CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI

Petition No. 234/GT/2015

Coram:

Shri A.S. Bakshi, Member
Dr. M. K. Iyer, Member

Date of Hearing: 11.7.2016
Date of Order : 31.8.2016

In the matter of

Approval of tariff of Vindhyachal Super Thermal Power Station Stage-V (500 MW) from the date of commercial operation (30.10.2015) to 31.3.2019

And in the matter of

NTPC Ltd
NTPC Bhawan,
Core-7, SCOPE Complex,
7, Institutional Area, Lodhi Road,
New Delhi-110003) **.....Petitioner**

Vs

1. Madhya Pradesh Power Management Company Ltd., (MPPMCL)
   Shakti Bhawan, Vidyut Nagar,
   Jabalpur 482 008

2. Maharashtra State Electricity Distribution Co Ltd.(MSEDCL)
   Prakashgad, Bandra (East),
   Mumbai 400 051

3. Gujarat Urja Vikas Nigam Ltd.(GUVNL)
   Vidyut Bhavan, Race Course
   Vadodara – 390 007

4. Chattisgarh State Power Distribution Co. Ltd (CSPDCL).,
   P.O. Sundar Nagar,
   Danganiya, Raipur – 492013

5. Government of Goa,
   Electricity Department,
   Vidyut Bhawan,

Panaji, Goa

6. Electricity Department,
   Administration of Daman & Diu
   Daman-396 210

7. Electricity Department,
   Administration of Dadra & Nagar Haveli,
   Silvasa

...Respondents

Parties present:

For Petitioner:	Shri Bhupinder Kumar, NTPC Shri Rajeev Chaudhary, NTPC Shri T. Vinodh Kumar, NTPC Shri Sachin Jain, NTPC Shri Manish Jain, NTPC Shri S. Maggon, NTPC Shri Rohit Ladha, NTPC
For Respondents:	None

ORDER

This petition has been filed by the petitioner, NTPC for approval of tariff of Vindhyachal Super Thermal Power Station Stage-V (1x500 MW) (hereinafter referred to as "the generating station") from the anticipated date of commercial operation (31.10.2015) to 31.3.2019 in accordance with the provisions of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2014 (hereinafter referred to as "the 2014 Tariff Regulations").

2. The generating station is an expansion project of NTPC in the existing stages I, II, III & IV of Vindhyachal STPS located at Singrauli District, in the State of Madhya Pradesh. The investment approval of the Vindhyachal STPS Stage-V project was accorded by Board of NTPC Ltd. at its 376th meeting held on 28.12.2011. As per the investment approval, the project cost of ₹ 3431.29 Crore was approved at a price level of 4th Quarter 2011 pending clearance of the Ministry of Environment & Forests ("MoEF"), Government of India.

3. The petitioner has entered into Power Purchase Agreement (PPA) on 27.11.2010 with all the beneficiaries of the western region. The allocation of 425 MW of capacity from the generating station was notified by Ministry of Power, Government of India on 10.8.2015, wherein the power generated from this generating station was allocated on long term basis to the beneficiaries located. The petitioner has sought approval of the tariff for the supply of 425 MW power to the beneficiaries under the long term allocation.

4. The petitioner vide affidavit dated 9.10.2015 had filed this petition for determination of tariff for the generating station for the period from the anticipated COD i.e. 31.10.2015 to 31.3.2019 in terms of the provisions of the 2014 Tariff Regulations. Thereafter, the petitioner by affidavit dated 6.7.2016 has submitted that the generating station was declared under commercial operation on 30.10.2015 and accordingly amended the petition revising the tariff filing forms in line with the provisions of the 2014 Tariff Regulations. The annual fixed charges claimed by the petitioner for the installed capacity of 500 MW, vide affidavit dated 6.7.2016, from 30.10.2015 to 31.3.2019 is as under:

(₹in lakh)

	2015-16 (30.10.2015 to 31.3.2016)	**2016-17**	**2017-18**	**2018-19**
Depreciation	10489.96	12299.62	14545.74	15241.95
Interest on Loan	10877.15	12094.01	13346.03	12852.43
Return on Equity	12272.51	14389.69	17017.48	17832.00
Interest on Working Capital	3675.40	3920.95	4105.04	4174.20
O&M Expenses	9489.99	10988.67	11682.01	12418.06
Total	**46805.01**	**53692.93**	**60696.30**	**62518.63**

5. In compliance with the directions of the Commission, the petitioner has filed additional information and has served copies on the respondents. The respondent, M.P.Power Management Co. Ltd. (MPPMCL) filed its reply in the matter. We now proceed to examine the claim of the petitioner based on the submissions of the parties and the documents available on record, as discussed in the subsequent paragraphs.

Date of Commercial Operation (COD) and Time Overrun

6. The petitioner vide its affidavit dated 9.10.2015 has submitted that the Investment Approval of the project was accorded by the Board of Petitioner Company at a project cost of ₹3431.29 Crore at price level of 4th Quarter 2011 pending clearance of the MOEF, GOI. The petitioner has submitted that the original scheduled COD as per Board approval is 31.10.2015. The petitioner vide affidavit dated 6.7.2016, has submitted the copy of MoEF clearance dated 2.5.2015 and has clarified that no land has been acquired for implementation of the project and therefore, no forest clearance was required to be obtained. Accordingly, the petitioner has submitted that as per Board resolution approved in the 376th Board meeting, the zero date shall be reckoned as the date of receipt of environmental clearance from MoEF, GOI and as per the investment approval, the scheduled COD of the unit has been envisaged as 42 months from the date of investment approval/MoEF clearance.

Time Overrun

7. As stated, the environmental clearance from MoEF, GOI was accorded on 2.5.2012. The petitioner has submitted that the zero date shall be reckoned as the date of receipt of environmental clearance from MoEF, GOI. The actual COD of the generating station is 30.10.2015 and the same is within the original schedule COD of 31.10.2015 as per Board approval. The project has been commissioned within the schedule COD and accordingly the adjustment in IDC and IEDC is not considered.

Capital Cost

8. Regulation 9(2) of the 2014 Tariff Regulations provides as under:

> "*(2) Capital cost for a project shall include: (a) the expenditure incurred or projected to be incurred up to the date of commercial operation of the project; (b) Interest during construction and financing charges, on the loans (i) being equal to 70% of the funds deployed, in the event of the actual equity in excess of 30% of the funds deployed, by treating the excess equity as normative loan, or (ii) being equal to the actual amount of*

loan in the event of the actual equity less than 30% of the funds deployed; (c) Increase in cost in contract packages as approved by the Commission; (d) Interest during construction and incidental expenditure during construction as computed in accordance with Regulation 11 of these regulations; (e) capitalised Initial spares subject to the ceiling rates specified in Regulation 13 of these regulations; (f) expenditure on account of additional capitalization and de-capitalisation determined in accordance with Regulation 14 of these regulations; (g) adjustment of revenue due to sale of infirm power in excess of fuel cost prior to the COD as specified under Regulation 18 of these regulations; and (h) adjustment of any revenue earned by the transmission licensee by using the assets before COD."

9. The actual capital cost claimed by the petitioner vide affidavit dated 6.7.2016 on cash basis, as on 30.10.2015 and duly certified by statutory auditor is ₹194191.19 lakh. This includes IEDC of ₹12473.63 lakh, IDC & FC of ₹149000.72 lakh and FERV of ₹2710.82 lakh.

10. As stated, the generating station is an expansion project. The bench mark hard cost excluding IDC & FC for the unit having size of 500 MW of an expansion project with 1 unit is ₹4.92 crore/ MW at December, 2011 price level. The benchmark capital cost for thermal power generating stations as per Commission`s order dated 4.6.2012 is dynamic and based on market trends, indices, subject to adjustment based on inflation. The hard cost linked to escalation in WPI for the intervening period to be taken into account to arrive the capital cost as on schedule COD. The indicative benchmark norms for capital cost based on December, 2011 Index as base, needs to be escalated upto October, 2015 based on the WPI index for prudence check of the capital cost. As per data available with Minister of Commerce and Industry, Government of India, the WPI index for October, 2015 is 176.90 as against the WPI index of 157.30 as on December, 2011 resulting in inflation of 1.10. Accordingly, the indicative benchmark hard cost is worked out as 5.41 Crore/MW (1.10x4.92). The benchmark capital cost norms represent the hard cost of the project and do not include cost of land, financing cost, interest during construction, taxes and duties, right of way charges, cost of R&R etc. The Capital cost of the project as on COD is ₹194191.19 lakh which works out to ₹3.88 crore /MW including IDC, IEDC etc. as claimed by the petitioner. The total completion capital cost for the project has been indicated as ₹290275.56 lakh including IDC,FC & FERV of ₹19201.81 lakh (which works out to ₹5.81 crore/ MW) including

additional capital expenditure of ₹73693.97 lakh and the discharge of liability of ₹20800 lakh. The hard cost after excluding IDC, FC & FERV of ₹19201.81 works out to ₹271073.75 lakh (₹5.42 crore/MW) which is closer to the benchmark capital cost of ₹5.41 crore at the 2015 price level. Since the capital cost of the expansion project of the petitioner is close to the benchmark capital cost, the variation in the capital cost is found reasonable specially as the addition of ₹20130 lakh is on account of installation of Flue Gas Desulphurization (FGD) system. However, the petitioner's claim for capital cost has been examined as discussed in the subsequent paragraphs.

Infirm Power

11. The petitioner vide affidavit dated 6.7.2016 has submitted that the sale from infirm power, duly certified by statutory auditor is ₹1529.81 lakh. We have considered the submissions of the petitioner. In our view, the net construction and pre-commissioning expenses amounting to ₹4746.67 lakh, as submitted in Form 5B, are inclusive of the infirm power after deduction of the revenue earned from the sale of power, excluding fuel cost. Hence, the same is capitalised as on COD of the generating station.

Cost Overrun

12. It is noticed from Form 5B submitted by the petitioner that the reasons for the variation in cost of various components/packages has not been properly clarified. It is observed that the cost approved by the Board of the Petitioner Company was on the higher side and the completion cost worked out was lesser than the approved cost in most of the packages due to change in the award contract price and change in exchange rate for foreign currency. The major variation in cost is in the cost of Rolling Stock and Locomotives (i.e. the estimated completion cost is of ₹6893.48 lakh compared to the board approved cost of ₹4956.25 lakh), Construction & Pre-Commissioning Expenses (for which the estimated completion cost is of ₹4746.67 lakh as compared to the Board approved cost of ₹1410.00 lakh) and the petitioner has not furnished proper reasons for the said variation in the cost. It is noticed that the estimated completion cost of

₹13743.93 lakh for establishment costs have increased as compared to the approved cost of ₹10553.40 lakh for which the petitioner has submitted that the same is on account of increase in the construction power charges during the construction period. The petitioner has also submitted the beak-up of the cost in Form 13-D.

