

**MADHYA PRADESH ELECTRICITY REGULATORY  
COMMISSION**

**"Metro Plaza", Bittan Market , Bhopal - 462 016**



**Petition Nos. 102 & 103 of 2006**

**PRESENT:**

**Dr. J. L. Bose, Chairman**

**D. Roy Bardhan, Member**

**R. Natarajan, Member**

**IN THE MATTER OF:**

**Approval of Generation Tariff (Provisional) for Newly  
Commissioned Madhikheda (2X20=40 MW) (P-102/2006)  
and Bansagar Jhinna (2X10=20 MW) (P-103/2006) Hydro  
Power Projects of MP Power Generating Company Limited.**

**MPPGCL (Petitioner) represented among others by –**

- 1. Shri S. P. Soni (S. E.)**
- 2. Shri Manjeet Singh (Deputy Director, Costs)**
- 3. Shri Salil Choudhary (Addl. E.E.)**
- 4. Smt. Manisha Lavania (Addl. E.E.)**
- 5. Shri A.N. Sarkar (A.E.)**

**ORDER**

*Petition Nos. 102 & 103 of 2006*

*(Passed on this 18th Day of January, 2008)*

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- 1 The Madhya Pradesh Electricity Regulatory Commission (hereinafter called “the Commission” or “MPERC”) having gone through the petitions submitted by the MP Power Generating Company Limited (hereinafter called “the Petitioner” or “Company” or “Generating Company” or “MPPGCL”) and having had the formal interactions with the officers of the Petitioner and having considered the documents available on record and orders issued by the Government of Madhya Pradesh (Energy Department) on 31<sup>st</sup> May 2005 making the Transfer Scheme Rules effective from 1<sup>st</sup> June 2005, (order no. 3679/FRS/18/13/2002 dated 31.5.2005) and thereon, hereby accepts the applications with modifications, conditions and directions as herewith attached.
- 2 The Commission has made modification to the estimates of the Annual Revenue Requirement as filed by the petitioner in respect of Madhikheda and Jhinna Bansagar Hydro Power Projects of the MPPGCL and has made alternative estimates thereof based on the efficient and reasonable operating parameters and expenditure and has accordingly made modifications to the proposal submitted by the Madhya Pradesh Power Generating Company Limited for approval of the provisional generation tariff as per detailed order attached to this order.
- 3 The station-wise generation tariff determined by this order by the Commission in exercise of the powers vested in it under Section 64 of the Electricity Act, 2003, will be applicable w.e.f. September 2006 i.e. the date when both the generating stations started their commercial operation. The petitioner must take steps to implement the Order after giving seven (7) days’ public notice in accordance with clause 1.30 of MPERC (Details to be furnished and fee payable by licensee or generating company for determination of tariff and manner of making application) Regulations, 2004 and raise its bills for energy supplied to the three Distribution Companies in accordance with allocation made by the Government of Madhya Pradesh vide notification dated 18.10.2006 and again modified on 14.03.2007.

Ordered as above read with attached detailed reasons and grounds,

**(R. Natarajan)**  
**Member (Economics)**

**(D. Roy Bardhan)**  
**Member (Engineering.)**

**(Dr. J. L. Bose)**  
**Chairman**

**Date: January 18, 2008**

**Place: Bhopal**

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## CHAPTER 1

### **Background of the order**

- 1.1 This order relates to petitions bearing number 102/2006 and 103/2006 filed by the Madhya Pradesh Power Generating Company Limited (MPPGCL) for approval of the generation tariff for MPPGCL's newly commissioned Madhikheda (2X20=40MW) and Jhinna Bansagar (2X10=20 MW) hydro power projects for FY07 to FY09.
- 1.2 The Commission notified the MPERC (Terms and Conditions for Determination of Generation Tariff) Regulations, 2005 in the Madhya Pradesh Government Gazette on 23<sup>rd</sup> December 2005. As per clause 1.3 of the said Regulations, the Regulations shall come into force from the date of their publication in the official Gazette of the Government of Madhya Pradesh. As per clause 1.4, the Regulations shall apply in all cases of determination of generation tariff under section 62 of the Electricity Act 2003 (Act) for supply of electricity to a distribution licensee by existing State Generating Stations where the State Government, under section 123 of the Act, allocates the capacity. As stated in the Commission's order dated 25<sup>th</sup> January 2006 determining the tariff of various State generating stations, the State Government issued an order on 31<sup>st</sup> May 2005 to give effect to the reorganization of the Madhya Pradesh State Electricity Board in terms of the Madhya Pradesh Electricity Reforms First Transfer Scheme Rules 2003 (Transfer Scheme Rules) notified on 30<sup>th</sup> September 2003. As per paragraph 4 of this Order, the Madhya Pradesh State Electricity Board (MPSEB) was to continue to undertake the electricity Bulk Purchase and Bulk Supply function as provided in Schedule F to the Transfer Scheme Rules, 2003.
- 1.3 The Govt. of MP, through a subsequent notification of June 03, 2006 transferred the functions, properties, interest rights, and obligation of MP State Electricity Board relating to Bulk Purchase and Bulk Supply of electricity in MP Power Trading Company Limited (hereinafter referred to as "MP Tradeco" or "Tradeco" or "MPPTC").
- 1.4 MP Power Generating Company Limited filed the subject petitions before the Commission on October 12, 2006. The Commission observed that the petitioner indicated in the petition that in accordance with the Govt. of MP notification of June 03, 2006, the petitioner has been required to sell the entire generation of MPPGCL to MPPTC at a rate determined by the Commission.
- 1.5 The Commission held the hearing on 16/11/2006. The Commission stated that in accordance to section 62(1)(a) of the Electricity Act 2003, the Commission may determine the tariff of a generating station when the energy is supplied to the Distribution Company. The Commission directed the petitioner to confirm on affidavit whether the petitioner had proposed to supply the power to Distribution Licensee of the State or any other entity. The petitioner had not filed such affidavit.

- 1.6 In the meantime, the Govt. of MP through its notification of 18<sup>th</sup> October 2006 allocated the entire existing generation capacity among the three Distribution Companies of the State. The generation from Madhikheda and Jhinna Bansagar Hydro Power Stations are also included in the said allocation of 18/10/2006. The Govt. of MP had revised the allocation of the entire generating capacity through its notification of 14<sup>th</sup> March 2007. At present this allocation is applicable.

### **Procedural history**

- 1.7 The Commission had notified the regulations for determination of the generation tariff, namely “MPERC (Terms and Conditions for determination of Generation Tariff) Regulations, 2005” in December 2005. These tariff regulations have been notified under the multi year tariff principles for the block of 3 years from FY 2006-07 to FY 2008-09.
- 1.8 The petitioner filed the subject petitions on 12/10/2006 through its authorised signatory Shri C. S. Dubey, Chief Engineer (CP) in accordance with the Commission’s regulations indicated in paragraph 1.7 for block of 3 years from FY 2006-07 to FY 2008-09. Consequent to the superannuation of Shri Dubey, the petitioner authorised Shri S. P. Soni as the Officer In charge to present the facts and figures before the Commission. The petitioner has made the following submissions for the consideration of the Commission:
- 1.8.1 Consequent to the implementation of power sector reforms in the State where under, amongst others, the activities of generation, transmission, distribution and retail supply of electricity carried out by the MPSEB have been restructured and transferred initially to the five successor corporate entities and the function of power generation has been vested with MPPGCL. Subsequently, the MP Tradeco (the sixth company) has been vested with the responsibility of Power trading and MPPGCL is required to sell its entire generation from existing capacity to MP Tradeco at rates determined by the Commission for different generating stations.
- 1.8.2 Madhikheda is a new plant having its Commercial Operation Date (COD) of unit #1 on 28<sup>th</sup> Aug 06 and unit #2 on 9<sup>th</sup> Sept 06. Jhinna Bansagar is also a new plant having its COD of Unit # 1 on 20 Aug 06 & Unit #2 on 30 Aug 06. Actual generation has started from these two stations from the month of Sept 06. i.e. for 7 months in FY 2006-07.
- 1.8.3 As per GoMP notification entire power of from these stations are to be sold to the MP TRADECO for onward sale to Discoms, at rates determined by the Commission.
- 1.8.4 The petitioner has filed the following elements of cost for the consideration of the Commission for determination of the generation tariff for the two projects.
- i. Madhikheda (2X20 = 40 MW) Generating Station:

**Table 1: Aggregate revenue requirement and proposed tariff for Madhikheda HPS**

Particulars	Unit	FY'07	FY'08	FY'09
Depreciation	Cr.Rs	2.12	3.64	3.64
Interest on Loan	Cr.Rs	3.81	7.03	6.26
Return on Equity	Cr.Rs	2.98	5.12	5.12
Interest on Equity	Cr.Rs	0.00	0.00	0.00
Advance Against Depreciation	Cr.Rs	3.13	6.86	6.86
Interest on Working Capital	Cr.Rs	0.36	0.66	0.65
MPERC Fee @ Rs 1000/MW	Cr.Rs	0.0023	0.004	0.004
O&M Expenses	Cr.Rs	1.24	2.25	2.38
<b>Total Fixed Cost</b>	<b>Cr.Rs</b>	<b>13.64</b>	<b>25.56</b>	<b>24.92</b>
Month of Operation	No	7	12	12
<b>Fixed Charges / month</b>	<b>Cr.Rs</b>	<b>1.95</b>	<b>2.13</b>	<b>2.08</b>
Net Generation	MU	24.75	73.38	73.38
<b>Rate of Generation (proposed tariff)</b>	<b>p/u</b>	<b>551</b>	<b>348</b>	<b>340</b>

ii. Jhinna Bansagar (2X10 = 20 MW) Generating Station:

**Table 2: Aggregate revenue requirement and proposed tariff for Jhinna Bansagar HPS**

Particulars	Unit	FY'07	FY'08	FY'09
Depreciation	Cr.Rs	1.45	2.48	2.48
Interest on Loan	Cr.Rs	2.32	4.28	3.81
Return on Equity	Cr.Rs	2.36	4.05	4.05
Interest on Equity	Cr.Rs	0.13	0.24	0.22
Advance Against Depreciation	Cr.Rs	1.75	3.91	3.91
Interest on Working Capital	Cr.Rs	0.24	0.44	0.44
MPERC Fee @ Rs 1000/MW	Cr.Rs	0.0012	0.002	0.002
O&M Expenses	Cr.Rs	0.84	1.53	1.63
Total Fixed Cost	Cr.Rs	9.09	16.94	16.54
Month of Operation	No	7	12	12
Fixed Charges / month	Cr.Rs	1.30	1.41	1.38
Net Generation	MU	63.44	79.30	79.30
Rate of Generation (proposed tariff)	p/u	143	214	209

