CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI

Petition No. 28/2011

Coram:
Shri V.S.Verma, Member
Shri M. Deena Dayalan, Member

Date of Hearing: 20.6.2013
Date of Order: 22.8.2013

In the matter of

Approval of tariff of Sipat Super Thermal Power Station, Stage-I (1980 MW) for the period from the anticipated date of commercial operation till 31.3.2014.

AND

In the matter of

NTPC Ltd, New Delhi **…Petitioner**

Vs

1. Madhya Pradesh Power Trading Ltd., Jabalpur
2. Maharashtra State Electricity Distribution Company Ltd., Mumbai
3. Gujarat Urja Vikas Nigam Limited, Vadodora
4. Chhattisgarh State Power Distribution Company Ltd, Mumbai
5. Electricity Department, Govt. of Goa, Goa
6. Electricity Department, Administration of Daman & Diu, Daman
7. Electricity Department, Administration of Dadra and Nagar Haveli, Silvassa

…**Respondents**

Present:
Shri Ajay Dua, NTPC
Shri Rohit Chhabra, NTPC
Ms. Suchitra Maggon, NTPC
Shri A.S.Pandey, NTPC
Shri Sachin Jain, NTPC
Shri S.K.Sharma, NTPC
Shri A.Dutta, NTPC
Shri Y.R.Dhingra, NTPC
Shri Bhupinder Kumar, NTPC
Shri Deepak Paliwal, NTPC

ORDER

This petition has been filed by the petitioner, NTPC for approval of tariff for Sipat Super Thermal Power Station, Stage-I (3 x 660 MW) (hereinafter referred to as "the generating station") for the period from the anticipated date of commercial operation till 31.3.2014, based on the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2009 (hereinafter referred to as "the 2009 Tariff Regulations").

2. During the pendency of this petition, Unit-I of the generating station was declared under commercial operation (COD) on 1.10.2011. Based on the prayer of the petitioner, the Commission vide its order dated 3.11.2011 granted provisional tariff for Unit-I from 1.10.2011 to 31.3.2014. Accordingly, the petitioner vide its affidavit dated 24.4.2012 filed amended petition revising the tariff calculations based on the actual audited capital expenditure up to COD of Unit-1 i.e. 1.10.2011 and the expected additional capital expenditure up to the anticipated COD of Unit-II (i.e 1.5.2012) and Unit-III/generating station (i.e 1.10.2012).

3. Thereafter, Unit-II of the generating station was declared under commercial operation on 25.5.2012 and based on the prayer of the petitioner, the Commission by order dated 18.7.2012 granted provisional tariff for Unit-I from 1.4.2012 to 24.5.2012 and Unit-I and Unit-II (combined) for the period from COD of Unit-II (i.e 25.5.2012) till the date of commercial operation of Unit-III. Subsequently, Unit-III of the generating station was declared under commercial operation from 1.8.2012 and based on the prayer of the petitioner, provisional tariff was granted by Commission's order dated 6.9.2012 from the date of commercial operation of Unit-III/ generating station till 31.3.2014, in order to enable the petitioner to bill the respondents.

4. In terms of the directions of the Commission vide letter dated 28.9.2012 for submission of additional information, the petitioner vide its affidavit dated 6.12.2012 has revised its claim for tariff of the generating station for the period 2011-14, based as on the audited capital cost as on the actual COD of Unit II and Unit III.

5. The annual fixed charges claimed by the petitioner for 2009-14 is as under:

(₹in lakh)

	2011-12	2012-13			2013-14
	(1.10.2011 to 31.3.2012)	(1.4.2012 to 24.5.2012)	(25.5.2012 to 31.7.2012)	(1.8.2012 to 31.3.2013)	
Depreciation	19564	20128	31377	42691	44477
Interest on Loan	20525	20449	32347	42772	42226
Return on Equity	26395	27236	42583	57837	60256
Interest on Working Capital	3562	3610	7339	12958	13137
O&M Expenses	8633	9121	18242	26451	27983
Secondary Fuel Oil cost	1901	1895	4711	7704	7704
Total	**80578**	**82439**	**136600**	**190413**	**195783**

6. None of the respondents have filed replies to the petition. As one of the Members of this Commission had demitted office before passing orders in the matter, the petition was again listed for hearing on 20.6.2013. During the hearing, the representative of the petitioner submitted that the Commission may revise the tariff of the generating station after truing up exercise considering the documents and the submissions of the parties. Accordingly, we proceed to determine the tariff of the generating station as stated in the subsequent paragraphs.

Capital Cost

7. Regulation 7(1)(a) of 2009 Tariff Regulations provides as under:

> *"7. **Capital Cost.** (1) Capital cost for a project shall include: (a) the expenditure incurred or projected to be incurred, including interest during construction and financing charges, any gain or loss on account of foreign exchange risk variation during construction on the loan - (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, - up to the date of commercial operation of the project, as admitted by the Commission, after prudence check;"*

8. The petitioner has submitted that the investment approval of the project was accorded by the Board of the petitioner company on 8.12.2003 at a cost of ₹9456.12 crore including IDC, FC, FERV and FERV hedging cost. The petitioner vide its affidavit 6.12.2012 has revised the capital cost based as on the audited capital cost as on the actual date of commercial operation (COD) of different units of the generating station. The petitioner has claimed an amount of ₹378869 lakh as on COD of Unit-I which comprises of capital cost of ₹369183 lakh, on cash basis, notional IDC of ₹10497 lakh and FERV gain of (-) ₹810.479 lakh. The capital cost as on COD of Unit-II and Unit-III have also been claimed by the petitioner on the basis of auditor's

certificate. The petitioner has claimed an amount of ₹616892 lakh and ₹ 823251 lakh as on the actual COD of Unit-II and Unit -III respectively. The capital cost claimed comprises of hard cost, notional IDC and FERV loss/gain. The summary of the capital cost claimed on different dates of commercial operation CODs of the generating station is as under:

(₹in lakh)

	2011-12	**2012-13**			**2013-14**
	1.10.2011 to 31.3.2012	**1.4.2012 to 24.5.2012**	**25.5.2012 to 31.7.2012**	**1.8.2012 to 31.3.2013**	
Capital Cost	369183	388059	403316	620399	857268
Capitalization as on COD of Unit II	0	0	212882	0	0
Capitalization as on COD of Unit-III	0	0	0	202887	0
Notional IDC	10497	0	504	0	0
FERV charged to Revenue	(-) 810.479	0	189.937	(-) 34.465	0
Opening Capital Cost	378869	388059	616892	823251	857268
Additions during the period including discharge of undercharged liabilities	9189.42	15257.62	3506.73	34017	36282
Closing Capital Cost as claimed	**388059**	**403316**	**620399**	**857268**	**893550**

9. The capital cost of the generating station considering the additional capital expenditure till 31.3.2014 is ₹8935.50 crore and accordingly, the same works out to ₹4.51crore/MW. The bench mark norms for capital cost specified by the Commission for Thermal Power generating stations consisting of three units of 660 MW is ₹4.67 crore/ MW. It is observed from the above table that the main plant package cost of the generating station is less than the bench mark cost and is comparable to other generating stations of the petitioner, namely, NCTPS, Dadri Stage-II (2 x 490MW) at ₹5.04 crore/MW, Vindhyachal STPS, Stage-III (2 x 500MW) at ₹4.13 crore/MW, Kahalgaon STPS, Stage-II (3 x 500MW) at ₹3.98 crore/MW and Korba Stage-III (1 x 500MW) at ₹5.18 crore/MW. Considering the above factors, we are of the view that the capital cost of ₹8935.50 crore is reasonable.

