clearance, Ministry of Environment & Forests conducts Site Inspection of the project site through its Regional Office as soon as the project is received for forestry clearance. Site inspection is mandatory only in cases where extent of forest land to be diverted exceeds 100 hectares. In the cases involving less than 100 hectares the site visits are done only rarely and in very important cases.

- For forestry clearance, Central Government has fixed time limit of 90 days to dispose of the proposal including Site Inspection.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 30, Para No. 5.94)

The Committee note that forest clearance is accorded to a hydel 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-constructive activities on the basis of in-principle clearance once non-forest land certified 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 faculties. The Committee desire that the modalities of this issue be finalized by the Ministry of Power in consultation with MoEF. The Committee also recommend that the application for forest clearance be processed by the Forest Wing of the Ministry of Environment & 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.

Reply of the Government

- It is true that Forestry clearance is given in two stages. In the first instance the "In principle" or Stage I clearance is given with certain stipulations. Payment of the charges for compensatory afforestation is the major but not the sole stipulation. The 'final' or Stage II clearance is given immediately on the receipt of the compliance of the conditions of Stage I approval.

- There is no delay at the level of Ministry to accord Stage II clearance as soon as compliance report is received.

- As far as parallel processing of the project proposals from forestry and environment angle is concerned, it is already in place. However, environmental clearance is issued after forestry clearance has been accorded.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 31, Para No. 5.95)

The Committee note that the proposals for forest clearances 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 project can be considered at one place which will go a long way in reducing delays.

Reply of the Government

- "Land" is the State subject and therefore it is within the powers of the State / UT Governments to examine the utilization of forest land for non-forestry purposes.

- Besides taking up development projects, it is also the mandate of the State / UT Governments to maintain a good forest cover.

- Central Government has constituted a Forest Advisory Committee (FAC) under Section 3 of Forest (Conservation) Act, 1980, which is a Statutory Body. However, as a routine practice, user agencies and representatives of concerned Department/Ministry are invited for discussion in the FAC meeting. As for Hydro-Power, the user agency is invariably invited for discussion during the FAC meeting. Therefore, there is no need to have a Joint Committee as the proposals are examined as per the provisions of the Forest (Conservation) Act, 1980 and Rules therein.

- While examining the project proposal, the State / UT Governments try to complete the information which are not submitted by the user agency but required as per the guidelines issued under the Forest (Conservation) Act, 1980.

- Since, the project proposal involves large area with forest cover, it necessitates the various field inspections, enumeration of trees, effect on wildlife, site specificity, examination of alternatives for which sufficient time is needed, etc.

- The complete proposals are examined by the Central Government. A time limit of 90 days is fixed for the Central Government to take decision on the complete and flawless proposal.

- Normally the delays are either at the level of State Government or the User Agency. Though a time limit of 210 days has been prescribed under the Forest Conservation Rules for the State Governments to process the case at their end and forward it to the Central Government, it may be useful if the matter is chased up by the user agency with the State Government.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 32, Para No. 5.96)

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 environmental 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 & 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 discuses the same plan and at times their views are different from those of EAC and the project proponents 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 in this regard.

Reply of the Government

- There is no duplication of work between Forest Advisory Committee (FAC) and Environment Appraisal Committee (EAC).

- For diversion of forest land for non-forestry purposes, it is essential for the User Agency to submit Catchment Area Treatment Plan, Bio-diversity Conservation Plan, and Resettlement & Rehabilitation Plan where ever required.

- Forest Advisory Committee ensures that these plans are submitted with the proposal. Generally, FAC does not go into details of these plans as these plans are thoroughly examined by the EAC.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 35, Para No. 5.99)

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 Report 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.

Reply of the Government

The hiring of consultants for preparing the Environment Impact Assessment Study Report is a choice exercised by the project proponent. MoEF can only advise and guide the project proponents in this regard.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 36, Para No. 5.100)

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.

Reply of the Government

- As already emphasized that 'Land' is the State subject and therefore it is within the powers of the State / UT Governments to examine the utilization of forest land for non-forestry purposes.

- State / UT Governments are within their powers to charge the lease rent, land premium etc.

- Central Government normally does not interfere in the State matters.

- Central Government is stipulating the condition for charging Net Present Value (NPV) of diverted forest land to comply with the orders of the Hon'ble Supreme Court dated: 30-10-2002 & 1-8-2003 in IA No.566 in Writ Petition (C) No. 202 of 1995.

- It is also true that some of the State Governments are charging premium as well as lease rent at the rate of 10% of the premium per annum. The annual lease rent appears on higher side. This needs to be discussed with the State Governments and a rational view taken.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 39, Para No. 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. The 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 as high as Rs. 1.60 per unit. The Committee are constrained a 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.

Reply of the Government

POWERGRID has invested around Rs. 1450 Crore in North-Eastern Region (NER) for implementing various transmission projects and is presently operating about 5000 ckt. kms. of inter-State transmission lines and 13 sub-stations. The transmission system was evolved after discussions in the meetings of North Eastern Regional Electricity Board (NEREB). This transmission system currently cates to the evacuation requirement of existing hydro/ gas generating stations at Kathalguri (294 MW), Doyang (75 MW), Ranganadi (405 MW), Kopili (200 MW), Agartala (84 MW). It has also been envisaged that these transmission systems shall also facilitate evacuation & dispersal of power from Kameng (600 MW), Damwe (520 MW) and Amguri (100 MW) with marginal investments.