- 1.8.5 In view of the above, the petitioner had made the following submissions for the consideration of the Commission:
- i. Accept the tariff (fixed cost) as elaborated in Tables 1 & 2 above and permit recovery in equal monthly instalments.
  - ii. Accept and permit recovery of Incentive and cost of Secondary Energy on the terms specified in the "MPERC (Terms and Conditions of Generation Tariff) Regulations, 2005 (G-26 of 2005)". Deduction on account of under achievement of CI shall also be applicable as specified in the above regulation.
  - iii. Permit additional recovery on account of Water Charges, taxes, duties and levies on actual basis, over and above the amounts elaborated in the table above.
  - iv. Permit recovery of expenses understated / not considered in this petition e.g. cost, interest and finance charges, depreciation etc at a later stage, if required.
  - v. Permit recovery of fixed charges as proposed above w.e.f. September 06 on provisional basis, till issue of final order and effect reconciliation based on the rates approved by the Commission at a latter stage.
- 1.9 The Commission held the hearing on June 19, 2007. The petitioner had made the following submissions for consideration of the Commission:
- 1.9.1 Although the power has been intended to be sold to MP Tradeco but the entire capacities of the Madhikheda and Jhinna Bansagar power stations have been allocated to three Distribution Companies of the State vide M.P. Government Gazette notification dated 14<sup>th</sup> March, 2007.
  - 1.9.2 Jhinna Bansagar is a part of 425MW Bansagar Project whose capacity is fully allocated to Discoms of the State vide notification dated 14/03/2007.
- 1.10 The Commission noted the submission made by the petitioner. The Commission had also noted that the petitioner had also filed a petition before the Commission (P-110/2006), in the matter of "Continuation of Generation Tariff for Existing Power Stations of MP Power Generating Company, as determined by the Commission in its Multi Year Generation Tariff Order for FY07 to FY09 Dated 7<sup>th</sup> March 2006". The Commission vide its order dated 28 February 2007 on this petition, had pointed out that the Government of Madhya Pradesh vide its notification dated 18.10.2006 had reallocated 92% of the capacity to the three Distribution Companies on firm basis and the balance 8% is required to be allocated by MPPTC on the basis of requirement of the Distribution Companies from time to time. The Commission stated that in view of the above, the generation tariff determined for FY 2007-08 in the Commission's generation Tariff order for FY 2006-07 to FY 2008-09 shall be applicable for FY 2007-08 and the same shall be considered while determining the ARR of the Distribution Companies for FY 2007-08 even though the supplies routed through MPPTC.



## **Public Hearing**

1.11 In view of the foregoing, the Commission directed the petitioner to file the draft of the public notice. The petitioner filed the draft of public notices to the Commission office on 06/07/2007. The public notices were published in news papers on 01/08/2007. The last date for filing the comments / objections / suggestions was 21/08/2007. On the request of MP Power Trading Company Limited the last date for filing the comments / objections / suggestions was extended up to 31/08/2007. The Commission arranged to publish the public notice in the following newspapers:

Hindustan Times	-	All MP
Dainik Bhaskar	-	Bhopal edition
Dainik Swadesh	-	Gwalior edition
Madhyanchal	-	Ujjain edition
Deshbandhu	-	Jabalpur edition
Agniban	-	Indore edition
Dainik Jagran	-	Rewa, editions

1.12 The Commission office had not received any feedback from any of the stakeholders within the stipulated time i.e. by 31/08/2007. The replies from the respondents viz. The MP Power Trading Company Limited and MP Paschim Kshetra Vidyut Vitaran Company Limited filed their replies after last date. In view of the fact that only two of the respondents filed their comments and the office of the Commission had not received any comment / objection / suggestion from the public, the Commission decided not to hold the public hearing in the subject case. Instead, the Commission decided to hold the hearing on 17/10/2007. The petitioner and the respondents were issued the notices accordingly.

## **State Advisory Committee**

1.13 The Commission held the meeting of the State Advisory Committee on September 29, 2007. The subject petitions were included in the agenda of the meetings for discussion. The members made their observations on the petition and gave valuable suggestions, which have been kept in mind while finalising this order.

## CHAPTER-2

### Analysis of Petitions

#### A: Madhikheda Hydel Project (MHP):

##### Brief Introduction

- 2.1 Madhikheda Hydel Project is a part of Sindh River Project, Phase – II (Multi-purpose Scheme) located in District Shivpuri, Madhya Pradesh. It is located between Gwalior and Shivpuri close to National Highway No. 3, about 110 kMs from Gwalior and 30 kMs from Shivpuri.
- 2.2 The project envisages utilization of water available at Madhikheda dam reservoir and the head created due to construction of 59 meter high Madhikheda dam for generation of power for peaking purpose. The project comprises two phases. The first phase consists of installation of two units of 20MW each i.e. 2x20MW. Further in order to avoid under utilization of available water, an additional capacity of 20 MW has been considered under phase-II. The petitioner has filed the subject petition for the determination of the generation tariff for the first phase i.e. 2x20MW.
- 2.3 It is submitted by the petitioner that the water conductor system for the project has been designed to feed water for generating 60 MW of power. The total energy generation in a 90% dependable year works out to be 74.12 Million Units. It is further submitted by the petitioner that the availability of 60 (40 + 20) MW power during peak hours would provide some relief to the power system especially in the Northern Region of the State. During the monsoon months, the energy available will be much higher and prove to be a boon to the power system of MP by providing voltage improvement with reactive power compensation. The power so generated was proposed to be evacuated by connecting the Power House to 132 KV Substation at Karera with double circuit 132 KV (DCDS) line. Karera S/s is about 22 KM from the Power House. With the evacuation system in place presently, the project has started generation of the electricity.
- 2.4 Status of Statutory Clearances:- Various statutory clearances viz. Techno-economic clearance from Central Electricity Authority (CEA), approval from GoMP and the Environment clearance from Ministry of Environment and Forest (MoEF) had already been arranged by the petitioner. The details are given below:
- 2.4.1 The Techno-economic clearance of the project was granted by CEA vide 302/25/93-HPA.I/389 dated 12.05.1993 at a total estimated cost of Rs. 106.94 Crore.

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***Generation Tariff Order for Madhikheda & Bansagar Hydro Power Stations***

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- 2.4.2 The GoMP approval was conveyed to erstwhile MPSEB vide GoMP letter No. 2043/F-3/5/13/2001 dated 11.05.2001 for Rs. 177.38 Crore which included the cost of transmission line as well. After deleting the cost of transmission line, the cost of generation project works out as Rs 169.36 Crore.
- 2.4.3 The Environmental clearance and diversion of forest land of 3106 hectares for Sindh Project was accorded by Ministry of Environment and Forest vide letter No. 8-161/91-FC dated 24<sup>th</sup> Dec 1995.
- 2.5 It has been informed by the petitioner that the project was to be fed from the water discharged from Madhikheda dam constructed by the Water Resource Department of Government of MP. The Water Resources Department, vide its letter No.1499/Gate/217/CE/BODHI/2001 of March 05, 2001 intimated the start of the construction of masonry and Earth Dam. The initial schedule for completion of the project was the monsoon season of 2001. The WRD revised the schedule to complete the dam by 2005. This had slowed down the whole process and accordingly, the petitioner completed the work of the power project works in 2005. It is further informed by the petitioner that due to delay in Madhikheda dam works and due to non-availability of water the generation could not commence.
- 2.6 The petitioner has informed that the dam is completed up to crest level of 334.25 M. The dam gates are scheduled to be installed by March 2008. In the hearing of October 17, 2007 the Commission enquired about the status of completion of the project in all respects. The petitioner through its written submission of November 21, 2007 and in the subsequent hearing of December 05, 2007 submitted the following facts:
- 2.6.1 Madhikheda Hydro Power Station (HPS) was commissioned on September 09, 2006.
- 2.6.2 The dam work has been completed upto crest level and erection of dam gates scheduled to be completed by March 2008.
- 2.6.3 Even with the water level upto crest level the machines are capable of generating to its rated capacity of 2x20=40 MW. During September 06, the generation from Madhikheda HPS had almost reached the maximum level of installed capacity i.e. upto 39 and 38 MW on different occasions.
- 2.6.4 The Minimum Draw Down Level (MDDL) for this project is 320.05 meters and reservoir level had recorded during August, September and October 2006 and July, August and September 2007 above MDDL.
- 2.6.5 The incomplete civil works are Boundary wall, Residential colony and Fire protection system
- 2.6.6 The Interest During Construction (IDC) component at the time of commissioning date was Rs. 16.28 Crore.

2.6.7 The status of actual expenditure till date i.e. 05/12/2007 is given as below:

**Table 3: Actual Expenditure on the project (Rs. Crore)**

Particulars	Approved Estimated Cost	As on November 2007				
		Incurred	Bills pending	Sub total	Balance	Total
Civil works	53.87	62.03	0.21	62.24	3.50	65.74
E&M Works	84.07	62.48	1.02	63.51		63.51
IDC	31.42	29.55		29.55		29.55
<b>Total</b>	<b>169.36</b>	<b>154.06</b>	<b>1.23</b>	<b>155.30</b>	<b>3.50</b>	<b>158.80</b>

### **Analysis of the Petition**

- 2.7 The respondent, MP Power Trading Company Limited, during the course of the proceedings in the subject petition, had raised the issue of the date of the commercial operation of the project. The petitioner should have demonstrated the maximum continuous rating after the completion of the project and successful operation of the project and only thereafter the date of commercial operation of the project be decided. The respondent had further submitted that the energy generated prior to the date of commercial operation should be treated as in-firm energy.
- 2.8 The Commission had also enquired from the petitioner that how a project can generate to its full capacity when the gates have not been installed. The Commission opined that without the gates at their place, the required head for the generation may not be available. The petitioner was directed to substantiate its claim.
- 2.9 The petitioner, in its submission, had submitted that in accordance to the clause 3.25(7) of the Commission's regulations namely, MPERC (Terms and Condition for Determination of the Generation Tariff) Regulations, 2005, the maximum available capacity has been defined as below:

*“The maximum capacity in MW, the generating station can generate with all units running, under the prevailing conditions of water levels and flows, over the peaking hours of next day,*

*Provided that the peaking hours for this purpose shall not be less than 3 hours within a 24 hours period.”*

The petitioner, through its submission made vide the letter number 07-12/CP/MPPGL/MPERC/518 dated 21/11/2007, had filed on the affidavit that during September 2006, the project had generated almost its full capacity i.e. 39 MW at one instance and 38 MW on three instances. The petitioner had also filed the sample calculations which show that for this particular project, the sufficient head is available for making the project to generate the electricity at its rated capacity even without the gates.