13. As per Form-5D, which provides the break-up of construction/ supply/ services packages as on COD, it is noticed that there has been increase in the contract price than the value of award in main plant turnkey packages. The petitioner has submitted that there is escalation in prices for the different packages; however the petitioner has not furnished proper reasons for the escalation in the prices. The petitioner has also submitted that the increase in the some of the plant turnkey packages is on account of foreign exchange variation

14. The respondent, MPPMCL vide affidavit dated 5.7.2016 has submitted that capital cost claimed as on COD is ₹194191.19 lakh and the closing capital cost as on 31.3.2019 is ₹292215.92 lakh and the petitioner`s claim of excessive additional capital expenditure is objectionable. The respondent has submitted that the Board of the Petitioner Company accorded investment approval of ₹3431.29 crore which is ₹6.86 crore per MW and is on a very higher side at the price level of 4th quarter of 2011 and the petitioner has inflated the estimated cost itself to accommodate its future additional capital expenditure and it is a subject of scrutiny and prudence check. The respondent has further submitted that as per Form 5B, there is huge difference between the original and estimated cost and estimated cost at cut-off date and the petitioner has not submitted any justification for the abnormal increase in capital expenditure, therefore the same may be rejected. The respondent has further submitted that there is an increase of 265% in pre-commissioning expenses, for which no justification has been provided by the petitioner, an increase of 52% in cost of rolling stock and locomotives for which the petitioner has submitted that increase is due to change in award contract price. Hence, the respondent has prayed that the petitioner`s claim is without any basis and may be rejected.

15. We have considered the submissions of both the parties. As observed in para 10 above, since the capital cost (hard cost) of the project is comparable with the benchmark capital cost of expansion project, the capital cost as on COD as submitted by the petitioner has been considered. However, the petitioner is directed to submit the detailed reasons for the component wise variation and increase in the completion cost with respect to the Board approved cost for each component at the time of true-up.

Capital cost as on actual COD (30.10.2015)

16. The petitioner vide affidavit dated 6.7.2016 has revised its claim for annual fixed charges based on the audited capital cost as on actual COD and has furnished the auditor certificate for capital expenditure as on COD and audited balance sheet for the generating station as on COD. The petitioner has claimed ₹196131.68 lakh as on COD which comprise of the Capital cost on cash basis for ₹194191.19 lakh, notional IDC for ₹1392.64 lakh, ₹714.20 lakh for 80 acres land from the generating station used for Ash Dyke for disposal of ash of the generating station and short term FERV gain charged to P&L Account for ₹166.35 lakh. The petitioner has claimed additional capital expenditure for ₹9960 lakh for the period from 30.10.2015 to 31.3.2016, ₹59429.02 lakh in 2016-17 and ₹26695.22 lakh in 2017-18 respectively, which is inclusive of liabilities proposed to be discharged.

17. The capital cost of ₹196131.68 lakh as on COD of 30.10.2015 has been worked out, after deduction of un-discharged liabilities. Accordingly, the admissible capital cost has been worked out in accordance with the Regulation 9(2) of the 2014 Tariff Regulations, as stated in the subsequent paragraph.

Interest During Construction (IDC) & Financing Charges (FC)

18. The IDC & FC claimed by the petitioner vide affidavit dated 7.9.2012 is as under:

(₹ *in lakh)*

	As on 31.10.2015
Actual IDC, FC & FERV claimed	17611.54
Notional IDC claimed	1392.64
Total IDC, FC & FERV claimed	**19004.18**

19. In terms of Regulation 9(2)(b) of the 2014 Tariff Regulations, if the actual equity deployed is less than 30% of funds deployed (i.e. actual debt is more than 70%), the interest on the actual amount of loan has to be included in capital cost. If the actual equity deployed is more than 30% of the funds deployed (i.e. actual debt is less than 70%), interest on 70% of the funds deployed has to be included in capital cost as IDC by treating the equity infusion above 30% as normative loan by the company to itself.

20. The actual amount of loan deployed based on the details submitted by the petitioner in Form-8 and Form-14 has been considered. The IDC on actual loan has been allowed by considering the loan deployed by the petitioner and the corresponding repayment. The petitioner has considered the repayment method as FIFO method in its claim for the loans taken from Bank of India-II, Dena Bank-III, State Bank of India-VII, Syndicage Bank-III, Syndicate Bank-IV and Vijaya Bank-V. However, as per the consistent methodology adopted by the Commission as upheld by the Tribunal, the average re-payment method for these loans has only been considered.

21. The interest on normative loan (i.e. excess of equity infusion over and above 30 % of funds deployed) has been considered. The fund deployment made by the petitioner periodically till the COD of the unit (i.e. during construction period) has been sourced partly by equity and partly by debt (i.e. debt-equity ratio) which is not uniform during the entire construction period. Therefore, the quarter-wise debt-equity ratio has been computed as per the quarter-wise cash expenditure submitted by the petitioner in Form-14A and the infusion of debt has been computed as per drawl and repayment schedule claimed by the petitioner in Form-8. For this purpose, the

Average method of re-payment has been considered in place of FIFO method wherever claimed by the petitioner.

22. In case of the cumulative equity deployed in any quarter is more than 30% of the cumulative fund deployed, the excess of equity over and above 30% of cumulative fund deployed is treated as normative loan. The interest on normative loan has been allowed based on the quarter wise rate arrived as per the actual interest and the actual loan balance applicable to the concerned quarter.

Liabilities deducted from Capital cost as on 30.10.2015

23. The admitted Capital cost as on 30.10.2015 is on cash basis and the same has been arrived at after deducting the liabilities of ₹20800.13 lakh as on 30.10.2015. Any discharge of these liabilities beyond the COD of the generating station would be considered as additional capital expenditure in the year of discharge. Accordingly, the capital cost as on 30.10.2015, after removal of un-discharged liabilities works out to ₹196131.68 lakh (on cash basis).

Foreign Exchange Rate Variation ("FERV")

24. The FERV gain amounting to ₹166.35 lakh as on 30.10.2015 has been adjusted with the admitted capital cost. This is subject to truing -up. The petitioner is directed to submit the unit-wise computation of Short Term FERV claim in order to reconcile with the amount specified in Schedule 7 of the combined balance sheet as on 3.4.2012.

Land for Ash Dyke

25. The petitioner has claimed an amount of ₹714.20 lakh towards cost of 80 acres of land for Ash Dyke acquired in another generating station of the petitioner (VSPTS-IV), for disposal of ash for this generating station as an additional cost to the Capital cost as on COD off the station. In response to the direction of the Commission, the petitioner vide affidavit dated 6.7.2016 has submitted as below:

"It is submitted that in the investment approval of VSTPS-V as accorded by NTPC Board, 125 acre of land was envisaged to be acquired for ash dyke. However due to delay in identification of land for the ash dyke of VSTPS Stage-V at the time of investment approval, the Petitioner has envisaged to discharge the ash generated from VSTPS Stage-V in VSTPS Stage-IV Ash dyke. Accordingly the petitioner has acquired additional land of 80 acres over and above 500 acres of land as envisaged in the investment approval for VSTPS Stage-IV ash dyke. It is further submitted that Hon'ble Commission vide its order dated 31.08.2015 in petition no. 70/GT/2013 & 297/GT/2014 for VSTPS Stage-IV has disallowed the expenditure of Rs 7.142 Crores spent against the additional land of 80 acres stating that this land is of no use. It is, therefore, submitted that Hon'ble Commission may be pleased to allow this expenditure of Rs 7.142 Crs for purchase of land for common ash dyke, which was acquired on account of disposal of ash from VSTPS-V for the purpose of tariff in VSTPS-V."

26. On prudence check of Form 5B, it has been observed that the petitioner has not claimed the cost of land against the original estimated cost as per investment approval. Hence, the cost of ₹714.20 lakh towards the cost of 80 acres of land for Ash Dyke acquired in VSPTS-IV for disposal of ash for this generating station has been considered a part of capital cost.

27. In view of above discussions, the capital cost allowed for the purpose of tariff as on COD of the generating station is as under**:**

	As on 30.10.2015
Capital cost allowed including ₹714.20 lakh towards the cost of 80 acres of land and excluding IDC, FC & FERV (on cash basis) and deduction of liabilities of ₹20800.13 lakh	177293.85
Add: IDC, FC & FERV allowed including the interest on normative loan	19004.18
Add: Short term FERV Loss/(Gain)	(-) 166.35
Capital cost (on cash basis) allowed	196131.68

Actual/ Projected Additional Capital Expenditure during 2014-19

28. Regulation 14 (1) of the 2014 Tariff Regulations, provides as under:

"(1) The capital expenditure in respect of the new project or an existing project incurred or projected to be incurred, on the following counts within the original scope of work, after the date of commercial operation and up to the cut-off date may be admitted by the Commission, subject to prudence check:

(i) Undischarged liabilities recognized to be payable at a future date;

(ii) Works deferred for execution;

(iii) Procurement of initial capital spares within the original scope of work, in accordance with the provisions of Regulation 13;

(iv) Liabilities to meet award of arbitration or for compliance of the order or decree of a court of law; and

(v) Change in law or compliance of any existing law:

Provided that the details of works asset wise/work wise included in the originalscope of work along with estimates of expenditure, liabilities recognized to be payable at a future date and the works deferred for execution shall be submitted along with the application for determination of tariff."

