BEFORE THE HON'BLE UTTARANCHAL ELECTRICITY REGULATORY COMMISSION

At 80, Vasant Vihar, Phase-I, Dehradun, Uttaranchal.

FILING NO. _____

CASE NO. _____

In the matter of: Filing of *PROVISIONAL TARIFFS* for the financial year 2007-08 for Maneri Bhali- II generating station of Uttaranchal Jal Vidyut Nigam Limited for the Determination of Hydro Generation Tariffs for its Electricity Generation Stations under Section 62 and 86 of the Electricity Act, 2003 read with the relevant regulations and guidelines of the Commission

AND

In the matter of: Uttaranchal Jal Vidyut Nigam Limited (hereinafter referred to as "UJVNL"), a Company incorporated under the provisions of the Companies Act, 1956 and having its registered office at UJJWAL, Maharani Bagh, GMS Road, Dehra Dun - Petitioner

A. Specific Legal Provisions under which the Petition is being filed

1. The Uttaranchal Jal Vidyut Nigam Limited (hereinafter referred to as "UJVNL"), under Section 62 and 86 of the Electricity Act, 2003 read with section 4(2) of the Uttaranchal Electricity Regulatory Commission (Terms and Conditions for Determination of Hydro Generation Tariff) Regulations, 2004 is filing this Tariff Petition before the Hon'ble Commission for approval of Provisional Tariff for the FY 2007-08.

B. Limitation

2. As mentioned in other petitions, there has been limited transfer of historical data from the erstwhile UPJVNL to the entities formed in the state of Uttaranchal. Despite the Petitioner's repeated requests, technical details and studies conducted over the years on projects transferred to the Petitioner have not been passed on by UPJVNL. UJVNL has made all efforts to improve the data availability in line with the requirements of the Commission. The process of aggregating the information on similar lines for the present filing is underway. To the extent the information is already available, the same is being furnished along with this petition. The Petitioner is making all efforts to ensure that the remaining information becomes available to the Commission in reasonable time to enable objective decision-making on part of the Commission.

C. Facts of the case

3. The Petitioner, Uttaranchal Jal Vidyut Nigam Limited (hereinafter referred to as "UJVNL") is a company incorporated under the provisions of the Companies Act, 1956, having its registered office at UJJWAL, Maharani Bagh, GMS Road, Dehradun.

4. Maneri Bhali Stage-II Hydroelectric Project is a Run-of-River (ROR) scheme on river Bhagirathi, in District Uttarkashi (Uttaranchal).

5. The project is located near the famous city of Uttarkashi at a distance of about 120 Km from Rishikesh and is on the downstream of the existing UJVNL's Tiloth Hydro Power Project.

6. The diversion structure is situated near Uttarkashi at about 152 kms from Rishikesh and is designed to divert 142 cumecs of water into a headrace tunnel of diameter 6.0 m and length 16 km.

7. MBII proposed at Dharasu, promising an additional peaking power of 304 MW and an annual generation of 1566 Million units would be second power project on River Bhagirathi. It would harness the 285 m. drop available in river Bhagirathi between the tail waters of Uttarkashi power house (MB I) and the headwaters of Tehri dam.

8. The Single Stage Maneri Bhali development

In July 1965 a project proposal was framed for single stage development and project report was submitted to CEA in Dec 1965. It comprised of the following main features: -

- A diversion dam at Maneri, 13 Km upstream of Uttarkashi Township.
- A 16.8 Km long headrace tunnel from Maneri to Bhali.
- A 200 MW power station at village Bhali, 16.5 Km downstream of the Uttarkashi town, utilizing a head of 351 m between Maneri and Bhali.

As the original project was spread in area from Maneri to Bhali project got the name of Maneri Bhali Project.

The Two-Stage Development (1966)

9. Dr K.L.Rao the then Union Minister for Irrigation and Power visited the Bhagirathi valley in 1965 In order to have earlier benefits, he suggested splitting of the scheme into a two stage development, the first stage utilising the drop upto Uttarkashi while the second stage consisting of a barrage at Uttarkashi, a combination of open channel and tunnel from Uttarkashi to Bhali and a power house at Bhali. The above proposal was studied in detail and survey was conducted to study the alignment of the conductor system and location of various units of the project. Cost estimates for these proposals were also worked out in detail.

10. The proposal was discussed at a meeting called by the Union Minister for Irrigation and Power on 8th January 1966 when he suggested that the scope of works proposed under the scheme should be simplified. It was also decided that details of modified scheme be worked out in consultation with Central Water & Power Commission. Accordingly, designs of two-stage development were worked out. For this review a detailed geological report, prepared in Feb. 1966 by Sri G. Pant of geological survey of India was also available, and the following points emerged.

11. The single stage development will involve driving a 10.5-mile long tunnel in geologically complex terrain. Unforeseen poor rock conditions and likely seepage of water into the tunnel, over the10.5 miles length would increase difficulties of constructing and maintaining such a long tunnel. In the event of any accidents, which are not uncommon in tunnel work, the entire project may receive set back with consequent delay in benefits and resulting losses.

12. As per report of the geologist a number of major and minor fault zones are expected along the tunnel alignment. Among them, tunnelling through suspected fault zones in the Indravati section may be difficult in the case of single stage development. The valley being of glacial origin, the depth of fill in the Indravati section is likely to be considerable and may result in day lighting of the tunnel necessitating the construction of siphon which would be a costlier structure in view of the high heads for which it will have to be designed. The two-stage development would obviate these difficulties.

13. The further investigations required to establish rock at the Bhali penstocks site of the single stage scheme, would delay early implementation. The two stage alternative gives more flexibility as work on each stage can be taken up depending on availability of resources in money, material and construction equipment. The two-stage development would give additional power by utilising 100 cusecs discharge available between Maneri and Uttarkashi, which would, to that extent, offset additional costs.

14. In view of the above, the modified proposal of developing power through two power stations have definite advantages and has therefore been adopted for the project. The advantages by splitting the single stage project in two stages are listed below: -

a) The geologically difficult areas could be avoided easily in the two-stage development.

b) Flexibility in construction could be achieved in view of financial resources and construction material. (This can be proved by the fact that the Stage-I of the Project had been commissioned in 1984 while the stage –II having faced severe financial Crisis, is still under construction).

c) An additional discharge of 3 cumecs could be available for the stage- II owing to the tributaries, which were not contributing to the single stage development and hence additional power.

d) The gestation period could be reduced considerably by splitting of the project, especially because of long race tunnel.

e) In single stage development the head race tunnel by-passed the Uttarkashi Township and therefore there would be periods when there would be no water in river Bhagirathi at Uttarkashi. This could be a cause of resentment for the religious people. In the two-stage development this could be avoided.

15. Estimates of cost have now been prepared on this basis in super cession to the earlier single powerhouse development submitted in July 1965 and the revised project report is now submitted for approval of the C.W. P.C. and Planning Commission.

Stage-I of the modified proposal consists of a dam at Maneri, a tunnel from Maneri to Uttarkashi, and a 105MW power house at Uttarkashi, operating under a head of 574.40 ft. stage II, on which some further investigations are necessary, will have a barrage at Uttarkashi, a short open channel followed by a tunnel from Uttarkashi to Bhali and a 105MW power house at Bhali operating under a head of 569.37 ft. The principal features of the project are described below: -

(i) HYDROLOGY

The discharge at Maneri Dam site has been computed from the existing discharge observations at Raiwala, which is located further downstream on river Ganga. On the basis of these calculations the 90% available discharge for the last 30 years has been assessed as 29.73 cumecs (1050 cusecs) at the diversion dam near Maneri and 32.56 cumecs (1150 cusecs) at the barrage site near Uttarkashi (Stage-II).

The maximum flood discharge has been calculated by various formulae and design flood having a peak of 3,71,000 cusecs at Maneri and 4,00,000 cusecs at Uttarkashi has been adopted.

(ii) Diversion Arrangement

It is proposed to divert the maximum non-monsoon flow of water estimated as 11,000 cusecs though two diversion tunnels of Horse Shoe shape each having equivalent dia of 4.6395 m which is the same as of the main tunnel. Suitable cofferdams will be provided on the upstream and downstream of the dam area. During the monsoon period the water would

be passed over the spillway blocks of the dam and the diversion tunnels will be closed by bulkheads so that debris and bed load may not damage the diversion tunnel.

(iii) Dam

The Dam is proposed to be a cement concrete gravity section. The river elevation at dam site is EL.1268.73 m and the deepest foundation is expected to be EL.1259.00 m. The crest level of the spillway section is expected to be at EL 1278m and the top of radial gates at EL 1291.3m allowing for a free board of 0.3m(0.984 ft.) the full reservoir level would be at EL 1291m. The minimum draw down level is proposed to be EL 1283m, which is such that storage of 450-acre ft. is available between the F.R.L. and minimum draw down level.

(iv) Barrage:

The barrage proposed at Uttarkashi for diversion of water to the tunnel of stage II has been designed to have 3 sluices bays and 10 weir bays each 60ft. wide. The length between abutments is 880 ft. The maximum design flood is taken as 4.0 lacs cusecs giving an average intensity of 512 cusecs/ft. run. The intensity is more than usually allowed on barrage but the river valley in this area is very narrow and even for providing this length quite expensive excavation will have to be done. Hence the length of the barrage has been kept to a minimum.

The floor length and thickness are provided on usual considerations of static and dynamic conditions.

(v) Intake

The designs of intakes for both the stages have been provided as per suggestions of C.W.&P.C. the intakes are ordinary open head type. For stage-I it consists of five bays 4 metres wide each. The crest level of intake is at EL 1279 m, which is one metre above the crest of the spillway. The operating platform is located at EL 1300 m that is 2 metres above the

H.R.L. The tunnel intake for stage II is similar and consists of 4 bays 4 metre wide each.

The intakes will be provided with suitable trash racks as usual and there will also be arrangement for flushing cut the bed material if the same enters the intake. Arrangement has also been kept for putting in stologs in the intake so that they can be used either during floods to prevent entry of water from lower level carrying more bed load or to close the intake entirely. Regular gate will also be provided at the entry to tunnel for normal control.

(vi) Tunnel:

A circular tunnel has been provided for both stages I & II as suggested by C.W &P.C. The tunnel for stage I will have a length of 7.8 km and a diameter of 4.73 m (15.5 ft.) The water conductor system for stage II consists of an open channel 1. 4 Km. long a tunnel 7.29 km. long of same cross section and diameter as the tunnel of stage-I. The tunnels will be concrete lined throughout the length and steel supports, rock bots etc. would be provided accordingly to requirement as the construction progresses.