- 2.10 The Commission had got verified the claim and the data filed by the petitioner. The Commission agrees with the claim of the petitioner. As the project generated the rated capacity in September 2006 for the first time, the Commission accepts this as the date of commercial operation.

**Generation Details of Madhikheda Project:**

- 2.11 Madhikheda Phase-I has an installed capacity of 40 MW (2X20=40 MW). Design energy of the plant is 74.12 MU per year. As per the Commission's regulation on the generation tariff for hydro power stations, the auxiliary consumption is 0.5% and transformation losses are also 0.5%. After deducting these losses net generation comes out to be 73.38 MU per annum. The petitioner had submitted that since the plant was not in operation for a complete year during the first year, the design energy has been reduced to 25 MU and accordingly the net generation 24.75 MU. The details as filed are given below:

**Table 4: Generation Details of Madhikheda (2X20 MW) Project:**

Particulars			FY 07	FY 08	FY 09
1	Capacity of Plant	MW	40	40	40
2	Design Energy (DE)	MU	74.12	74.12	74.12
3	% of DE Generation	%		100%	100%
4	Gross Generation	MU	25.00*	74.12	74.12
5	Auxiliary Consumption	%	0.50%	0.50%	0.50%
6	Transformation Loss	%	0.50%	0.50%	0.50%
7	Net Generation	MU	24.75	73.38	73.38

\* As filed by the petitioner.

**Plant Cost:**

- 2.12 The petitioner in the petition filed the details of the capital cost of the plant on the basis of the provisional actual expenditure as Rs. 141.50 Crore. The capital cost has been revised by the petitioner in its submission before the Commission in the hearing on 05/12/2007 as Rs. 158.80 Crore. The estimated cost of the project as per the approved estimates is Rs. 169.36 Crore. The details are given below:

**Table 5: Capital Cost Details of Madhikheda (2X20 MW) Project (Rs. Crore)**

Sl.No.	Particulars of the Cost	As per approved Estimates	As filed in the petition on 12/10/2006	As per revised filing of 05/12/2007
1	E&M Works	84.07	61.89	63.51
2	Civil Works	53.87	64.82	65.74
3	IDC	31.42	14.78	29.55
4	<b>Total</b>	<b>169.36</b>	<b>141.50</b>	<b>158.80</b>

- 2.13 The Commission has further enquired from the petitioner about the Interest During Construction (IDC) component at the time of commissioning of the project. The petitioner through its submission in the hearing of 05/12/2007 informed that the IDC component on the date of the commercial operation was Rs. 16.28 Crore. The Commission accepts the same. The capital cost as approved by the Commission is given below:

**Table 6: Capital Cost of Madhikheda (2X20 MW) Project as accepted by the Commission (Rs. Crore)**

Sl.No.	Particulars of the Cost	On the basis of Actual Expenditure
1	E&M Works	61.89
2	Civil Works	64.82
3	IDC	16.28
<b>4</b>	<b>Total</b>	<b>142.99</b>

- 2.14 As per section 2.5 of MPERC (Terms and Condition for Determination of Generation Tariff) Regulation, 2005, actual expenditure till the Commercial Operation Date of the project can be taken as capital expenditure subject to prudence check by the MPERC. The Commission thus approves the actual expenditure of Rs. 142.99 Crore as provisional capital cost. The finalisation of the capital cost will be done at the time of the determination of the final tariff by the Commission on the basis of the availability of the audited figures for this project.

**Loan Repayment and Interest Cost**

- 2.15 The petitioner filed the capital cost of the projects initially as Rs. 141.50 Crore which is subsequently revised to Rs. 158.80 Crore. On the basis of the actual expenditure as on date of commercial operation, the project cost has been worked out to Rs. 142.99 Crore. This project cost is funded through loan amount of Rs.104.95 Crore. For this amount of loan for the control period of three years, the interest amount and repayment amount as filed by the petitioner is given below:

**Table 7: Loan Repayment and Interest Cost**

Particulars			FY 07	FY 08	FY 09
1	Opening Balance	Rs. Crore	104.95	99.70	89.20
2	Repayment installments	No.	2	4	4
<b>3</b>	<b>Repayment Amount</b>	<b>Rs. Crore</b>	<b>5.25</b>	<b>10.50</b>	<b>10.50</b>
4	Closing Balance	Rs. Crore	99.70	89.21	78.71
5	Rate of Interest	%	7.35%	7.35%	7.35%
<b>6</b>	<b>Interest Amount</b>	<b>Rs. Crore</b>	<b>3.81</b>	<b>7.04</b>	<b>6.27</b>

- 2.16 As per section 2.15 of MPERC (Terms and Condition for Determination of Generation Tariff) Regulation, 2005, interest and finance charges are to be approved by taking into account the schedule of repayment, as per the terms and conditions of the relevant loan document and restricted it to PFC/REC term landing rate or the rates specified by CERC. As the loan taken for the above project is financed by PFC and the interest rate is weightage interest rate (7.35%) on the loans availed from PFC, Commission approves the above interest amount.

**O&M Expenditure**

- 2.17 In the petition filed, the MPPGCL had worked out the O&M charges as Rs. 5.31 Lakh per MW with an inflation of 6% per annum. Details of the O&M expenses as submitted by MPPGCL are given below in the table.

**Table 8: O&M Expenditure as proposed by the petitioner**

Particulars			FY 07	FY 08	FY 09
1	Rate of O&M Charges	Lakh Rs/MW	5.31	5.62	5.96
2	Months of Operation	No.	7	12	12
3	Amount of O&M Charges	Rs. Crore	1.24	2.25	2.38

- 2.18 As per section 3.32 of MPERC (Terms and Condition for Determination of Generation Tariff) Regulation, 2005, the O&M charges are to be considered at the rate of 1.5% of capital cost with a provision for annual escalation rate. Annual escalation rate is the weighted average of consumer price index and whole sale price index in the ratio of 60:40. Based on this, the initial amount for 7 months period of operation worked out to Rs.1.25 Crore. The Commission approves the same for FY 2006-07. However, as per the method of calculation of escalation rate mentioned above escalation comes out as 5.18%. Hence revised O&M rates are given in table below.

**Table 9: O&M Expenditure as Approved by the Commission**

Particulars			FY 07	FY 08	FY 09
1	Rate of O&M Charges	Lakh Rs/MW	5.36	5.64	5.93
2	Months of Operation	Nos.	7	12	12
3	Amount of O&M Charges	Rs. Crore	1.25	2.26	2.37

**Return on Equity (RoE)**

- 2.19 The MPERC (Terms and Condition for Determination of Generation Tariff) Regulations, 2005 stipulates Return on Equity as 14% on the amount of the equity invested in the project. The petitioner has made its submission accordingly. The Commission has reworked the capital cost of the project as Rs. 142.99 Crore. Hence the total equity amount invested in this project after considering the debt of Rs. 104.95 Crore is worked out to Rs 38.04 Crore thereby making the Debt Equity ratio as 73.4 : 26.6. The Commission has allowed return on equity on this amount as given in table below.

**Table 10: Return on Equity as Approved by the Commission**

Particulars			FY 07	FY 08	FY 09
1	Amount of Equity	Rs. Crore	38.04	38.04	38.04
2	Rate of Return	%	14.00%	14.00%	14.00%
3	Eligible Return on Equity	Rs. Crore	3.11*	5.33	5.33

\* For part of the financial year 2006-07.

### **Working Capital**

- 2.20 The petitioner has worked the Working Capital requirement for the project by taking 30 days of O&M, spares worth 1% of project cost and 2 months of receivables. The interest on the Working Capital has been worked at the rate of 11.25%. The petitioner filing is given below:

**Table 11: Working Capital Requirement & Interest on Working Capital as Filed**

<b>Particulars</b>		<b>FY 07</b>	<b>FY 08</b>	<b>FY 09</b>	
1	O&M Charges (30 Days)	Rs. Crore	0.17	0.18	0.20
2	Maint. Spares (1% of Project Cost)	Rs. Crore	1.41	1.47	1.53
3	Receivables (2 Months)	Rs. Crore	3.84	4.20	4.10
4	Working Capital	Rs. Crore	5.43	5.86	5.82
5	Interest Rate	%	11.25%	11.25%	11.25%
6	Interest on Working Capital.	Rs. Crore	0.36	0.66	0.65

- 2.21 As per clause 3.4 of MPERC (Terms and Condition for Determination of Generation Tariff) Regulations, 2005, the Working Capital amount should include O&M expense for 1 month, maintenance spare @ 1% of historical cost annually escalated by 4% and 2 months' of receivables. The rate of interest on the Working Capital amount is allowed as SBI PLR plus 1 %.
- 2.22 The Commission has re-worked the working capital requirement as per the norms specified by the Commission for generation tariff determination. The current Prime Lending Rate (PLR) is 12.75%. Hence, for FY08 and FY 09 interest rate of 13.75% is approved. The PLR during FY 2006-07 was 10.25% hence the Commission has considered the interest rate on Working Capital for FY 2006-07 as 11.25%. The revised calculations for interest on working capital are given below.

**Table 12: Working Capital Requirement & Interest on WC as Approved**

<b>Particulars</b>		<b>FY 07</b>	<b>FY 08</b>	<b>FY 09</b>	
1	O&M Charges (30 Days)	Rs. Crore	0.18	0.19	0.20
2	Maint Spares (1% of Project Cost)	Rs. Crore	1.43	1.49	1.55
3	Receivables (2 Months)	Rs. Crore	2.28	4.33	4.22
4	Working Capital	Rs. Crore	3.89	6.01	5.96
5	Interest Rate	%	11.25%	13.75%	13.75%
6	<b>Interest on Working Cap.</b>	<b>Rs. Crore</b>	<b>0.26</b>	<b>0.83</b>	<b>0.82</b>

### **Depreciation**

- 2.23 The Commission in its regulation "MPERC (Terms and Conditions of Generation Tariff) Regulations, 2005" has specified the principles of charging depreciation as below:



Depreciation shall be chargeable on historical cost of project on straight line method.