29. The break-up of the projected additional capital expenditure claimed for the period 2014-19 is detailed as under:

(₹in lakh)

Sl. No	Head of Work /Equipment	Regulation	2015-16 (30.10. 2015 to 31.03. 2016)	2016-17	2017-18	2018-19	Total
1	Steam Generator Island including ESP	14(1)(ii)	-	4500.00	1819.00	0.00	6319.00
2	Turbine Generator Island	14(1)(ii)	-	2009.00	1425.00	0.00	3434.00
3	CW system including make-up water system	14(1)(ii)	-	1161.00	0.00	0.00	1161.00
4	Clarification plant (PT plant)	14(1)(ii)	-	1555.00	0.00	0.00	1555.00
5	Ash Handling System	14(1)(ii)	-	6946.00	0.00	0.00	6946.00
6	Coal Handling Plant	14(1)(ii)	-	3760.00	3940.00	0.00	7700.00
7	Rolling Stock and Locomotives (Wagon & loco)	14(1)(ii)	-	0.00	4719.00	0.00	4719.00

Sl. No	Head of Work /Equipment	Regulation	2015-16 (30.10. 2015 to 31.03. 2016)	2016-17	2017-18	2018-19	Total
8	Air Condition & Ventilation System	14(1)(ii)	-	785.00	0.00	0.00	785.00
9	Fire fighting System(FDPS)	14(1)(ii)	-	580.00	490.00	0.00	1070.00
10	HP/LP Piping(Stn Piping)	14(1)(ii)	-	335.00	0.00	0.00	335.00
11	FGD system,	14(1)(ii)	-	14540.00	5590.00	0.00	20130.00
12	Switch Yard Package (incl construction power)	14(1)(ii)	-	1666.00	0.00	0.00	1666.00
13	Transformer Package	14(1)(ii)	50.00	895.00	0.00	0.00	945.00
14	Switch gear Package	14(1)(ii)	40.00	118.00	0.00	0.00	158.00
15	Cables, Cable facilities & grounding	14(1)(ii)	-	917.00	0.00	0.00	917.00
16	Control & Instrumentation (C & I) Package	14(1)(ii)	-	800.00	140.00	0.00	940.00
17	Main plant/Adm.Building	14(1)(ii)	1040.00	5000.00	0.00	0.00	6040.00
18	CW system	14(1)(ii)	-	0.00	0.00	0.00	0.00
19	Cooling Towers	14(1)(ii)	290.00	0.00	0.00	0.00	290.00
20	Township & Colony	14(1)(ii)	-	300.00	0.00	0.00	300.00
21	Temp. construction & enabling works	14(1)(ii)	-	-	-	0.00	0.00
22	Road & Drainage	14(1)(ii)	40.00	-	-	0.00	40.00
23	Tools & Plant	14(1)(ii)	-	400.00	240.00	0.00	640.00
24	Initial Spares	14(1)(iii)	-	4002.00	2351.00	0.00	6353.00
25	EDC	14(1)(iii)	-	950.75	300.22	-	1250.97
26	IDC, FC & ERV	14(1)(iii)	-	1209.27	381.00	-	1590.27
	Sub-Total		**1460.00**	**52429.02**	**21395.22**	**0.00**	**75284.24**
27	Discharge of Un-discharged Liabilities	14(1)(i)	8500.00	7000.00	5300.00	0.00	20800.00
	Total Additional Capital Expenditure Claimed		**9960.00**	**59429.02**	**26695.22**	**0.00**	**96084.24**

30. The respondent, MPPMCL has submitted that the petitioner has claimed additional capitalization of ₹96084.24 lakh during the period 2014-19 and such a huge amount during cut-off period has to be justified. However, the petitioner has not provided any justification for claiming such additional capital expenditure after COD. Hence, the claim of the petitioner may be disallowed.

31. It is observed that the additional capital expenditure claimed by the petitioner SI.No. 1 to 23 above towards deferred works/liabilities within the original scope of work under Regulation 14(1)(ii) and SI.No. 24 are for the capitalization of spares within the cut-off date under Regulation 14(1)(iii) of 2014 Tariff Regulations. On prudence check, the projected additional capital expenditure claimed by the petitioner as above is allowed in terms of the said Regulations 14(1)(ii) and 14(1)(iii) of the 2014 Tariff Regulations. In regards to the claim of the petitioner for FGD system (SI.No. 11 above), the same has been examined separately. The discharge of liabilities as projected by the petitioner, vide its affidavit dated 6.7.2016 has also been allowed. The projected additional capital expenditure allowed is subject to truing-up based on actual capital expenditure incurred.

Flue Gas Desulfurization (FGD) system

32. The petitioner has claimed projected additional capital expenditure of ₹14540.00 lakh in 2016-17, ₹5590.00 lakh in 2017-18, towards works of flue gas desulfurization (FGD) system. In justification for the same, the petitioner has submitted that these works are under approved scheme in the original scope of works. The petitioner, vide affidavit dated 6.7.2016, has further submitted that FGD system is being installed in the generating station to minimize SO_2 emissions in compliance with the conditions laid down by MoEF, GOI in the environmental clearance accorded on 2.5.2012. The petitioner has enclosed the technical details and submitted that the FGD installed as additional component in the layout of flue-gas path shall consume additional power of 5,439 KW which will result in increase of Auxiliary Power Consumption of the generating station by approx 1.088 %. The petitioner has stated that, in addition to increase in

Auxillary Power Consumption, the installation of FGD will also result in additional operational expenses for the station. The petitioner has further submitted that the FGD is being installed in the station at an estimated cost which is 10 % of the total estimated completion cost of the Project (excluding FGD) upto the cut-off date of generating station. Accordingly, the Petitioner in the instant tariff petition has claimed additional O&M expenses of 10% of O&M norms as specified by Hon'ble Commission for 500 MW unit(s) in 2014 Tariff Regulations 2014 towards the O&M of FGD. In view of the above, the petitioner has prayed the Commission to allow the increase in Auxiliary Power Consumption by 1.088% and additional O&M expenses of 10 % over and above the O&M norms as specified in 2014 Tariff Regulations in exercise of the powers under Regulation 54 of 2014 Tariff Regulations 2014.

33. The petitioner has further submitted that the Flue Gas Desulfurization (FGD) system package is being implemented by M/s Alstom India Ltd with the SO_2 removal efficiency of 90.60 % at a normative specific limestone Consumption of 0.0162 Kg/KWh considering the consumption of lime stone @ 6250 kg/hr at normative availability of 83%. Accordingly, the Petitioner has claimed the energy charge based on the landed price of Coal & Oil for the month of April 2015, May 2015 and June 2015 and the estimated landed price of lime stone @ Rs 1600/MT (excluding taxes) including Transportation Cost. The petitioner has claimed the total estimated capital expenditure of ₹20130 lakh for the FGD system, assuming an approximate expenditure of 10% of the total project cost of the station upto cut-off date. The petitioner has also submitted the extract of the Guarantee Declaration by their vendor M/s Alstom depicting guarantee figures of SO2 removal efficiency of 90.6%, Lime Stone consumption of 6250 kg/hr and Auxiliary Power Consumption of 5439 KW. The petitioner has therefore prayed that the Commission may allow the increase in APC of 1.088% and additional O&M expenses of 10 % over and above the O&M norms.

34. The respondent, MPPMCL has submitted that to improve the quality of emission from its plant is the social responsibility of the developer and the petitioner should bear the additional cost of FGD being installed for removal of SOx from flue gas under its corporate social responsibility provisions and the additional capitalization of the FGD system may not be allowed. The petitioner may be directed to bear the cost of FGD system under its CSR head.

35. We have examined the matter. It is observed from the submissions of the petitioner that expenditure towards FGD system has been planned by the petitioner in compliance with the guidelines laid down by the environmental clearance accorded by MoEF, GOI vide letter dated 2.5.2012 to minimize SO_2 emissions, which mentions that the FGD shall be installed for the proposed expansion unit. Considering fact that the projected additional capital expenditure is incurred by the petitioner for compliance with the direction of MoEF, GOI for minimizing SO_2 emissions of the area, we are inclined to allow the capitalization of the FGD system under Regulation 14(3)(ii) of 2014 Tariff Regulations. The capitalization is allowed as a special case by relaxing the provision of Regulation 14(1) in term of Regulation 54 of the 2014 Tariff Regulations. However, the same may not be quoted as a precedent in future.

36. It is however noticed that there is no adequate information submitted with regard to the capital cost and the assets to be installed. The petitioner has only provided a one page extract of the Guarantee Declaration by their vendor M/S Alstom. In the absence of any precedent on the installation of FGD system, it appears that the petitioner is unable to substantiate/furnish adequate reasons in support of the reasonability of the estimated cost of FGD system claimed as 10% of the project cost. In the present case, there is an increase in the capital cost of the generating station is increasing on account of installation of FGD system. There may also be increase in Auxiliary Power Consumption and O&M expenses beyond the norms specified under the 2014 Tariff Regulations. We have in the above paragraph, allowed the capitalization of the

FGD system on the ground that the same is in compliance with the statutory guidelines of the statutory authority MoEF,GOI.

37. It is observed that the additional investment on account of installation of FGD system would require prudence check of the reasonability of the proposed expenditure and technology used should be commensurate with the requirement. Also, the benefits of the installation of this system should be made known to the procurers and the possible tariff impact on the tariff. Further, the petitioner has not submitted the details of packages awarded in respect of FGD as required under Form 5D of the tariff forms. In this background and based on the information available on record, the projected cost of the FGD system is provisionally considered as 80% of the claim of the petitioner i.e. ₹ 16104 lakh (₹11632 lakh in 2016-17 and ₹4472 lakh in 2017-18) and the same is subject to revision based on the actual capital expenditure incurred.

38. As discussed above, we have considered the petitioners submission for the increase in Auxiliary Power Consumption due to FGD system installation. The specification submitted by the supplier M/s Alstom are the guaranteed specifications and are subject to actual performance of FGD when it is installed. Accordingly, the increase of 1.00% is allowed, along with limestone Consumption of 6250 kg/hr which is subject to revision at the time of truing-up of tariff or the separate norms specified by the Commission, if any .

39. As regards, the submissions of the petitioner for additional O&M of 10% of O&M norms for expenditure towards the installation of FGD system, we are of the considered view that there are no defined norms/ standards relating O&M expenses of FGD system at present. Also, the FGD system has not yet been installed. Accordingly, the additional O&M expenses on account of installation of FGD are not allowed at present. We direct the petitioner to submit the O&M expenses relating to FGD system on actual basis at the time of truing-up. In case the norms for O&M expenses for FGD is notified prior to truing-up, same will be considered in the case of the petitioner.

40. The petitioner is also directed to submit the following details of actual expenditure incurred at the time of true-up as per Regulation 8 of the 2014 Tariff Regulations:

a. Justification for assuming estimated cost of the FGD system as 10% of the project cost, details of packages awarded in respect of FGD system and details of LOA with M/s Alstom
b. Cost benefit analysis for the installation of the FGD system in he project
c. Actual expenditure incurred after installation of FGD
d. Actual Auxiliary Consumption of the FGD system
e. Year-wise actual O&M expenses incurred for FGD system
f. Actual Limestone Consumption of the FGD system

Initial Spares

41. As per Regulation 13 of 2014 Tariff Regulation

> ***"13. Initial Spares:*** *Initial spares shall be capitalised as a percentage of the Plant and Machinery cost upto cut-off date, subject to following ceiling norms:*
> *(a) Coal-based/lignite-fired thermal generating stations - 4.0%*
> ……."