Time Overrun

10. The petitioner has not furnished the schedule date of commercial operation as per the Investment Approval dated 8.12.2003 despite the direction of the Commission vide letter dated 27.9.2011. However, the petitioner vide its affidavit dated 2.12.2011 has furnished the revised date

of synchronization of the different units as approved by the Board of the petitioner company in its meeting on 11.11.2009. The dates of synchronization of the different units, the actual COD and the time overrun involved in the project are as under:

	Date of synchronization as per NTPC Board meeting dated 11.11.2009	**Time of 3 months for declaration of COD**	**Actual COD**	**Time overrun as per petitioner**
Unit-I	31.10.2010	31.1.2011	1.10.2011	08 months
Unit-II	30.4.2011	30.7.2011	25.5.2012	10 months
Unit-III	31.10.2011	31.1.2012	1.8.2012	06 months

11. It is observed from the above that against the schedule date of commercial operation of the units as per the revised date of synchronization of different units of the generating station as per approval dated 11.11.2009 of the Board of the petitioner company, there is time over run considering the actual COD of all the units. However, considering the first investment approval of the Board of the petitioner company on 8.12.2003, the total time taken for declaration of commercial operation of Unit-I is 94 months (approx), Unit-II is 95 months (approx) and Unit-III is 92 months (approx). Since the timeline for completion of projects as per the provisions of the 2009 Tariff Regulations is 52 months from the date of investment approval, the additional Return on Equity of 0.5% shall not be admissible in terms of the second proviso to Regulation 15(2) of the 2009 Tariff Regulations.

Major reasons for Time overrun

12. In order to examine the delay in the commissioning of the project, the Commission by it letter dated 27.9.2011 directed the petitioner, to submit information amongst others, on the following:

(a) Details in respect of time overrun of 55 months and the justification to the effect that time overrun is not attributable to the petitioner and its contractors;

(b) Associated cost overrun in view of the fact that almost all packages ordered by the petitioner were with escalation;

(c) Efforts/measures taken by the petitioner to avoid the time overrun;

(d) Details of LD recovered from contractors, if any. Has the same been adjusted in the capital cost as claimed by the petitioner? If LD as not been imposed on the contractors responsible for the delay, reasons thereof.

13. In response, the petitioner *vide* its affidavit dated 2.12.2011 has submitted clarification/ information as detailed hereunder:

(a) **Infrastructural constraints in India:** The Turbine Generator components for 660 MW units are much heavier and voluminous than the components of traditional sub critical 210/500 MW units. The major components of TG i. e. Generator Stator (weighing 330 MT), rotor and turbine casings were to be transported from Russia to Mumbai port via sea. Further, transportation of these components to site was through road links covering a distance of 1800 Km. approximately. The Indian roads/ bridges/ culverts have not been designed for such voluminous and heavy consignments. Particularly, the roads passing through Western Ghats has sharp curves. The 1st stator of Sipat 660 MW unit was stuck up in the Western Ghats for about 11 months (from May, 2007 to March, 2008). The culverts were strengthened to bear huge load. Transporting this heavy and over size equipment via Indian roads was arduous and time consuming as the condition of roads, bridges and culverts en route to site are not conducive for the transportation of these heavy and oversize equipments. At some places other constraints such as the over head transmission lines that restricted the movement of this equipment. Shut down were taken for these EHT lines coordinating multiple agencies. All this led to the delay in reaching main equipment to site on time. These delays in the transportation of equipment to site due to the infrastructural constraints hampered the progress of erection work and led to the rescheduling of the erection activities.

(b) **Technology Incubation**: The 660 MW units (which are based on super critical technology), the feed water piping and associated systems are subjected to very high pressure for which clearance are required as per Indian Boiler Regulation Act. Stipulation of IBR is not very clear w.r.t feed water piping, valves, HP heaters and other high pressure equipment for supercritical units. Further, the drawing and details submitted by M/s Power Machine were as per Russian standards and in Russian Language. Inordinate time was taken in obtaining IBR approval from Central Boiler Board (India)/ Chief Inspector of Boiler (Raipur, Chhattisgarh) office, as the unit was first supercritical unit in the country and the TG package contractor being foreign contractor (Power Machines, Russia) was not conversant with the various provisions of IBR stipulations and stage inspections / approvals required from IBR approved agencies pertaining to the design, manufacturing/fabrication of equipment and erection at site with regard to High Pressure Heaters and power cycle piping under Turbine package. It may be noted that approx. 7½ months (11.9.2008 to 28.4.2009) were taken in obtaining the clearance for manufacture of HP heaters from the date of 1st submission of design / engineering document to IBR by TES, Russia, the accredited agency employed by Power Machine to facilitate IBR approval for heaters. Even after manufacturing clearance, it took approx 1 year (28.4.2009 to 30.3.2010) in getting installation clearance from IBR / Chhattisgarh State Govt. which was beyond control of NTPC or Power Machine, Russia. This also affected adversely the completion of erection activities of heaters & connected piping systems. Further in case of super critical boiler, the HP joints are about 65 % more than standard 500 MW subcritical units. The shortage of qualified welders and T&P also constricted the progress of the Boiler erection. However, NTPC opened many ITIs and the utility of the same will be there in future projects. The Unit was synchronized on 18.2.2011 and the COD took place on 1.10.2011. Commercial operation of the unit could not take place earlier due to recurrent IPT seizure. Finally after carrying out certain modification on IPT, unit could be declared for commercial operation on 1.10.2011. The above problem of seizure occurred due to supercritical turbine being adopted in India (tropical country) first time.

(c) **Law & order problem at site**: The villagers around the project were demanding permanent employment and certain other concession resulting in agitation from August, 2007 to January, 2008, and during this period the work was totally stopped. Further, there was strike by local villagers of Sipat, Janji, Kaudia, Matiyari and other nearby village residents etc, for about 4 months between January, 2008 to April, 2008 demanding, among other things, employment in

NTPC. All these issues could be resolved after lot of persuasion and with kind intervention of Hon'ble Chief Minister, Chhattisgarh by end of April, 2008.