Depreciation shall be charged till cumulative depreciation reaches to the ceiling limit of 90%.

The principles of Company Act are applicable and the depreciation can be charged for the proportionate number of days during first year of its operation when the project is available for part of the year.

The rate of depreciation shall be weighted average rates based on element wise rate specified in Annexure I of "MPERC (Terms and Conditions of Generation Tariff) Regulations, 2005 (G-26 of 2005)".

- 2.24 The petitioner has submitted that in the instant case the project cost has not been finalized and hence it would be redundant to determine the weighted average rate of depreciation for this project based on cost elements. The average depreciation rates for the new existing hydro power plants viz. Birsinghpur and Rajghat Hydro Projects are 2.56% and 2.67% respectively. For most of the cost elements elaborated in Annexure I of "MPERC (Terms and Conditions of Generation Tariff) Regulations, 2005 (G-26 of 2005)", the rate applicable for Hydro Station is 2.57%. Hence, MPPGCL in this petition, for the purpose of determination of provisional tariff has considered rate of depreciation as 2.57% per year.
- 2.25 The Commission approves the average rate of depreciation for the Madhikheda Hydro Project as proposed by the petitioner i.e. 2.57%. The Commission directs the petitioner to bring the actual facts and figures before the Commission for working of the depreciation when the project is complete in all respects and the audited statements of accounts are available.

**Advance Against Depreciation (AAD)**

- 2.26 The petitioner has further submitted that as per "MPERC (Terms and Conditions of Generation Tariff) Regulations, 2005", the Advance Against Depreciation (AAD) is also permissible if the available cumulative depreciation up to the year is lower than the cumulative repayment till the year. Further ceiling of depreciation shall be 1/10<sup>th</sup> of the loan less depreciation for the year.
- 2.27 The petitioner by referring to the amount of repayment of loan to PFC, has submitted that the depreciation amount alone can not set aside the repayment liability of the PFC loan. In view of this, the petitioner has requested the Commission to consider the AAD as per the provisions in the Commission's regulations on generation tariff. The PFC loan has repayment period of 10 years and loan is to be repaid in equal instalments. Thus, in no case the repayment requirement shall be more than 1/10<sup>th</sup> of the loan during the year. Further, The depreciation and cumulative depreciation during each year (from FY 07 to FY 09) is lower than repayment/cumulative repayment requirements.

2.28 The Commission has examined the repayment liability of the petitioner. The repayment is more than the depreciation allowed. The Commission has also examined the Advance Against Depreciation as proposed by the petitioner. The Commission agrees with the proposal of the petitioner. The details of the repayment, depreciation and AAD are given below:

**Table 13: Depreciation as Approved by the Commission**

Particulars		FY 07	FY 08	FY 09
Months of Operation	Nos.	7	12	12
Annual Depreciation Rate	%	2.57%	2.57%	2.57%
Effective Dep Rate for Year	%	1.50%	2.57%	2.57%
Cumulative Depreciation	%	1.50%	4.07%	6.64%
Project Cost	Rs. Crore	142.99	142.99	142.99
Depreciation Amount	Rs. Crore	2.14	3.67	3.67
Cum Depreciation Amount	Rs. Crore	2.14	5.82	9.49
Loan Repayment	Rs. Crore	5.25	10.50	10.50
Cum Loan Repayment	Rs. Crore	5.25	15.74	26.24
Adv. Against Dep. Required	Rs. Crore	3.10	6.82	6.82

**Provisional Annual Capacity (Fixed) Charges of Generation for Madhikheda**

2.29 Details of provisional annual capacity (fixed) charges of generation for Madhikheda Hydro Power Station (2X20 = 40 MW) are given in table below.

**Table 14: Provisional Annual Capacity (Fixed) Charges for Madhikheda**

Particulars		FY 07	FY 08	FY 09
<b>Depreciation</b>	<b>Rs. Crore</b>	<b>2.14</b>	<b>3.67</b>	<b>3.67</b>
<b>Interest on Loan</b>	<b>Rs. Crore</b>	<b>3.81</b>	<b>7.04</b>	<b>6.27</b>
<b>Return on Equity</b>	<b>Rs. Crore</b>	<b>3.11</b>	<b>5.33</b>	<b>5.33</b>
<b>Advance Against Depreciation</b>	<b>Rs. Crore</b>	<b>3.10</b>	<b>6.82</b>	<b>6.82</b>
<b>Interest on Working Capital</b>	<b>Rs. Crore</b>	<b>0.26</b>	<b>0.83</b>	<b>0.82</b>
<b>MPERC Fee @ Rs 1000/MW</b>	<b>Rs. Crore</b>	<b>0.0023</b>	<b>0.004</b>	<b>0.004</b>
<b>O&amp;M Expenses</b>	<b>Rs. Crore</b>	<b>1.25</b>	<b>2.26</b>	<b>2.37</b>
<b>Total Cost of Generation</b>	<b>Rs. Crore</b>	<b>13.68</b>	<b>25.99</b>	<b>25.31</b>

2.30 The Commission allows the recovery to the extent of 95% of full provisional annual capacity charges.

## **B: Jhinna-Bansagar Hydrel Project (MHP):**

### **Brief Introduction**

- 2.31 The Bansagar Project is the largest Hydro Electric Project of MP Power Generating Company Limited. The total capacity of the project is 425 MW. The Bansagar complex consists of four power stations namely:-
1. **Bansagar-I (Tons Hydro Power Station)**: This is the main project of cascade development of Bansagar Multipurpose project. It is located at Sirmour in Rewa district of Madhya Pradesh. It is about 40 km away from Rewa. The power station has 3 units of 105 MW each having total installed capacity of 315 MW. To meet the water requirement of this project two barrages are constructed on rivers Tons & Beehar. During lean period water from the Bansagar Multipurpose dam is supplied through common water carrier. The power station is Semi Underground type.
  2. **Bansagar-II (Silpara Hydro Power Station)**: This is located at Silpara in Rewa District of Madhya Pradesh. It is about 8 km away from Rewa. The power station has 2 units of 15 MW each having total installed capacity of 30 MW. This is a canal based power station.
  3. **Bansagar III (Devlond Hydro Power Station)**: This is built at the toe of Bansagar Dam built across river Sone and is located at Deolond Village in Shahdol district of Madhya Pradesh. It is about 70 km away from Rewa Railway Station. The power station has 3 units of 20 MW each having total installed capacity of 60 MW. The power station is Storage type i.e. Dam toe Surface Power House type.
  4. **Bansagar IV (Jhinna)**: This is the recent project built on the toe of the Head Regulator of common water carrier canal to divert Sone river water for irrigation & power generation. It is situated at Jhinna village in Satna district of MP. It is 60 km away from Rewa Railway station. The power station has two units of 10 MW each having a total installed capacity of 20 MW. The power station is of storage type.
- 2.32 The Commission determined the generation tariff for the three stations of the Bansagar Complex viz. PH-I, PH-2 and PH-3 in its Generation Tariff Order for FY 2006-07 to 2008-09 of March 2006. Since PH-IV had also started generation in August 2006, the MPPGCL has filed the subject petition for determination of the generation tariff for PH-IV only for the tariff period from FY 2006-07 to FY 2008-09.
- 2.33 In the existing arrangement, water from Bansagar dam is fed through common water carrier and power channel to PH-II. The studies discovered that there exists a potential for generating about 20 MW power utilizing the drop available at the Head Regulator in the saddle. Accordingly the project conceived with 2 X 10 MW capacity.

- 2.34 Status of Statutory Clearances:- Various statutory clearances viz. Techno-economic clearance from Central Electricity Authority (CEA), approval from GoMP and the Environment clearance from Ministry of Environment and Forest (MoEF) had already been arranged by the petitioner. The details are given below:
- 2.34.1 Techno-economic clearance of the project was granted by CEA vide 3/114/91-PSE/2227-33 dated 22.11.91 at a total estimated cost of Rs. 51.06 Crore.
- 2.34.2 The approval of GoMP was conveyed to erstwhile MPSEB vide GoMP letter No. 3615/3724/13/92 dated 31.7.92. The Investment approval to the revised cost of Rs. 133.10 Crore was granted by State Government vide its letter No. 9704 / F III /21 13 /2001 dated 17.12.2002
- 2.34.3 Environmental clearance was already available for the project vide Director and Member Secretary, Environmental Appraisal Committee's letter No. J-11016/90/82-env.5 dated 2<sup>nd</sup> June 84.
- 2.35 It has been informed by the petitioner that the project was to be fed from the water discharged from Bansagar dam which has been constructed by Water Resources Department of Government of MP (WRD). After the commissioning of the PH-1, II and III, the work for construction of the Power House – IV was initiated. The WRD scheduled the date for completion of the dam including the installation of the gates in the year 2005. The target then revised to June 2006.
- 2.36 The petitioner has informed that the dam is complete up to crest level of 326.4 M. In the hearing of October 17, 2007 the Commission enquired about the status of completion of the project in all respects. The petitioner through its written submission of November 21, 2007 and in the subsequent hearing of December 05, 2007 submitted the following facts:
- 2.36.1 Bansagar – IV Jhinna Hydro Power Station (HPS) was commissioned on September 30, 2006.
- 2.36.2 Chief Engineer (WRD) vide its letter of 31/7/06 confirmed the completion of the construction of the Dam including the erection of 18 numbers radial gates and the reservoir was proposed to be filled to its maximum water level.
- 2.36.3 During October 2006, the project generated to its maximum level of installed capacity i.e. 20 MW.
- 2.36.4 The incomplete civil works are Approach road, Residential colony, Air conditioning and ventilation system and Fire protection system.
- 2.36.5 The Interest During Construction (IDC) component at the time of commissioning date was Rs. 9.28 Crore.
- 2.36.6 The status of actual expenditure till date i.e. 05/12/2007 is given as below:

**Table 15: Actual Expenditure on the project (Rs. Crore)**

Particulars	Approved Estimated Cost	As on November 2007				
		Incurred	Bills pending	Sub total	Balance	Total
Civil works	34.32	30.65		30.65		30.65
E&M Works	71.04	58.03	0.62	58.65		58.65
IDC	27.74	16.91		16.91		16.91
<b>Total</b>	<b>133.10</b>	<b>105.59</b>	<b>0.62</b>	<b>106.21</b>	<b>0.00</b>	<b>106.21</b>

### Analysis of the Petition

#### Generation Details of Bansagar – IV Jhinna Project:

- 2.37 Bansagar – IV has the installed capacity of 20 MW (2X10=20 MW). Design energy of the plant is 80.10 MU per year. As per the Commission’s regulation on the generation tariff for hydro power stations, the auxiliary consumption as is 0.5% and transformation losses are also 0.5%. After deducting these losses net generation comes out to be 79.30 MU per annum. The petitioner had submitted that since the plant was in operation for a only 7 months during the first year, the design energy has been reduced to 64.08 MU and accordingly the net generation 63.44 MU. The details as filed are given below:

**Table 16: Generation Details of Bansagar – IV Jhinna (2X10 MW) Project**

Particulars			FY 07	FY 08	FY 09
1	Capacity of Plant	MW	20	20	20
2	Design Energy	MU	80.10	80.10	80.10
3	% of DE Generation	%	80%	100%	100%
4	Gross Generation	MU	64.08*	80.10	80.10
5	Auxiliary Consumption	%	0.50%	0.50%	0.50%
6	Transformation Loss	%	0.50%	0.50%	0.50%
7	Net Generation	MU	63.44	79.30	79.30

\* As filed by the petitioner.