42. The petitioner has claimed an additional expenditure of ₹4002.00 lakh in 2016-17 and ₹2351.00 lakh in 2017-18 towards initial spares under Regulation 14(1)(iii) of the 2014 Tariff Regulations. The capital cost as on COD already includes initial spares of ₹1333.47 lakh and the petitioner has submitted that these are part of the original scope of works.

43. The respondent, MPPMCL has submitted that the total initial spares claimed in ₹7686.47 lakh and as per Regulation 13, initial spares shall be capitalized @ 4% of plant and machinery cost upto cut-off date. As per for 5B, total plant and equipment cost is ₹197890.99 lakh and thus allowable initial spares is ₹7915.64 lakh. Also, what is to be considered within plant and

machinery cost in instant petition, needs prudence check. In view of the above, the allowable initial spares may only be allowed.

44. We have examined the matter. As per Regulation 13 (a) of 2014 Tariff Regulations, the ceiling limit for grant of initial spares upto cut-off date, for coal-based thermal generating stations is 4%. The Plant and Machinery cost upto the cut-off date is ₹197890.99 lakh and the total initial spares claimed upto cut-off date is ₹7686.47 lakh. As, only the 80% of the claimed cost of FGD system is allowed at present, the corresponding Plant and Machinery cost upto the cut-off date claimed in the instant case works out to be ₹193864.99 lakh. The initial spares to be allowed as per ceiling norms of 4% works out to be ₹7757.44 lakh. It is observed that petitioner has claimed excess amount of initial spares over and above the ceiling norms permitted under 2014 Tariff Regulations by ₹70.97 lakh. Hence, the petitioner claimed of initial spares, which is in excess of the initial spares permissible is disallowed and the same is deducted from the additional capital expenditure for 2017-18. Accordingly, initial spares of ₹4002.00 lakh in 2016-17 and ₹2280.03 lakh in 2017-18 is allowed.

45. Based on the above discussions, the projected additional capital expenditure allowed for the period 2014-19 is summarised as under:

(₹in lakh)

Sl. No	**Head of Work /Equipment**	**Regulations invoked**	**2015-16 (30.10. 2015 to 31.03. 2016)**	**2016-17**	**2017-18**	**2018-19**	**Total**
1	Steam Generator Island including ESP	14(1)(ii)	-	4500.00	1819.00	0.00	6319.00
2	Turbine Generator Island	14(1)(ii)	-	2009.00	1425.00	0.00	3434.00
3	CW system including make-up water system	14(1)(ii)	-	1161.00	0.00	0.00	1161.00
4	Clarification plant (PT plant)	14(1)(ii)	-	1555.00	0.00	0.00	1555.00
5	Ash Handling System	14(1)(ii)	-	6946.00	0.00	0.00	6946.00
	Coal Handling Plant	14(1)(ii)	-	3760.00	3940.00	0.00	7700.00

Sl. No	Head of Work /Equipment	Regulations invoked	2015-16 (30.10. 2015 to 31.03. 2016)	2016-17	2017-18	2018-19	Total
6							
7	Rolling Stock and Locomotives (Wagon & loco)	14(1)(ii)	-	0.00	4719.00	0.00	4719.00
8	Air Condition & Ventilation System	14(1)(ii)	-	785.00	0.00	0.00	785.00
9	Fire fighting System(FDPS)	14(1)(ii)	-	580.00	490.00	0.00	1070.00
10	HP/LP Piping(Stn Piping)	14(1)(ii)	-	335.00	0.00	0.00	335.00
11	FGD system,	14(1)(ii)	-	11632.00	4472.00	0.00	16104.00
12	Switch Yard Package (incl construction power)	14(1)(ii)	-	1666.00	0.00	0.00	1666.00
13	Transformer Package	14(1)(ii)	50.00	895.00	0.00	0.00	945.00
14	Switch gear Package	14(1)(ii)	40.00	118.00	0.00	0.00	158.00
15	Cables, Cable facilities & grounding	14(1)(ii)	-	917.00	0.00	0.00	917.00
16	Control & Instrumentation (C & I) Package	14(1)(ii)	-	800.00	140.00	0.00	940.00
17	Main plant/Adm.Building	14(1)(ii)	1040.00	5000.00	0.00	0.00	6040.00
18	CW system	14(1)(ii)	-	0.00	0.00	0.00	0.00
19	Cooling Towers	14(1)(ii)	290.00	0.00	0.00	0.00	290.00
20	Township & Colony	14(1)(ii)	-	300.00	0.00	0.00	300.00
21	Temp. construction & enabling works	14(1)(ii)	-	-	-	0.00	0.00
22	Road & Drainage	14(1)(ii)	40.00	-	-	0.00	40.00
23	Tools & Plant	14(1)(ii)	-	400.00	240.00	0.00	640.00
24	Initial Spares	14(1)(iii)	-	4002.00	2280.03	0.00	6282.00
25	EDC	14(1)(iii)	-	950.75	300.22	-	1250.97
26	IDC, FC & ERV	14(1)(iii)	-	1209.27	381.00	-	1590.27
	Sub-Total		**1460.00**	**49521.02**	**20206.22**	**0.00**	**71187.24**
27	Discharge of Un-discharged Liabilities	14(1)(i)	8500.00	7000.00	5300.00	0.00	20800.00
	Total Additional Capital Expenditure Claimed		**9960.00**	**56521.02**	**25506.22**	**0.00**	**91987.24**

46. Accordingly, the capital cost for the period 2014-19 in respect of the generating station is worked out and allowed as under:

(₹in lakh)

	2015-16	2016-17	2017-18	2018-19
Opening Capital Cost	196131.68	206091.68	262612.70	288118.95
Add: Additional capital expenditure	9960.00	56521.02	25506.25	0.00
Closing Capital Cost	**206091.68**	**262612.70**	**288118.95**	**288118.95**

Debt-Equity Ratio

47. Regulation 19 of the 2014 Tariff Regulations provides as under:

(1) For a project declared under commercial operation on or after 1.4.2014, the debt-equity ratio would be considered as 70:30 as on COD. If the equity actually deployed is more than 30% of the capital cost, equity in excess of 30% shall be treated as normative loan:

Provided that:
(i) where equity actually deployed is less than 30% of the capital cost, actual equity shall be considered for determination of tariff:

(ii) the equity invested in foreign currency shall be designated in Indian rupees on the date of each investment:

(iii) any grant obtained for the execution of the project shall not be considered as a part of capital structure for the purpose of debt-equtiy ratio.

Explanation - The *premium, if any, raised by the generating company or the transmission licensee, as the case may be, while issuing share capital and investment of internal resources created out of its free reserve, for the funding of the project, shall be reckoned as paid up capital for the purpose of computing return on equity, only if such premium amount and internal resources are actually utilised for meeting the capital expenditure of the generating station or the transmission system.*

(2) The generating Company or the transmission licensee shall submit the resolution f the Board of the company or approval from Cabinet Committee on Economic Affairs (CCEA) regarding infusion of fund from internal resources in support of the utilisation made or proposed to be made to meet the capital expenditure of the generating station or the transmission system including communication system, as the case may be.

(3) In case of the generating station and the transmission system including communication system declared under commercial operation prior to 1.4.2014, debt-equity ratio allowed by the Commission for determination of tariff for the period ending 31.3.2014 shall be considered.

(4) In case of generating station and the transmission system including communication system declared under commercial operation prior to 1.4.2014, but where debt:equity ratio has not been determined by the Commission for determination of tariff for the period ending 31.3.2014, the Commission shall approve the debt:equity ration based on actual information provided by the generating company or the transmission licensee as the case may be.

(5) Any expenditure incurred or projected to be incurred on or after 1.4.2014 as may be admitted by the Commission as additional capital expenditure for determination of tariff, and renovation and modernisation expenditure for life extension shall be serviced in the manner specified in clause (1) of this regulation.

48. The petitioner has submitted the quarterly deployment of debt and equity vide affidavit dated 6.7.2016 and accordingly, the actual debt and equity at the end of third quarter of 2015-16 is ₹153222 lakh and ₹765450 lakh respectively corresponding to the cumulative expenditure of ₹229672 lakh. However, the petitioner has not submitted the actual debt and equity as on COD i.e. 30.10.2015 in the third quarter of 2015-16 and corresponding cumulative expenditure as on COD. In absence of these details, it is not possible to ascertain the actual debt and equity upto COD. It is observed that the equity deployment is higher than the debt at the end of 2nd quarter and 3rd quarter of 2015-16. Therefore, the petitioner's claim of gross normative loan and equity amounting to ₹137292.18 lakh and ₹58839.50 lakh respectively as on COD i.e. 30.10.2015 has been considered as opening gross normative loan and equity with the normative debt:equity ratio of 70:30. Also the normative debt equity ratio of 70:30 has been considered in case of additional capital expenditure for the years 2015-16, 2016-17 and 2017-18 respectively and the same is subject to revision the time of truing-up in terms of Regulation 8 of the 2014 Tariff Regulations. The petitioner is also directed to submit the details of the actual debt and equity as on COD i.e. 30.10.2010 in the third quarter of 2015-16 and the corresponding cumulative expenditure as on COD at the time of truing-up.

Return on Equity

49. Regulation 24 of the 2014 Tariff Regulations provides as under:

*“**24. Return on Equity**: (1) Return on equity shall be computed in rupee terms, on the equity base determined in accordance with regulation 19.*

(2) Return on equity shall be computed at the base rate of 15.50% for thermal generating stations, transmission system including communication system and run of the river hydro generating station, and at the base rate of 16.50% for the storage type hydro generating stations including pumped storage hydro generating stations and run of river generating station with pondage:

Provided that:

i) in case of projects commissioned on or after 1st April, 2014, an additional return of 0.50 % shall be allowed, if such projects are completed within the timeline specified in Appendix-I:

ii). the additional return of 0.5% shall not be admissible if the project is not completed within the timeline specified above for reasons whatsoever:

iii). additional RoE of 0.50% may be allowed if any element of the transmission project is completed within the specified timeline and it is certified by the Regional Power Committee/National Power Committee that commissioning of the particular element will benefit the system operation in the regional/national grid:

iv). the rate of return of a new project shall be reduced by 1% for such period as may be decided by the Commission, if the generating station or transmission system is found to be declared under commercial operation without commissioning of any of the Restricted Governor Mode Operation (RGMO)/ Free Governor Mode Operation (FGMO), data telemetry, communication system up to load dispatch centre or protection system:

v) as and when any of the above requirements are found lacking in a generating station based on the report submitted by the respective RLDC, RoE shall be reduced by 1% for the period for which the deficiency continues:

vi) additional RoE shall not be admissible for transmission line having length of less than 50 kilometers.