(d) **Contractual problems with M/s Power Machine**: The principal contractor M/s Power Machine from Russia expressed various problems with respect to supplies which were delayed due to severe cash flow problems on account of abnormal increase in price of raw material and other input cost in Russia and globally**.** It is noteworthy that from the period starting 2006 onwards there was unprecedented rise in commodity prices (steel, copper etc.). M/s Power Machines projected the cumulative loss towards above as approx. USD 200 million and indicated difficulty in timely execution of the project due to serious cash flow problem. Furthermore, TG & Auxiliary package was specific technology of Power Machine and being implemented for the 1st time in India, understandably delays occurred due to product development and validity establishment in ordering and supply of associated bought out equipments from sub vendors of Power Machines. NTPC tried to resolve amicably all these contractual issues with a series of meetings and through protracted discussions at all levels of Power Machine. In endeavor to complete the Project, NTPC approached other TG manufactures like BHEL for getting the work executed in time in the best interest of the plant. These efforts did not yield satisfactory results as indigenous manufactures do not have machine specific technical knowledge apart from factors like the commercial risk and threat of warranty lapse by M/S Power Machine. Moreover, there was constraint of transfer of Technical knowhow from OEM / Supplier to any Indian vendor due to proprietary issues. NTPC approached the Central Vigilance Commission for its guidance as a major part of investment was stranded and decaying. CVC vide OM dated 27.10.2009 informed NTPC that being an independent authority they cannot suggest a particular course of action in an individual case. The commission directed to NTPC management to take an objective, fair, just and transparent decision on the issue of amendment of contract conditions in line with company policy and best practices. As Power Machine was a manufacturer and designer of TG, involvement of Power Machine at the time of commissioning was of importance. Supervision of erection by any other TG manufacturer like BHEL was not possible .In the absence of any other alternative, the work was required to be executed by Power Machine only. Any delay in a commercial settlement would have led to cost and time over run. Further, the assurance by Power Machine to complete the project in time once the commercial settlement is made lead NTPC to pay higher money and reach a commercial settlement linking price increase with prevailing price indices in Russia and accordingly contract was amended in Oct.2009. Furthermore due to prolong slow down /idleness of various system there was natural degradation, damages & obsolescence etc and restoration work of the same also resulted into delay in commissioning of the units.

14. Based on the above submissions, the petitioner has submitted the time taken in the execution of 660 MW units (the generating station) should be viewed in light of adoption of better technology into the country within the prevailing infrastructure and system. It has also been submitted that the benefits of technology in the form of higher efficiency, lower environmental pollution and cheaper power from a pit-head generating station will flow to the beneficiaries in the long run and in this context, the time taken should not be measured with any past bench mark. Accordingly, the petitioner has submitted that it has acted in a sincere and bona fide manner to implement this project and in case there is any extra time taken in the commissioning of the project, the same is beyond the control of the petitioner.

15. The submissions of the petitioner have been considered. As per TEC of CEA, the commissioning schedule for Unit-I was 62 months from main plant order and subsequent units to be commissioned at an interval of one year from the date of commissioning of the last unit. However, the approval of the Board of the petitioner company dated 11.1.2009, envisaged that the first unit shall be synchronized within 48 months from the placement of main plant order and subsequent units at the interval of 10 months each thereafter. Accordingly, the contract for SG package was awarded on 6.4.2004 and TG package on 14.4.2004 and the unit-I was declared under commercial operation with effect from 1.10.2011. The petitioner has submitted that at the time of investment approval there was no bench mark on time line available for units based on super critical technology and the schedule prepared were on the basis of best efforts keeping in mind all the conditions being favorable for execution of the project. Considering the submissions of the petitioner and taking into account that this generating station is the first generation project based on super critical technology, we are of the considered view that the problems associated with execution of such technology, thereby leading to delay in the commercial operation of the project cannot be attributable to the petitioner.

Implication of Cost overrun due to Time Overrun

16. As stated, the petitioner was directed to submit the implication of cost overrun on the capital cost. The petitioner in its affidavit dated 6.12.2012 has submitted as under;

> *"NTPC Board has approved the completed project cost of ₹9456.12 crore for sipat STPS Stage-I in the Investment approval as accorded by NTPC Board in 252nd meeting held on 8.12.2003. The petitioner has claimed ₹8716.00 crore as capital cost as on COD of unit-III/ station which is well within the completed cost as approved by NTPC Board. Therefore there is no implication on project cost due to time overrun and the actual capital cost is well within the original estimate".*

17. We are not convinced with the argument of the petitioner that despite substantial time overrun and increase in the value of contract of Power Machine, Russia, there is no implication on the cost of the project. It appears that the original estimates of the project cost were on higher side. Besides this, on account of time overrun, the beneficiaries of the project have been deprived of the benefit of competitive price discovered for the plant packages of the project. However, considering the fact that this project is the first generation project based on super

critical technology in the country and the problems associated with the execution of such a technology has lead to delays/time overrun, we are of the view that the reasons for the said delay leading to cost overrun cannot be made attributable to the petitioner. As the overall project cost is comparable to the other sub critical technology projects and the bench mark price specified by the Commission, the actual expenditure as on date of commercial operation of the respective units of the generating station has been considered for the purpose of tariff.

Capital cost as on COD of Unit-I (1.10.2011)

18. The approved capital cost of ₹378869 lakh as on the COD of Unit-I is exclusive of un-discharged liability of ₹ 21332.72 lakh, but inclusive of IDC and FC of ₹73507 lakh, Loan FERV loss of ₹10352 lakh, Notional IDC of ₹10497 lakh, Short term FERV gain of ₹810.47 lakh as claimed by the petitioner. Therefore, the capital cost allowed after exclusion of IDC, FC and FERV is ₹306656.20 lakh (i.e.378869+21332.72-73507-10352-10497+810.47)]

Capital cost as on COD of Unit-II (25.5.2012)

19. The approved capital cost of ₹ 616892 lakh as on COD of Unit II, is exclusive of un-discharged liabilities of ₹40690.35 lakh, but inclusive of IDC & FC of ₹122440 lakh, loan FERV loss of ₹33945 lakh, Notional IDC of ₹11001 lakh and Short term FERV gain of ₹620.54 lakh as claimed by the petitioner. Therefore, the capital cost allowed after exclusion of IDC, FC and FERV is ₹490816.89 lakh (i.e. 616892 +40690.35 -122440-33945-11001+620.54)].

Capital cost as on COD of Unit-III /generating station (1.8.2012)

20. The approved capital cost of ₹823251.00 lakh as on COD of Unit-III is exclusive of un-discharged liabilities of ₹58693 lakh, but inclusive of IDC & FC of ₹167742 lakh, loan FERV loss of ₹44712 lakh, Notional IDC of ₹11060 lakh (as per data submitted vide affidavit dated 26.2.2013) and Short term FERV gain of ₹ 655.01 lakh, as claimed by the petitioner. Therefore, the capital cost allowed after exclusion of IDC, FC and FERV is ₹659085.01 lakh (i.e. 823251+58693 -167742-44712 -11060 +655.01)].