The transmission charges payable to POWERGRID (all over the country except NER) are decided based on Government of India (GoI) / Central Electricity Regulatory Commission (CERC) tariff Notifications. The transmission charges in NER are paid based on the principles of Uniform Common Pool Transmission Tariff (UCPTT) system, finalised in 1987 as per the decision of NEREB and was adopted in 1990, i.e., prior to transfer of transmission assets to POWERGRID in 1991. The tariff of 35 paisa/KWh as per UCPTT was applicable for fixing of tariff for all the assets commissioned till 1st April, 1998 only.

Since 1997, POWERGRID has made requests, time and again, in NEREB meetings for inclusion of new transmission assets in UCPTT commissioned after 01.04.1998 and every time it was decided that the tariff would be pegged at 35 pasie/unit only. It may be mentioned here that the new transmission projects commissioned/ to be completed after 1.4.1998 are either linked with generation projects or categorized as system strengthening/augmentation of transmission capacity and were implemented at a cost of about Rs. 1008 Crore.

After the constitution of CERC, POWERGRID approached CERC for fixation of tariff for the new assets commissioned after April, 1998, who also directed POWERGRID to continue billing as per UCPTT even after commissioning of new assets and this is resulting in a substantial revenue loss to POWERGRID.

In regard to high transmission charges in NER, it may be noted that there has been considerable delay in implementation of generation projects in NER, which is beyond the control of POWERGRID. If all the generation projects as envisaged at the time of finalisation of transmission system had materialized, the transmission tariff would have come down to the level comparable to the tariff being levied in other Regions.

Presently, based on the investment made by POWERGRID in NER, the annual transmission charges works out to Rs. 261.83 Crore whereas the permissible billing in NER based on pegged transmission tariff of 35 paise per unit works out to Rs. 167.16 Crore. This is causing a loss of Rs. 94.67 Crore annually to POWERGRID.

POWERGRID is a Central Sector company implementing its projects without any budgetary support. It does not have the capacity to absorb the deficit arising out of pegging of tariff at a level lower than it is entitled as per norms, applicable elsewhere in the country. This deficit has also affected POWERGRID's balance sheet adversely and impacted upon its capacity

to invest further. In addition, it is also impacting its capacity to carry out O&M and service the debt. Therefore, to offset this deficit, POWERGRID had been requesting Government of India for a suitable compensation. The proposal of POWERGRID is under consideration.

The matter regarding compensating POWERGRID for the losses being suffered by the Company in this regard was considered in the past but the proposal was not agreed to by the Planning Commission and Ministry of Finance. For finding a solution to the problem of losses being incurred by POWERGRID in NER, the following options are being examined in Ministry of Power:

i) POWERGRID may be compensated through grant for its financial losses in NER.

ii) The amount of shortfall in realization of tariff by POWERGRID due to pegging of transmission tariff in NER may be spread over to the transmission tariff in the rest of the country on the pattern of cross-subsidy being provided in the petroleum sector.

iii) The investment made by POWERGRID on transmission system in NER may be converted into 5% equity and 95% long-term soft Government loan or any other financial re-engineering model without any direct subsidy.

The implications of these options are being analyzed on the basis of the latest tariff and interest rates.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No.43, Para No.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 jeopardizing 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 States of America where under development rights 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.

Reply of the Government

In the notification of the Electricity Act, 2003, it has been explicitly stated that "the appropriate Regulatory Commission shall adopt the tariff, if such tariff has been determined through transparent process of bidding in accordance with the guidelines issued by the Central Government". This provision of the Electricity Act under Section 63 provides for automatic adoption of tariff if determined through the competitive bidding process. The guidelines for competitive bidding are being framed for development of all power projects, including Hydro Power Projects, in a transparent and credible manner.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 45, Para No.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 pre-qualification 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 feels 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 pre-qualification 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.

Reply of the Government

The features of the hydro-electric projects, being site-specific, depend on the geology, topography and hydrology at the site. The construction time of a hydro project is greatly influenced by the geology of the area and its accessibility. Even when extensive investigations using new techniques are undertaken on element of uncertainty remains in the subsurface geology and the geological surprises during actual construction which could cause time and cost overruns, cannot be completely ruled out. The cost escalations on account of inadequacies in S&I have contributed to certain misgivings and misapprehensions regarding hydro power development. It has therefore become necessary to expedite S&I with the latest state of the art and prepare a shelf of Bankable DPRs of projects for execution over a decade or more.

Allocation of projects for development under Private Sector is the subject matter of State Governments. The recommendations of the Committee have been forwarded to all State Governments.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 58, Para No. 8.28)

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 atleast 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.

Reply of the Government

It has been informed by NEC that the allocation of funds is made by NEC on the recommendations of the State Government. Due to paucity of funds, the State Government gave priority to other schemes. The proposal of fund contribution for construction of about 90 kms of road for Tipaimukh HEP was not approved by the Council.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 65, Para No. 11.11)

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 on 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 given 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.