(vii) Surge Tank:

Surge tanks have been provided as per designs suggested by C.W.&P.C. The surge tank for stage-I has a vertical shaft of 9.75 m (32ft.) dia and 55.8 m (163 ft.) height above the C.L. of tunnel. The lower expansion chamber has 2 tunnels 6.11 m (20.05 ft.) dia and 80 m (262.5 ft.) long. The upper expansion chamber is 29.8 m dia and 9.1 m high.

The surge tank for stage II has a vertical shaft 9.75 m (32ft.) dia and 44 m (144.32 ft.) high above C.L. of tunnel. The lower expansion chamber has 2 tunnels 6.11 m (20 ft.) dia and 80 m (262.5 ft) long. The upper expansion chamber is 29.8m (98 ft.) dia and 8m (26.5 ft) high.

(viii) Penstocks:

Design of penstocks has also been adopted as per suggestions of C.W.&P.C. For the first stage the penstocks consist of circular pressure shafts of 2.74m (9ft) dia. These are underground for a length of 103 m(337.85 ft.) and on surface for 294.7 m(966.76 ft.) The liner thickness varies from ½" to 1- 3/8".

For the second stage there are 3 circular penstocks of same diameter as for stage I. These are placed underground for a length of 106 m (347.68 ft.) and are on surface for 301 m (987.28 ft.). The thickness of liner varies from ½" to 1-1/4".

(ix) Power Potential

The 90% available discharge has been worked out as 29.73 cumecs (1050 cumecs) at Maneri for Stage-I and as 32.56 cumecs (1150 cusecs) at Uttarkashi for stage-II. The firm power output for these discharges is 43.20 MW for stage-I and 46.0 MW for stage-II. However, higher discharges are available for a substantial part of the year and to utilized the same power tunnel is being designed for a discharge of 2850 cusecs for stage I and 3000 cusecs for stage II, which has a week wise availability of over 40%. At these discharges the peak generation will be 99.6 MW for stage I and 105 MW for stage II.

(xi) Power House & Switchyard

There will be two-power house, one located at Uttarkashi and the other at Bhali. Each powerhouse will have 3 unit bays and one erection bay. The internal dimensions of each powerhouse will be 37.2m.x 12.5 m. The installed capacity at each power house will be 105 MW to keep the machines at both the power houses similar, and will consist of 3 Francis type hydraulic turbines each rates 48.400 H.P. at a rated head of 144.78 m (475.0 ft.) and directly coupled to 39,000 KVA, 300 r.p.m. , 11 kV Generators.

At each power station of two stage developments, the voltage would be stepped upto 220 kV to connect these two power stations to the Ganga Grid System at Rishikesh. The switchyard at each power station

would be equipped with 220 kV single sectionalised bus bars. A tie line will connect these two power stations and single 220 kV feeders will transmit power station to the grid sub-station.

(xii) Tail Race

The tailrace for both the powerhouses will be short channels in open excavation. Draft tube gates are provided as usual.

Accordingly, the project was divided into two stages i.e. Maneri Bhali Stage –1 Project (3 X 30 MW Tiloth power House) and Maneri Bhali stage –II project (3X35 MW Bhali Power station). Later the powerhouse was shifted to Jaspur, and then again to a better site Dharasu, but the name has been retained.
The report for stage –I was cleared by CWPC for execution after some modifications.

16. COST ESTIMATES:

The site of these works is located in difficult hilly region of border area of U.P. where the rates of labour are very high. Also the site is about 100 miles from railhead along a hill road so that carriage charges for various materials and equipment are also substantial. The rates of various items are, therefore, based on actual rates prevailing in the area for similar works and described in further detail in the project. The cost of the project based on these rates in Rs.1797.23 lacs for stage I, Rs.1792.24 lacs for stage II. The total cost thus will be Rs.3589.47 lacs as tabulated below: -

GENERAL ABSTRACT OF COST
MANERI BHALI HYDRO ELECTRIC PROJECT
TWO STAGE DEVELOPMENT

Sl. No.	Details	Stage-I		Stage-II	
		Cost of each item in lacs of Rs.	Total in lacs of Rs.	Cost of each item in Rs. lacs	Total in lacs of Rs.
1	2	3	4	5	6

	Direct Charges				
1.	A-Preliminary		14.15		14.15
2	B-Land		38.35		19.98
3.	C-Works				
	(i) Diversion Dam	164.29			
	(ii) Intake	35.30		29.99	
	(iii) Diversion Arrangement	28.20			
	(iv) Surge Tank	52.00		51.87	
	(v) Penstocks & Control points	97.46		95.25	
	(vi) Power House & Switchyard	42.94		42.94	
	(vii) Power Tunnel	566.79		538.64	
	(viii) Tail Race Regulator	14.54		13.19	
	ix) Barrage	-		281.86	
	x) Transport of Timber	35.00	1036.52	35.00	1088.74
4	K-Buildings		66.38		69.00
5.	M-Plantation		0.90		0.90
6.	O-Miscellaneous		39.83		41.40
7.	P-Maintenance		14.08		14.08
8.	Q-Equipment		291.24		291.24
9.	R-Communication		62.60		20.95
10.	Spl. Tools & Plants				
	I.D.	13.25		13.25	
	E.D.	16.00	29.25	16.00	29.25
	Total Works		Rs.1593.30 Lacs		Rs.1589.69 Lacs
11.	Establishment in field & design at @10%		159.33		158.57
12.	Ordinary T&P 1.5% of works	23.90			23.84
13.	Losses on stock	1.00			1.00

	I.D.				
	Total Direct Charges	1777.53			1773.50
	INDIRECT CHARGES				
14.	Audit & Accounts @1%	17.78	17.78		17.74
15.	Capitalised abutment of Land Revenue @5% of cost of land		1.92		1.00
	TOTAL INDIRECT CHARGES		19.70		18.74
	GRAND TOTAL		1797.23 LACS		1792.23 LACS
GRAND TOTAL OF STAGE I & STAGE II = Rs.3589.49 LACS					

RECAST ON 1976 BASE (DPR –April 1977)

17. The Stage-II of the project had originally been designed with an installed capacity of 3X52 MW of which the capacity was revised to 4X76 in due course of time.

18. The installed capacity of the proposed underground powerhouse at Jaspur will be 156 Megawatts as per the 1976 base and the anticipated annual generation will be $913x10^6$ kWh on 90% availability basis.

19. The diversion structure will be a barrage located downstream of Uttarkashi town. There will bean intake and sedimentation chamber and water will be conducted through a 800 meters long open power channel followed by a 4.8 meters equivalent diameter. The surge tank will be 9 meters diameter and about 139 meters high. The penstocks would be steel lined and an underground power house has been proposed at Jaspur. This will be followed by a tail race tunnel and outfall works.

20. The original project estimate costing Rs.4333.00 lacs had been submitted in April 1972. During checking at the C.W.P.C. some time in June 1973, the cost was brought upto date by increasing the living index only and the cost then worked out to Rs. 4751.00 lacs and the same was cleared by the C.W.& P.C. The Technical Advisory Committee of the Planning Commission, at its meeting on 3rd April 1974, had found the project technically feasible and had cleared the project for Rs.4751.00 lacs but formal approval was withheld till financial resources become available.

21. In the meeting held at the Planning Commission at New Delhi on 27th July 1976, it had been desired that the project might be recast on 1976 base. The recast project estimate on 03/76 bases for Rs. 8263.0 lakh thus was cleared technically by CEA & CWC. **The project was approved by the Planning Commission vide letter No. 1-26/2/1/74/P&E dated 27.01.1981. The Ministry of Environment & Forests also approved the project vide letter no. 14/48/80En-6 dated 19.01.1983(Copy of the above referred letters enclosed in Annexure 1).**

The recasted project estimate has been detailed in the following paragraphs:

22. INVESTIGATIONS & PRE-CONSTRUCTION WORKS CARRIED OUT ON THE PROJECT:

The exploratory works and pre-construction activities taken up till that time are briefly described below: -

a) Survey by Survey of India: - The work of triangulation and establishing Geodetic Control Points at various work sites was entrusted to the Survey of India. They have also been requested to prepare a 1:15000 scale map for the project area. These works are in progress.

b) Geological Investigations: Surface geological studies have been carried out at the barrage site, power channel alignment, Tunnel Intake, Alignment of the Head Race Tunnel and the Location of the Power House and appurtenant works. Besides, drilling has been carried out at the Barrage site, site of the sedimentation tank, tunnel intake, Dhanari Gad crossing and at the Gamri Gad crossing of the H.R.T. These holes have been geologically logged and studied. A 270 meters long drift has also been made for exploration of the nature of the rock at the Power House Cavity. Director (Geophysical Survey) of the Geological Survey of India has been requested to carry out studies for delineating the exact profile of the Thrust Zone. Tilt meter bases were installed across the Srinagar Thrust and observations are being made in collaboration with the School of Research and Training in Earthquake Engineering of the University of Roorkee.

c) Srinagar Thrust: - The Srinagar Thrust, as anticipated from geological explorations done so far, would be in a length of 78 m only. There are expectations that there might be in rush of Luke warm water. At the Maneri Bhali Hydro Electric Project Stage-I. We are going to cross about 900 M length of Crushed and sheared quartzite rock mass in the syncline surcharged with about 80 M, head of water with the help of special fast Drilling Equipment and High Pressure (100kg/cm^2) grouting equipment which is being obtained for this purpose. The purpose of such grouting treatment is to watertight the crushed rock formation by creating a net work of

"Clanguages" (Breaks) which will increase the internal stresses of the rock mass by increasing the cohesion of the fine material surrounding the rocks. In this process a cylindrical mass of suitable diameter (excavated dia. Of tunnel +4 to 5 m annular ring around it) is consolidated in a section of 25 M to 30 M ahead of the tunnel Heading and excavation is done thereafter. In the case of Srinagar thrust such treatment in about 3 sections of 30 M length would only be required and will be much less time consuming as com-pared to 900 M length which we have to traverse in the Maneri Bhali Stage-I tunnel.

d) Pre-Construction works: - The following jobs are at present in progress and are expected to be completed by the date noted against each: -

(i)	A 3.4 kms. Long approach road to Intermediate Adit Site	June 1977
(ii)	A 1.4 kms. Long approach road to Adit for the power House cavity	September 1977
(iii)	A 60 meters span steel bridge over the Bhagirathi River near Dhannari Gad	June 1977
(iv)	A 60 meters span steel bridge over the Bhagirathi River near Dharasu	September 1977
(v)	A 2.1 kms. Long approach road to Adit to H.R.T. at Power House site.	December 1977
(vi)	Acquisition of land for location of various Structures and for colonies and roads	December 1977
(vii)	Procurement and erection of 12 nos. Nissen Sheds for stores	December 1977
(viii)	Construction of site offices and temporary quarters for work charged staff at Dhanari Gad, Joshiyara, Dharasu and at Chinyalisaur	December 1977

e) Expenditure so far: - An expenditure of Rs. 82,99,345/- only has been incurred on the above works upto the end of March 1977.