Projected Additional capital expenditure

21. The petitioner has claimed item-wise additional capital expenditure (net of liabilities) on actual basis for the years 2011-12 and 2012-13 and has also categorized the additions for the period from 1.10.2011 to 31.3.2012, 1.4.2012 to 24.5.2012 and from 25.5.2012 to 31.7.2012. However, the capital expenditure for the years 2012-13 (1.8.2012 to 31.3.2013) and 2013-14 has been claimed on projected basis. The details of additional capital expenditure claimed under the provisions of Regulation 9(1) of the 2009 Tariff Regulations are as under:

(₹in crore)

	Regulation	Actual Additional Capital Expenditure			Projected Additional Capital Expenditure	
		2011-12	2012-13			2013-14
		1.10.2011 to 31.3.2012	1.4.2012 to 24.5.2012	25.5.2012 to 31.7.2012	1.8.2012 to 31.3.2013	
DM water plant	9(1)(ii)	0.0089	0.0157	-	-	-
765 KV AC Switchyard		0.172		0.3125	-	-
Wagons		(-) 0.9542	-	-	-	-
SG+ESP		-	-	-	41.51	17.45
TG-PM& LMZ		-	-	-		18.00
MGR		4.1417	0.2609	0.1053	3.85	7.80
Wagon Tippler		-	-	-	-	15.00
CHP		-	-	-	-	1.55
AHP		-	-	-	1.54	8.25
Ash Dyke				(-) 0.0010	10.07	12.15
Ash water recirculation System		0.3833		0.0214	0.50	-
Cooling Towers		-	-	-	0.06	-
CW System		-	-	-	0.21	-
PT Plant & DM Plant		-	-	-	0.04	-
Fire Protection		-	-	-	1.16	0.41
A/C Ventilation		-	-	-	0.61	0.09
Simulator		0.2262	-	-	0.48	0.06
Switch gear Package		-	-	-	0.16	-
Lighting/Cabling		-	-	-	3.09	-
Construction Tools & Plants workshop lab. equipment.		-	-	-	8.58	10.72
Town ship		-	-	-	22.47	27.37
Off-Site civil works, Road & Drainage		-	-	-	9.85	9.18
Main Plant civil work		-	-	-	6.98	0.42
Raw water reservoir		-	1.0532	0.1998	1.56	0.81
Land & Infrastructure		12.8000		0.5054	5.94	6.00
MBOA		6.5952	1.0947	2.5365	-	-
Capital Spares	9(1)(iii)	14.020	1.7816	5.8549	12.65	35.00
Additional capital expenditure on cash basis		3739.13	520.61	953.48	13131	17026
Adjustment of Foreign Rate Variation related to Unit-I		21.0235	58.5378	-	-	-
Adjustment of Foreign Rate Variation related to Unit-I &		-	-	(-) 13.1846	-	-

Unit-II						
Discharge of previous period Liabilities	9(1)(i)	33.4794	88.8323	38.7171	208.86	192.56
Total		**91.8942**	**152.5762**	**35.0673**	**340.17**	**362.82**
Total (*₹in lakh*)		**9189.42**	**15257.62**	**3506.73**	**34017.00**	**36282.00**

22. The total additional capital expenditure claimed by the petitioner during the period 2011-14 is ₹98252.77 lakh. It is observed that the additional expenditure claimed by the petitioner as above is within the cut-off date of 31.3.2015 and is within the original scope of work. These works are under different stages of execution and are likely to be capitalized during the respective years. In view of this, the additional capital expenditure of ₹98252.77 lakh from COD of Unit-I (1.10.2011) to 31.3.2014 has been allowed. The actual additional capital expenditure is inclusive of adjustment of FERV loss of ₹2102.35 lakh for the period 1.10.2011 to 31.3.2012, and ₹5853.78 lakh for the period 1.4.2012 to 24.5.2012, FERV gain of ₹1318.46 lakh for the period from 25.5.2012 to 31.7.2012 relating to Unit-I and II as claimed by the petitioner. However, the petitioner is directed to submit the details of the FERV adjustment at the time of truing up to be undertaken in terms of Regulation 6 of the 2009 Tariff Regulations.

<u>IDC & FC</u>

23. The details of IDC & FC as claimed by the petitioner as on COD of the respective units of the generating station as per affidavits dated 6.12.2012 and 26.2.2013 are as under:

(₹in lakh)

	As on COD of Unit-I (1.10.2011)	As on COD of Unit-II (25.5.2012)	As on COD of Unit-III (1.8.2012)
Actual IDC & FC claimed	73507	122440	167742
Notional IDC claimed	10497	11001	11060
Total IDC claimed	**84004**	**133441**	**178802**

24. In terms of Regulation 7(1)(a) of 2009 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 Interest During Construction (IDC) by treating equity infusion above 30% as normative loan by the company to itself.

25. The actual amount of loan deployed based on the details submitted by the petitioner in Form 8 and Form 14 has been considered. Also, the Interest During Construction on actual loan has been allowed subject to the following:

(i) The petitioner has considered in its claim on the FIFO method of repayment for the loans taken from State bank of Patiala, State Bank of Patiala-Syndicate, IDBI Bank, Central Bank of India II, UCO bank I, SBI – IV, Syndicate bank II, Allahabad bank. However, Commission has considered the average re-payment method for these loans in the same line which has been followed by the commission in earlier period and upheld by ATE.

(ii) Some minor excess IDC claim has been found in few Bond series due to difference in applying the starting date. The commission has restricted interest on bonds based on the details submitted in Form 8.

26. For the purpose of quantifying the normative loan (i.e. excess of equity infusion over and above 30% of funds deployed) and allowing interest thereon, the following has been considered:

(i)The fund deployment done by the petitioner periodically till the COD of respective units (i.e. during construction period) has been sourced in the debt-equity ratio which was not uniform during the entire construction period. Therefore, 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 the drawl and repayment schedule (average method in place of FIFO) as claimed by the petitioner in Form 8.

(ii) 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.

(iii) 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 starting from quarter-3 of 2003-04 in which the debt infusion has started.

(iv) The claimed interest on normative loan for the year 2000-01 and 2001-02 has been allowed since the quarter wise cash expenditure is not available for this period. However from the quarter-1 of 2002-03 to quarter-2 of 2003-04, the interest on normative loan has been allowed as per the rate applicable to the quarter-4 of 2003-04 on actual loan. All the interest on normative loans, allowed is subject to truing-up.

27. Based on the above, IDC & FC computed and allowed is as under:

(₹ in lakh)

	As on COD of Unit-I (1.10.2011)	**As on COD of Unit-II (25.5.2012)**	**As on COD of Unit-III (1.8.2012)**
Total Interest During Construction (IDC) & Finance Charges (FC)	75795.80	127023.71	172886.28

28. The petitioner is directed to submit the following details, on affidavit, at the time of truing-up to be undertaken in terms of Regulation 6 of the 2009 Tariff Regulations.

(i) Reconciliation of year-wise IDC as mentioned in Page No. 202 of the petition and the Bank-wise/Bond-wise IDC as mentioned in Form-14 of the petition;

(ii) Computation of Finance Charges claimed against all loans (especially for k-Exim loan);

(iii) Revised Form-14 A consisting the cash expenditure up to the COD of the respective units along with reconciliation of cash expenditure with Gross Block & CWIP, on cash basis, as claimed in Form No. 9A & 9B.

Loan FERV

29. The loan FERV loss of ₹10352 lakh as on COD of Unit-I, ₹33945 lakh as on COD of Unit-II and ₹44712 lakh as on COD of Unit-III respectively has been allowed. This is subject to truing up.