#### Plant Cost:

- 2.38 The petitioner in the petition filed the details of the capital cost of the plant on the basis of the provisional actual expenditure as Rs. 96.45 Crore. The capital cost has been revised by the petitioner in its submission before the Commission in the hearing on 05/12/2007 as Rs. 106.21 Crore. The estimated cost of the project as per the approved estimates is Rs. 133.10 Crore. The details are given below:

**Table 17: Capital Cost Details of Bansagar - IV (2X10 MW) Project (Rs. Crore)**

Sl.No.	Particulars of the Cost	As per approved Estimates	As filed in the petition on 12/10/2006	As per revised filing of 05/12/2007
1	E&M Works	32.32	33.59	30.65
2	Civil Works	71.04	54.31	58.65
3	IDC	27.74	8.55	16.91
<b>4</b>	<b>Total</b>	<b>133.10</b>	<b>96.45</b>	<b>106.21</b>

- 2.39 The Commission has further enquired from the petitioner about the Interest During Construction (IDC) component at the time of commissioning of the project. The petitioner through its submission in the hearing of 05/12/2007 informed that the IDC component on the date of the commercial operation was Rs. 9.28 Crore. The Commission accepts the same. The capital cost as approved by the Commission is given below:

**Table 18: Capital Cost of Bansagar – IV (2X10 MW) Project as accepted by the Commission (Rs. Crore)**

Sl.No.	Particulars of the Cost	On the basis of Actual Expenditure
1	E&M Works	33.59
2	Civil Works	54.31
3	IDC	9.28
4	<b>Total</b>	<b>97.18</b>

- 2.40 As per section 2.5 of MPERC (Terms and Condition for Determination of Generation Tariff) Regulation, 2005, actual expenditure till the Commercial Operation Date of the project can be taken as capital expenditure subject to prudence check by the MPERC. The Commission thus approves the actual expenditure of Rs. 97.18 Crore as provisional capital cost. The finalisation of the capital cost will be done at the time of the determination of the final tariff by the Commission on the basis of the availability of the audited figures for this project.

**Loan Repayment and Interest Cost**

- 2.41 The petitioner filed the capital cost of the projects initially as Rs. 96.45 Crore which is subsequently revised to Rs. 106.21 Crore. On the basis of the actual expenditure as on date of commercial operation, the project cost has been worked out to Rs. 97.18 Crore. This project cost is funded through loan amount of Rs.63.90 Crore. For this amount of loan for the control period of three years, the interest amount and repayment amount as filed by the petitioner is given below:

**Table 19: Loan Repayment and Interest Cost**

Particulars			FY 07	FY 08	FY 09
1	Opening Balance	Rs. Crore	63.90	60.71	54.32
2	Repayment instalments	Nos.	2	4	4
3	<b>Repayment Amount</b>	<b>Rs. Crore</b>	<b>3.19</b>	<b>6.39</b>	<b>6.39</b>
4	Closing Balance	Rs. Crore	60.71	54.32	47.93
5	Rate of Interest	%	7.35%	7.35%	7.35%
6	<b>Interest Amount</b>	<b>Rs. Crore</b>	<b>2.32</b>	<b>4.29</b>	<b>3.82</b>

- 2.42 As per section 2.15 of MPERC (Terms and Condition for Determination of Generation Tariff) Regulation, 2005, interest and finance charges are to be approved by taking into account the schedule of repayment, as per the terms and conditions of the relevant loan document and restricted it to PFC/REC term landing rate or the rates specified by CERC. As the loan taken for the above project is financed by PFC and the interest rate is weightage interest rate (7.35%) on the loans availed from PFC, Commission approves the above interest amount.

**O&M Expenditure**

- 2.43 In the petition filed, the MPPGCL had worked out the O&M charges as Rs. 7.23 Lakh per MW with an inflation of 6% per annum. Details of the O&M expenses as submitted by MPPGCL are given below in the table.

**Table 20: O&M Expenditure as proposed by the petitioner**

Particulars			FY 07	FY 08	FY 09
1	Rate of O&M Charges	Lakh Rs/MW	7.23	7.66	8.12
2	Months of Operation	No.	7	12	12
3	Amount of O&M Charges	Rs. Crore	0.84	1.53	1.63

- 2.44 As per section 3.32 of MPERC (Terms and Condition for Determination of Generation Tariff) Regulation, 2005, the O&M charges are to be considered at the rate of 1.5% of capital cost with a provision for annual escalation rate. Annual escalation rate is the weighted average of consumer price index and whole sale price index in the ratio of 60:40. Based on this, the initial amount for 7 months period of operation worked out to Rs. 0.85 Crore. The Commission approves the same for FY 2006-07. However, as per the method of calculation of escalation rate mentioned above escalation comes out as 5.18%. Hence revised O&M rates are given in table below.

**Table 21: O&M Expenditure as Approved by the Commission**

Particulars			FY 07	FY 08	FY 09
1	Rate of O&M Charges	Lakh Rs./MW	7.29	7.67	8.06
2	Months of Operation	No	7	12	12
3	Amount of O&M Charges	Rs. Crore	0.85	1.53	1.61

**Return on Equity (RoE)**

2.45 The MPERC (Terms and Condition for Determination of Generation Tariff) Regulations, 2005 stipulates Return on Equity as 14% on the amount of the equity invested in the project. The petitioner has made its submission accordingly. The Commission has reworked the capital cost of the project as Rs. 97.18 Crore. Hence the total equity amount invested in this project after considering the debt of Rs. 63.90 Crore is worked out to Rs 33.28 Crore. The debt – equity ratio is 65.8 : 34.2. The equity portion in the capital cost for this project is more than 30%. The eligible return on equity is for only 30% of the capital cost i.e. Rs. 29.15 Crore at 14% per annum. The balance amount of equity of Rs. 4.13 Crore is eligible for return at the weighted average rate of interest of the loans availed for this project i.e. 7.35% per annum. Accordingly, the Commission allows the return on equity as given below:

**Table 22: Return on Equity as Approved by the Commission**

Particulars		FY 07	FY 08	FY 09	
1	Total Amount of Equity	Rs. Crore	33.28	33.28	33.28
2	Amount of Equity portion eligible for RoE	Rs. Crore	29.15	29.25	29.25
3	Rate of Return	%	14.00%	14.00%	14.00%
4	Return on Equity Eligible for RoE	Rs. Crore	2.38*	4.08	4.08
5	Amount of Equity eligible for return at weighted average rate of interest of loans	Rs. Crore	4.13	4.13	4.13
6	Weighted Average Rate of Interest of Loans	%	7.35%	7.35%	7.35%
7	Interest on Equity	Rs. Crore	0.18*	0.30	0.30
8	Return Amount (4 + 7)	Rs. Crore	2.56*	4.38	4.38

\* For part of the Financial Year 2006-07.

**Working Capital**

2.46 The petitioner has worked the Working Capital requirement for the project by taking 30 days of O&M, spares worth 1% of project cost and 2 months of receivables. The interest on the Working Capital has been worked at the rate of 11.25%. The petitioner filing is given below:

**Table 23: Working Capital Requirement & Interest on Working Capital as Filed**

Particulars		FY 07	FY 08	FY 09	
1	O&M Charges (30 Days)	Rs. Crore	0.12	0.13	0.13
2	Maint. Spares (1% of Project Cost)	Rs. Crore	0.96	1.00	1.04
3	Receivables (2 Months)	Rs. Crore	2.56	2.78	2.72
4	Working Capital	Rs. Crore	3.65	3.91	3.89
5	Interest Rate	%	11.25%	11.25%	11.25%
6	Interest on Working Capital	Rs. Crore	0.24	0.44	0.44



- 2.47 As per clause 3.4 of MPERC (Terms and Condition for Determination of Generation Tariff) Regulations, 2005, the Working Capital amount should include O&M expense for 1 month, maintenance spare @ 1% of historical cost annually escalated by 4% and 2 months' of receivables. The rate of interest on the Working Capital amount is allowed as SBI PLR plus 1 %.
- 2.48 The Commission has re-worked the working capital requirement as per the norms specified by the Commission for generation tariff determination. The current Prime Lending Rate (PLR) is 12.75%. Hence, for FY08 and FY 09 interest rate of 13.75% is approved. The PLR during FY 2006-07 was 10.25% hence the Commission has considered the interest rate on Working Capital for FY 2006-07 as 11.25%. The revised calculations for interest on working capital are given below.

**Table 24: Working Capital Requirement & Interest on WC as Approved**

Particulars		FY 07	FY 08	FY 09	
1	O&M Charges (30 Days)	Rs. Crore	0.12	0.13	0.13
2	Maint Spares (1% of Project Cost)	Rs. Crore	0.97	1.01	1.05
3	Receivables (2 Months)	Rs. Crore	1.53	2.89	2.82
4	Working Capital	Rs. Crore	2.62	4.02	4.00
5	Interest Rate	%	11.25%	13.75%	13.75%
6	Interest on Working Cap.	Rs. Crore	0.17	0.55	0.55

### **Depreciation**

- 2.49 The Commission in its regulation "MPERC (Terms and Conditions of Generation Tariff) Regulations, 2005" has specified the principles of charging depreciation as below:

Depreciation shall be chargeable on historical cost of project on straight line method.

Depreciation shall be charged till cumulative depreciation reaches to the ceiling limit of 90%.