RECAST ON 1980 BASE

23. In the recast project of 1976, the installed capacity of powerhouse was 156 MW (3X52) and diameter of tunnel was 4.8 metres for a discharge of 75 cumecs. Further studies were carried out to determine the optimum tunnel diameter, design discharge, and the corresponding installed capacity of powerhouse. On the basis of detailed studies, it has been decided to provide a tunnel of 6 metres dia to carry a discharge of 120 cumecs. The corresponding installed capacity of the powerhouse has been increased from 3X52 MW to 4X64 MW.

24. The project will have a diversion structure of a 98 meters long barrage along with intake, sedimentation chamber and flushing conduit at Uttarkashi. The water conductor system will consist of about 200 meters long cut and cover section near intake followed by a 16 kms lg head race tunnel of horseshoe shape and 6 meter equivalent diameter. At the end of headrace tunnel will be a surge tank of 11 meters dia and about 145 meters high. Two steel lined penstocks of 3.8 m dia will take off from the surge tank with 2 nos. Y-pieces located near the powerhouse. The powerhouse will be located on left bank of Bhagirathi in a cut a will have four machines of 64 MW each. The anticipated annual generation of power will be 1195.78 million units on 90% availability basis and 1492.12 million units on average availability basis.

25. The project estimate was recast in 1980 for Rs. 18197 Lakhs.

26. INFRASTRUCTURE FACILITIES AND WORKS CARRIED OUT ON THE PROJECT

a. INFRASTRUCTURE FACILITIES

The work on detailed investigation and construction of infrastructure facilities (approach roads, bridges and colonies etc.) was started during 77-78 and following works have been completed: -

I. About 90% land required for works and camp sites has been acquired.

II. Approach road to head works and tunnel intake at Joshiyara (Uttarkashi) has been completed.

III. Approach road to Intermediate Adit at Dhanarigad along with bridge on river Bhagirathi has been completed.

IV. Approach road to H.R.T. and surge shaft at Dharasu and double land bridge on river Bhagirathi has been completed.

V. Work on colonies at Joshiyara (Uttarkashi), Shaktipuram (Chinyalisaur) and Dharasu was started and about 350 residences have been completed and work is in hand for another 250 residences.

b. Surveys: -

The Survey of India has completed the fieldwork for preparing the maps on scale of 1:5000. The work of triangulation and establishing geodetic control points at various work sites is also being carried out by Survey of India to meet the construction requirement.

c. Geological Investigations:

Surface geological studies have been carried out at barrage site, intake, alignment of H.R.T. and location of powerhouse and appurtenant works. Besides drilling has been carried out at barrage site, sedimentation chamber, tunnel intake, Dhanarigad and Gamarigad crossings of H.R.T. Further geological investigations are in progress for layout of penstocks and Y-pieces and for the junction of H.R.T. with intermediate Adit.

d. Civil Works:

(i) Open excavation (4.5 lacs cum.) for inlet portal and approach cut has been completed.

(ii) Excavation of 500 metres length of intermediate Adit at Dhanarigad out of total length of 750 metres has been completed.

(iii) Excavation of 50 metres length of surge tank, Adit at Dharasu out of total length of 150 metres has been completed.

e. Main Works

The layout of main works including barrage and power house have been finalised. The tenders for main works (Barrage, intake, sedimentation chamber etc., H.R.T., Surge Tank and excavation of penstocks) have been finalised and works have been allotted. The

orders for import of modern and fast equipment for construction of H.R.T. (which is most critical structure) have also been finalised.

f. Expenditure incurred

An expenditure of Rs. 472 lacs for the infrastructure and other works has been incurred upto March 1980. An expenditure of Rs.151 lacs has been incurred during 80-81 upto December 1980.

27. **REVISED PROJECT ESTIMATE: -**The revised project estimate has been framed on June 1980 base. The increase in the cost is mainly due to following reasons: -

I. Change in scope of Project: The diameter of the tunnel has been increased from 4 metres to 6 Metres and installed capacity of power house increased from to 4X64 MW for optimum utilization of available water. This basic change has affected provisions for both civil and electrical works.

II. Increase in cost of living index

III. Increase in cost of main construction materials (e.g. cement, steel, explosives, P.O.L. tyres and tubes) and increase in cost of construction equipment and machinery.

IV. Increase in cost of generation equipment (from about Rs. 1404 per KW to about 2265 per KW)

RECAST ON 1982 BASE

28. Further studies were carried out to determine the optimum design discharge and the corresponding installed capacity of powerhouse. On the basis of detailed studies, it has now been decided to provide a tunnel of 6 metres dia to carry a discharge of 142 cumecs. The corresponding installed capacity of the powerhouse has been increased from 4X64MW to 4X76 MW. This was discussed with CEA by UPSEB and correspondence was exchanged regarding the enhancement of Installed capacity by increasing the design discharge of the tunnel (i.e. velocity of water). **Copy of letter No.2575-GNP/II/M-8 dated 27.09,1982 from CE Planning) UPSEB to CEA appended in Annexure 2)**. The cost estimate of the project for Rs. 21266 Lakhs with revised capacity was prepared on 1982 base. **Copy of the studies carried out to determine the optimum tunnel discharge and the enhanced capacity of the powerhouse is enclosed in Annexure 3.**

29. The recast project of 1982 was revised mainly due to change in scope, increase in cost of living Index, cost of construction material and generation equipments.

30. The project will have diversion structure a 81 metre long barrage along with intake, sedimentation chamber and flushing conduit at Uttarkashi. The water conductor system will consist of about 200 metres long cut and cover section near intake followed by a 16 kms long head tunnel of horse shoe shape and 6 metres equivalent diameter. At the end of head race tunnel will be surge tank of 13 metres dia and about 150.8 metres high. The steel lined penstocks of 4.0 m dia will take off from the surge tank with 2 Nos. Y-pieces located near the powerhouse. The powerhouse will be located on left bank of Bhagirathi in a cut and will have four machines of 76 MW each. The anticipated annual generation of power will be 1327.13 million units on 90% availability basis and 1641.52 million units on average availability basis.

31. In the mean time in 1985 damages were observed due to silt in underwater parts of machines of Maneri Bhali stage-I and difficulties in maintenance of machines because of common penstock came to light and so the following major modification were incorporated in the design of Maneri Bhali Stage –II: -

- The sedimentation Chamber earlier designed to exclude particles larger than 0.25 mm was redesigned for size larger than 0.15 mm.
- In place of earlier configuration of two main penstocks, each being bifurcated into two unit penstocks, four unit penstocks were directly taken from the surge tank to feed each unit individually.
- Facility of runner removal from bottom, which had not been provided in earlier design, was incorporated in machines.

RECAST ON 1986/1990 BASE

32. Further revisions were made in 1986(Rs 33866 lakhs) and 1990 (Rs. 47379 Lakhs) but none of these estimates except the original (1976 base for Rs. 8263 Lakhs) have been sanctioned.

33. Present status of progress of work is given below (As per 1990 base): -

Sl. No.	Item	Agency	Total	Progress	Percentage	Remarks
1.	Barrage a) Excavation b) Concreting	Continental Constructions	183000M^3 99000M^3	81300M^3	Completed 82	All five bays bays of barrage completed upto EL:1096
2.	Intake, Sedimentation & Forebay a) Excavation b) Concreting	Continental Constructions	478000M^3 227000M^3	340000M^3 62000M^3	71 27	Intake structure nearly completed .Forebay piers abutment and hoppers in progress
3.	Head Race Tunnel a)Joshiyara Face i) Excavation ii) Overlining b)Dhanari Face i) Excavation ii) Overt lining c)Dharasu Face i) Excavation ii) Overt lining	Continental Constructions Hydel Const. NPCC Ltd.	 4500M 4500M 7500M 7500M 4000 M 4000 M	 3075M 1316M 3281M 2118M 2723M 1550M	 68 29 44 28 68 38	
	TOTAL I) Excavation ii) Overt lining		 16000M 16000M	 9079M 4984M	 57 31	Total of ….Km of Tunnel excavation completed.
4	Surge Shaft Open Excavation Underground Excavation	NPCC Ltd.	 165000M^3 40000M^3	 1240M^3	 Completed 3	Steel liner being fabricated by Irrigation Workshop Roorkee
5	Penstocks Excavation	NPCC Ltd.	3175M	2339M	74	
6	Power House, Tail Race & Switchyard					Progress satisfactory and will not delay completion of project.
	Excavation Concreting		1022000M^3 62000 M^3	995500M^3 40315M^3	97 65	

34. It will be obvious from the above progress chart of works that achievements had been slow and particularly slower for the works of Surge Tank and Tunnel. Various reasons for these slow progresses are enumerated below: -

1) Poor Geological Condition:

a) <u>In Tunnel</u>

The 9 km length of the total 16 km long headrace tunnel driven so far has encountered a variety of rocks proving fair to good tunnelling media in general. But at least five small reaches in the entire length showed unforeseen geological conditions leading to unavoidable hold-ups. The first reach traversing sheared and crushed Seri cite quartzite with rush of water had u predictable collapses and formation of as much as 5 cavities between RDs 228 m and 312m from inlet end. The reach could be negotiated in about a year. The second and third reaches were from the Dhanarigad intermediate Adit – one in the upstream (RDs 758 m to 791m) and other in the downstream (RDs 758m to 630m). The upstream reach intercepting thinly foliated, jointed a sheared matavolconics with enormous water force led to following conditions. The tunnel reach was held up from December ’84 to February ’87 and since all the remedial measures to rectify the above reach failed, a bypass tunnel from RD 737.5m was successfully driven by multiple drifting methods in the week zone.

The downstream tunnelling problem due to crushed and sheared quartzite with heavy ingress of water was unavoidable for reason of very low rock over below Dhanarigad. This reach could be negotiated in about a year. The last two reaches were from Dharasu Adit one in the upstream at RD 1928m and other in the downstream at RD 238m.

The upstream problem was associated with excessive flow of crushed material with very heavy seepage of water. Here too, the tunnel was held up for over a year and ultimately it had to be diverted. The downstream tunnel reach traversing sheared phyllite collapsed due to heavy ingress of water and had to be bypassed after considerable stoppage of work.

b) In Surge Shaft:

Work on the pilot shaft 3m dia from bottom upwards was cone in a height of 116 m. This had to be stopped on account of rock falls from slumped rock zone expected at that elevation. Then it was decided to do balance excavation of pilot shaft from top after completing open excavation from top. The work has thus been delayed. Later the work could not proceed due to lack of cash credit limit and funds.