Reply of the Government

In pursuance of certain recommendations of Sarkaria Commission in Chapter XVII of its report as endorsed by the Inter-State Council and accepted by the Ministry of Water Resources, the Inter-State Water Disputes Act, 1956(presently Inter-State River Water Disputes Act) was

amended on 28.3.2002. The title of the Act was changed to the Inter-State River Water Disputes Act. Some of the major amendments carried out in the Act are as under :-

i) Section 4(1) of the Act has been amended to specify a time frame of 1 year for setting up of a Tribunal after receipt of the application from any disputant State. Section 4(1) of the Act has also been amended to ensure that any dispute settled earlier by a Tribunal constituted under the Act is debarred from being reopened.

ii) Section 5(2) of the Act has been amended to provide that the Tribunal should give its award within 3 years. However, the amendment in Section 5(2) also provides for extension of further 2 years for a Tribunal to given its award that if the award could not be given within the first spell of 3 years.

iii) Section 6 of the Act has been amended to provide that the award of the Tribunal, after its publication in the Official Gazette by the Central Government shall have the same force as an order or decree of the Supreme Court.

iv) Section 9(1) of the Act has been amended to add a provision for requisitioning of any data as may be required by the Tribunal from the State Governments. A new Section 9A has been added in the Act to provide for a data bank and an information system to be maintained by the Central Government at the national level for each river basin.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 67, Para No.11.27)

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 5,000 MW have been initiated in June, 1997 under Mahakali Treaty. Although, all investigations have reportedly to be jointly completed, Detailed Project Report (DPR) 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 10^{th} 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.

Reply of the Government

Pancheshwar Multi-purpose Project

As mutually agreed, a Joint Project Office-Pancheshwar Investigations (JPO-PI) was opened at Kathmandu in Dec.,1999 and field investigations for preparation of Detailed Project Report (DPR) for Pancheshwar Multi-purpose Project on river Mahakali (Sarda) have been

jointly carried out by India & Nepal. JPO-PI works were funded by GOI. The JPO-PI was closed on 31.7.2002.

The DPR of the project is under preparation and would be finalized after resolving the issues regarding re-regulating dam site, cost apportionment between irrigation and power components and between India and Nepal. Meeting of the Joint Group of Experts will be organised to discuss and settle various outstanding issues facilitating preparation of a joint DPR.

An expenditure of Rs. 14.26 crore has been spent on the activities undertaken by Joint Project Office - Pancheshwar Investigations for the preparation of joint DPR. In addition, Govt. of India is also incurring expenditure on continuation of hydro-meteorological observations at Pancheshwar on Indian side since 8th Plan to generate long term data to facilitate finalisation of project parameters.

Sapta Kosi High Dam Multi-Purpose Project & Sunkosi Storage cum Diversion Scheme

An agreement was reached between India & Nepal to establish a Joint Project Office at Birat Nagar in Nepal for taking up field investigations/ studies and preparation of the DPR of Sapta Kosi High Dam Multi-purpose Project and Sunkosi Storage cum diversion Scheme.

The proposal for detailed field investigations/ studies and the preparation of DPR of the above project has been approved by Govt. of India for Rs. 29.34 crore. The field investigations and preparation of DPR will take 30 months. The Joint Project Office has since been set up in Birat Nagar in Nepal on 17th Aug. 2004.

Upper Karnali HE Project (300 MW) and Burhi Gandaki HE Project (600 MW)

On the request of Govt. of Nepal, it has been decided to take up the implementation of the Upper Karnali HE Project by NHPC. As regards Burhi Gandaki Hydro-electric Project, a Technical Team from Ministry of Water Resources held discussions with HMG/ Nepal in Oct., 2003 in order to work out modalities with Nepal regarding taking up field investigations and preparation of Detailed Project Report. It was inter-alia agreed to take up the above work by an Indian agency after signing of MOU between the two Governments.

MOWR is the Nodal Ministry dealing with development of Water Resources Projects in Nepal. As regards possibility of tapping hydel resources in other neighbouring countries, NHPC is preparing PFR for Tamanthi HE Project (1200 MW) in Myanmar. Development of Punatsangchu (870 MW) in Bhutan is presently under consideration by MEA and investigation of the project has been taken up.

The activities in other countries like Bhutan where the potential exists for such development, the progress, is substantial. Chukha HEP Stage I (336 MW) has been generating the power since 1986. Kurichu HEP (60 MW) has been completed in 2003. Tala HEP (1020 MW) is under construction and is scheduled for completion in about 2 years.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

CHAPTER IV

RECOMMENDATIONS/OBSERVATIONS IN RESPECT OF WHICH THE REPLIES OF THE GOVERNMENT HAVE NOT BEEN ACCEPTED BY THE COMMITTEE

Recommendation (Sl. No. 15, Para No. 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 organization the consultancy charges are raised on man-days spent on designs and preparation of specification and construction drawings of the projects. However, on 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 or Water Resources helps WAPCOS in the design consultancy works, 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 earthquake, 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 consultant 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 cannot but deplore the casual reply of the Ministry of Water Resources as regards to steps taken by CWC to ensure that projects are not affected due to natural calamities.

Reply of the Government

a) The CWC follows practices established world over and various BIS codes on the subject matter of design of various water resources projects. The unprecedented and extreme natural calamities, that too at construction stage, would cause certain damages. However, prudent project management and timely actions by the project authorities would help in minimising the extent of damages.

b) A suitable flood forecasting system is being planned in Satluj basin for the operation stage.

Bhakra Beas Management Board (BBMB) is participating in project named Hydrology Project, Phase-II which is being undertaken by the Ministry of Water Resources. Scope of the proposal is indicated as under:

- Installation of Telemetry System in the catchments of Sutlej and Beas rivers for improvement of water management through effective early flood warning system with the help of automatic sensors and satellite based data communication system. The main objective of the scheme would be to have following inputs on Real Time basis:-

a) Discharges in the river Beas and Sutlej upstream Bhakra, Pandoh and Pong Dams.
b) Rainfall in corresponding runoff in the Beas and Sutlej catchments.
c) Rainfall and corresponding runoff in the Sutlej catchment.
d) Atmospheric temperatures in the catchments.
e) Relative humidity.
f) Wind Velocity (Speed and Direction).