50. Regulation 25 of the 2014 Tariff Regulations provides as under:

“Tax on Return on Equity

(1) The base rate of return on equity as allowed by the Commission under Regulation 24 shall be grossed up with the effective tax rate of the respective financial year. For this purpose, the effective tax rate shall be considered on the basis of actual tax paid in the respect of the financial year in line with the provisions of the relevant Finance Acts by the concerned generating company or the transmission licensee, as the case may be. The actual tax income on other income stream (i.e., income of non-generation or non-transmission business, as the case may be) shall not be considered for the calculation of “effective tax rate”.

(2) Rate of return on equity shall be rounded off to three decimal places and shall be computed as per the formula given below:
Rate of pre-tax return on equity = Base rate / (1-t)

Where "t" is the effective tax rate in accordance with Clause (1) of this regulation and shall be calculated at the beginning of every financial year based on the estimated profit and tax to be paid estimated in line with the provisions of the relevant Finance Act applicable for that financial year to the company on pro-rata basis by excluding the income of non-generation or non-transmission business, as the case may be, and the corresponding tax thereon. In case of generating company or transmission licensee paying Minimum Alternate Tax (MAT), "t" shall be considered as MAT rate including surcharge and cess.

51. The petitioner has claimed effective tax rate(MAT) of 21.342% for the period 2015-19 and return on equity, considering base rate of 15.5%. The petitioner has also claimed an additional 0.5% return on equity as per provisions of Regulation 24(2) read with Appendix-I of the 2014 Tariff Regulations, stating that, being an expansion project, the project has been completed on 30.10.2015 which is within 42 months from the date of investment approval of the project.

52. The respondent, MPPMCL vide affidavit dated 5.7.2016 has submitted that the Board of the petitioner Company accorded investment approval on 28.12.2011 and the commercial operation date of plant is 31.10.2015, thus it took 46 months and 3 days for completion of the project and hence, the additional return on equity of 0.50% is not admissible for reasons whatsoever in view of provision contained in second proviso of Regulation 24(2). Accordingly, the respondent has prayed to disallow the additional return of 0.50%.

53. We have considered the submissions of the petitioner and the respondent. The investment approval of the project was accorded by the Petitioner Company Board at its 376th meeting held on 28.12.2011 at a project cost of ₹ 3431.29 Crore as of price level of 4th Qtr 2011 pending clearance of the Ministry of Environment & Forests, Govt. of India. The environmental clearance from MoEF, Govt. of India was accorded on 2.5.2012. The petitioner has submitted

that the zero date shall be reckoned as the date of receipt of environmental clearance from MoEF, Govt. of Indi`a. The actual COD of the generating station is 30.10.2015. As per provisions of Regulation 24(2) read with Appendix-I of the CERC Tariff Regulations, the project has been completed within 42 months and hence, an additional RoE of 0.5% is allowed. Accordingly, the rate of Return on Equity works out to 20.341% for the year 2015-16 onwards. This is however, subject to true-up. Accordingly, return on equity has been worked out as under:

(₹in lakh)

	2015-16 (30.10.2015 to 31.3.2016)	**2016-17**	**2017-18**	**2018-19**
Notional Equity- Opening	58839.50	611827.50	78783.81	86435.69
Addition of Equity due to additional capital expenditure	2988.00	16956.31	7651.88	0.00
Normative Equity-Closing	**61827.50**	**78783.81**	**86435.69**	**86435.69**
Average Normative Equity	**60333.50**	**70305.66**	**82609.75**	**86435.69**
Return on Equity (Base Rate)	16.000%	16.000%	16.000%	16.000%
Tax Rate for the year	21.342%	21.342%	21.342%	21.342%
Rate of Return on Equity (Pre Tax)	20.341%	20.341%	20.341%	20.341%
Return on Equity(Pre Tax) annualised	**12272.51**	**14300.96**	**16803.75**	**17581.99**

Interest on Loan

54. Regulation 26 of the 2014 Tariff Regulations provides as under:

> ***"26. Interest on loan capital:*** *(1)The loans arrived at in the manner indicated in regulation 19 shall be considered as gross normative loan for calculation of interest on loan.*
> *(2) The normative loan outstanding as on 1.4.2014 shall be worked out by deducting the cumulative repayment as admitted by the Commission up to 31.3.2014 from the gross normative loan.*
>
> *(3) The repayment for each of the year of the tariff period 2014-19 shall be deemed to be equal to the depreciation allowed for the corresponding year/period. In case of de-capitalization of assets, the repayment shall be adjusted by taking into account cumulative repayment on a pro rata basis and the adjustment should not exceed cumulative depreciation recovered upto the date of de-capitalization of such asset.*
>
> *(4) Notwithstanding any moratorium period availed by the generating company orthe transmission licensee, as the case may be, the repayment of loan shall be considered from the first year of commercial operation of the project and shall be equal to the depreciation allowed for the year or part of the year.*

(5) The rate of interest shall be the weighted average rate of interest calculated on the basis of the actual loan portfolio after providing appropriate accounting adjustment for interest capitalized:

Provided that if there is no actual loan for a particular year but normative loan is still outstanding, the last available weighted average rate of interest shall be considered:

Provided further that if the generating station or the transmission system, as the case may be, does not have actual loan, then the weighted average rate of interest of the generating company or the transmission licensee as a whole shall be considered.

(6) The interest on loan shall be calculated on the normative average loan of the year by applying the weighted average rate of interest.

(7) The generating company or the transmission licensee, as the case may be, shall make every effort to re-finance the loan as long as it results in net savings on interest and in that event the costs associated with such re-financing shall be borne by the beneficiaries and the net savings shall be shared between the beneficiaries and the generating company or the transmission licensee, as the case may be, in the ratio of 2:1.

(8) The changes to the terms and conditions of the loans shall be reflected from the date of such refinancing.

(9) In case of dispute, any of the parties may make an application in accordance with the Central Electricity Regulatory Commission (Conduct of Business) Regulations, 1999,as amended from time to time, including statutory re-enactment thereof for settlement of the dispute:

Provided that the beneficiaries or the long term transmission customers /DICs shall not withhold any payment on account of the interest claimed by the generating company or the transmission licensee during the pendency of any dispute arising out of re-financing of loan."

55. Interest on loan has been worked out as under**:**

(a) The gross normative loan of ₹137292.18 lakh as on COD (30.10.2015) has been considered.

(b) The Cumulative repayment of loan as on COD is "nil".

(c) Accordingly, the net normative opening loan as on 30.10.2015 works out to ₹137292.18 lakh.

(d) Addition to normative loan on account of the admitted additional capital expenditure has been considered on year to year basis.

(e) Depreciation allowed for the period has been considered as repayment of normative loan during the respective year for the period 2015-19.

(f) In line with the provisions of the regulation, the weighted average rate of interest has been calculated applying the actual loan portfolio existing as on 30.10.2015 along with subsequent additions during the period 2015-19, if any, for the generating station. In case of loans carrying floating rate of interest the rate of interest as provided by the petitioner has been considered for the purpose of tariff. The calculations for weighted average rate of interest on loan have been enclosed as Annexure-I to this order.

56. The necessary calculation for interest on loan is as under:

(₹in lakh)

	2015-16 (30.10.2015 to 31.3.2016)	**2016-17**	**2017-18**	**2018-19**
Gross opening loan	137292.18	144264.18	183828.89	201683.27
Cumulative repayment of loan upto previous year	0.00	4383.57	16529.74	30808.10
Net Loan Opening	137292.18	139880.61	167299.15	170875.17
Addition due to additional capital expenditure	6972.00	39564.71	17854.38	0.00
Repayment of loan during the year	4383.57	12146.17	14278.36	14941.35
Less: Repayment adjustment on account of de-capitalization	0.00	0.00	0.00	0.00
Net Repayment	4383.57	12146.17	14278.36	14941.35
Net Loan Closing	139880.61	167299.15	170875.17	155933.81
Average Loan	138586.39	153589.88	169087.16	163404.49
Weighted Average Rate of Interest of loan	7.8495%	7.8278%	7.7946%	7.7578%
Interest on Loan (annualized)	**10878.34**	**12022.71**	**13179.67**	**12676.59**

Depreciation

57. Regulation 27 of the 2014 Tariff Regulations provides as under:

> ***"27. Depreciation:*** *(1) Depreciation shall be computed from the date of commercial operation of a generating station or unit thereof or a transmission system including communication system or element thereof. In case of the tariff of all the units of a generating station or all elements of a transmission system including communication system for which a single tariff needs to be determined, the depreciation shall be computed from the effective date of commercial operation of the generating station or the*

transmission system taking into consideration the depreciation of individual units or elements thereof.

Provided that effective date of commercial operation shall be worked out by considering the actual date of commercial operation and installed capacity of all the units of the generating station or capital cost of all elements of the transmission system, for which single tariff needs to be determined.

(2) The value base for the purpose of depreciation shall be the capital cost of the asset admitted by the Commission. In case of multiple units of a generating station or multiple elements of transmission system, weighted average life for the generating station of the transmission system shall be applied. Depreciation shall be chargeable from the first year of commercial operation. In case of commercial operation of the asset for part of the year, depreciation shall be charged on pro rata basis.

(3) The salvage value of the asset shall be considered as 10% and depreciation shall be allowed up to maximum of 90% of the capital cost of the asset:

Provided that in case of hydro generating station, the salvage value shall be as provided in the agreement signed by the developers with the State Government for development of the Plant:

Provided further that the capital cost of the assets of the hydro generating station for the purpose of computation of depreciated value shall correspond to the percentage of sale of electricity under long term power purchase agreement at regulated tariff:

Provided also that any depreciation disallowed on account of lower availability of the generating station or generating unit or transmission system as the case may be, shall not be allowed to be recovered at a later stage during the useful life and the extended life.