(ii) Non availability of funds and Cash Credit:

Since the year 1988-89 the project witnessed on acute shortage of funds, so much so that in the year 1988-89 Rs.10.75 crores were made available against the requirement of Rs..25 crores. Subsequently the position of funds took a turn from bad to worse. The contractors either closed down the works or go-slow policy was adopted.

Having assured by the Govt. the availability of funds and cash credit as per demand so that the commissioning of the project could be ensured by the end of eighty-five year plan, the detailed programme was framed. However, despite the assurances the project received the fund allotment of bare Rs.5 crores in the year 1990-91 against the sanctioned outlay of Rs.21 crores.

Therefore, the non-availability of funds or cash credit has been one of the biggest adverse ingredient in the slow down of progress. Now even if the funds are made available at the earliest the construction agencies engaged in the construction of the project are likely to take time in full mobilization i.e. Overhauling, repairing of fleet of their machines, reemploying skilled and unskilled labor and supervisory staff and arrangement of materials to resume the work in full swing/. Besides contractors have submitted claims of crores of Rupees on account of idle machines, work force and the disputes are in arbitration. This is also affecting the smooth functioning of the project.

(iii) Labour problems Faced by the Contractors

The construction agencies also faced labour unrest during previous years of execution. One of the contractors M/s NPCC have to declare lock out for sixteenth months. Similarly, M/s Hydel Construction Co. also faced the labour problems. This factor also contributed the delay in construction work of main HRT, which fall on the critical paths of the commissioning of the project.

(iv) Shortage of Materials:

Advance payments are required to be made for purchase of essential materials like steel and cement. However, due to shortage of cash credit limit adequate quantities of these and other materials could not be arranged which also hampered progress of the work sufficiently.

35. REVISED PROJECT: The total cost of project now works to Rs.473.79 crores as per base 1990.

RECAST ON 1998 BASE

36. The project preliminary works were started in 1979-80 by the erstwhile UPSEB along with UP Irrigation Department and the main civil works contracts were signed by UPID between 1980-82. The civil works on the project at Diversion dam and tunnel were taken up but the pace was slow due paucity of funds and geological hurdles. The works finally came to a halt in 1990-91 due to non-availability of funds and remain suspended until the creation of the state of Uttaranchal and formation of UJVNL. By then 9 km of tunnel had been excavated and works of barrage complex was in advance stage of completion. The orders for the Generating equipment of the power stations had also been placed and an expenditure of Rs.153 crores had been made on the project. Subsequently, Government of UP made efforts to get the project completed in private sector or through Central Sector undertakings viz. NHPC, THDC etc. but could not succeed in making headway because of legal, technical and financial complications involved.

37. Apart from dire need of energy in the country, of which 1300 Mu can be annually supplemented by the project of 304 MW peaking capacity, Maneri Bhali Stage-II project needs to be completed at the earliest because of the following reasons:-

    a. Till 3/98 an amount of Rs. 155 crore has been spent on this project of which the value is more than Rs.450 crore today considering interest rate of 9.5% p.a. This money shall remain blocked unless the project is commissioned.
    b. The cost of the project is rising with time due to burden of interest, establishment expenditure and rise in price index of material. This has hampered the viability of this project to a very great extent. Further delay may render the project unviable.
    c. The half completed works are undergoing deterioration at site and the only way to prevent further deterioration is project completion.

38. The estimated cost of the project on 3/98 price base is Rs.825.67 crore.

39. Efforts to obtain loan from PFC for completion of the project are in progress. PFC has already agreed in principle to provide a loan upto Rs.600 crore subject to submission/approval of Revised DPR.

40. The project civil works are likely to be completed within 40 months from the date of availability of loan. If loan is immediately available, the project is likely to be commissioned by March 2002.

41. The project was already under construction, when the works were stopped because of shortage of funds since 89-90.

42. The infrastructure facilities have already been completed for construction work at all sites.

43. A brief resume of main Civil Works completed upto 3/98 is being given below: -

S.No.	Item	Unit	Total Qty.	Progress	Progress in
1.	Barrage				
	i) Earth Work	Cum	1,88,000	1,88,000	100
	ii) Concreting	Cum	99,000	82,459	83.3
2.	Intake & Sed.Tank				
	i) Earth Work	Cum	5,25,000	3,70,011	70.5
	ii) Concreting	Cum	2,22,000	69,903	31.5
3.	Head Race Tunnel				
	i) Excavation	M	16000	9157	57.2
	ii) Overt lining	M	16000	5041	31.5
	iii) Invert lining	M	16000	235	1.5
4.	Surge Tank				
	i) Excavation	M	172	-	-
	ii) Concreting	M	172	-	-
5.	P.H. Complex				
	i) Excavation	Cum	10,22,000	10,22,000	98
	ii) Concreting	Cum	62,000	41,277	66.6

The supply of trash racks radial gates and intake gates are almost complete.

In addition to above, it is worth mentioning that 100% land acquisition, construction of roads & bridges and buildings required during construction is also complete.

44. The resume of electrical works is as follows: -

(a) Construction power supply arrangements are complete.

(b) Order for supply of main machines and MIV's had already been placed with BHEL but was cancelled in 1995 due to paucity of funds and decision of the Govt. to privatise the project. Order is being revised.

(c) E.O.T. cranes for powerhouse have been received.

(d) A few workshop equipment and other miscellaneous equipment have been procured.

(e) The powerhouse and switchyard layouts are in final stages. Only layout of equipment which depends upon requirement of supplier remains to be finalized.

45. The cost of the project on 3/98 price base is: -

Civil works	Rs.519.08 crore
Electrical works	Rs.306.59 crore

	Rs.825.67 crore
	---

46. The expenditure incurred on the project upto 3/98 is as follows:

Civil works	Rs.138.42 crore
Electrical works	Rs. 16.68 crore

	Rs.155.10 crore
	---

47. Thus the requirement of funds on present day cost basis to complete the balance works is: -

Civil works	Rs.380.66 crore
Electrical works	Rs.289.91 crore

	Rs.670.57 crore
	---

48. The yearwise break-up of requirement is as follows: -

	(Rs. In crore)
Year-I	90.00
Year-II	205.00
Year-III	225.00
Year-IV	150.57
Total	Rs. 670.57

49. Details of expenditure during the above period from 1979-80 till abandonment of project due to shortages of funds is enumerated below:

S.No.	Item		Expenditure upto 3/99	Estimated cost (base 2/99)	Balance
1	2		3	4	5
DIRECT CHARGES					
I	**WORKS**				
	A	Preliminary	0.906	2.240	1.334
	B	Land	1.177	1.220	0.043
	C	Works	31.485	133.480	101.996
	J	Power Plant	73.108	409.990	336.882
	K	Building	3.996	8.920	4.924
	M	Plantation	0.143	0.800	0.657
	O	Miscellaneous	-0.237	17.980	18.217
	P	Maintenance	1.367	5.440	4.073
	Q	Spl.T&P	2.998	0.880	-2.118
	R	Communication	2.258	3.210	0.952
	S	Plant & Equipment	7.651	293.170	285.519
	X	Environment & Ecology	0.002	0.070	0.068
		Total	**124.852**	**877.400**	**752.548**
	Y	Losses on stock	0.287	4.800	4.513
		Total I- Works	**125.139**	**882.200**	**757.061**
II	**Establishment**		29.520	83.470	53.950

III	**Ordinary T&P@ 1% of I-Works**		1.219	9.250	8.031
IV	**SUSPENSE**		3.564	-0.650	-4.214
V	**Receipt & Recovery**		-3.487	-11.910	-8.423
	Total Direct charges		**155.955**	**962.360**	**806.405**
INDIRECT CHARGES					
	I.	Capitalised abatement of land revenue	0.039	0.040	0.001
	II.	Audit & A/C @ 1% of I-Works	1.199	9.230	8.031
	III.	Contingencies	0.000	0.000	0.000
	Total Excluding IDC		157.192	971.630	814.438
VI	**Interest during construction**		0.000	246.490	246.490
	Total including IDC		**157.192**	**1218.120**	**1060.928**
VII	**Claims of the contractor**		0.000	31.050	31.050
	GRAND TOTAL		**157.192**	**1249.170**	**1091.978**

Note: the major civil works abandoned in 1990-91. However minor maintenance works continued till restart of the project i.e. August 2002.

RECAST ON 1999 BASE (DPR 2000)

50. The govt. of U.P. had taken a decision to privatise the project. During the period when efforts were being made to give the project in private sector the project remained at stand still. This decision was reversed only in 3/98 and since then the efforts to complete the project and arrangement of funds has been vigorously pursued.

51. The estimated cost of the project on 2/99 price base is Rs.887.04 crore and completion cost including IDC is Rs.1249.18 crore.

52. Till 3/99 an expenditure of Rs. 157 crore has been already done.

53. The cost of the project on 2/99 price base is: -

Civil works	Rs.596.23 crore
Electromechanical works	Rs.290.81 crore
	Rs.887.04 crore

54. The expenditure incurred on the project upto 3/99 is as follows: -

Civil works

UPID	Rs.139.00 Crore
UPSEB	Rs. (-) 2.26 Crore
Total	Rs. 136.74 Crore

Electromechanical Works:

UPSEB	Rs. 20.45 Crore
Total	Rs.157.19Crore

55. Thus the requirement of funds on present day cost basis to complete the balance works is: -

Civil Works	Rs. 459.49 Crore
Electrical works	Rs. 270.36 Crore
Total	Rs.729.85 Crore

56. The year wise break-up of present day cost basis requirement is as follows: -

		(Rs. In Crores)
Year I		187.41
Year II		203.38
Year III		206.34
Year IV		132.72
Total	Rs.	729.85

57. Since the discussions on the project proceeded till 2/2000, the cost was worked out 3/2000 base. For calculation of I.D.C. & completion cost the project cost has been first calculated on 3/2000 base as under.

Civil works	Rs.626.21 crore
Electromechanical works	Rs.301.62 crore
Total	Rs.927.86 crore

58. <u>Escalated & completion cost:</u>

The escalated completion cost of the project is as follows: -

Civil Works	Rs.678.27 crore
EM works	Rs.324.12 crore
	Rs.1002.69 crore

59. Requirement of balance funds on 3/2000 base: -Thus the requirement of funds (3/2000 base) for completion of balance works is Rs,.770.67 crore without escalation and Rs. 845.50 crore including escalation. The year wise break-up is as following: -

(Crores Rs.)