- Estimation and forecasting of rainfall & snowfall and corresponding runoffs.
- Installation of state-of-art automatic electronic gauge recorders at various gauge discharge sites on rivers/channels downstream of Dams along with Real Time Data Communication System.

Setting up a Central Control Room at Nangal for real time display of observed data of catehcments, dams and various rivers/channels.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Comments of the Committee

(Please see para 23 & 24 of Chapter I of the Report)

Recommendation (Sl. No. 37, Para No. 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.

Reply of the Government

This Ministry had mooted a proposal for off-loading cost of security and other indirect costs from the project cost in order to bring down the tariffs to make the Hydro projects, specially in the Northeast, commercially viable. This was to be applied on a case to case basis for development of hydel projects located in remote and disturbed areas. The note was circulated to other Ministries for their comments. The proposal did not find favour with the other Ministries including Planning Commission, Ministry of Finance and Ministry of Home Affairs who have all not agreed to the proposal and maintained that these costs be borne by the project only. The proposal is being further pursued with the Stake holders for acceptance.

Ministry of Finance is of the view that all components which are directly related to the project have to be a legitimate charge on the project budget. These include R&R costs, security costs and flood mitigation measures, etc. At best, security costs should be borne by the State Government which benefits from the project.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Comments of the Committee

(Please see para 34 of Chapter I of the Report)

Recommendation (Sl. No. 38, Para No. 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 H.E. Project in the State of Uttaranchal through Boarder Roads Organization (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, where under 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.

Reply of the Government

The proposal of off-loading cost of highways/roads from the project cost was also including in the Cabinet note mentioned in para 6.3 above. However, the same was not agreed to by the Ministry of Finance, Planning Commission and Ministry of Road Transport and Highways. Their comments are reproduced below:

Comments of Ministry of Finance, Deptt. of Expenditure:-

" Alternate highway development due to submergence of a highway as a direct consequence of a hydro project as in the case of 'Tipaimukh' project has to be an integral part of the total project cost and must be included accordingly".

Comments of Planning Commission

' Planning Commission has consistently maintained that all costs such as roads, mitigation of environmental or ecological damage, security, R&R etc. that are directly resulting from the project should be included in the project cost. This is in accordance with the best international accounting practice and will preclude development of uneconomic and unsustainable sites based on erroneous or incomplete cost numbers'.

Comments of Ministry of Road, Transport and Highways

1. *We have no comments on the loading or otherwise of the cost of alternative highway development on the power component cost of a hydro electric project as long as specific funding is provided for such highway development.*
2. *The Ministry has no objection to the proposal of special Government loans having low interest rates and long moratorium periods.*

This Ministry also is pursuing with the State Governments to agree to stagger the 12% free power keeping it low in the initial year and raising it gradually to 12% in order to keep the initial tariffs viable. However, the State Governments are yet to agree to the proposal even on a case by case basis. However, the Govt. of J&K has agreed to forego its share of free power from Baglihar H.E. Project and the Govt. of M.P. has also agreed to forego its share of 12% free power from Omkareshwar H.E. Projects. The Ministry of Power is taking up the matter with concerned State Govt. on case to case basis wherever necessary.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Comments of the Committee

(Please see para 43 of Chapter I of the Report)

Recommendation (Sl. No. 52, Para No. 8.22)

The Committee find that due to poor industrialization, 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 at least provide transmission facilities for these projects in the North East which the Government propose to take up during the 10^{th} & 11^{th} Five Year Plans. In the 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, Seshen, 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 either investigation, which are in a very advanced stage and they be given added responsibilities.

Reply of the Government

In regard to high transmission cost related to NER and perspective transmission plan for investment in transmission projects in NER by POWERGRID for next 10 years, it may be mentioned that for optimal development and utilization of transmission system, which are key factors for providing adequate transmission system at a lower cost, it is very important that the commissioning of various generation projects, for which transmission systems are required to be planned, are known. For example, in the past , due to technical considerations and judicious utilization of Right of Way in NER, Misa - Badarpur – Bongaigaon - Malda 400 kV D/c line was constructed, considering the power evacuation requirement of various generation projects, like, Kaithalguri, Kameng, Doyang, Damwae, etc. Out of this, only Kathalguri, Ranganadi (full generation from the project is delayed) and Doyang could materialize leading to incidence of high transmission cost. Therefore, for optimal development of transmission scheme connecting NER to National Grid, it is very important to identify and firm up generation capacity, time frame and allocation of power from different generation schemes so that a long term cost effective perspective plan with phased development can be worked out. In case these issues are not firmed up and generation additions plan is not available, proper transmission development for the region would be difficult.

Further, it may be mentioned that in NER as well as in Chicken Neck area, there are serious Right of Way bottlenecks and hence it would not be desirable to develop transmission scheme for each generation project, separately. The approach has to be to pool power from various generation projects in NER and transfer it to different regions with high capacity transmission links. To utilize these high capacity transmission links to its full capacity, it is very important that a large no of generation projects are planned in similar time frame otherwise a high capacity transmission link, planned to conserve Right of Way, would have low utilisation initially and would lead to incidence of high transmission cost.

Regarding providing transmission facilities by POWERGRID for those projects which are expected to be taken up during 10^{th} and 11^{th} plan, it is to mention that POWERGRID has already submitted Feasibility Report for the transmission system associated with Monarchak Gas Based Project of NEEPCO, likely to come up by the end of X or early XI plan. Similarly, POWERGRID is in the process of evolving transmission system for Lower Subansiri (2000 MW) generation project of NHPC, Tipaimukh (1500 MW) & Kameng (600 MW) of NEEPCO.