(4) Land other than the land held under lease and the land for reservoir in case of hydro generating station shall not be a depreciable asset and its cost shall be excluded from the capital cost while computing depreciable value of the asset.

(5) Depreciation shall be calculated annually based on Straight Line Method and at rates specified in ***Appendix-II*** *to these regulations for the assets of the generating station and transmission system:*

Provided that the remaining depreciable value as on 31st March of the year closing after a period of 12 years from the effective date of commercial operation of the station shall be spread over the balance useful life of the assets.
(6) In case of the existing projects, the balance depreciable value as on1.4.2014 shall be worked out by deducting the cumulative depreciation as admitted by the Commission upto 31.3.2014 from the gross depreciable value of the assets.

(7) The generating company or the transmission license, as the case may be, shall submit the details of proposed capital expenditure during the fag end of the project(five years

before the useful life) along with justification and proposed life extension. The Commission based on prudence check of such submissions shall approve the depreciation on capital expenditure during the fag end of the project.

(8) In case of de-capitalization of assets in respect of generating station or unit thereof or transmission system or element thereof, the cumulative depreciation shall be adjusted by taking into account the depreciation recovered in tariff by the de-capitalized asset during its useful services."

58. The petitioner has claimed the weighted average rate of depreciation of 5.2160%. However, as per Form-11, the petitioner has not considered the cost of freehold land as part of gross block as on COD. Hence, the weighted average rate of depreciation of 5.1987% has been computed based on the gross block as on COD of the generating station and the same has been considered for the period from 30.10.2015 to 31.3.2016 and for the year 2016-19.Accordingly, depreciation has been computed as follows:

(₹in lakh)

	2015-16 (30.10.2015 to 31.3.2016)	**2016-17**	**2017-18**	**2018-19**
Opening Capital Cost	196131.68	206091.68	262612.70	288118.95
Add: Projected Additional Capital Expenditure	**9960.00**	**56521.02**	**25506.25**	0.00
Closing Capital Cost	206091.68	262612.70	288118.95	288118.95
Average Capital Cost	**201111.68**	**234352.19**	**275365.83**	**288118.95**
Freehold Land	714.20	714.20	714.20	714.20
Depreciable value (excluding land)@ 90%	180357.73	210274.19	247186.46	258664.28
Rate of Depreciation	5.1987%	5.1987%	5.1987%	5.1987%
Depreciation	4383.57	12146.17	14278.36	14941.35
Depreciation (annualized)	**10418.09**	**12146.17**	**14278.36**	**14941.35**
Cumulative depreciation (at the end of the period)	4383.57	16529.74	30808.10	45749.45

O&M Expenses

59. Regulation 29 (1) (a) of the 2014 Tariff Regulations provides the year-wise O&M expense norms for the generating station of the petitioner as under:

(₹in lakh)

2015-16	**2016-17**	**2017-18**	**2018-19**
17.01	18.08	19.22	20.43

60. The proviso to the said regulation provides as under:

500 MW and above	Additional 3rd & 4th units	0.90
	Additional 5th & above units	0.85

61. The petitioner has also claimed additional O&M expenses of 10% of O&M norms towards the operation and maintenance of FGD.

	2015-16	2016-17	2017-18	2018-19
O & M Expenses under Regulation 29(1)	8505.00	9040.00	9610.00	10215.00
Additional O&M Expenditure on account of FGD @ 10 % of O&M norms	0.00	904.00	961.00	1021.50

62. The proviso to Regulation 29 (1) (a) of 2014 Tariff Regulations, provides for multiplication factors for arriving at norms of O&M norms for additional units in respective unit sizes for the units whose COD occurs on or after 1.4.2014. The respondent, MPPMCL has submitted that since this is the expansion unit of VSTPS, hence a factor of 0.85 is applicable in this case.

63. The generating station, VSTPS-V is the expansion project the 13th unit of the project and hence, the admissible O&M norms have been multiplied by a factor of 0.85 and are allowed as under:

(₹in lakh)

2015-16	2016-17	2017-18	2018-19
14.46	15.37	16.34	17.37

64. As regards, the submissions of the petitioner for additional O&M for expenditure towards the installation of FGD system, we have discussed the same in detail in para 36 of this order. Accordingly, the additional O&M expenses on account of installation of FGD are not allowed at present and we direct the petitioner to submit the O&M expenses relating to FGD system on actual basis at the time of truing-up. In case the norms for O&M expenses for FGD are notified

prior to truing-up, same will be considered in the case of the petitioner. Based on this, the O&M expenses allowed are as under:

(₹ in lakh)

	2015-16 (30.10.2015 to 31.3.2016)	**2016-17**	**2017-18**	**2018-19**
O & M Expenses (annualized)	7229.25	7684.00	8168.50	8682.75

Water Charges

65. Regulation 29(2) of the 2014 Tariff Regulations provide as under:

"*29.(2) The Water Charges and capital spares for thermal generating stations shall be allowed separately:*

Provided that water charges shall be allowed based on water consumption depending upon type of plant, type of cooling water system etc., subject to prudence check. The details regarding the same shall be furnished along with the petition:

Provided that the generating station shall submit the details of year wise actual capital spares consumed at the time of truing up with appropriate justification for incurring the same and substantiating that the same is not funded through compensatory allowance or special allowance or claimed as a part of additional capitalisation or consumption of stores and spares and renovation and modernization"

66. In terms of the above regulation, water charges are to be allowed based on water consumption depending upon type of plant, type of cooling water system etc., subject to prudence check of the details furnished by the petitioner.

67. The petitioner has claimed water charges based on the expected water consumption of the generating station and the type of cooling water system has also been furnished. The water charges claimed by the petitioner are as follows:

(₹ in lakh)

2015-16	**2016-17**	**2017-18**	**2018-19**
984.99	1044.67	1111.01	1181.56

68. In order to examine the trend of the actual water consumption and rate of water charges, the petitioner was directed vide ROP of the hearing dated 20.5.2016 to furnish the details of the

actual water consumption of Vindhyachal STPS along with the rate of water charges for the last five years (i.e. 2009-10 to 2013-14) and the relevant notification in support of the same.

69. In compliance with the above, the petitioner vide affidavit dated 6.7.2016 has furnished the details of the year-wise actual water consumption and water charges for last 5 years as detailed below:

Year	Stage-1		Stage-II		Stage-III		Stage-V	
	Actual annual water consumption (M3)	Actual Annual water Consumption (Cusec)	Actual annual water consumption (M3)	Actual Annual water Consumption (Cusec)	Actual annual water consumption (M3)	Actual Annual water Consumption (Cusec)	Actual annual water consumption (M3)	Actual Annual water Consumption (Cusec)
2011-12	28354576	31.73	32048890	35.87	31482267	35.23	-	-
2012-13	35667042	39.92	28748000	32.17	29657680	33.19	-	-
2013-14	36867357	41.26	32724020	36.62	26534241	29.70	-	-
2014-15	27669687	30.97	25313080	28.33	23851252	26.69	-	-
2015-16	34009765	38.06	22431711	25.1	28329123	31.71	5455300	14.47

Year	Stage-V		Station		
	Actual annual water consumption (M3)	Actual Annual water Consumption (Cusec)	Contracted Quantum of Water (Cusec)	Rate of Water Charges (Rs/M3)	Water Charges paid for total water consumption of station (Rs. Crs)
2011-12	-	-	180	4.5 (April- Dec`11), 5 (Jan- March`12)	67.09
2012-13	-	-		5 (April-Dec`12), 5.5 (Jan-March`13)	74.10
2013-14	-	-		5.5	79.60
2014-15	-	-		5.5	79.60
2015-16	5455300	14.47		5.5	79.80

70. The petitioner has further submitted that single agreement was executed for Vindhyachal STPS (all stages) with water resource department. It has also submitted that as per the agreement, VSTPS has been allocated 180 cusec (equivalent to the quantum of 160.8 MCM/year) of water for 30 years and if the actual drawl is less than contracted quantity, the

minimum payment of water charges is to be made based on allocation equivalent to 90% of the monthly contracted quantity i.e. 162 cusec for VSTPS. It has also submitted that if the actual drawl exceeds the contracted quantity, the water charges are payable to the Government of MP at 1.5 times the applicable rate of water charges. The petitioner has further submitted that the agreement for water for a thermal generating station is carried out based on Water Balance Diagram based on various considerations like temperature and relative humidity affecting rate of evaporation of water from raw water pond, Cooling Towers etc, blow-down for design Cycle of Concentration (COC) for circulating water, drift loss of cooling tower, steam loss in the cycle, level of generation etc.

71. Considering the above factors the petitioner has envisaged 20 cusec of water requirement for the generating station. Based on the above water requirement and the rate of water charges as notified by water resource Department of Government of Madhya Pradesh, the petitioner has claimed the water charges for 2015-16 which is escalated at 6.35% up to 2018-19. The petitioner has further mentioned the Report of CEA on “minimization of water requirement in coal based thermal power station”, and quoted the relevant extract from the report, submitted that the water requirement for 4760 MW (for Stage-I to Stage-V) at 5 cubic meter/hr/MW comes out to be 233 cusec (i.e. 208.5 MCM/year). It has further stated that even on conservative side with water flow at 4 cubic meter/hr, the water requirement for all five stages of generating stations of VSTPS works out to 186.7 cusec (i.e. 166.78 MCM/year).

72. The respondent, MPPMCL has submitted that as per Regulation 29(2), the water charges is not a part and parcel of O&M expenses and has to be recovered separately. Once, water charges have been excluded from O&M expenses for separate recovery, it cannot be added to O&M expenses for recovery of interest on working capital and it is prayed to disallow the same. The respondent has further submitted that the petitioner has prayed for separate O&M expenses for FGD system and that it strongly opposes the same. O&M expenses are based on normative

basis being allowed on basis of installed capacity of the generating station and accordingly only O&M expenses as per norms may be allowed. O&M expenses on account of FGD may be subject to prudence check by Commission. Accordingly, the additional O&M expenses may be rejected.