	Unescalated	Escalated
Year I	196.94	201.46
Year II	215.19	232.24
Year III	217.91	245.48
Year IV	140.63	166.32
Total	770.67	845.50

60. Capitalised cost and cost of generation: -

The capitalized cost of the project including escalation and IDC is as mentioned below: -

(Crore Rs.)

On present day cost base	1111.39
On completion cost base	1149.18

AFTER THE CREATION OF UJVNL

61. After the formation of Uttaranchal in year 2000 and Uttaranchal Jal Vidyut Nigam Ltd. (UJVNL) in 2001, a decision was taken to revive the project to unlock the investments on the project (Rs 165 Crores upto 10/2002) and derive benefit of power generation. **Copy of GoU Order No. 900/9-Urja/2001 dated 24.11.2001 vide which UJVNL was sanctioned approval to restart the work of Maneri Bhali- II is hereby enclosed in Annexure 4.** Various Clearances needed to be obtained after the revamping of this Maneri Bhali- II project scheme by UJVNL due to the change in capacity of the project over the period of time. **Copy of these Clearances along with the copy of Letters regarding transfer of earlier clearances from UPSEB to UPJVNL is enclosed in Annexure 5.**

62. Financial Assistance for the project was taken from Power Finance Corporation (PFC). An amount of Rs 800 Crores was sanctioned by PFC in July 2002. PFC also sanctioned an additional financial assistance of Rs 400 Crores in October 2005. Hence till now Rs 1200 Crores was sanctioned by PFC for the construction of Maneri Bhali-II Project. Till date (10.03.2006) Rs 773.92 Crores was disbursed by PFC.

63. The rate of interest on this loan varies from time to time. The interest rate is charged by PFC, which was prevailed on the date of each disbursement. The rate of interest was 12.5% on the date of sanctioning of original loan of Rs 800 Crs. However, the present rate of interest is 9.25% after rebate for timely payment. There is an interest-reset clause wherein rate of interest is charged based on a prevailing date.

64. It is also submitted that after October 2004 the interest has become as a component of loan and hence, no payment was made against that. However the interest was charged to our account as a component of loan.

65. The PFC Loan has to be repaid in 40 equal quarterly instalments. The first instalment will become due on 15th day of October 2007 and the subsequent instalment will become due for payment on the 15 th of January, April, July and October every year. The gestation period is six month after completion of project.

66. The restart of the project was a major challenge requiring financial intermediation, revival of old civil work contracts and detailed inspection of the half completed works, which might have seen the aging effect and deterioration during the long idle period. The earlier civil work contracts

were revived and considerable renovation work of infrastructure like roads, buildings and other facilities had also to be done. **Brief note on contracts awarded (Civil & E&M) for execution of the project since the restart of the Project in August, 2002 are listed in Annexure 6.**

67. **The contract details of different packages ordered to various contractors along with copy of certain major agreements with BHEL and other contractors is enclosed in Annexure 7 for your reference.**

68. The MOU between UJVNL and Irrigation Department was signed on 25.06.2002 and the major works re-started in full swing in October 2002**. (Copy of MOU between ID & UPSEB is enclosed in Annexure 8)**

69. The revised project estimate was prepared on 3/98 price base and submitted along with the detailed project report for 4 X76 MW installed capacity in August 1998. The CEA and CWC suggested certain modifications in the cost and advised to adopt cost on 2/99 price base.

70. The project estimates was revised on 2/99 base for Rs 1249.18 crores (including escalation and IDC) and techno economic clearance was accorded by CEA vide their letter No. F.No.2/UP/46/99-PFC/1298-1321 dated 21.02.2000**(Copy enclosed in Annexure 4).** Means of financing for above approved cost is enumerated below: -

Project cost (as per DPR): - 1249.18 Crores

Means of financing (in Crores)

PFC Loan	600 ★
GoU Loan	245.50
Total debts	845.50
Equity by UJVNL	403.68
Total (Debts+Equity)	1249.18

★ PFC Loan actually sanctioned in 2002= Rs 800 Crores
UJVNL Equity = Rs 449.12 Crores
Total = Rs 1249.12 Crores

71. The approved completion cost of the project is Rs 1249.18 Crores. However the actual completion cost of the project is estimated to be around Rs 1714.40 crores. **The revised DPR submitted before CEA for**

approval for the project cost of Rs 1714.40 Crores is enclosed in Annexure 9. The difference of Rs. 465.22 crores in the completion cost is projected in Table below: -

S.No.	HEAD OF PROJECT ESTIMATE	CEA Appd. Cost (2/99 base hard cost)	Escalation, IDC etc included in completion cost	CEA Appd. Completion cost	Provisions in revised Cost Estimate (1/05 base)	Total Increase
DIRECT CHARGES						
A	Preliminary	2.10	0.14	2.24	2.97	0.73
B	Land	1.21	0.01	1.22	2.73	1.51
C	Works	112.39	21.09	113.48	152.27	18.79
J	Power Plant	359.34	50.65	409.99	687.18	277.18
K	Buildings	8.45	0.47	8.92	4.32	-4.60
M	Plantation	0.69	0.11	0.80	0.31	-0.49
O	Miscellaneous	15.65	2.33	17.98	43.13	25.15
P	Maintenance	4.77	0.67	5.44	7.03	1.59
Q	Special T&P	1.53	-0.65	0.88	1.90	1.02
R	Communication	3.11	0.10	3.21	4.69	1.48
S	Plant & Equipment	264.51	28.66	293.17	310.39	17.22
X	Environment & Ecology	0.07	0.00	0.07	0.07	0.00
	Total	**773.81**	**103.59**	**877.14**	**1216.99**	**339.58**
Y	Losses on stock	1.29	3.51	4.80	2.64	-2.16
	Total I- Works	**775.10**	**107.11**	**882.21**	**1219.63**	**337.42**
II	Establishment	75.05	8.42	83.47	76.05	-7.42
III	Tools & Plants	8.06	1.19	9.25	4.69	-4.57
IV	Suspense	0	-0.65	-0.65	0.00	0.65
V	Receipt & Recovery	-10.33	-1.58	-11.91	-11.91	0.00
	Total Direct Charges	**847.88**	**114.49**	**962.37**	**1288.45**	**326.08**
	INDIRECT CHARGES					
I	Capitalised Abatement of Land Revenue	0.04	0.00	0.04	0.04	0.00

II	Audit & Accounts	8.06	1.17	9.23	14.30	5.07
III	Contingency		0.00	0.00	47.12	47.12
	Sub- Total	**855.98**	**115.66**	**971.64**	**1349.90**	**378.27**
	Interest During Construction	0	246.49	246.49	154.50	-91.99
	TOTAL	**855.98**	**362.15**	**1218.13**	**1504.40**	**286.28**
	Claims of contractors already accounted for in Estimate	31.05	0.00	31.05	210.00	178.95
	Grand Total	**887.03**	**362.15**	**1249.18**	**1714.40**	**465.23**

The reasons for rise in completion cost of the project from Rs 1249.18 Crores to 1714.40 Crores is discussed in following paragraphs: -

The cost of civil works has increased substantially due the reasons listed below: -

72. Under A- Preliminary, there is marginal increase of Rs 0.726 crore in total cost due to increase in expenditure on geological & geophysical survey and survey of project area.

73. Under B- land, cost of compensation of land to be acquired for works at Joshiyara and Dharasu has increased from the provision made in earlier estimate due to rise in land compensation rates. Actual expenditure likely to be incurred has been incorporated in the present estimate. The increase on this account is Rs 1.51. Crore in cost.

74. Under C-works the factors attributing to increase in cost are:

a) As per available drawings some of the quantities have increased considerably. The items are common excavation, rock excavation, drilling holes for grouted anchors, furnishing and installing grouted anchors, variation in cement use, furnishing and installing steel reinforcement, furnishing and installing steel liner in flushing conduit, making weld lap splices for different diameters, etc. The total increase on this account is Rs. 68.15 crore (which included provision of Rs 50 crore for contactors claims).

b) Due to steep rise in cost of material viz Cement and steel there an increase of Rs 6.50 Crore.
c) Hydro mechanical parts of Barrage radial gates, Intake vertical gates supplied by M/S TSL & government workshop Roorkee about 16 years back were badly rusted and partially damaged due to lying in open space for such a long period. These parts were extensively repaired before installation at site. Moreover, some parts were short supplied by M/s TSL, and fresh supplies of such parts have now been taken. The increase on account of this is Rs 2.00 Crore in cost.
d) In the supplementary agreement there is provision of reimbursement of bank guarantee against which advance is sanctioned and reimbursement of insurance premium of equipments on which equipment advance is paid to the contractor. Provision for this expenditure has been made in the estimate.
e) Provision of trash rack cleaning machine has been made in the present estimate, which was not taken in the earlier estimate.
f) Provision of Rs 50 crore on tentative basis has been made in the present estimate towards old claims of Contractors, while in the old estimate it was Rs 0.636 Crore.

75. Under J- Power plant increase in cost is due to the following reasons:

a) Due to closure of works for more than 10 years whole tunnel remained filled up with seepage water for a long period and major cavity was formed at face –1(chainage 930 m). Dewatering & cleaning of the tunnel and treatment of cavity involved additional expenditure.
b) To reduce construction time, NATM is being adopted for tunnel excavation. Swellex bolts followed by shotcrete are being used in tunnel. In the BOQ of original contract/supplementary agreement there was no provision for Swellex bolts and various admixtures being used in shotcrete namely Superplasticizers, steel fibre, Micro Silica & Accelerators. Provision of these items has been made in the present estimate.
c) Due to frequent encounter of poor rocks and subsequent formation of cavities, there is considerable increase in the following quantities:
    i) Tunnel Excavation
    ii) Tunnel Concrete lining
    iii) Backfill concreting
    iv) Permanent steel support
d) In certain critical reaches, steel liners are required from design point of view, which was not anticipated earlier, provision of the same has been made accordingly.
e) Due to continuous heavy ingress of seepage water in H.R.T quantity of dewatering increased manifold.

f) Steep rise in cost of material viz cement & steel has caused increase of the order of Rs 20.83 Crore.

In the earlier estimate there was a provision of Rs 30.42 crores for old claims of contractors. This provision has been increased to Rs 160 crore.

76. Cost under O-miscellaneous has increased by 25.152 crore due to change in tariff of construction power supply and rate of revenue to be recovered from contractors.

77. Under P-Maintenance cost has increased due to extensive repairs required for residential, buildings and roads lying in very shabby condition due to closure of works for more than 10 years.