The transmission system planning for the National Grid is being carried by CEA in coordination with POWERGRID and other stakeholders e.g. NHPC, NEEPCO, and also the State Utilities. The various transmission lines and grid substations which would collectively form the National Grid, are being planned as evacuation system for new generation projects as well as, as system strengthening schemes for the various regions for enabling increased trade in electricity across regions. The development of National grid network is being programmed in a phased manner to match with commissioning of generation projects. Additional transmission capacity is also being provided in the regional networks of Northern, Western and Southern grids for import of power. This additional transmission capacity in the regional networks would help in reducing incremental transmission requirement for hydro projects in North Eastern Region/ Arunachal Pradesh, which in turn enhance the commercial viability of the hydro projects.

Under 50,000 MW initiative, 162 schemes spreading in 16 states with aggregating capacity of over 50,000 MW have been considered for preparation of PFRs. The studies / PFRs for all 162 schemes have been completed. National Hydro-Electric Power Corporation, WAPCOS, North-Eastern Electric Power Corporation, Satluj Jal Vidyut Nigam and number of State Power Utilities have been associated to complete these feasibility studies. As a follow up of completion of PFRs action has been initiated for preparation of DPRs of attractive sites through these agencies.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Comments of the Committee

(Please see para 43 of Chapter I of the Report)

CHAPTER V

RECOMMENDATIONS/OBSERVATIONS IN RESPECT OF WHICH THE FINAL REPLIES OF THE GOVERNMENT ARE STILL AWAITED

Recommendation (Sl. No. 5, Para No. 2.43)

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 optimizing 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.

Reply of the Government

Pumped Storage Schemes work on the principle of surplus power available during the off-peak period being used to pump water from a reservoir at a lower height to a reservoir at a higher level. During peak hours the water in the higher reservoir is used to generate power thereby increasing the available peaking power in the grid. The cost of peaking power obtained through the pumped storage scheme, is high as it includes the cost of the power (off-peak), losses in transmission and in the pumping operations (of the order of 30%) and the cost of operations of the pumped storage schemes. The Indian Power Industry has not enhanced sufficiently to have a high enough differentiation in price between peak and off-peak power to allow commercial operation of pumped storage schemes. As a result, in spite of best efforts the Tehri Pumped Storage Scheme which is sought to be set up on commercial lines has not yet fructified since the beneficiary States are unwilling to offer off-peak power at low prices (marginally above the cost from thermal units) and purchase the peaking power at rates including the cost explained above.

According to re-assessment study of H.E. potential of the country carried out by CEA during 1978-87, 56 Nos. pumped storage schemes with probable aggregate installed capacity of 94,000 MW were identified. At present 8 no. of pumped storage schemes with installed capacity of 2454 MW are under operation. This works out to 2.61 % of the total installed capacity as per CEA studies. Details of the schemes in operation are given below :

S. No.	Scheme		Installed Capacity
			MW
1.	Kadana St. I&II – Gujarat		240
2.	Paithan – Maharashtra		12
3.	Nagarjuna Sagar – Andhra Pradesh		700
4.	Kadamparai – Tamil Nadu		400

5.	Panchet Hill – DVC		40
6.	Ujjani – Maharashtra		12
7.	Bhira PSS –Maharashtra		150
8.	Srisailam LBPH – Andhra Pradesh		900
Total			2454

At present 3 no. of pumped storage schemes with total installed capacity of 2350 MW are under construction. This works out to2.5% of the total installed capacity as per CEA studies. The details of the schemes under construction are given below :

S. No.	Scheme	Installed Capacity
1.	Sardar Sarovar – Gujarat	1200
2.	Ghatgar – Maharashtra	250
3.	Purulia – West Bengal	900
Total		2350

In addition, one scheme namely Tehri St II in Uttaranchal with an installed capacity of 1,000 MW has been accorded TEC by CEA and is awaiting investment decision.

In this connection, it may be mentioned that pumped storage schemes may also involve environmental / forest hindrances similar to conventional hydro electric projects.

Since Pumped Storage Schemes stabilise the grid, increase the efficiency and reliability of thermal plants by sharing peak and fluctuating load, the operation of pump storage projects would need to be rationalised to give a proper weightage for these factors and also for the prime power available during peak demand from pumped storage projects. The weightage to the following factors would be quite justified considering that Pumped Storage Project will obviously be costly as the fuel cost would be added for pumping which would be about 50% of total cost of energy, besides lower efficiency in pumping mode etc:-

- Weightage for stabilizing grid and frequency variation in the entire system and thus saving infructuous power consumption
- Weightage for optimum utilization of thermal Plants and ensuring effective fuel economy
- Increasing longivity and reducing damage to the thermal plants
- For assuring industrial growth by providing stable & reliable power

By giving weightage to the above aspects, the PSS may become economical & reasonably comparable with the other modes of feasible Peaking Power.

In Eastern and Western regions of India, where hydro capacity compared to thermal is very small (12-13%), the induction of more and more pumped storage plants would need specific consideration. In these regions, due to less demand during off-peak hours, thermal plants are forced to operate at part loads causing considerable efficiency loss and reduced PLF. The operation of pumped storage plants would provide much needed load in the off-peak hours to enable efficient operation of thermal plants and provide premium peaking power during peak hours.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Comments of the Committee

(Please see para 18 of Chapter I of the Report)

Recommended (Sl. No. 10, Para No.2.48)

The Committee are further distressed to note that the cost of Nathpa Jhakri Hydro electric project in Kinnuar district of Himachal Pradesh has been raised from Rs. 1678.02 crore to Rs. 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 way 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.