The principles of Company Act are applicable and the depreciation can be charged for the proportionate number of days during first year of its operation when the project is available for part of the year.

The rate of depreciation shall be weighted average rates based on element wise rate specified in Annexure I of "MPERC (Terms and Conditions of Generation Tariff) Regulations, 2005 (G-26 of 2005)".

- 2.50 The petitioner has submitted that in the instant case the project cost has not been finalized and hence it would be redundant to determine the weighted average rate of depreciation for this project based on cost elements. The average depreciation rates for the new existing hydro power plants viz. Birsinghpur and Rajghat Hydro Projects are 2.56% and 2.67% respectively. For most of the cost elements elaborated in Annexure I of "MPERC (Terms and Conditions of Generation Tariff) Regulations, 2005 (G-26 of 2005)" the rate applicable for Hydro Station is 2.57%. Hence, MPPGCL in this petition, for the purpose of determination of provisional tariff has considered rate of depreciation as 2.57% per year.
- 2.51 The Commission approves the average rate of depreciation for the Bansagar – IV Jhinna Hydro Project as proposed by the petitioner i.e. 2.57%. The life of the plant is assumed to be 25 years and construction period of 48 months. The Commission directs the petitioner to bring the actual facts and figures before the Commission for working of the depreciation when the project is complete in all respect and the audited statements of accounts are available.

**Advance Against Depreciation (AAD)**

- 2.52 The petitioner has further submitted that as per "MPERC (Terms and Conditions of Generation Tariff) Regulations, 2005", the Advance Against Depreciation (AAD) is also permissible if the available cumulative depreciation up to the year is lower than the cumulative repayment till the year. Further ceiling of depreciation shall be  $1/10^{\text{th}}$  of the loan less depreciation for the year.
- 2.53 The petitioner by referring to the amount of repayment of loan to PFC, has submitted that the depreciation amount alone can not set aside the repayment liability of the PFC loan. In view of this, the petitioner has requested the Commission to consider the AAD as per the provisions in the Commission's regulations on generation tariff. The PFC loan has repayment period of 10 years and loan is to be repaid in equal instalments. Thus, in no case the repayment requirement shall be more than  $1/10^{\text{th}}$  of the loan during the year. Further, the depreciation and cumulative depreciation during each year (from FY07 to FY09) is lower than repayment/cumulative repayment requirements.
- 2.54 The Commission has examined the repayment liability of the petitioner. The repayment is more than the depreciation allowed. The Commission has also examined the Advance Against Depreciation as proposed by the petitioner. The Commission agrees with the proposal of the petitioner. The details of the repayment, depreciation and AAD are given below:

**Table 25: Depreciation as Approved by the Commission**

Particulars		FY 07	FY 08	FY 09
Months of Operation	Nos.	7	12	12
Annual Depreciation Rate	%	2.57%	2.57%	2.57%
Effective Dep Rate for Year	%	1.50%	2.57%	2.57%
Cumulative Depreciation	%	1.50%	4.07%	6.64%
Project Cost	Rs. Crore	97.18	97.18	97.18
<b>Depreciation Amount</b>	<b>Rs. Crore</b>	<b>1.46</b>	<b>2.50</b>	<b>2.50</b>
Cum Depreciation Amount	Rs. Crore	1.46	3.96	6.45
Loan Repayment	Rs. Crore	3.195	6.39	6.39
Cum Loan Repayment	Rs. Crore	3.195	9.585	15.975
<b>Adv. Against Dep.Required</b>	<b>Rs. Crore</b>	<b>1.74</b>	<b>3.89</b>	<b>3.89</b>

**Provisional Annual Capacity (Fixed) Charges of generation for Bansagar – IV Jhinna**

- 2.55 Details of provisional annual capacity (fixed) charges cost of generation for Bansagar – IV Jhinna Hydro Power Station (2X10 = 20 MW) are given in table below:

**Table 26: Provisional Annual Capacity Charges for Bansagar –IV (Jhinna)**

Particulars		FY 07	FY 08	FY 09
<b>Depreciation</b>	<b>Rs. Crore</b>	<b>1.46</b>	<b>2.50</b>	<b>2.50</b>
<b>Interest on Loan</b>	<b>Rs. Crore</b>	<b>2.32</b>	<b>4.29</b>	<b>3.82</b>
<b>Return on Equity</b>	<b>Rs. Crore</b>	<b>2.56</b>	<b>4.38</b>	<b>4.38</b>
<b>Interest on Equity</b>	<b>Rs. Crore</b>	<b>0.18</b>	<b>0.30</b>	<b>0.30</b>
<b>Advance Against Depreciation</b>	<b>Rs. Crore</b>	<b>1.74</b>	<b>3.89</b>	<b>3.89</b>
<b>Interest on Working Capital</b>	<b>Rs. Crore</b>	<b>0.17</b>	<b>0.55</b>	<b>0.55</b>
<b>MPERC Fee @ Rs 1000/MW</b>	<b>Rs. Crore</b>	<b>0.0012</b>	<b>0.002</b>	<b>0.002</b>
<b>O&amp;M Expenses</b>	<b>Rs. Crore</b>	<b>0.85</b>	<b>1.53</b>	<b>1.61</b>
<b>Total Fixed Cost</b>	<b>Rs. Crore</b>	<b>9.20</b>	<b>17.33</b>	<b>16.94</b>

- 2.56 The Commission allows the recovery to the extent of 95% of full provisional annual capacity charges.

**Recovery of Charges**

- 2.57 The normative capacity indices for recovery of the full capacity charges for both the projects shall be as defined in MPERC (Terms and Conditions for determination of the Generation Tariff) Regulations, 2005. The recovery of the capacity charges, primary and secondary energy charges and incentive will be done in accordance with the relevant sections of the regulations. These charges shall be payable by the beneficiaries.

- 2.58 Since both the projects had started commercial operation from September 2006, any energy, if generated and sent to grid prior to September 2006 shall be treated as infirm power. The energy corresponding to the infirm power will be charged at the primary energy rate as defined in the Commission's regulations, i.e. at the lowest variable charges of the central sector thermal power generating station in the Western Region at that time. The revenue earned from the sale of infirm power shall be treated as reduction in the capital cost of the respective generating stations and shall not be treated as revenue.
- 2.59 The ED on the auxiliary consumption and the other taxes including cess etc., if any, shall be recoverable as per actuals.
- 2.60 The Commission has determined the provisional tariffs. These shall be applicable during the present control period i.e. up to 31<sup>st</sup> March 2009. The MPPGCL should take immediate steps to finalise its accounts as early as possible. The petitioner is directed to file appropriate petition(s), based on the actual audited accounts, for approval of final tariff in accordance with the terms and conditions notified by the Commissions from time to time.

## CHAPTER 3

### **Summary of Respondents' Objections, Petitioner's Reply and Commission's Observation.**

- 3.1 In response to the public notice published by the Commission to obtain the comments / objections / suggestions the Commission office had not received any feedback from public. However, the respondents MP Power Trading Company and MP Paschim Kshetra Vidyut Vitaran Company Limited had filed their objections. In the following paragraphs the summary of the objections, petitioner's reply and the Commission's observation have been discussed.

#### **Madhikheda Hydro Power Station (2X20=40MW)**

**Name of Respondent: MP Power Trading Company Limited.**

#### **Respondent's Objection No. 1:**

MPPGCL to demonstrate the Maximum Continuous Rating after completion of dam and after successful operation only, the date of commercial operation be decided

#### **Petitioner's Reply:**

MPPGCL has submitted following facts-

- (i) MP Power Trading Co. was formed and made operational w.e.f. 3<sup>rd</sup> June 2006.
- (ii) The agreement for sale of power from the capacity entrusted to the MPPGCL vide GoMP notification dated 31.5.05 was done on 29.11.06. By this time both the units have commenced their operation.
- (iii) Till this date the MPPGCL was supplying power to MPSEB for onward sale to the ultimate users. All the details about the project status were already known to Load Dispatch as per prevailing practice and in fact the generation was governed by the Dispatch instructions issued by SLDC only. Therefore, the buyer of the power was well informed about the commissioning activities and had full opportunity to witness the commissioning activities.
- (iv) Since the GoMP vide its letter dated 29.11.06 directed the MPPGCL to sell its entire power only to Tradeco for onward sale to ultimate consumer and hence it was not feasible to inform M.P. Tradeco (specifically) before such instructions/clarity from the GoMP. The MPPGCL has informed to the then buyer of the power and have generated power only after obtaining dispatch instructions.
- (v) Clause 3.25 (7) of Point 49 of MPERC Regulation defines maximum available capacity as under :-  
***"Maximum capacity in MW, the generating station can generate with all units running, under prevailing conditions of water level and flows over the peaking hours of next day."***

Thus it is clear from the Commission's regulations that hydro stations can generate only when adequate quantity of water is available in the dam/catchment area. Thus the request of respondent for demonstrating the maximum continuous rating is not practical.

For the purpose of declaring COD continuous successful running of the machine for 72 hours was required as per the contract conditions with the available water in the catchment area. This term was successfully complied before taking over the plant from the Contractor and was duly informed to all concerned. As such the MPPGCL submitted to consider the COD of the unit as illustrated in the petition and requested to kindly not consider cascading the COD of the units at any subsequent date.

**Commission's observation**

The Commission has agreed with the reply of the petitioner.

**Respondent's Objection No. 2:**

Generation injected prior to date of commercial operation may be considered as infirm power and the revenue earned may be deducted from the capital cost while computing the tariff of the generating station as per Clause 53 (3.30) of MPERC Regulation 2005. The rate of infirm power should be as per the provision indicated in the Regulation of MPERC.

**Petitioner's Reply:**

The MPPGCL has agreed with the observations of the respondent. It is submitted by the MPPGCL that it has not charged for any amount of infirm power generated by these units and hence the question of further compliance as per procedure specified in the MPERC directives/ Regulations does not arise.

**Commission's observation**

The Commission has agreed with the reply of the petitioner.

**Respondent's Objection No. 3:**

Provisional tariff can only be allowed when petitioner submits the required documents and calculation sheets.

**Petitioner's Reply:**

The MPPGCL has submitted that in addition to petition submitted by the MPPGCL, it has also made available all the relevant document including, copy of orders and DPRs etc. to the Commission for finalization of project cost. The MPPGCL has submitted that its estimation for the project cost are true transparent and fair and therefore permitted the same for the purpose of determination of provisional tariff.