73. It is noted that the petitioner has claimed the total water charges during 2015-16 and have escalated the same @ 6.35% as per escalation rate in the O&M expense norms applicable for the period 2014-19. However, it is not clear from the submissions of the petitioner on what basis, the consumption of water as on 2015-16, has been considered. Accordingly, water consumption has been calculated from the water consumption data furnished by the petitioner vide affidavit dated 6.7.2016 for all the stages of the generating station. Since, the actual water consumption of the generating station for the previous year is not available, and since, the water consumption in Stage-II of VSTPS (2x500MW) will be similar to the water consumption of the generating station (1x500), the water consumption for the year 2011-12 to 2015-16 of VSTPS Stage-II, as submitted by the petitioner has been considered for the purpose of calculation of the water charges of the generating station and the same has been allowed with the annual escalation of 6.35% for the period 2016-19. Based on this, water charges allowed for the period 2015-19 are as under:

(₹in lakh)

Year	**Water charges allowed**
2015-16	873.56
2016-17	929.03
2017-18	988.03
2018-19	1050.77

74. The water charges allowed as above is subject to truing-up at the end of the tariff period for which the petitioner is directed to place on record all the actual expenses incurred under water charges.

75. Accordingly, the total O&M expenses including water charges as claimed by the petitioner and allowed for the purpose of tariff is as under:

(₹ in lakh)

	2015-16	2016-17	2017-18	2018-19
O&M Expenses claimed (including additional O&M for FGD)	8505.00	9944.00	10571.00	11236.50
O&M Expenses allowed	7229.25	7684.00	8168.50	8682.75
Water charges claimed	984.99	1044.67	1111.01	1181.56
Water charges allowed	873.56	929.03	988.03	1050.77
Total O&M Expenses claimed (including Water charges)	9489.99	10988.67	11682.01	12418.06
Total O&M Expenses allowed (including Water charges)	8102.81	8613.03	9156.53	9733.52

Operational Norms

76. The operational norms in respect of the generating station claimed by the petitioner are as under:

Target Availability (%)	83.00
Heat Rate (kcal/kWh)	2351.25
Auxiliary Energy Consumption (%)	5.75
Specific Oil Consumption (ml/ kWh)	0.50

77. The operational norms claimed by the petitioner are in accordance with Regulation 36 of the 2014 Tariff Regulations and discussed as under:

Normative Annual Plant Availability Factor (NAPAF)

78. Regulation 36 (A) (a) of the 2014 Tariff Regulations provides as under:

(a) All Thermal generating stations, except those covered under clauses (b) (c) (d) & (e)- 85%.

Provided that in view of the shortage of coal and uncertainty of assured coal supply on sustained basis experienced by the generating stations, the NAPAF for recovery of fixed charges shall be 83% till the same is reviewed.
The above provision shall be reviewed based on actual feedback after 3 years from 01.04.2014.

79. The petitioner has considered the target availability norm of 83% during 2014-19. In response to the direction of the Commission, the petitioner vide affidavit dated 6.7.2016 has submitted as under:

"It is submitted that coal from Pakri Barwadih coal mines was envisaged to meet the coal requirement of VSTPS Stage-V at the time of Investment Approval. The mining activities of Pakri Barwadih got delayed due to various reasons. Meanwhile to mitigate the coal requirements, the petitioner has entered into MOU with Northern Coalfields Limited (NCL) in FY 2015-16 for annual coal quantity of 1.5 Lakh Metric Ton(LMT) , against which 1.56 LMT has been supplied by NCL in FY 2015-16. NTPC has also procured 2.06 LMT through e-auction from NCL. Accordingly, the tied up coal quantity from NCL was not adequate to meet the requirement of the station. In view of the above, the petitioner has computed the tariff in the instant station in line with Regulation 36(a)"

80. Regulation 36 (a) provides target availability of 83% for first 3 years from 1.4.2014 and the same shall be reviewed after 3 years as per Regulation. Keeping in view, the submissions of the petitioner as regards the shortage of domestic coal, the target availability of 83% is allowed for the period 2015-16 to 2016-17 and 85% for the period 2017-18 & 2018-19 in terms of the Regulation 36(A) (a) of the 2014 Tariff Regulations.

Heat Rate (kCal/kWh)

81. Regulation 36(C)(b) of the 2014 Tariff Regulations, provides for maximum design unit heat rate (kcal/kwh) for Calculation of Heat Rate of New Thermal generating station achieving COD on or after 1.4.2014. The petitioner has claimed the Station Heat Rate of 2351.25 kCal/kwh as per 2014 Tariff Regulation. The petitioner has also provided the plant characteristics for the generating station as under:

Pressure Rating (kg/cm2)	170
SHT/RHT (0C)	565
Type of BFP	2 Turbine Driven+ 1 Motor Driven
Guaranteed Turbine Heat Rate (kcal/Kwh)	1932
Guaranteed Boiler Efficiency (%)	84.47

82. As per the plant characteristics submitted by the petitioner, the Design Unit Heat Rate works out as 2287 kCal/kwh. However, the maximum design unit heat rate allowed as per Regulation, 36 (C) (b) is 2250 kCal/kwh. Accordingly, maximum allowable design Heat Rate has been capped at 2250 kCal/kwh for the purpose of calculation of gross station heat rate. Accordingly, the Gross Station Heat Rate is calculated as below:

Guaranteed Design Gross Turbine Cycle Heat Rate	1932
Guaranteed Boiler Efficiency	84.47%

Maximum Allowable Design Heat Rate	2250
Multiplying Factor	1.045
Gross Station Heat Rate	2351.25

83. The Station heat rate of **2351.25 kCal/kwh,** as considered by the petitioner is as per 2014 Tariff Regulation and same is allowed in this case.

Auxiliary Energy Consumption

84. Regulation 36(E)(a) of Tariff Regulations, 2014 provides Auxiliary Energy Consumption of 5.25% for coal based generating stations of 500 MW sets with Natural Draft cooling tower or without cooling tower with steam driven BFP. It further provides that for thermal generating stations with induced draft cooling towers, the norms shall be further increased by 0.5%. Accordingly, the Auxiliary Energy Consumption to be considered is 5.75% as per the norms and the same is allowed for the purpose of tariff computations.

85. The petitioner has claimed Auxiliary Energy Consumption at 5.75% for the period 2015-19. The petitioner has further prayed that the Commission may allow the increase in Auxiliary Power Consumption of 1.088% for the FGD system installed. Accordingly, the petitioner has claimed the Auxiliary Energy Consumption as under:

2015-16	2016-17	2017-18	2018-19
5.75%	6.84%	6.84%	6.84%

86. As regards to the increase in Auxiliary Energy Consumption due to FGD system, we have discussed the same in para 36. We have decided that the increase in APC due to installation of FGD system will be 1% and the same is subject to revision at the time of truing-up. Accordingly, the Auxiliary Energy Consumption allowed is as under:

2015-16	2016-17	2017-18	2018-19
5.75%	6.75%	6.75%	6.75%

Specific Oil Consumption

87. Regulation 36(D)(a) of the 2014 Tariff Regulations, provides secondary fuel oil consumption of 0.50 ml/kWh for coal-based generating station. Hence, the secondary fuel oil consumption considered by the petitioner is as per norms and is allowed.

Interest on Working Capital

88. Sub-section (c) of clause (1) of Regulation 28 of the 2014 Tariff Regulations provides as under:

> *"28. Interest on Working Capital:*
> *(1) The working capital shall cover*
> *(b) Open-cycle Gas Turbine/Combined Cycle thermal generating stations*
> *(i) Fuel cost for 30 days corresponding to the normative annual plant availability factor, duly taking into account mode of operation of the generating station on gas fuel and liquid fuel;*
>
> *(ii) Maintenance spares @ 30% of operation and maintenance expense specified in regulation 29; and*
>
> *(iii) Liquid fuel stock for 15 days corresponding to the normative annual plant availability factor and in case of use of more than one liquid fuel, cost of main liquid fuel duly taking into account mode of operation of the generating stations of gas fuel and liquid fuel';*
>
> *(iv)Receivables equivalent to two months of capacity charge and energy charge for sale of electricity calculated on normative plant availability factor, duly taking into account mode of operation of the generating station on gas fuel and liquid fuel;*
>
> *(v) Operation and maintenance expenses for one month."*

Fuel Components and Energy Charges in working capital

89. The petitioner has claimed cost for fuel components in working capital based on "as received" GCV at the secondary crusher for the preceding three months of July, 2015, August, 2015 and September, 2015 and secondary fuel oil for the preceding three months of January, 2014, February, 2014 and March, 2014, as under:

(₹ in lakh)

Sl. No.	Particulars	2015-16	2016-17	2017-18	2018-19
1A	Cost of Coal for Stock for 30 days (non pit head)	4104.32	4093.10	4093.10	4093.10
1B	Cost of Coal for Generation for 30 days	4104.32	4093.10	4093.10	4093.10
1C	Cost of lime stone for Stock 30 days	0.00	73.01	73.01	73.01
1D	Cost of Lime Stone for Generation for 30 days	0.00	73.01	73.01	73.01
2	Cost of Main Secondary Fuel Oil for 2 months	159.11	158.68	158.68	158.68

90. The Commission vide ROP of the hearing dated 20.5.2016 directed the petitioner to submit the GCV of coal on "as received" basis. In response, the petitioner vide affidavit dated 6.7.2016 has submitted that from Aug 2014, onwards sampling for measurement of 'as received' GCV is being taken from secondary crusher. The issue of "as received" GCV for computation of energy charges was challenged by NTPC and other generating companies through writ petition in the Hon"ble High Court of Delhi. The writ petition was heard on 7.9.2015 and Hon'ble High Court of Delhi had directed that the Commission shall decide the place from where the sample of coal should be taken for measurement of GCV of coal on as received basis within 1 month on the request of petitioners.

91. As per the directions of the Hon'ble High Court, the Commission vide order dated 25.1.2016 in Petition No. 283/GT/2014 has decided as under:

"58. In view of the above discussion, the issues referred by the Hon'ble High Court of Delhi are decided as under:
(a) There is no basis in the Indian Standards and other documents relied upon by NTPC etc. to support their claim that GCV of coal on as received basis should be measured by taking samples after the crusher set up inside the generating station, in terms of Regulation 30(6) of the 2014 Tariff regulations.

(b) The samples for the purpose of measurement of coal on as received basis should be collected from the loaded wagons at the generating stations either manually or through the Hydraulic Auger in accordance with provisions of IS 436(Part1/Section1)-1964 before the coal is unloaded. While collecting the samples, the safety of personnel and equipment as discussed in this order should be ensured. After collection of samples, the sample preparation and testing shall be carried out in the laboratory in accordance with the

procedure prescribed in IS 436(Part1/Section1)-1964 which has been elaborated in the CPRI Report to PSERC."