Reply of the Government

The Nathpa Jhakri Project got delayed due to the following reasons:

- Massive rock slides in July, 1993 and March, 1996 at the Dam site and their consequent removal.
- Consequent increase in the length of the Diversion Tunnel from 400m to 700m.
- Strengthening of both the right & left banks of river satluj with cable anchors.
- Emergence of shear zones at Nugalsari, Sholding, Manglad and Rattanpur ends.
- Presence of hot water springs and extremely hot working temperature in the HRT at Wadhal downstream.
- Massive floods in August, 1997 and 1st August, 2000.

All the units of Nathpa Jhakri have been commissioned during 2003-04.

The reasons for delay and time & cost overruns are being looked into by the Standing Committee of the Ministry of Power in which the representatives of CEA, CWC, Planning Commission etc. are also members. The responsibility for lapses, if any,

on the part of any organization or individuals will be fixed by the said Standing Committee.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Comments of the Committee

(Please see paras 23 & 24 Chapter I of the Report)

Recommendation (Sl. No. 12, Para No. 2.50)

Taking into account the world scenario in Hydro Department, 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 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.

Reply of the Government

The development of pumped storage schemes has attracted attention in recent past because of important role these plants are capable of playing in evening out energy generation from base load thermal stations and in meeting fluctuations in power demands and system contingencies. The pumped storage stations as means of meeting peaking requirement, in large power supply system with different characteristics are now becoming desirable as the peak demands are rising fast. Pumped storage schemes could be considered in systems with predominant thermal/nuclear generating capacity in which the requirements of peaking capacity cannot be met from conventional hydro projects. The advantage of these plants are enumerated below:

i) The pumped storage plants have the same favorable operating characteristics as of a conventional hydro-plant, quick start-up and rapid loading-unloading and shutdown and low outage rates.
ii) They offer flexibility in sitting than a conventional hydro plant and involve less hydrological risks.
iii) They are normally used to provide a balancing load to base-load thermal and nuclear plants during off-peak hours, and thus reduce severe cycling of these units and improve their efficiency, durability and reliability.
iv) They could also be designed for synchronous condenser operation.
v) Pumped storage plants can be introduced to improve system performance and reliability.

Since Pumped Storage Schemes stabilise the grid, increase the efficiency and reliability of thermal plants by sharing peak and fluctuating load, the operation of pump storage projects would need to be rationalised to give a proper weightage for these factors and also for the prime power available during peak demand from pumped storage projects. The weightage in following areas would be quite justified considering that Pumped Storage Project will obviously be costly as the fuel cost would be added for pumping which would be about 50% of total cost of energy, besides lower efficiency in pumping mode, etc.

- Weightage for stabilizing grid and frequency variation in the entire system and thus saving infrauctuous power consumption
- Weightage for optimum utilization of thermal Plants and ensuring effective fuel economy
- Increasing longibility and reducing damage to the thermal plants
- For assuring industrial growth by providing stable & reliable power

By giving weightage to the above aspects, the PSS may become economical & reasonably comparable with the other modes of feasible Peaking Power.

In Eastern and Western regions of India, where hydro capacity compared to thermal is very small (12-13%), the induction of more and more pumped storage plants would need specific consideration. In these regions, due to less demand during off-peak hours, thermal plants are forced to operate at part loads causing considerable efficiency loss and reduced PLF. The operation of pumped storage plants would provide much needed load in the off-peak hours to enable efficient operation of thermal plants and provide premium peaking power during peak hours. However, states are not willing to purchase costly pumped storage peaking power.

The reassessment studies of CEA acknowledged the need for identifying PSS sites and identified 56 sites for Pumped Storage Schemes (PSS) with total installation of about 94,000 MW. Presently, 8 PSS with aggregate installed capacity of 2454 MW are in operation. 3 PSS with total capacity of 2350 MW (Sardar Sarovar 1200 MW, Ghatgar 250 MW and Purlia 900 MW) are under construction and further 1 PSS i.e., Tehri PSS (1,000 MW) have been approved by CEA for implementation.

Pumped Storage Schemes work on the principle of surplus power awaitable during the off-peak period being used to pump water from a reservoir at a lower height to a reservoir at a higher level. During peak hours the water in the higher reservoir is used to generate power thereby increasing the available peaking power in the grid. The cost of peaking power obtained through the pumped storage scheme, is high as it includes the cost of the power (off-peak), losses in transmission and in the pumping operations (of the order of 30%) and the cost of operations of the pumped storage schemes. The Indian Power Industry has not enhanced sufficiently to have a high enough differentiation in price between peak and off-peak power to allow commercial operation of pumped storage schemes. As a result, in spite of best efforts the Tehri Pumped Storage Scheme which is sought to be set up on commercial lines has not yet fructified since the beneficiary States are unwilling to offer off-peak power at low prices (marginally above the cost from thermal units) and purchase the peaking power at rates including the cost explained above.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Comments of the Committee

(Please see para 18 of Chapter I of the Report)

Recommendation (Sl. No. 26, Para No. 5.90)

The Committee have noted that 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 to 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 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.