**Commission's observation**

The Commission has agreed with the reply of the petitioner. The provisional tariff has been determined on the basis of details submitted by the MPPGCL and after applying the prudent checks by the Commission.

**Respondent's Objection No.4:**

The Design energy is required to be re-calculated as it appears to be on higher side.

**Petitioner's Reply:**

The MPPGCL has appreciated that higher is the design energy lower will be the effective tariff for the consumer on per unit basis. It is also submitted that –

- (i) The tariff for the Hydro Station is basically in the nature of fixed cost and therefore the instance of design energy does not change the financial burden on the buyer.
- (ii) The MPPGCL has also committed full power of its plant through PPA entered on 29.11.06 and have agreed to supply all the energy generated from this plant to the MP Tradeco only. Therefore, any change in the actual amount of energy generated does not provide any major change in financial burden on MP Tradeco except for cost of secondary energy, if any.
- (iii) In the Regulation under Sec. 49 of 3.25(6) the Commission has defined the design energy as the quantum of energy which could be generated in 90% dependable year with 95% of installed capacity of generating station. As per standard national practice the design energy is computed based on 30 to 50 years Hydrological data. The MPPGCL has complied with both the requirements.
- (iv) Further design energy is determined once in the life of the project, under normal circumstances, which have already been done in this case. There is no change in the physical & technical parameters like height of Dam, change in catchment area etc. Hence there is no need for revision in design energy.

**Commission's observation**

The Commission has agreed with the reply of the petitioner.

**Name of Respondent: MP Paschim Kshetra Vidyut Vitaran Company Limited.**

**Respondent's Objection No.1:**

The Design Energy has direct implication on the ultimate tariff. It is in the interest of Discom to have higher Design Energy. Therefore, the Commission to take appropriate steps for upward revision of design energy.

**Petitioner's Reply:**

The MPPGCL has appreciated that higher the design energy, lower will be per unit cost of generation. The tariff of Hydro Station consists of fixed cost only. This is as per regulations of MPERC and is in line with the national practice, which has been adopted considering the fact that generator has no control over rains and accumulated water in the catchment area for actual generation of energy. For the purpose of estimation, design energy of the project is considered as Benchmark.

Any artificial increase in design energy will not give benefit because even if the design energy is not achieved (due to non availability of water / poor rains), the respondent is required to pay full fixed cost. For ensuring efficiency of operation by the generator, regulations provide for cuts in fixed cost depending upon target availability. Rather is adverse for the Distribution companies to have artificial increase in the Design energy, because this will change their power purchase cost artificially. In case of lower generation, it will affect their capacity to purchase power under approved tariff. The MPPGCL has already committed its full generation for sale to Distribution companies in MP through MP Tradeco. Additional generation, if any shall also be made available to them at very nominal rate of secondary energy.

Further, design energy is determined once in the life of the project, under normal circumstances, which have already been done in this case. There is no change in the physical & technical parameters like height of Dam, change in catchment area etc. Hence there is no need for revision in design energy.

**Commission's Observations:**

The design energy of a Hydel Project has been defined as the quantum of energy which could be generated in 90% dependable year with 95% of installed capacity of generating station. As per standard national practice the design energy is computed based on 30 to 50 years Hydrological data. The design energy has been fixed by the CEA. Hence, it is not required to change the design energy on the basis of the 1 or 2 years' performance.

**Respondent's Objection No.2:**

- a. The Project Cost directly affects the tariff and it is in the favour of Discom to have lower Project Cost.
- b. The TEC of the Project was given by CEA and the MPPGCL should have approached CEA for revision in the TEC demonstrating prudent reasons. The MPPGCL has not approached CEA for revision of TEC.
- c. The consequences of time over run should not be loaded on Discoms

**Petitioner's Reply:**

The project cost of Hydro Station depends on number of parameters including the geographical arrangement at site, the cost of dam and R&R and market conditions. CEA gives TEC only after considering the technical and economic feasibility of the projects. The TEC to the project was given by CEA after considering its merit, technical feasibility and economical / commercial feasibilities. Thus the cost of the project may be considered reasonable. The project cost revised due to the reasons explained in the subsequent observations.



The TEC to the project was given by CEA in 1993 at a total cost of Rs. 106.94 Cr including the element of Rs. 4.26 Cr. for transmission lines. The need for revising the project cost has arisen subsequently for the reasons that the project was to be constructed and fed from the water to be discharged from Madhikheda dam which was to be constructed by Water Resources Department of GoMP (WRD). In the meantime there was a shuffle in the national policy for power generation and participation of independent power investors was envisaged with best possible spirit. The construction of Madhikheda dam was got delayed due to the various reasons at WRD end. The dam works could be accelerated by WRD in the year 2000 only when GOI approved financing of construction of Madhikheda dam through Accelerated Irrigation Benefit Program (AIBP) in the next 5 years i.e. by 2005.

Considering the above fact, GoMP further considered it prudent to construct the project and approved the revised cost as Rs. 169.36 Crore excluding the element of transmission line amounting to Rs. 8.02 Crore.

It is also prudent to mention that TEC of the projects is generally sought either before start of construction activity or after the completion of the project activities considering all changes affecting the project cost. Mid term revision of TEC is necessary when there is any major change in technical or physical parameter like height of dam, major changes in design / technology, change in catchment area etc. The impact of cost overruns due to various inflationary factors is not adequate reason to approach CEA during the construction period for revision of TEC. During the period increase in the project cost is due to inflationary reasons is also below 6%, which is well commensurate with the national inflation during this period.

Since the go ahead to the project was given by GoMP in the month of May 2001 and in the meantime the provisions of Electricity Act 2003 have become effective, thus, it was not necessary for the MPPGCL to approach CEA for revision of TEC for the project. In the present scenario it is MPERC who approves the project cost, for tariff principle.

The consequences of time over run should not be loaded on Discoms, provided they are controllable and attributable to the MPPGCL. The delay in the project was partly due to change in the national policy and was partly on account of delay in construction of dam attributable to WRD. The MPPGCL had put extraordinary efforts to match and synchronize the construction activities with the progress of the dam works so that the asset is not commissioned before the dam is available. Yet, the full benefit could not be reaped in the first year due to sluice gate kept opened by WRD to meet other administrative requirements.

The delay in completion of project has resulted in slight increase in IDC. The delay in completion of the project is not attributable to the MPPGCL.

**Commission's Observations:**

The arguments put forth the petitioner are acceptable to the Commission. The Commission is taking full care that no extraordinary costs be loaded in the tariff determined in this order. The Commission has determined the provisional tariff on the basis of the actual expenditure as filed by the petitioner at the time of the date of commercial operation of the project. The provisional capital cost of the project as considered by the Commission in this order is much less than that as approved by the GoMP. The Commission will also give a prudent check on the capital cost when the final tariff is determined by the Commission in due course of the time.

**Respondent's Objection No.3:**

The cost on transmission line, as considered in the TEC should not be included in the project cost.

**Petitioner's Reply:**

The GoMP accorded the approval of revised cost of project as Rs. 177.38 Crore which includes the cost of transmission line. In the present petition the estimated cost is taken as Rs. 169.36 which does not include the cost of associated transmission system for evacuation of power.

**Commission's Observations:**

The cost of the associated transmission system of the Madhikheda project has been in the approved cost of the project. For the purpose of determination of the generation tariff the petitioner had not included the cost of the transmission system in the capital cost of the project, hence the Commission agrees with the reply of petitioner.

**Respondent's Objection No.4:**

The Petitioner need to ring fence the accounts and provide assurance that it is not charging any cost incurred for other stages.

**Petitioner's Reply:**

The MPPGCL has assured that no cost element of the project pertaining to other stages has been booked against this project in this petition.

**Commission's Observations:**

The Commission has determined the provisional tariff on the basis of the provisional capital cost which is lower than the estimated cost as approved by the GoMP. At the time of determination of the final tariff, the petitioner should be required to file the relevant information / certificates in this regard.

**Respondent's Objection No. 5:**

The reliability of Design Energy declared by the MPPGCL is not appreciable as many Hydro Stations of the petitioner have not been able to achieve the Design Energy since the date of Commissioning except for one or two year.

**Petitioner's Reply:**

The MPPGCL has appreciated that many of its projects could not achieve generation to the design energy in past. This is primarily due to lower rains in the catchment area of the project. The design energy is estimated on 90% dependability for past 30 to 50 year's hydrological data with 95% availability of machines. The machines are available for the generation. Hence, the MPPGCL is not responsible for the lower generation of its Hydel projects.

**Commission's Observations:**

The Commission agrees to the reply of the petitioner.

**Respondent's Objection No. 6:**

The respondent requested to direct the MPPGCL to provide detailed working sheets for tariff calculations.

**Petitioner's Reply:**

The hard as well as soft copies of the petition have been made available by the petitioner. The soft copy including the forms and sheets are also available in web site.

**Commission's Observations:**

The soft copies of the Petition & formats have also been available in website.

**Bansagar – IV Hydro Power Station (2X10=20MW)**

**Name of Respondent: MP Power Trading Company Limited.**

**Respondent's Objection No.1:**

The MPPGCL to demonstrate the Maximum Continuous Rating after completion of dam and after successful operation only, the date of commercial operation be decided

**Petitioner's Reply:**

The MPPGCL has submitted following facts-

- (i) MP Power Trading Co. was formed and made operational w.e.f. 3<sup>rd</sup> June 2006.
- (ii) The agreement for sale of power from the capacity entrusted to the MPPGCL vide GoMP notification dated 31.5.05 was done on 29.11.06. By this time both the units have commenced their operation.
- (iii) Till this date the MPPGCL was supplying power to the MPSEB for onward sale to the ultimate users. All the details about the project status were already known to Load Dispatch as per prevailing practice and in fact the generation was governed by the Dispatch instructions issued by SLDC only. Therefore the buyer of the power was well informed about the commissioning activities and had full opportunity to witness the commissioning activities.
- (iv) Since the GoMP vide its letter dated 29.11.06 directed the MPPGCL to sell its entire power only to Tradeco for onward sale to ultimate consumer and hence it was not feasible to inform M.P. Tradeco (specifically) before such

instructions/clarity from the GoMP. The MPPGCL has informed to the then buyer of the power and have generated power only after obtaining dispatch instructions.