92. Further, the petitioner has claimed Energy Charge Rate (ECR) of 146.129 Paise/kWh based on the weighted average price, GCV of coal (as received basis at the secondary crusher) & oil procured and burnt for the preceding three months for 2015-16 and 150.423 Paise/kWh based on the weighted average price, GCV of coal (as fired basis), the lime stone procured and consumed & oil procured and burnt for the preceding three months for 2016-17 onwards. It is observed that the petitioner has provided the GCV of coal on "as received" basis from the secondary crusher. In compliance with the direction of the Hon'ble High Court of Delhi, the Commission in its order dated 25.1.2016 in Petition No. 283/GT/2014 has clarified that the measurement of GCV of coal on as received basis shall be taken from the loaded wagons at the unloading point either manually or through the Hydrolic Augur. The petitioner has not submitted the required data regarding measurement of GCV of coal in compliance with the directions contained in the said order dated 25.1.2016. The present petition cannot be kept pending till the petitioner submits the required information. Hence, the Commission has decided to compute fuel components and the energy charges in the working capital by provisionally taking the GCV of coal on as "billed basis" and allowing an adjustment for total moisture as per the formula given as under:

$$\frac{GCV \text{ X } (1-TM)}{(1-IM)}$$

Where: GCV=Gross Calorific value of coal
TM=Total moisture
IM= Inherent moisture

93. In view of the above, the cost for fuel components in working capital have been computed at 83% NAPAF for the years 2015-16 and 2016-17 and at 85% NAPAF for the year 2017-18 & 2018-19 and based on "as billed" GCV of coal and price of coal procured and secondary fuel oil for the preceding three months from July 2015 to September 2015 and allowed as under:

(₹ in lakh)

Sl. No.		2015-16	2016-17	2017-18	2018-19
1A	Cost of Coal for Stock for 30 days (non pit head)	2972.90	2964.77	3036.21	3036.21
1B	Cost of Coal for Generation for 30 days	2972.90	2964.77	3036.21	3036.21
1C	Cost of lime stone for Stock 30 days	-	73.07	74.83	74.83
1D	Cost of Lime Stone for Generation for 30 days	-	73.07	74.83	74.83
2	Cost of Main Secondary Fuel Oil for 2 months	159.11	158.68	162.50	162.50

Energy Charge Rate (ECR)

94. Clause (6) sub-clause (a) of Regulation 30 of the 2014 Tariff Regulations provides for computation and payment of Capacity Charge and Energy Charge for thermal generating stations:

"6. Energy charge rate (ECR) in Rupees per kWh on ex-power plant basis shall be determined to three decimal place in accordance with the following formulae:
(a) For coal based and lignite fired stations
ECR = {(GHR – SFC x CVSF) x LPPF / CVPF+SFC x LPSFi + LC x LPL} x 100 / (100 – AUX)
Where,
AUX = Normative auxiliary energy consumption in percentage.
CVPF = (a) Weighted Average Gross calorific value of coal as received, in kCal per kg, for coal based stations.
(b)….
(c) In case of blending of fuel from different sources, the weighted average Gross calorific value of primary fuel shall be arrived in proportion to blending ratio.
CVSF = Calorific value of secondary fuel, in kCal per ml.
ECR = Energy charge rate, in Rupees per kWh sent out.
GHR = Gross station heat rate, in kCal per kWh.
LC = Normative limestone consumption in kg per kWh.
LPL = Weighted average landed price of limestone in Rupees per kg.
LPPF = Weighted average landed price of primary fuel, in Rupees per kg, per litre or per standard cubic metre, as applicable, during the month. (In case of blending of fuel from different sources, the weighted average landed price of primary fuel shall be arrived in proportion to blending ratio)
SFC = Normative Specific fuel oil consumption, in ml per kWh.
LPSFi=Weighted Average Landed Price of Secondary Fuel in Rs./ml during the month."

95. The petitioner has claimed Energy Charge Rate (ECR) of 146.129 Paise/kWh in 2015-16 and 150.423 Paise/kWh for 2016-19 period. The ECR based on operational norms specified in

2014 Tariff Regulations and on "as billed" GCV of coal for preceding 3 months i.e. March to January 2014 is worked out as under:

S.No.		Unit	2015-16	2016-19
1	Capacity	MW	500	500
2	Gross Station Heat Rate	kCal/kWh	2351.25	2351.25
3	Aux. Energy Consumption	%	5.75	6.75
4	Weighted average GCV of oil (As fired)	kCal/lt.	9710	9710
5	Weighted average GCV of Coal (As Billed)	kCal/kg	4660.38	4660.38
6	Specific Limestone Consumption	Kg/kWh	-	0.0162
7	Adjustment on account of coal received at the generating station for equilibrated basis (Air dried) in the billed GCV of Coal India		*	*
8	Weighted average price of oil	Rs./KL	52378.03	52378.03
9	Weighted average price of Coal	Rs./MT	1943.75	1943.75
10	Weighted average price of Limestone (as received)	Rs./MT	-	1600
11	Rate of energy charge ex-bus	Paise/kWh	106.613**	110.342**

** To be calculated by the petitioner based on the adjustment formula*

*** To be revised as per the figures at Sr. No. 7*

96. The GCV of coal as computed above shall be adjusted in the light of the GCV of coal on "as received basis" computed by the petitioner as per our directions in order dated 25.1.2016 in Petition No. 283/GT/2014.

Maintenance spares

97. The petitioner has claimed maintenance spares in the working capital as under:

(₹ in lakh)

2015-16	2016-17	2017-18	2018-19
1898.00	2197.73	2336.40	2483.61

98. Regulation 28(1)(a)(iv) of the 2014 Tariff Regulations provide for maintenance spares @ 20% of the O&M expenses as specified in Regulation 29. As specified in Regulation 29 (2) of the 2014 Tariff Regulations and as allowed by the Commission in order dated 6.10.2015 in Petition

No. 186/GT/2014 (Sugen Power Plant), the maintenance spares @ 20 %of the operation & maintenance expenses including water charges, allowed are as under:

(₹in lakh)

2015-16	2016-17	2017-18	2018-19
1620.56	1722.61	1831.31	1946.70

Receivables

99. Receivables equivalent to two months of capacity charge and energy charges has been worked out and allowed as under:

(₹in lakh)

	2015-16	2016-17	2017-18	2018-19
Variable Charges (two months)	6104.91	6234.36	6384.59	6384.59
Fixed Charges (two months)	7439.05	8370.95	9461.62	9723.72
Total	**13543.95**	**14605.31**	**15846.20**	**16108.31**

O&M Expenses

100. O&M expenses for 1 month claimed by the petitioner for the purpose of working capital are as under:

(₹in lakh)

2015-16	2016-17	2017-18	2018-19
790.83	915.72	973.50	1034.84

101. Based on the O&M expense norms specified by the Commission and in terms of the Commission's order dated 6.10.2015 in Petition No. 186/GT/2014, the O&M expenses for 1 month is allowed as under:

(₹in lakh)

2015-16	2016-17	2017-18	2018-19
675.23	717.75	763.04	811.13

Rate of interest on working capital

102. Clause (3) of Regulation 28 of the 2014 Tariff Regulations provides as under:

"Interest on working Capital: (3) Rate of interest on working capital shall be on normative basis and shall be considered as the bank rate as on 1.4.2014 or as on 1st April of the year during the tariff period 2014-15 to 2018-19 in which the generating station or a unit thereof or the transmission system including communication system or element thereof, as the case may be, is declared under commercial operation, whichever is later."

103. In terms of the above regulations, SBI PLR of 13.50% (Bank rate 10.00 + 350bps) has been considered for the purpose of calculating interest on working capital. Interest on working capital has been computed as under:

(₹in lakh)

	2015-16	**2016-17**	**2017-18**	**2018-19**
Cost of Coal for Stock for 30 days (non pit head)	2972.90	2964.77	3036.21	3036.21
Cost of Coal for Generation for 30 days	2972.90	2964.77	3036.21	3036.21
Cost of lime stone for Stock 30 days	0.00	73.07	74.83	74.83
Cost of Lime Stone for Generation for 30 days	0.00	73.07	74.83	74.83
Cost of Main Secondary Fuel Oil for 2 months	159.11	158.68	162.50	162.50
Maintenance Spares	675.23	717.75	763.04	811.13
Receivables- 2 months	1620.56	1722.61	1831.31	1946.70
O & M expenses- 1 Month	13543.95	14605.31	15846.20	16108.31
Total Working Capital	**21944.66**	**23280.03**	**24825.14**	**25250.72**
Rate of Interest	13.50%	13.50%	13.50%	13.50%
Interest on Working Capital (annualized)	**2962.53**	**3142.80**	**3351.39**	**3408.85**

104. Accordingly, annual fixed charges approved for the generating station for the period from 30.10.2015 to 31.3.2019 is summarized as under**:**

(₹in lakh)

	2015-16	**2016-17**	**2017-18**	**2018-19**
Depreciation	10418.09	12146.17	14278.36	14941.35
Interest on Loan	10878.34	12022.71	13179.67	12676.59
Return on Equity	12272.51	14300.96	16803.75	17581.99
Interest on Working Capital	2962.53	3142.80	3351.39	3408.85
O&M Expenses	8102.81	8613.03	9156.53	9733.52
Total (annualized)	**44634.28**	**50225.68**	**56769.69**	**58342.30**

Application Fee and Publication Expenses

105. The petitioner has sought the reimbursement of filing fee and also the expenses incurred towards publication of notices for application of tariff for the period 2014-19. The petitioner has deposited the filing fees of ₹919700 for the period 2015-16 in terms of the provisions of the Central Electricity Regulatory Commission (Payment of Fees) Regulations, 2012. Accordingly, in terms of Regulation 52 of the 2014 Tariff Regulations and in line with the decision in Commission's order dated 5.1.2016 in Petition No. 232/GT/2014, we direct that the petitioner shall be entitled to recover *pro rata,* the filing fees for 2014-15 and the expenses of ₹321492 incurred on publication of notices directly from the respondents on submission of documentary proof. The filing fees for the remaining years of the tariff period 2016-19 shall be recovered *pro rata* after deposit of the same and production of documentary proof.

106. The annual fixed charges approved for the period 2014-19 as above are subject to truing-up in terms of Regulation 8 of the 2014 Tariff Regulations.

107. Petition No. 234/GT/2014 is disposed of in terms of the above.

Sd/-	Sd/-
(Dr. M.K.Iyer) **Member**	**(A. S. Bakshi)** **Member**