78. Under R- Communication, provision of road from steel bridge Dharasu to Surge shaft has been made in the present estimate. Increase in total cost due to cost of the road.

79. The cost of S- Plant & Equipment has increased by Rs 17.221 crore. Rs 10.14 Crore is due to change in scope.(Penstock valve(Rs 8.84 Crore) which were earlier shown under works of ID have been transferred to S-Plant & equipment. One number 5 MVA 220/11 KV step-down T/F costing Rs 1.30 Crore, which was not provided in original estimate, has now been included.). The rest Rs 7.08 Crore is attributable to price rise.

80. The establishment cost has not increased.

81. The difference in indirect charges (pro rata) is due to rise in total works cost.

82. The interest during construction has decreased from Rs 246.49 crore to Rs 154.50 crore.

83. Viewing the uncertain rock conditions in the HRT, a provision of contingency of Rs 47.117 crore has been made in the present estimate.

84. **Reasons for increase in Cost of Maneri Bhali-II Project in tabulated form is enclosed in Annexure 10**.

85. Latter on, on 2nd September 2005, Government of India in its notification also allotted the liability of the part of LIC Loan to the tune of Rs 359.59 Crores to the Maneri Bhali stage –II Project. **Copy of GoI Notification is**

enclosed in Annexure 11. Copy of LIC agreement signed between UPSEB and LIC is also enclosed in Annexure 12.

86. Rs 15.79 Crores added to Financing Charges on account of LIC Loan as per above mentioned GOI notification The figure has been arrived at as follows: -

Total LIC Loan	Rs 359.59 Crores
Less attributable to Lakwar Vyasi Project	50% of above i.e. Rs 179.79 Crores
Adjusted against Capital cost incurred in the project prior to Being taken over by UJVNL	Rs 164 Crores
Residual Figure	Rs 15.79 Crores

To this figure of 15.79 Crores Rs, an amount of Rs 15.32 Cores has been added on account of interest that have accumulated from the period from Jan.2000 to March 2006 @ 14% to arrive at final figure of LIC Loan in the Capital Cost.

87. In addition to this, Centage Charges amounting to Rs 62.38 Crores at the rate of 12.5% on the civil works has been added to arrive at the Final Capital Cost in accordance to GoU Notification No. 2075(1)/MAV/SVUD/B-1/Budget/MB-II dated 08.06.2006. **Copy of the same is enclosed in Annexure 13.**

88. **The revised** means of financing after considering the LIC Loan component and the Centage charges works out to be: -

Project cost : - Rs 1807.89 Crores

<u>Means of financing (in Crores)</u>

PFC Loan	1200
LIC Loan & Interest thereon	31.12
Total debts	1231.12
Equity by UJVNL	576.78
Total (Debts+ Equity)	1807.89

89. Work is under progress under all the agreements and the target date of Dec 2006 was fixed for the commissioning of first machine of the project. **The status of work completed upto 25.03.2006 is enclosed in Annexure 14.**

90. The Graphs showing the Progress of works by various contractors as on 15 Feb 2005 is enclosed in Annexure 15.

91. **The Approved DPRs is enclosed in annexure 16.**

92. **The copy of Trial balances for Financial Year ending March 2002,March 2003, March 2004, March 2005 and Internal audit Report as of August 2004 is enclosed in Annexure 17.**

93. This petition includes the following documents:

i) Detailed tariff formats;
ii) Supporting documents and annexures mentioned in the petition;
iii) Demand Draft No. dated drawn on Punjab National bank for an amount of Rs. 10,00,000/-, towards the processing fees;
iv) Soft Copy of the petition.

Detailed submissions are as follows:

ITINARY OF CHANGES

94. The changes witnessed by the project during its development deserve special mention, as this would be one of the very few projects to have undergone as many changes since inception. **The summary of entire itinerary of changes from the day of initiation of project till date is enumerated below: -**

YEAR	DAM/BARRAGE COMPLEX	HRT	POWER HOUSE COMPLEX	ANNUAL ENERGY Gwh	COST (Crore Rs)	REMARKS
1965	At Maneri 13 Km upstream of Uttarkashi	16.8 Km long and dia 4.73 m (75 cumec)	200MW power house near Bhali village, 16.5 km downstream of Uttarkashi	1207 Gwh	1965:32.86	Single Stage Development. Discussed in CW&PC in 1966
1966	Barrage at Uttarkashi	7.29 Km long and dia 4.73 m (75 cumec)	3X35 MW power house at Bhali	583Gwh	1966:17.92	Project spilt into two stages. Two-stage development report submitted in 1966.
1973	Barrage at Uttarkashi	15.4 Km long and dia 4.8 m (75 cumec)	3X52 MW underground power house at Jaspur	913 Gwh	1972:43.33 1973:47.51 1976:82.63	Revised estimate submitted to CEA in 1973 and cleared by CW&PC.Cost of Rs 82.83 crore cleared by approved by Planning Commission in 1981
1979						Project works

						started.
1980	Barrage at Uttarkashi	16 Km long and dia 6.0m (120 cumec)	4X64 MW surface power house at Dharasu	1195.8	1980:182.0	
1980-81-82						Major Civil work Contracts signed
1982	Barrage at Uttarkashi	16 Km long and dia 6.0m (142 cumec)	4X76 MW surface power house at Dharasu	1327 Gwh	1982:213.0	
1983						Clearance from Environmental angle .Order for main plant palced
1986	Barrage at Uttarkashi (sedimentation tank redesigned to exclude particles above 150 microns)	16 Km long and dia 6.0m (142 cumec)	4X76 MW surface power house at Dharasu	1566 Gwh	1998:887(Completion cost 1250.0)	
1990						Funds stopped and works halted
1998	Barrage at Uttarkashi					Revised DPR for 4X76 MW submitted to CEA. Cleared by CEA in 2000
2000						Formation of State of Uttaranchal

2001						Formation of UJVNL and decision of GoU to complete Maneri Bhali-II
2002						Restart of Project works

Salient Features of the Project Maneri Bhali – II

1. LOCATION

State	Uttaranchal
Distt.	Uttarkashi
River	Bhagirathi
Dam/Barrage Intake site	Joshiyara
PH Site	Near Dharasu on left bank of river Bhagirathi to be located in a cut at the terrace at El. 892 M.

2. HYDROLOGY

Catchment area at Barrage site	4416 Sq. kms
Snow Catchment area above 12000 ft.	3199 Sq. kms.
90% available discharge	27.0 cumecs
70% available discharge	31 cumecs.
Diversion Flood	
a) For Hydraulic design	5000 cumecs
b) For over toppling	8000 cumecs

3. RESERVIOR

Full reservoir level	EL 1108.0
Minimum Draw Down Level	EL 1103.0
Live storage at Maximum Water Level	7.55 lakh cuM

4. DAM

Type	Diversion Barrage

5. BARRAGE

Location	At 950 m down stream of Joshiyara steel bridge and about 2.5 kms downstream (on the river) of confluence of tailrace channel of powerhouse of Stage-I.
Over all length	81 Metres Clear spans-5 bay each 13 M wide with 4 M intermediate piers.
Number & size of 5 Nos. gates	Radial gates of size 13 M (width) x 15.35 M (height)
Crest level of barrage	El. 1093.0 M
Pond level	
A) Max.	El. 1108.0 M
B) Min.	El. 1103.0 M
Top of gate	El. 1108.35 M
Live storage	7.55 lac cum.

6. CUT AND COVER SECTION

Location	Between the fore bay and headrace tunnel inlet portal
Length	About 43 Metres
Size	6 M dia horse shoe shape
Invert level at junction with H.R.T.	1094.0 Metres

7. FORE BAY

Location	D/s of the sedimentation chamber with gate arrangement
Total length	93 M
Number of bays	10 Nos. fixed wheel gate of size 7.7 x 8.25 M

8. POWER INTAKE

Location	On left bank of barrage at an angle of 1130 with the barrage axis.
Total length	56.0 Meters
No.s	6 bays of 8 M wide with 1.5 M intermediate piers.
Crest elevation	El. 1099.25 M
Number and size of gates	6 Nos. fixed wheel gates of size 8 M (width) x 6.75 M (height)

9. SEDIMENTATION CHAMBER

Size of silt settling tank	93.00 M wide x 182 M long
Number of hoppers	97 Nos.
Size of hoppers	13 M x13 M
Top level of hoppers	1098.80 M
Bottom level of conduits at exit	El. 1096.4 M
Design discharge for flushing	77.6 cumecs.
Full supply level in tank	El. 1108.0 M
Particle size to be removed	Above 0.15 MM

10. Power Tunnel

Type	Horseshoe 6.0 M equivalent dia
Length	16.00 KM
Thickness of lining	30 Cms. to 40 Cms
Design discharge (Max.)	142 cumecs

Maximum velocity	4.75 M per sec.
Invert elevations	
a) Inlet	El. 1094.0 M
b) Intermediate Adit	El. 1040.0 M
c) Surge tank end	El. 1000.0 M
Grade	
Upto intermediate Adit	1 In 159
b) Beyond	1 In 189
Intermediate adits at Dhanarigad	
a) Shape & Size	D-Shaped 6 M dia.
b) Length	760 Metres
Surge Tank adit	
a) Size	D-Shaped 6 M dia
b) Length	137 Metres

11. DESILTING CHAMBER

Type	Hoppers(93 mX 182m)
No.s	97
Size	13X 13 m
Particle size to be removed	0.15 mm and above

12. HEAD RACE TUNNEL

Type	Horse Shoe section
Length	16 km
Diameter	6m dia
Design Discharge	142 Cumecs

13. POWERHOUSE

Location	Near Dharasu on left bank of river Bhagirathi to be located in a cut at the terrace at El. 892 M.
Installed capacity	304 MW (4 Machines of 76 MW)
Rated Head	267.6m
Rated Discharge	35.5 Cumecs per Machine

Head	
a) Gross head	285 Metres
b) Net head at discharge of 142 Cumecs	247.3.0 Metres (With Tehri reservoir down). 237.6 Metres (With Tehri Reservoir full)
Type of Turbine	Francis vertical shaft
Generator floor level	832.42 M

14. D/S SURGE TANK

Type	Restricted orifice type
Size	13.7 M dia and about 172 M high
Bottom El. Of Tank	El. 1002.20 M

15. Penstocks/Pressure Shaft

Type	steel
Main penstocks	4 Nos., 3.0 M dia
Length of each penstock	About 800 M

16. TAIL RACE TUNNEL

Shape	Open Channel
Length	125 m
Min. TWL	EL 820m

17. SWITCH YARD

Type of Switchyard	220 KV (Conventional)
No. of bays in the switchyard:	
Generator Bays	4
Bus coupler Bays	1
Line bays	5
Station Transformer bay	1

18. POWER GENERATION

Design Energy	1566.1MU

95. The power from the project shall be evacuated to Rishikesh sub-station through three 220 kV lines. Two lines, which are already evacuating power to Rishikesh from Maneri Bhali Stage-I, shall be looped in and out at this switchyard. The third line is being constructed by the PTCUL.