Un-discharged liabilities

30. Un-discharged liabilities of ₹21332.72 lakh as on COD of Unit-I, ₹40690.35 lakh as on COD of Unit-II and ₹58693 lakh as on COD of Unit-III has been deducted from the capital cost, to work out the capital cost, on cash basis.

Short-Term FERV

31. The short term FERV gain of ₹810.48 lakh as on COD of Unit-I, ₹620.54 lakh as on COD of Unit-II and ₹655.01 lakh as on COD of Unit III respectively as claimed by the petitioner has been considered. The petitioner is directed to submit the computation of short-term FERV claim at the time of truing-up in terms of Regulation 6 of the 2009 Tariff Regulations.

32. Based on the above, the capital cost allowed for the purpose of tariff as on COD of respective units is as under:

(₹in lakh)

Sl. No.		As on 1.10.2011 (COD of Unit-I)	As on 25.5.2012 (COD of Unit-II)	As on 1.8.2012 (COD of Unit-III)
1	Capital cost allowed	306656.20	490816.89	659085.01
2	Add: IDC & FC allowed including the interest on normative loan	75795.80	127023.71	172886.28
3	Add: Loan FERV (Gain) /loss allowed	10352.00	33945.00	44712.00
4	Add: Short term FERV (Gain)/Loss	(810.48)	(620.54)	(655.01)
5	Less: Un-discharged liabilities included	21332.72	40690.35	58693
6	**Capital cost allowed on cash basis**	**370660.80**	**610474.71**	**817335.28**

33. Accordingly, the capital cost allowed for the purpose of tariff from COD of the respective units of the generating station upto 31.3.2014 is as under:

(₹in lakh)

	2011-12	**2012-13**			**2013-14**
	(1.10.2011 to 31.3.2012)	(1.4.2012 to 24.5.2012)	(25.8.2012 to 31.7.2012)	(1.8.2012 to 31.3.2013)	(1.4.2013 to 31.3.2014)
	Unit-I	**Unit-I**	**Unit-I & II**	**Unit-I, II & III**	**Unit-I, II & III**
Opening Capital cost	370660.80	379850.22	610474.71	817335.28	851352.28
Add: Additional Capital Expenditure	9189.42	15257.62	3506.73	34017.00	36282.00
Closing Capital Cost	**379850.22**	**395107.84**	**613981.44**	**851352.28**	**887634.28**

Debt-Equity Ratio

34. Regulation 12 of the 2009 Tariff Regulations provides that:

"(1) For a project declared under commercial operation on or after 1.4.2009, 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 where equity actually deployed is less than 30% of the capital cost, the actual equity shall be considered for determination of tariff.*

***Provided further** that the equity invested in foreign currency shall be designated in Indian rupees on the date of each investment*.

***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, provided such premium amount and internal resources are actually utilised for meeting the capital expenditure of the generating station or the transmission system.*

(2) In case of the generating station and the transmission system declared under commercial operation prior to 1.4.2009, debt-equity ratio allowed by the Commission for determination of tariff for the period ending 31.3.2009 shall be considered.

(3) Any expenditure incurred or projected to be incurred on or after 1.4.2009 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."

35. The normative debt-equity ratio of 70:30 has been considered for capital cost as on COD and the additional capital expenditure as allowed the purpose of tariff. The same is subject to truing-up in terms of Regulation 6 of the 2009 Tariff Regulations.

Return on Equity

36. Regulation 15 of the 2009 Tariff Regulations provides as under:

> *"(1) Return on equity shall be computed in rupee terms, on the equity base determined in accordance with regulation 12.*
>
> *(2) Return on equity shall be computed on pre-tax basis at the base rate of 15.5% to be grossed up as per clause (3) of this regulation.*
>
> *Provided that in case of projects commissioned on or after 1st April, 2009, an additional return of 0.5% shall be allowed if such projects are completed within the timeline specified in Appendix-II.*
>
> *Provided further that the additional return of 0.5% shall not be admissible if the project is not completed within the timeline specified above for reasons whatsoever.*
>
> *(3) The rate of return on equity shall be computed by grossing up the base rate with the Minimum Alternate/Corporate Income Tax Rate for the year 2008-09, as per the Income Tax Act, 1961, as applicable to the concerned generating company or the transmission licensee, as the case may be.*
>
> *(4) Rate of return on equity shall be rounded off to three decimal points and be computed as per the formula given below:*
>
> *Rate of pre-tax return on equity = Base rate / (1-t)*
>
> *Where t is the applicable tax rate in accordance with clause (3) of this regulation.*
>
> *(5) The generating company or the transmission licensee, as the case may be, shall recover the shortfall or refund the excess Annual Fixed Charge on account of Return on Equity due to change in applicable Minimum Alternate/Corporate Income Tax Rate as per the Income Tax Act, 1961 (as amended from time to time) of the respective financial year directly without making any application before the Commission:*
>
> *Provided further that Annual Fixed Charge with respect to the tax rate applicable to the generating company or the transmission licensee, as the case may be, in line with the provisions of the relevant Finance Acts of the respective year during the tariff period shall be trued up in accordance with Regulation 6 of these regulations."*

37. The petitioner has claimed Return on Equity of 22.944% [(15.50/ (1-32.445%)] per annum on the normative equity after considering the base rate of 15.50%, in line with the first proviso to clause (2) of Regulation 15 and the Tax rate of 32.445%. Accordingly, return on equity has been worked out @ 22.944% per annum on the normative equity after accounting for Additional capital expenditure.

(₹in lakh)

	2011-12	2012-13			2013-14
	1.10.2011 to 1.3.2012	**1.4.2012 to 24.5.2012**	**25.5.2012 to 31.7.2012**	**1.8.2012 to 31.3.2013**	
Normative Equity -Opening	111198.24	113955.07	183142.41	245200.58	255405.68
Add: Addition to equity on account of additional capitalization	2756.83	4577.29	1052.02	10205.10	10884.60
Normative Equity - Closing	113955.07	118532.35	184194.43	255405.68	266290.28
Average Equity	112576.65	116243.71	183668.42	250303.13	260847.98
Return on Equity (Base Rate)	15.500%	15.500%	15.500%	15.500%	15.500%
Tax Rate	32.445%	32.445%	32.445%	32.445%	32.445%
Rate of Return on Equity (Pre-Tax)	22.944%	22.944%	22.944%	22.944%	22.944%
Return on Equity @ 22.944%	**25829.59**	**26670.96**	**42140.88**	**57429.55**	**59848.96**

Interest on loan

38. Regulation 16 of the 2009 Tariff Regulations provides as under*:*

"(1) The loans arrived at in the manner indicated in regulation 12 shall be considered as gross normative loan for calculation of interest on loan.

(2) The normative loan outstanding as on 1.4.2009 shall be worked out by deducting the cumulative repayment as admitted by the Commission up to 31.3.2009 from the gross normative loan.

3) The repayment for the year of the tariff period 2009-14 shall be deemed to be equal to the depreciation allowed for that year.

(4) Notwithstanding any moratorium period availed by the generating company or the 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 annual depreciation allowed.

(5) The rate of interest shall be the weighted average rate of interest calculated on the basis of the actual loan portfolio at the beginning of each year applicable to the project.

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 re-financing.