Reply of the Government

A. Regarding environmental clearance

In the reengineering of environmental clearance procedures, it is proposed that the MoEF would initially prescribe the Terms of Reference (TOR) for carrying out the EIA/EMP studies. This will ensure that the parameters for the preparation of documents are fixed initially. There would be no scope for asking for additional details or new information once the TOR has been agreed to. The revised procedure when implemented would ensure that there is no delay in carrying out environmental appraisal once the documents are prepared conforming to the TOR.

B. Regarding forestry clearance

- The 'Land' is a State subject and hence it is the State / UT Government who first decide on the possible utilization of forest land for non-forestry purpose.

- The project proponents may take up essential studies in advance which are in the interest of conservation of forests and environment, prior to submission of the project to the State/ UT Government.

- When the State/UT Governments recommend the project, the Central Government considers it in a time bound manner under the provisions of the Forest (Conservation) Act, 1980.

- A time limit of 210 days has been prescribed for the State Governments/UTs to process the forestry clearance cases at their various levels and forward it to Central Government for their consideration.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Comments of the Committee

(Please see para 28 of Chapter I of the Report)

Recommendation (Sl. No. 41, Para No. 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 form 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 authorities. Sometimes it is found that the same land exists in the names 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.

Reply of the Government

The recommendations of the Committee have been forwarded to the State Governments, The Department of Land Resources, Ministry of Rural Development and MoEF for implementation.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Comments of the Committee

(Please see para 37 of Chapter I of the Report)

Recommendation (Sl. No. 59, Para No. 9.21)

The Committee find that Tipaimukh Hydro Electric (Multipurpose) Project situated near Manipur-Mizoram border at 500 m downstream of confluence of river Barak with Tuivai in Churachandpur district of Manipur envisages construction of 162.8 high Rockfill Dam on River Barak to generate 1500 MW of power with 5 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 and 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, the

execution of the project could not take place due to one or the other reason. The Committee can not 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.

Reply of the Government

The Central Electricity Authority has accorded techno-economic clearance to Tipaimukh H.E. project on 2.7.2003 at a cost of Rs.5163.96 crore (which includes Rs.288.76 crore on flood moderation, Rs.280.59 crore on security and Rs.105 crore on diversion of national highway). As the security problems in and around the project area are very serious in view of large number of insurgent groups active in the area, it is essential to provide security not only in the project area but the long approach road as well. However, the loading of such indirect costs on the project is making the tariff unviable. In its present form. the tariff (1st year) works out to Rs.3 per unit (approx) at the bus bar. It is necessary for the tariff of Tipaimukh HEP to be brought down to below Rs.1.50 per unit to make it commercially viable and saleable after adding the transmission costs as the Power would need to be wheeled out of the NE Region.

Ministry of Power has already mooted a general proposal for off loading the cost towards security and other indirect costs from the cost of Hydro-electric projects in order to ensure their viability. The concerned Ministries/Departments have expressed reservations in making provisions in their budget for meeting expenses on security, flood moderation and diversion of national highway.

Ministry of Power has been considering various financial models and also exploring the possibility of the State Government agreeing to stagger the 12% free power by keeping it low in the initial years and raising it gradually to 12% in the seventh year or so and keeping it constant thereafter. However, the Government of Manipur and the Government of Mizoram are yet to agree to do so.

It is felt that since the State Governments are also the major beneficiaries of irrigation/flood control components of hydel power project, this cost should be perhaps alternatively be borne by State Government without being loaded on to the cost of power. A meeting with the concerned State Governments/Central Ministries is being organized.

In the meantime, NEEPCO has been directed to complete the field studies for the project at site including updating the DPR data. CEA had planned to visit the project site to estimate the expenditure in September/October, 2004 but the Government of Manipur has advised that the visit be called off for the time being and re-scheduled to end October, 2004 after necessary arrangement for security etc. have been tied up with the Govt. of India by the State Government.

N.E. Region has the highest untapped potential and, therefore, special thrust is being given to development its potential. Central Electricity Authority has carried out a ranking study to prioritise various hydro-electric projects identified in the country, out of which 145 projects totally 57,370 MW are in the N.E. Region. Under the 50,000 MW Hydro Initiative, Pre-Feasibility Reports of 62 schemes with an estimated capacity of 30,674 MW in the North Eastern States have since been prepared and the process of preparing DPRs in respect of attractive projects has already been initiated. The Central Sector HEPs being developed by NEEPCO are Turial (60 MW) in Mizoram, Kameng (600 MW) in Arunachal Pradesh, Tuivai (210 MW) in Mizoram, Tipaimukh (1500 MW) in Manipur, Ranganadi (130 MW) in Arunachal Pradesh, Lower Kopili (150 MW) in Assam and Dikrong (110 MW) in Arunachal Pradesh. NHPC is developing Loktak D/S (90 MW) in Manipur, Subansiri Lower (2000 MW) in Arunachal

Pradesh, Subansiri Middle (1600 MW), Subansiri Upper (2000 MW), Siang Middle (1000 MW), Siang Lower (1600 MW), Dibang (3000 MW) and Siang Upper Siang Intermediate (11000 MW) in Arunachal Pradesh.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 60, Para No. 9.22)

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 Organization (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 20.09.2001 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 to Tipaimukh dam as final investigations after obtaining required statutory clearance. NEEPCO, however, vide their letter No. ED (C)/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 serious ness 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.