96. Efforts have been made based on past experience to adopt the state of the art technology during construction and operation and to provide best possible protection to the machines. Also, to provide flexibility during operation and maintenance some special features being provided are mentioned below:

- The governors and excitation system for the machines in the power station are microprocessor based and numeric relays are being provided in the protection system.
- Sedimentation chamber designed to exclude silt particles larger then 150 microns.
- High Velocity Oxy Fuel (Tungsten Carbide) coating being provided on all under water parts of the machines to prevent erosion due to silt. The silt in river Bhagirathi contains very high percentage of quartz, which has hardness equal to that of diamond.
- Facility for removal of runner from the bottom has been provided to facilitate faster replacement of runners and to avoid long outage of machines.
- Single-phase main transformers used to limit the transportation weight/ dimensions. One single-phase unit kept in spare for quick replacement and reduction in down time in the extreme event of failure of a transformer.
- Nitrogen based fire protection system for transformers adopted for prevention of oil fire and minimizing wastage of oil.
- Unit penstocks with penstock protection valves to facilitate isolation individual penstocks/ machines for maintenance and to avoid loss of generation from all machines.

- Use of cyclonic strainers in cooling water system for machines to provide efficient filtration of water, good quality of cooling water and longer life to coolers.
- Slip form type shuttering used to speed up lining work in HRT.

Norms of Operation

The norms of the Hon'ble Commission as applicable for the Maneri Bhali – Stage II station would be as follows:

(i) Normative capacity index

97. Based on the norms for purely run of the river hydro stations the normative capacity index for the station during the first year of commercial operations is 85%. The Petitioner has adopted the same.

iii) Auxiliary Energy Consumption

98. The Petitioner has assumed transformation losses and auxiliary consumption at the normative levels specified by the Hon'ble Commission through the regulations. The Petitioner has also adopted the changes suggested by the Hon'ble Commission in the Tariff Order for FY 2004-05.

99. In view of the proposed change, the Petitioner has computed the transformation losses based on the norms prescribed by the Hon'ble Commission. In line with the previous order of the Hon'ble Commission, UJVNL has included the additional consumption for barrages/colonies/dams/lighting as a cost element instead of accounting them along with the auxiliary consumption.

Station Particulars	**Norm**	**Quantum (MU) for 2007-08**
Type of Station		
a) Surface	Yes	_
b) Underground	No	_
Type of excitation		
a) Rotating exciters on generator	Yes	_
b) Static excitation	No	_
Auxiliary Consumption (As a % of Total Generation)	***0.5%***	***7.83***
Transformation losses (As a % of Total Generation)	***0.5%***	***7.83***

Capital Costs

100. The approved completion cost of the project is Rs 1249.18 Crores. However the actual completion cost of the project is estimated to be around Rs 1714.40 crores. Means of financing for above approved cost and estimated Completion cost is enumerated below: -

Project cost (as per DPR): - Rs. 1249.18 Crores
Project cost (as per Revised Cost Estimate): - Rs.1714.41 Crores
Means of financing (in Crores)

PFC Loan	600 ★	1200
GoU Loan	245.50	0
Total debts	845.50	1200
Equity by UJVNL	403.68	514.41
Total (Debts+Equity)	1249.18	1714.41

★ PFC Loan actually sanctioned in 2002= Rs 800 Crores
UJVNL Equity = Rs 449.12 Crores
Total = Rs 1249.12 Crores

101. Latter on, on 2nd September 2005, Government of India in its notification also allotted the liability of the part of LIC Loan to the tune of Rs 359.59 Crores to the Maneri Bhali stage –II Project.

102. Rs 15.79 Crores added to Financing Charges on account of LIC Loan as per above mentioned GOI notification The figure has been arrived at as follows: -

Total LIC Loan	Rs 359.59 Crores
Less attributable to Lakwar Vyasi Project	50% of above i.e. Rs 179.79 Crores
Adjusted against Capital cost incurred in the project prior to Being taken over by UJVNL	Rs 164 Crores
Residual Figure	Rs 15.79 Crores

To this figure of 15.79 Crores Rs, an amount of Rs 15.32 Cores has been added on account of interest that have accumulated from the period from Jan.2000 to March 2006 @ 14% to arrive at final figure of LIC Loan in the Capital Cost.

103. In addition to this, Centage Charges amounting to Rs 62.38 Crores at the rate of 12.5% on the civil works has been added to arrive at the Final Capital Cost in accordance to GoU Notification No. 2075(1)/MAV/SVUD/B-1/Budget/MB-II dated 08.06.2006. **Copy of the same is enclosed in Annexure 10.**

104. **The revised** means of financing after considering the LIC Loan component and the Centage charges works out to be: -

Project cost : - Rs 1807.89 Crores

Means of financing (in Crores)

PFC Loan	1200
LIC Loan & Interest thereon	31.12
Total debts	1231.12
Equity by UJVNL	576.78
Total (Debts+ Equity)	1807.89

Debt – Equity Ratio

105. In case of all generating stations, debt-equity ratio as on the date of commercial operation shall be 70:30 for determination of tariff. Where equity employed is more than 30%, the amount of equity for determination of tariff shall be limited to 30% and the balance amount shall be considered as the normative loan.
Provided that in case actual equity employed is less than 30%, the actual debt and equity shall be considered for determination of tariff.

106. Return on Equity has been computed assuming a normative debt equity ratio, in accordance with the regulations of the Hon'ble Commission.

Annual Fixed Charges

107. The projections of the Petitioner on each element of the annual fixed charges are discussed below:

(i) Interest on loan capital

108. For the tariff computation as per the regulations of the Hon'ble Commission the Interest on loan capital has been computed loan-wise including on the loans arrived at in the manner indicated in regulation 18.

The rate of interest for such debt has been assumed to be at 11%, which is the PLR for State Bank of India. **(Certificate from SBI enclosed at Annexure 18)**

(ii) Depreciation

109. The Petitioner has estimated the depreciation expense for FY 2007-08 based on the asset classification shown below and applied the depreciation rates for these asset categories. The rates have been calculated based on the schedule provided to the regulations of the Hon'ble Commission.

Asset Class	Depreciation Rate
Land	0.00%
Building	2.00%
Major Civil Works	2.50%
Plant & Machinery	2.86%
Vehicles	20.00%
Furniture & Fixtures	6.67%
Office Equipments & Others	6.67%

110. In addition to allowable depreciation, generating company shall be entitled to an advance against depreciation, computed in the manner given hereunder.
AAD = Loan repayment amount as per regulation 22 subject to a ceiling of 1/10th of loan amount as per regulation 18 minus depreciation as per schedule.
Provided that Advance Against Depreciation shall be permitted only if the cumulative repayment up to a particular year exceeds the cumulative depreciation up to that year;

Provided further that Advance Against Depreciation in a year shall be restricted to the extent of difference between cumulative repayment and cumulative depreciation up to that year.

111. Since advance against depreciation is admissible as per the above Regulations, hence has been provided in the Petition.

(iii) Return on Equity

112. Based on the regulations of the Hon'ble Commission a 14% Return on Equity has been adopted for the station. The resultant returns are as follows:

Component	FY 2007-08 (Rs. Cr.)
Return on equity	75.93

(iv) Operations & Maintenance expenses

For the Hydro electric generating stations declared under commercial operation on or after 01.04.2004, the base operation and Maintenance expenses shall be fixed at 1.5 % of the actual capital cost as per Clouse 26(2) of UERC's Regulations, 2004 for determination of generation Tariff, in the year of Commissioning. Hence the O&M Expenses are considered at the levels prescribed by the Hon'ble commission.

Projected Expenses

113. The Petitioner has considered the normative approach for O&M expenses as prescribed by the Hon'ble Commission through its regulations.

Hence, the O&M expenses for FY 2007-08 based on this approach is provided alongside.

(Rs. Cr.)

Particulars	**2007-08**
Total O&M Expenses	27.12

(iv) Interest on Working Capital

114. In line with the Tariff Guidelines issued by the Hon'ble Commission, UJVNL has projected the working capital for each of the plants based on normative levels as per the following:

- O&M expenses at one month of projected expenses;
- Maintenance spares of 1% of project cost, along with a 6% annual escalation in value;
- Receivables at two months of revenue from sale of electricity.

Cost of working capital financing has been assumed at 11% per annum, which is in line with the current cost of financing of working capital for the utility.

115. The following table provides a summary of the principles adopted by the Petitioner on the various cost elements and operating parameters. A comparison with the relevant provisions of the tariff regulations issued by the Hon'ble Commission is also provided in the table:

Parameter	Provisions of relevant regulations of the Hon'ble Commission	Approach adopted by UJVNL
Operating parameters		
Auxiliary consumption	1. Surface hydro power generating stations with rotating exciters mounted on the generator shaft = 0.2% of energy generated 2. Surface hydro power generating stations with static excitation system = 0.5% of energy generated 3. Underground hydro power generating stations with rotating exciters mounted on the generator shaft = 0.4% of energy generated 4. Underground hydro power generating stations with static excitation system = 0.7% of	As per regulations.

Parameter	Provisions of relevant regulations of the Hon'ble Commission	Approach adopted by UJVNL
	energy generated	
Transformation losses	Transformation losses from generation voltage to transmission voltage = 0.5 percent of energy generated.	As per regulations.
Capacity index	Normative Capacity Index for recovery of full capacity charges. During the first year of commercial operation of the generating station: a. Purely run-of-river type generating stations = 85 % b. Pondage and storage type generating stations = 80% After first year of operation of the generating station: a. Purely run-of-river type generating stations = 90 % b. Pondage and storage type generating stations = 85%	As per regulations.
Financial parameters		
Capital cost	In case of existing projects, the project cost admitted by the Appropriate Hon'ble Commission prior to 1.4.2004 shall form the basis for tariff fixation.	As per details provided in the Petition.
Equity Base	Debt–equity ratio as on the date of commercial operation for the purpose of determination of tariff shall be 70:30. Where equity employed is more than 30%, the amount of equity for the purpose of tariff shall be	As per regulations.