(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 beneficiary or the transmission customers 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."

39. The interest on loan has been worked out as mentioned below:

(a) The gross loan computed as per the debt equity ratio as on respective COD of the units works out to ₹259462.56 lakh as on 1.10.2011, ₹427332.30 lakh as on 25.5.2012 and ₹572134.70 lakh as on 1.8.2012.

(b) Net loan opening as on 1.10.2011 i.e. as on COD of Unit-I is same as the gross loan, cumulative repayment of loan up to previous year/period being nil.

(c) Additional capital expenditure has been capitalized on the basis of debt equity ratio determined in accordance with Regulation 12.

(d) Depreciation allowed for the period under consideration has been considered as repayment.

(e) Average net loan is calculated as average of opening and closing.

(f) Weighted average rate of interest has been calculated as shown below:

(i) The rate of interest considered in calculation in case of all loans is on annual rest basis.

(ii) Actual drawls up to COD of the generating station, as furnished by the petitioner, has been considered.

(iii) Actual rate of interest corresponding to each loans as furnished by the petitioner has been considered as the actual rate of interest.

(iv) For the purpose of working out the weighted average rate of interest, average method of repayment has been considered.

40. Interest on normative loan is worked out as under:

(₹in lakh)

	2011-12	2012-13			2013-14
	1.10.2011 to 31.3.2012	**1.4.2012 to 24.5.2012**	**25.5.2012 to 31.7.2012**	**1.8.2012 to 31.3.2013**	
Gross Opening Loan	259462.56	265895.15	427332.30	572134.70	595946.60
Cumulative Repayment of Loan	-	9572.59	12488.61	18273.57	46495.10
Net Loan Opening	259462.56	256322.56	414843.68	553861.13	549451.50
Addition of loan due to additional capitalization	6432.59	10680.33	2454.71	23811.90	25397.40
Repayment of loan (Normative)	9572.59	2916.02	5784.96	28221.53	44176.19
Net Loan Closing	256322.56	264086.88	411513.44	549451.50	530672.71
Average Loan	257892.56	260204.72	413178.56	551656.31	540062.11
Weighted Average Rate of Interest on Loan	7.6557%	7.6923%	7.6323%	7.6338%	7.6799%
Interest on Loan	**19743.55**	**20015.77**	**31535.14**	**42112.17**	**41476.30**

Depreciation

41. Regulation 17 of the 2009 Tariff Regulations provides as under:

"(1) The value base for the purpose of depreciation shall be the capital cost of the asset admitted by the Commission.

(2) 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 stations, the salvage value shall be as provided in the agreement signed by the developers with the State Government for creation of the site.

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

(3) 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.

(4) Depreciation shall be calculated annually based on Straight Line Method and at rates specified in Appendix-III 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 date of commercial operation shall be spread over the balance useful life of the assets.

(5) In case of the existing projects, the balance depreciable value as on 1.4.2009 shall be worked out by deducting the cumulative depreciation including Advance against Depreciation as admitted by the Commission upto 31.3.2009 from the gross depreciable value of the assets.

(6) 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."

42. The petitioner in Form-11 has calculated the weighted average rate of depreciation of 5.1019% for the period from 1.10.2011 to 31.3.2012, 5.0868% from 1.4.2012 to 24.5.2012, 5.0719% from 25.5.2012 to 31.7.2012 and 5.0807% from 1.8.2012 to 31.3.2014. These rates have been considered. The free hold land included in the gross block on cash basis is ₹2138 lakh as on COD of Unit-I, ₹3455.01 lakh (gross ₹3503 lakh less liability of ₹47.99 lakh) as on COD of Unit-II is and ₹3505.01 lakh (gross ₹3553 lakh less liability of ₹47.99 lakh) as on COD of Unit-III. This land cost, on cash basis, has been excluded from the capital cost while computing the depreciable value of the asset. Accordingly, depreciation has been calculated as under:

(₹in lakh)

	2011-12	**2012-13**			**2013-14**
	1.10.2011 to 31.3.2012	**1.4.2012 to 24.5.2012**	**1.10.2011 to 31.3.2012**	**1.4.2012 to 24.5.2012**	
Opening capital cost	370660.80	379850.22	610474.71	817335.28	851352.28
Add: Additional capital expenditure	9189.42	15257.62	3506.73	34017.00	36282.00
Closing capital cost	379850.22	395107.84	613981.44	851352.28	887634.28
Average capital cost	375255.51	387479.03	612228.07	834343.78	869493.28
Rate of depreciation	5.1019%	5.0868%	5.0719%	5.0807%	5.0807%

Depreciation for the period	9572.59	2916.02	5784.96	28221.53	44176.19
Depreciation (*annualised*)	**19145.18**	**19710.14**	**31051.62**	**42390.36**	**44176.19**
Cumulative depreciation at the end of the period	9572.59	12488.61	18273.57	46495.10	90671.29

O & M Expenses

43. Clause (a) of Regulation 19 of Regulation of the 2009 Tariff Regulations provide the following O&M expense norms for Coal based and lignite fired generating stations as under:

(₹ in lakh/MW)

	2009-10	**2010-11**	**2011-12**	**2012-13**	**2013-14**
O&M expenses for 660 MW units	13.08	13.82	13.82	13.82	14.62

44. The O&M expenses claimed by the petitioner, based on above norms, are as under:

(₹ in lakh)

	2011-12	**2012-13**			**2013-14**
	1.10.2011 to 31.3.2012	**1.4.2012 to 24.5.2012**	**1.10.2011 to 31.3.2012**	**1.4.2012 to 24.5.2012**	
O&M expenses	8632.80	9121.20	18242.40	26451.48	27982.68

45. The O&M expenses claimed by the petitioner based on above norms are in order and has been allowed.

Normative Annual Plant Availability Factor (NAPAF)

46**.** The NAPAF of the generating station is considered as 85% for the period from the date of commercial operation till 31.3.2014.

Interest on Working Capital

47. Regulation 18(1) (a) of the 2009 Tariff Regulations provides that the working capital for coal based generating stations shall cover:

(i) Cost of coal for 1.5 months for pit-head generating stations and two months for non-pithead generating stations, for generation corresponding to the normative annual plant availability factor;

(ii) Cost of secondary fuel oil for two months for generation corresponding to the normative annual plant availability factor, and in case of use of more than one liquid fuel oil, cost of fuel oil stock for the main secondary fuel oil;

(iii) Maintenance spares @ 20% of operation and maintenance expenses specified in regulation 19.

(iv) Receivables equivalent to two months of capacity charge and energy charge for sale of electricity calculated on normative plant availability factor; and

(v) O&M expenses for one month.

48. Clause (3) of Regulation 18 of the 2009 Tariff Regulations as amended on 21.6.2011 provides as under:

> *"Rate of interest on working capital shall be on normative basis and shall be considered as follows:*
>
> *(i) SBI short-term Prime Lending Rate as on 01.04.2009 or on 1st April of the year in which the generating station or unit thereof or the transmission system, as the case may be, is declared under commercial operation, whichever is later, for the unit or station whose date of commercial operation falls on or before 30.06.2010.*
>
> *(ii) SBI Base Rate plus 350 basis points as on 01.07.2010 or as on 1st April of the year in which the generating station or a unit thereof or the transmission system, as the case may be, is declared under commercial operation, whichever is later, for the units or station whose date of commercial operation lies between the period 01.07.2010 to 31.03.2014.*
>
> *Provided that in cases where tariff has already been determined on the date of issue of this notification, the above provisions shall be given effect to at the time of truing up*.