Reply of the Government

NEEPCO has been directed to complete the field studies for the project at site including updating the DPR data. CEA had planned to visit the project site to estimate the expenditure in September/October, 2004 but the Government of Manipur has advised that the visit be called off for the time being and re-scheduled to end October, 2004 after necessary arrangements for security etc. have been tied up with the Govt. of India by the State Government.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

Recommendation (Sl. No. 61, Para No. 9.23)

In regard to 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 is 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 decided that no charge is to be levied. According to him, the other possibility is, the Department of North-East Affairs may agree for the security related aspects and pay it out from 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 on 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 on 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 power project. The Committee are of the view that no development project, including Hydel in North –Eastern be allowed to languish on 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 immediately 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 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 appraised of the action taken by the Government in this regard within 3 months.

Reply of the Government

In its present form, the tariff (1st year) of Tipaimukh HEP works out to Rs.3 per unit (approx) at the bus bar. It is necessary for the tariff of Tipaimukh HEP to be brought down to below Rs.1.50 per unit to make it commercially viable and saleable after adding the transmission costs as the Power would need to be wheeled out of the NE Region.

Ministry of Power has already mooted a general proposal for off loading the cost towards security and other indirect costs from the cost of Hydro-electric projects in order to ensure their viability. The concerned Ministries/Departments have expressed reservations in making provisions in their budget for meeting expenses on security, flood moderation and diversion of national highway.

Ministry of Power has been considering various financial models and also exploring the possibility of the State Government agreeing to stagger the 12% free power by keeping it low in the initial years and raising it gradually to 12% in the seventh year or so and keeping it constant thereafter. However, the Government of Manipur and the Government of Mizoram have yet to agree to do so.

It is felt that since the State Governments are also the major beneficiaries of irrigation/flood control components of hydel power project, these cost should be perhaps alternatively be borne by the State Governments without being loaded on to the cost of power.

In the meantime, NEEPCO has been directed to complete the field studies for the project at site including updating the DPR data. CEA had planned to visit the project site to estimate the expenditure in September/October, 2004 but the Government of Manipur has advised that the visit be called off for the time being and re-scheduled to end October, 2004 after necessary arrangements for security etc. have been tied up with the Govt. of India by the State Government.

[Ministry of Power F.No. 16/19/2004-H-II dated 08.10.2004]

NEW DELHI;
July 15, 2005
Asadha 14, 1927 (Saka)

GURUDAS KAMAT,
Chairman
Standing Committee on Energy

MINUTES OF THE FOURTEENTH SITTING OF THE STANDING COMMITTEE ON ENERGY (2004-05) HELD ON 13TH JULY, 2005 IN COMMITTEE ROOM 'E', PARLIAMENT HOUSE ANNEXE, NEW DELHI

The Committee met from 1600 hours to 1700 hours.

PRESENT

Shri Gurudas Kamat - Chairman

2. Shri Gauri Shankar Chaturbhuj Bisen
3. Shri Ajay Chakraborty
4. Shri Prashanta Pradhan
5. Shri Rabindra Kumar Rana
6. Shri J.M. Aaron Rashid
7. Shri Vijayendra Pal Singh
8. Shri G. Venkataswamy
9. Shri Chandrapal Singh Yadav
10. Shri Dara Singh Chauhan
11. Shri Sudarshan Akarapu
12. Shri Vedprakash P. Goyal
13. Shri Bimal Jalan
14. Shri Motilal Vora
15. Shri Jesu Das Seelam

SECRETARIAT

1. Shri P.K.Bhandrai, Director
2. Dr.Ram Raj Rai, Under Secretary

2. At the outset, the Chairman, Standing Committee on Energy (2004-05) welcomed the Members to the sitting of the Committee. The Committee condoled the death of Shri P.K. Vasudevan Nair, Chairman, Standing Committee on Labour, Lok Sabha. The Members stood in silence for two minutes in remembrance of the departed soul.

3. The Committee then took up for consideration draft Action Taken Report on Forty-second Report (Thirteenth Lok Sabha) on the subject 'Hydro Power – A Critique'.

4. The Committee adopted the aforesaid draft Report with minor additions/deletions/amendments.

5. The Committee also authorised the Chairman to finalise the above-mentioned Report after making consequential changes arising out of factual verification by the concerned Ministry and to present the same to the Houses of Parliament.

The Committee then adjourned.

ANNEXURE-II
(Vide Para 4 of Introduction)

ANALYSIS OF ACTION TAKEN BY THE GOVERNMENT ON THE RECOMMENDATION CONTAINED IN THE FORTY SECOND REPORT OF THE STANDING COMMITTEE ON ENERGY

I.	Total No. of Recommentaions made	69
II.	Recommendations that have been accepted by the Government (Vide recommendations at Sl. Nos. 1, 3, 4, 7, 9, 11, 13, 18, 19, 20, 21, 24, 27, 29, 33, 34, 40, 42, 44, 46, 47, 48, 49, 50, 51, 53, 54, 55, 56, 57, 62, 63, 64, 66, 68 and 69)	36
	Percentage of total	52.17%
III.	Recommendations which the Committee do not desire to persue in view of the Government's replies (Vide recommendations at Sl. Nos. 2, 6, 8, 14, 16, 17, 22, 23, 25, 28, 30, 31, 32, 35, 36, 39, 43, 45, 58, 65 and 67)	21
	Percentage of total	30.43%
IV.	Recommendations in respect of which the replies of the Government have not been accepted by the Committee (Vide recommendations at Sl. Nos. 15, 37, 38 and 52)	4
	Percentage of total	5.8%
V.	Recommendations in respect of which the final replies of the Government are still awaited (Vide recommendations at Sl. Nos. 5, 10, 12, 26, 41, 59, 60 and 61)	8
	Percentage of total	11.6%