Parameter	Provisions of relevant regulations of the Hon'ble Commission	Approach adopted by UJVNL
	limited to 30%. Where actual equity employed is less than 30%, the actual equity shall be considered. The Hon'ble Commission may in appropriate cases consider equity higher than 30% for the purpose of determination of tariff, where the generating company is able to establish to the satisfaction of the Hon'ble Commission that deployment of equity more than 30% was in the interest of general public	
Return on Equity (RoE)	Return on equity shall be computed on the equity base determined in accordance with regulations 36 and shall be at @14% per annum	As per regulations
O&M charges	For the Hydro electric generating stations declared under commercial operation on or after 01.04.2004, the base operation and Maintenance expenses shall be fixed at 1.5 % of the actual capital cost as admitted by the commission, in the year of Commissioning.	As per regulations
Interest on loan capital	Interest on loan capital shall be computed loan-wise on the actual outstanding loans duly taking into account the schedule of repayment and actual interest rate. Normative Loan will be equal to the equity in excess of thirty percent (30%) invested into the project. Provided that the total of actual loans, equity and the	As per regulations.

Parameter	Provisions of relevant regulations of the Hon'ble Commission	Approach adopted by UJVNL
	normative loan shall not exceed the cost of the project.	
Depreciation	Depreciation schedule provided in the regulations	As per regulations.
Interest on working capital	Rate of interest on working capital shall be the short-term Prime Lending Rate of State Bank of India as on 1st April of the tariff period. The interest on working capital shall be payable on normative basis notwithstanding that the generating company has not taken working capital loan from any outside agency.	Cost of working capital financing has been assumed at 11% per annum (SBI short term PLR) as per regulations.
Allowable tax	Tax on the income streams of the generating company from its core business shall be computed as an expense and shall be recovered from the beneficiaries. Any under-recoveries or over-recoveries of tax on income shall be adjusted every year on the basis of income tax assessment under the Income Tax Act, 1961 as certified by the statutory Auditors.	As per regulations through the tax escrow mechanism

Further details on the projections on operating parameters and costs are provided in the subsequent sections of the Petition providing the detailed data formats.

Design Energy and Primary Energy Charges

116. Any part of the Annual Fixed charges not recovered through the primary energy charge would be recouped through the capacity charges. Also as per the regulations of the Hon'ble Commission the secondary energy charges would be payable at the same rate as primary energy charges. The deemed generation charges, unscheduled interchange charges, Deemed generation charges and the incentives would also be applicable as per the regulations, but have not been projected in the tariff filings due

to the uncertain nature of such charges. The Hon'ble Commission may however kindly state explicitly in its orders the applicability of such charges for the convenience of the beneficiaries of the generating station and keeping in view the long pending non-payment of subject charges by the UPCL.

117. The total Gross Annual Fixed Charges for Maneri Bhali-II plant for the tariff year is provided in the table below:

Particulars	**Unit**	**FY 2007-08**
Interest on Loan Capital	*(Rs. Crores)*	119.14
Depreciation, including AAD	*(Rs. Crores)*	126.55
Return on Equity	*(Rs. Crores)*	75.93
O&M Expense	*(Rs. Crores)*	36.16
Interest on Working Capital	*(Rs. Crores)*	9.05
Annual Fixed Charges	***(Rs. Crores)***	**366.83**
Total Saleable Units*	*MU*	1364.39
Per Unit Tariff	***Rs/ kWh***	**2.69**

** Design energy less auxiliary consumption, transformation losses*

D. Cause of Action

118. Under Section 62 and 86 of the Electricity Act, 2003 and as per section 4(1) of the UERC Tariff Regulations, UJVNL is required to obtain approval for its tariff from the Hon'ble Commission based on provisions of the Tariff Regulations.

E. Ground of Relief

119. In this context, the Petitioner respectfully submits that the orders of the Hon'ble Commission should adequately consider the positions expounded in the present petition for approval of Annual Fixed Charges for the FY 2007-08.

120. The Petitioner has filed a review petition with the Hon'ble Commission with regard to some of the provisions of the applicable Tariff Regulations of the Hon'ble Commission. The Hon'ble Commission may kindly consider the submissions made in the said review petition while passing orders on the present tariff petition.

121. The financial projections have been developed based on the Petitioner's assessment, trend available and estimates available for the year FY 2007-08. There could be differences between the projections and the actual performance of the Petitioner. The Hon'ble Commission may condone the same. The Petitioner also reserves the right to make revisions to the Petition and submit additional relevant information that may emerge or become available subsequent to this filing.

122. The specific procedures and formats for billing may be provided in the orders of the Hon'ble Commission, along with illustrative examples as necessary depicting all the components of tariff as per the orders and regulations of the Hon'ble Commission.

123. While the tariff regulations of the Hon'ble Commission permit the generating companies to seek tariffs for a period up to five years, the Petitioner is seeking Provisional tariffs only for the year FY 2007-08. The Petitioner will submit a fresh tariff application for the subsequent year(s) at an appropriate time.

F. Detail of Remedies Exhausted

(Not applicable)

G. Matter Not Previously Filed or Pending With any Court

(Not applicable)

H. Relief Sought

124. In view of the facts mentioned above, the Petitioner prays for the following relief:

- Accept the accompanying financial projections of the Petitioner for FY 2007-08 prepared in accordance with Tariff Regulations established by the Hon'ble Commission and **pass/ issue Provisional Tariff Order for Maneri Bhali-II for the FY 2007-08;**
- Grant suitable opportunity to the Petitioner within a reasonable time frame to file additional material information that may be subsequently available;
- Grant the waivers prayed for with respect to such filing requirements as the Petitioner is unable to comply with at this stage in the filing;
- Treat the filing as complete in view of substantial compliance as also the specific humble requests for waivers with justification placed on record;
- Condone any inadvertent omissions/ errors/ shortcomings and permit the Petitioner to add/ change/ modify/ alter this filing and make further submissions as may be required at a future date;
- Consider and approve the Petitioner's application including all requested regulatory treatments in the filing;
- Consider the submissions of Petitioner that could be at variance with the orders and regulations of the Hon'ble Commission, but are nevertheless fully justified from a practical viewpoint;
- Pass such orders as the Hon'ble Commission may deem fit and proper keeping in mind the facts and circumstances of the case.

I. Interim Order, in any, prayed for

(Not applicable)

J. Details of Index

A list of documents enclosed and marked as annexure is given below;

1. Copy of Letter No. 1-26/2/1/74/P&E dated 27.01.1981 and letter no. 14/48/80En-6 dated 19.01.1983

2. Copy of letter No.2575-GNP/II/M-8 dated 27.09,1982 from CE Planning) UPSEB to CEA.

3. Copy of the studies carried out to determine the optimum tunnel discharge and the enhanced capacity of the powerhouse.

4. Copy of GoU Order No. 900/9-Urja/2001 dated 24.11.2001 vide which UJVNL was sanctioned approval to restart the work of Maneri Bhali- II

5. Copy of Clearances along with the copy of Letters regarding transfer of earlier clearances from UPSEB to UPJVNL.

6. Brief note on contracts awarded (Civil & E&M) for execution of the project since the restart of the Project in August, 2002

7. The contract details of different packages ordered to various contractors along with copy of certain major agreements with BHEL and other contractors

8. Copy of MOU between ID & UPSEB.

9. The revised DPR submitted before CEA for approval for the project cost of Rs 1714.40 Crores.

10. Reasons for increase in Cost of Maneri Bhali-II Project in tabulated form.

11. Copy of GoI Notification.

12. Copy of LIC agreement signed between UPSEB and LIC

13. Copy of GoU Notification No. 2075(1)/MAV/SVUD/B-1/Budget/MB-II dated 08.06.2006.

14. The status of work completed upto 25.03.2006

15. The Graphs showing the Progress of works by various contractors as on 15 Feb 2005.

16. Copy of the Approved DPRs

17. The copy of Trial balances for Financial Year ending March 2002,March 2003, March 2004, March 2005 and Internal audit Report as of August 2004.
18. Certificate From SBI certifying the current PLR of SBI.

K. Particulars of Fee Remitted

i) Demand Draft No. dated drawn on Punjab National bank for an amount of Rs. 10,00,000/-, towards the processing fees; is being included along with this petition.

L. List Of Enclosures

125. This petition includes the following documents:

i) Detailed tariff formats;
ii) Supporting documents and annexures mentioned in the petition;
   (i) **Annexure – 1:** Copy of Letter No. 1-26/2/1/74/P&E dated 27.01.1981 and letter no. 14/48/80En-6 dated 19.01.1983
   (ii) **Annexure – 2:** Copy of letter No.2575-GNP/II/M-8 dated 27.09,1982 from CE Planning UPSEB to CEA.
   (iii) **Annexure – 3**: Copy of the studies carried out to determine the optimum tunnel discharge and the enhanced capacity of the powerhouse.
   (iv) **Annexure – 4**: Copy of GoU Order No. 900/9-Urja/2001 dated 24.11.2001 vide which UJVNL was sanctioned approval to restart the work of Maneri Bhali-II
   (v) **Annexure – 5:** Copy of Clearances along with the copy of Letters regarding transfer of earlier clearances from UPSEB to UPJVNL.
   (vi) **Annexure – 6:** Brief note on contracts awarded (Civil & E&M) for execution of the project since the restart of the Project in August, 2002
   (vii) **Annexure – 7:** The contract details of different packages ordered to various contractors along with copy of certain major agreements with BHEL and other contractors
   (viii) **Annexure – 8:** Copy of MOU between ID & UPSEB

(ix) **Annexure – 9:** The revised DPR submitted before CEA for approval for the project cost of Rs 1714.40 Crores.

(x) **Annexure –10:** Copy of GoU Notification No. 2075(1)/MAV/SVUD/B-1/Budget/MB-II dated 08.06.2006.

(xi) **Annexure –11:** Reasons for increase in Cost of Maneri Bhali-II Project in tabulated form.

(xii) **Annexure –12:** Copy of GoI Notification.

(xiii) **Annexure –13:** Copy of LIC agreement signed between UPSEB and LIC

(xiv) **Annexure –14**: The status of work completed upto 25.03.2006

(xv) **Annexure –15:** The Graphs showing the Progress of works by various contractors as on 15 Feb 2005.

(xvi) **Annexure – 16:** Copy of the Approved DPRs

(xvii) **Annexure – 17:** The copy of Trial balances for Financial Year ending March 2002,March 2003, March 2004, March 2005 and Internal audit Report as of August 2004

(xviii) **Annexure – 18:** Certificate From SBI certifying the current PLR of SBI.

iii) Demand Draft No. Dated drawn on Punjab National bank for an amount of Rs. 10,00,000/-, towards the processing fees;

iv) Soft Copy of the petition.

Dated: October 19,2006

Petitioner
Uttaranchal Jal Vidyut Nigam Limited
Dehradun