49. Working capital has been calculated considering the following elements:

Fuel Component and Energy charges in working capital

50. The petitioner has claimed fuel component in working capital based on price and GCV of coal and oil for the preceding three months prior to the date of commercial operation of all the three units separately (For Unit-I: July,2011 to September, 2011, Unit-II: February, 2012 to April, 2012 and Unit-III: May, 2012 to July 2012) as given below :-

(₹ in lakh)

	2011-12	2012-13			2013-14
	1.10.2011 to 31.3.2012	**1.4.2012 to 24.5.2012**	**1.10.2011 to 31.3.2012**	**1.4.2012 to 24.5.2012**	
Cost of coal for 1.5 months	6051.34	6034.81	10990.02	23772.36	23772.36
Cost of Secondary Fuel oil for 2 months	317.0	316.0	785.0	1284.0	1284.0

51. Based on the norms specified by the Commission, the cost for fuel component in working capital, based on price and GCV of coal and oil for the preceding three months prior to the date of commercial operation of all the three units has been worked out and allowed as under:

(₹ in lakh)

	2011-12	2012-13			2013-14
	1.10.2011 to 31.3.2012	**1.4.2012 to 24.5.2012**	**1.10.2011 to 31.3.2012**	**1.4.2012 to 24.5.2012**	
Cost of coal for 1.5 months	5974.48	5958.15	10850.38	23470.41	23470.41
Cost of Secondary Fuel oil for 2 months	316.78	315.91	785.18	1284.07	1284.07

Maintenance Spares in working capital

52. The petitioner has claimed the following maintenance spares in the working capital:

(₹in lakh)

	2011-12	2012-13			2013-14
	1.10.2011 to 31.3.2012	1.4.2012 to 24.5.2012	1.10.2011 to 31.3.2012	1.4.2012 to 24.5.2012	
Cost of maintenance spares	1727.0	1824.0	3648.0	5290.0	5597.0

53. The 2009 Tariff Regulations provide for maintenance spares @ 20% of the operation and maintenance expenses as specified in Regulation 19. Accordingly, the maintenance spares @ 20% is worked out as under and the same has been considered for the purpose of tariff:

(₹in lakh)

	2011-12	2012-13			2013-14
	1.10.2011 to 31.3.2012	1.4.2012 to 24.5.2012	1.10.2011 to 31.3.2012	1.4.2012 to 24.5.2012	
Cost of maintenance spares	1726.56	1824.24	3648.48	5290.29	5596.54

Receivables

54**.** Receivables have been worked out on the basis of two months of fixed and energy charges (based on primary fuel only) on normative plant availability factors as under:

(₹ in lakh)

	2011-12	2012-13			2013-14
	1.10.2011 to 31.3.2012	1.4.2012 to 24.5.2012	1.10.2011 to 31.3.2012	1.4.2012 to 24.5.2012	
Variable Charges-2 months	7965.97	7944.20	14467.18	31293.89	31293.89
Fixed Charges-2 months	13126.12	13495.60	22489.82	31486.15	32365.80
Total	**21092.09**	**21439.80**	**36957.00**	**62780.04**	**63659.69**

O&M expenses for 1 month

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

(₹ in lakh)

	2011-12	2012-13			2013-14
	1.10.2011 to 31.3.2012	1.4.2012 to 24.5.2012	1.10.2011 to 31.3.2012	1.4.2012 to 24.5.2012	
O & M for 1 month	719	760	1520	2204	2332

56. For the purpose of computation of interest on working loan, the O&M expenses for one month as per norms has been considered as under:

(₹ in lakh)

	2011-12	2012-13			2013-14
	1.10.2011 to 31.3.2012	1.4.2012 to 24.5.2012	1.10.2011 to 31.3.2012	1.4.2012 to 24.5.2012	
O & M for 1 month	719.40	760.10	1520.20	2204.29	2331.89

57. Accordingly, interest on working capital has been calculated based on rate of interest of 11.75% (SBI Base Rate of 8.25% plus 350 basis points, as on 1.4.2011) for the period from 1.10.2011 to 24.5.2012 and subsequently at the rate of interest of 13.50% (SBI Base Rate of 10% plus 350 basis points, as on 1.4.2012). The necessary details in support of calculation of interest on working capital are as under:

(₹ in lakh)

	2011-12	2012-13			2013-14
	1.10.2011 to 31.3.2012	1.4.2012 to 24.5.2012	1.10.2011 to 31.3.2012	1.4.2012 to 24.5.2012	
Cost of coal for 1.5 months	5974.48	5958.15	10850.38	23470.41	23470.41
Cost of secondary fuel oil for 2 months	316.78	315.91	785.18	1284.07	1284.07
O&M Expenses	719.40	760.10	1520.20	2204.29	2331.89
Maintenance spares	1726.56	1824.24	3648.48	5290.30	5596.54
Receivables	21092.09	21439.80	36957.00	62780.04	21092.09
Total working capital	**29829.31**	**30298.21**	**53761.24**	**95029.11**	**96342.60**
Rate of interest	11.7500%	11.7500%	13.5000%	13.5000%	13.5000%
Interest on working capital	**3504.94**	**3560.04**	**7257.77**	**12828.93**	**13006.25**

Operational Norms

58. The following norms of operation for 500 MW units and above have been considered by the petitioner for the purpose of tariff:

Target Availability	85%
Heat Rate (kcal/kwh)	2380.59
Auxiliary power consumption	6.5%
Specific Oil Consumption (ml/kwh)	1.0

59. The operational norms considered by the petitioner are in order except for the Station Heat-Rate. As per the 2009 Tariff Regulations, the ceiling norm at a steam pressure of 247kg/cm^2 and super heat temperature/reheat temperature of 537/565 degree centigrade, the Gross Station Heat Rate works out to 2380.59 kcal/kwh. The petitioner has considered the same. However, with the guaranteed turbine heat-rate of 1904 kcal/kwh and guaranteed boiler efficiency of 86.27% as per OEM, the Gross Station Heat Rate works out to 2350.48 kcal/kwh.

Hence for determination of tariff, Heat Rate of 2350.48 kcal/kwh has been considered for the purpose of determination of tariff. Accordingly, the operational norms considered by the petitioner, except for the Gross Station Heat Rate, as above have been considered for the determination of tariff.