- (v) Clause 3.25 (7) of Point 49 of MPERC Regulation defines maximum available capacity as under :-  
***“Maximum capacity in MW, the generating station can generate with all units running, under prevailing conditions of water level and flows over the peaking hours of next day.”***

Thus it is clear from the Commission’s regulations that hydro stations can generate only when adequate quantity of water is available in the dam/catchment area. Thus the request of respondent for demonstrating the maximum continuous rating is not practical.

For the purpose of declaring COD continuous successful running of the machine for 72 hours was required as per the contract conditions with the available water in the catchment area. This term was successfully complied before taking over the plant from the Contractor and was duly informed to all concerned. As such the MPPGCL submitted to consider the COD of the unit as illustrated in the petition and requested to kindly not consider cascading the COD of the units at any subsequent date.

**Commission’s observation**

The Commission has agreed with the reply of the petitioner.

**Respondent’s Objection No. 2:**

Generation injected prior to date of commercial operation may be considered as infirm power and the revenue earned may be deducted from the capital cost while computing the tariff of the generating station as per Clause 53 (3.30) of MPERC Regulation 2005. The rate of infirm power should be as per the provision indicated in the Regulation of MPERC.

**Petitioner’s Reply:**

The MPPGCL has agreed with the observations of the respondent. It is submitted by the MPPGCL that it has not charged for any amount of infirm power generated by these units and hence the question of further compliance as per procedure specified in the MPERC directives/ Regulations does not arise.

**Commission’s observation**

The Commission has agreed with the reply of the petitioner.

**Respondent’s Objection No. 3:**

Provisional tariff can only be allowed when petitioner submits the required documents and calculation sheets.

**Petitioner's Reply:**

The MPPGCL has submitted that in addition to petition submitted by the MPPGCL, it has also made available all the relevant document including, copy of orders and DPRs etc. to the Commission for finalization of project cost. The MPPGCL has submitted that its estimation for the project cost are true transparent and fair and therefore permitted the same for the purpose of determination of provisional tariff.

**Commission's observation**

The Commission has agreed with the reply of the petitioner. The provisional tariff has been determined on the basis of details submitted by the MPPGCL and after applying the prudent checks by the Commission.

**Respondent's Objection No.4:**

The Design energy is required to be re-calculated as it appears to be on higher side.

**Petitioner's Reply:**

The MPPGCL has appreciated that higher is the design energy lower will be the effective tariff for the consumer on per unit basis. It is also submitted that –

- (i) The tariff for the Hydro Station is basically in the nature of fixed cost and therefore the instance of design energy does not change the financial burden on the buyer.
- (ii) The MPPGCL has also committed full power of its plant through PPA entered on 29.11.06 and have agreed to supply all the energy generated from this plant to MP Tradeco only. Therefore, any change in the actual amount of energy generated does not provide any major change in financial burden on MP Tradeco except for cost of secondary energy, if any.
- (iii) In the Regulation under Sec. 49 of 3.25(6) the Commission has defined the design energy as the quantum of energy which could be generated in 90% dependable year with 95% of installed capacity of generating station. As per standard national practice the design energy is computed based on 30 to 50 years Hydrological data. The MPPGCL has complied both the requirements.
- (iv) Further design energy is determined once in the life of the project, under normal circumstances, which have already been done in this case. There is no change in the physical & technical parameters like height of Dam, change in catchment area etc. Hence there is no need for revision in design energy.

**Commission's observation**

The Commission has agreed with the reply of the petitioner.

**Name of Respondent: MP Paschim Kshetra Vidyut Vitaran Company Limited.**

**Respondent's Objection No.1:**

The Design Energy has direct implication on the ultimate tariff. It is in the interest of Discom to have higher Design Energy. Therefore, the Commission to take appropriate steps for upward revision of design energy.

**Petitioner's Reply:**

The MPPGCL has appreciated that higher the design energy, lower will be per unit cost of generation. The tariff of Hydro Station consists of fixed cost only. This is as per regulations of MPERC and is in line with the national practice, which has been adopted considering the fact that generator has no control over rains and accumulated water in the catchment area for actual generation of energy. For the purpose of estimation, design energy of the project is considered as Benchmark.

Any artificial increase in design energy will not give benefit because even if the design energy is not achieved (due to non availability of water / poor rains), the respondent is required to pay full fixed cost. For ensuring efficiency of operation by the generator, regulations provide for cuts in fixed cost depending upon target availability. Rather is adverse for the Distribution companies to have artificial increase in the Design energy, because this will change their power purchase cost artificially. In case of lower generation, it will affect their capacity to purchase power under approved tariff. The MPPGCL has already committed its full generation for sale to Distribution companies in MP through MP Tradeco. Additional generation, if any shall also be made available to them at very nominal rate of secondary energy.

Further, design energy is determined once in the life of the project, under normal circumstances, which have already been done in this case. There is no change in the physical & technical parameters like height of Dam, change in catchment area etc. Hence there is no need for revision in design energy.

**Commission's Observations:**

The design energy of a Hydel Project has been defined as the quantum of energy which could be generated in 90% dependable year with 95% of installed capacity of generating station. As per standard national practice the design energy is computed based on 30 to 50 years Hydrological data. The design energy has been fixed by the CEA. Hence, it is not required to change the design energy on the basis of the 1 or 2 years' performance.

**Respondent's Objection No. 2:**

- a. The Project Cost directly affects the tariff and it is in the favour of Discom to have lower Project Cost.
  
- b. The TEC of the Project was given by CEA and the MPPGCL should have approached CEA for revision in the TEC demonstrating prudent reasons. The MPPGCL has not approached CEA for revision of TEC.
  
- c. The consequences of time over run should not be loaded on Discoms

**Petitioner's Reply:**

The project cost of Hydro Station depends on number of parameters including the geographical arrangement at site, the cost of dam and R&R and market conditions. CEA gives TEC only after considering the technical and economic feasibility of the projects. The TEC to the project was given by CEA after considering its merit, technical feasibility and economical / commercial feasibilities. Thus the cost of the project may be considered reasonable. The project cost revised due to the reasons explained in the subsequent paragraphs.

The TEC to the project was given by CEA in 1991 at a total cost of Rs. 51.06 Cr. The need of revising the project cost has arisen subsequently for the reasons that the project was to be constructed and fed from the water discharged from Bansagar dam. The dam was to be constructed by Water Resources Department of GoMP (WRD). In the meantime there was a shuffle in the national policy for power generation and participation of independent power investors was envisaged with best possible spirit. The construction of Bansagar dam was got delayed due to the various reasons at WRD end. The dam works could be accelerated by WRD in the year 1997 only when GOI approved financing of construction of Bansagar dam through Accelerated Irrigation Benefit Program (AIBP). After completion of construction activities of PH 2&3 in 2001 & 2002, the emphasis was given for construction of PH-4. The activities could be expedited only when WRD raised the height of dam up to crust level of RI 326.4 m.

Considering the above fact, the GoMP further considered it prudent to construct the project and approved the revised cost as Rs. 133.10 Crore.

It is further to mention that, though GoMP has approved the project cost as Rs. 133.10 Crore, the petition is based on the project cost of Rs. 96.45 Crore.

The TEC of the projects is generally sought either before start of construction activity or after the completion of the project activities considering all changes affecting the project cost. Mid term revision of TEC is necessary when there is any major change in technical or physical parameter like height of dam, major changes in design / technology, change in catchment area etc. The impact of cost overruns due to various factors is not adequate reason to approach CEA during the construction period for revision of TEC. During the period increase in the project cost is due to inflationary reasons is also about 6.5 %, which is well commensurate with the national inflation during this period.

The construction activities of the project could be started in 2002 and in the meantime the provisions of Electricity Act 2003 become effective, thus, it was not necessary for the MPPGCL to approach CEA for revision of TEC for the project. In the present scenario it is MPERC, who approves the project cost for tariff principle.

The consequences of time over run should not be loaded on Discoms, provided they are controllable and attributable to the MPPGCL. The delay in the project was partly due to change in the national policy and was partly on account of delay in construction of dam attributable to WRD. The MPPGCL had put extraordinary efforts to match and synchronize the construction activities with the progress of the dam works so that the asset is not commissioned before the dam is available. Yet, the full benefit could not be reaped in the first year due to sluice gate kept opened by WRD to meet other administrative requirements.

The delay in completion of project has resulted in slight increase in IDC. The delay in completion of the project is not attributable to the MPPGCL.

**Commission's Observations:**

The arguments put forth the petitioner are acceptable to the Commission. The Commission is taking full care that no extraordinary costs be loaded in the tariff determined in this order. The Commission has determined the provisional tariff on the basis of the actual expenditure as filed by the petitioner at the time of the date of commercial operation of the project. The provisional capital cost of the project as considered by the Commission in this order is much less than that as approved by the GoMP. The Commission will also give a prudent check on the capital cost when the final tariff is determined by the Commission in due course of the time.

**Respondent's Objection No.3:**

The cost on transmission line, as considered in the TEC should not be included in the project cost.

**Petitioner's Reply:**

In Bansagar IV, no cost element of Transmission loan has been included.

**Commission's Observations:**

The Commission agrees with the reply of petitioner.

**Respondent's Objection No.4:**

The Petitioner need to ring fence the accounts and provide assurance that it is not charging any cost incurred for other stages.

**Petitioner's Reply:**

The MPPGCL has assured that no cost element of the project pertaining to other stages has been booked against this project in this petition.

**Commission's Observations:**

The Commission has determined the provisional tariff on the basis of the provisional capital cost which is lower than the estimated cost as approved by the GoMP. At the time of determination of the final tariff, the petitioner should be required to file the relevant information / certificates in this regard.



**Respondent's Objection No.5:**

The reliability of Design Energy declared by the MPPGCL is not appreciable as many Hydro Stations of the petitioner have not been able to achieve the Design Energy since the date of Commissioning except for one or two year.

**Petitioner's Reply:**

The MPPGCL has appreciated that many of its projects could not achieve generation to the design energy in past. This is primarily due to lower rains in the catchment area of the project. The design energy is estimated on 90% dependability for past 30 to 50 year's hydrological data with 95% availability of machines. The machines are available for the generation. Hence, the MPPGCL is not responsible for the lower generation of its Hydel projects.

**Commission's Observations:**

The Commission agrees to the reply of the petitioner.

**Respondent's Objection No.6:**

The respondent requested to direct the MPPGCL to provide detailed working sheets for tariff calculations.

**Petitioner's Reply:**

The hard as well as soft copies of the petition have been made available by the petitioner. The soft copy including the forms and sheets are also available in web site.

**Commission's Observations:**

The soft copies of the Petition & formats have also been available in website.

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