Secondary Fuel Oil Consumption

60. Clause (1) of Regulation 20 of the 2009 Tariff Regulations provides as under:

> *"20. Expenses on secondary fuel oil consumption for coal-based and lignite-fired generating station. (1) Expenses on secondary fuel oil in Rupees shall be computed corresponding to normative secondary fuel oil consumption (SFC) specified in clause (iii) of regulation 26, in accordance with the following formula:*
>
> *SFC – Normative Specific Fuel Oil consumption in ml/kWh*
> *= SFC x LPSFi x NAPAF x 24 x NDY x IC x 10*
>
> *Where,*
>
> *LPSFi – Weighted Average Landed Price of Secondary Fuel in ₹/ml considered initially.*
> *NAPAF – Normative Annual Plant Availability Factor in percentage*
>
> *NDY – Number of days in a year*
>
> *IC - Installed Capacity in MW.*

61. The petitioner has claimed cost on Secondary fuel oil cost based on price and GCV of coal and oil for the preceding three months prior to the date of commercial operation of all the three units separately (For Unit-I: July, 2011 to September, 2011, Unit-II: February, 2012 to April, 2012 and Unit-III: May, 2012 to July, 2012) as given below:

(*₹in lakh)*

	2011-12	2012-13			2013-14
	1.10.2011 to 31.3.2012	1.4.2012 to 24.5.2012	1.10.2011 to 31.3.2012	1.4.2012 to 24.5.2012	
Cost on Secondary Fuel Oil Consumption	1901	1895	4711	7704	7704

62. The cost of secondary fuel oil as worked out below has been allowed for the purpose of tariff.

(*₹in lakh)*

	2011-12	2012-13			2013-14
	1.10.2011 to 31.3.2012	1.4.2012 to 24.5.2012	1.10.2011 to 31.3.2012	1.4.2012 to 24.5.2012	
Cost on Secondary Fuel Oil Consumption	1900.68	1895.49	4711.09	7704.43	7704.43

63. The cost of secondary fuel oil arrived at as above shall be subject to fuel price adjustment at the end of each year of tariff period in terms of the proviso to Regulation 20(2) as per the following formula*:*

SFC x NAPAF x 24 x NDY x IC x 10 x (LPSFy – LPSFi)

Where,

LPSFy = The weighted average landed price of secondary fuel oil for the year in ₹/ml

Annual Fixed charges for 2009-14

64. The annual fixed charges for the period 20011-14 in respect of the the generating station is summarized as under:

(***₹in lakh)***

	2011-12	2012-13			2013-14
	1.10.2011 to 31.3.2012	**1.4.2012 to 24.5.2012**	**1.10.2011 to 31.3.2012**	**1.4.2012 to 24.5.2012**	
Depreciation	19145.18	19710.14	31051.62	42390.36	44176.19
Interest on Loan	19743.55	20015.77	31535.14	42112.17	41476.30
Return on Equity	25829.59	26670.96	42140.88	57429.55	59848.96
Interest on Working Capital	3504.94	3560.04	7257.77	12828.93	13006.25
O&M Expenses	8632.80	9121.20	18242.40	26451.48	27982.68
Cost of secondary fuel oil	1900.68	1895.49	4711.09	7704.43	7704.43
Total	**78756.75**	**80973.60**	**134938.91**	**188916.92**	**194194.82**

Note: *(i) All figures are on annualized basis*
(ii) All the figures under each head have been rounded. (ii) The figure in total column in each year is also rounded. Because of rounding of each figure the total may not be arithmetic sum of individual items in columns.

Energy Charge Rate (ECR)

65. Sub-clause (b) of clause (6) of Regulation 21 of the 2009 Tariff Regulations provides as under:

"Energy charge rate (ECR) in Rupees per kWh on ex-power plant basis shall be determined to three decimal places in accordance with the following formulae:

ECR = GHR x LPPF x 100 / {CVPF X (100-AUX)}

Where,

AUX = Normative auxiliary energy consumption in percentage.

CVPF = Gross calorific value of primary fuel as fired, in kCal per kg, per litre or per standard cubic metre, as applicable.

ECR = Energy charge rate, in Rupees per kWh sent out.

GHR = Gross station heat rate, in kCal per kWh.

LPPF = Weighted average landed price of primary fuel, in Rupees per kg, per litre or per standard cubic metre, as applicable, during the month.

66. The petitioner has claimed Energy Charge Rate (ECR) of 105.10 paisa/kwh, 95.7 paisa/kwh and 137.96 paisa/kwh respectively for Unit-I, Unit-I & II and Unit-III /generating station respectively based on the weighted average price, GCV of fuel procured and burnt for the preceding three months of COD of each unit separately (For Unit-I: July, 2011 to September 2011, Unit-II: February, 2012 to April, 2012 and Unit-III : May,2012 to July, 2012) and operational norms based on the 2009 Tariff Regulations. Hence, the ECR of 136.211 paise/kwh is considered for the purpose of tariff. The relevant calculations are as under:

Description		**2011-12**	**2012-13**			**2013-14**
	Unit	**1.10.2011 to 31.3.2012**	**1.4.2012 to 24.5.2012**	**1.10.2011 to 31.3.2012**	**1.4.2012 to 24.5.2012**	
Capacity	MW	660	660	2X660	3X660	3X660
Gross Station Heat Rate	Kcal/kWh	2350.48	2350.48	2350.48	2350.48	2350.48
Aux. Energy Consumption	%	6.50	6.50	6.50	6.50	6.50
Weighted average GCV of oil	Kcal/lit	10153.0	10153.0	10185.0	10145.0	10145.0
Weighted average GCV of coal	Kcal/kg	3405.49	3405.49	3481.33	3489.67	3489.67
Weighted average price of oil	Rs/Kl	38570.38	38570.38	47931.91	52257.96	52257.96
Weighted average price of coal	Rs/MT	1411.36	1411.36	1313.75	1899.02	1899.02
Rate of energy charge ex-bus	Paise/kWh	**103.734**	**103.734**	**94.455**	**136.211**	**136.211**

67. The petitioner shall be entitled to compute and recover the annual fixed charges and energy charges in accordance with Regulation 21 of the 2009 Tariff Regulations

Application fee and the publication expenses

68. The petitioner has sought approval for the reimbursement of fees deposited for the years 2011-12 to 2013-14 towards filing the petition and for towards expenses incurred for publication of notices in connection with the petition. The petitioner by its affidavit dated 9.11.2011 has submitted that an expenditure of ₹405368/- has been incurred by it for publication of notice in the newspapers.

69. In terms of Regulation 42 of the 2009 Tariff Regulations and based on our decision contained in order dated 11.1.2010 in Petition No.109/2009, the expenses towards filing of tariff application and the expenses incurred on publication of notices are to be reimbursed.

Accordingly, the expenses incurred by the petitioner for petition filing fees for the years 2011-12 to 2013-14 and for publication of notices in connection with the present petition shall be directly recovered from the beneficiaries, on *pro rata* basis.

70. In addition to the above, the petitioner is entitled to recover other taxes etc., levied by statutory authorities in accordance with the 2009 Tariff Regulations, as applicable.

71. The petitioner is already billing the respondents as per provisional tariff granted by Commission's orders dated 3.11.2011, 18.7.2012 and 6.9.2012. The provisional tariff allowed shall be adjusted in terms of the proviso to Regulation 5(3) of the 2009 Tariff Regulations.

72. This order disposes of Petition No.28/GT/2011.

Sd/-	*Sd/-*
[M.Deena Dayalan]	**[V. S. Verma]**
Member	**Member**