CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI

Petition No. 197/GT/2013

Coram:
Shri Gireesh B. Pradhan, Chairperson
Shri A.K.Singhal, Member

Date of Hearing: 29.05.2014
Date of Order: 10.07.2015

In the matter of

Approval of tariff for Circulating Fluidized Bed Combustion (CFBC) Technology based Barsingsar Thermal Power Plant (2 x 125 MW) of Neyveli Lignite Corporation Ltd for the period from the date of commercial operation of Unit-I and II till 31.3.2014.

And

In the matter of

Neyveli Lignite Corporation,
Neyveli House,
135, EVR Periyar Road, Kilpauk,
Chennai -600 010 **…Petitioner**

Vs

1. Jodhpur Vidyut Vitran Nigam Ltd,
New Power House,
Heavy Industrial Area,
Jodhpur, Rajasthan

2. Jaipur Vidyut Vitran Nigam Ltd.
VidyutBhawan, Janpath,
Jaipur, Rajasthan – 302 005

3. Ajmer Vidyut Vitran Nigam Ltd.
Old Power House Hathi Bhata,
Jaipur Road,
Ajmer, Rajasthan **…Respondents**

Parties present:

For Petitioner: Shri M.G Ramachandran, Advocate, NLC
Ms. Anushree Bardhan, Advocate, NLC
Shri K. Nambirajan, NLC
Shri N.Murthy, NLC

ORDER

This petition has been filed by the petitioner, Neyveli Lignite Corporation Ltd (NLC) for approval of tariff of Circulating Fluidized Bed Combustion (CFBC) Technology based Barsingsar Thermal Power Plant (2 x 125 MW) (hereinafter referred to as "the generating station") for the period from the commercial date of operation of Units-I and II till 31.3.2014 based on the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2009 (hereinafter referred as "the 2009 Tariff Regulations").

2. The generating station with an installed capacity of 250 MW comprises of two units of 125 MW each with Circulating Fluidised Bed Combustion lignite fired boilers feeding to Turbines. The allocation of power to the respondents is based on the Energy department Govt of Rajasthan's letter dated 29.9.2011.

3. Petition No.171/2009 was filed by the petitioner for approval of tariff of the generating station from the anticipated date of commercial operation of the Units during the year 2011 based on the 2009 Tariff Regulations and the Commission by order dated 20.6.2011 disposed of the same as under:

> *"8. Accordingly, this petition is disposed of with a direction that the petitioner is at liberty to approach the Commission with a fresh petition for approval of tariff for the generating station in accordance with the provisions of the 2009 regulations, taking into account the revised capital expenditure on account rescheduling of the units of the generating station, which would be considered in accordance with law. We also direct that the petition shall be posted in the web-site of the petitioner and copy be served on the respondents/objectors, who are at liberty to file their reply/objections thereafter."*

4. Since Units I and II of the generating station were commissioned on 20.1.2012 and 29.12.2011 respectively, the petitioner, in terms of the liberty granted by Commission's order dated 20.6.2011 has filed this petition for fixation of tariff for Unit-II of the generating station for the period from 29.12.2011 to 19.1.2012 and for Units I & II for the period from 20.1.2012 to 31.3.2014 in accordance with the provisions of the 2009 Tariff Regulations.

5. The Commission by order dated 4.10.2012 has granted provisional tariff considering the opening capital cost of ₹87134.00 lakh as on 29.12.2011, subject to adjustment after determination of final tariff of the generating station.

6. The capital cost (as per affidavit dated 13.6.2014) and the annual fixed charges claimed by the petitioner for the period from 29.12.2011 to 31.3.2014 is as under:

Capital Cost

(₹in lakh)

	Unit-II (as on 29.12.2011)	**Unit-I (as on 20.1.2012)**
Capital Cost as per RCE-II	93404.00	186871.00
Less: IDC on actual loan included in above	15117.00	30488.00
Less : Liabilities included	6270.00	12011.00
Add: IDC including interest. on Normative loan	16892.79	35629.52
Opening Capital Cost	**88919.79**	**180001.50**
Add: Additional Capital Expenditure.	0.00	101.00
Closing Capital cost	**88919.79**	**180102.50**

Annual Fixed Charges

(₹in lakh)

	2011-12		**2012-13**	**2013-14**
	29.12.2011 to 19.1.2012	**20.1.2012 to 31.3.2013**		
Return on Equity	6120	12393	12810	13224
Interest on Loan	6227	12460	12156	11645
Depreciation	7523	15206	14309	9560
Interest on Working Capital	802	1611	1615	1540
O&M Expenses	3353	6705	7090	7495
Secondary fuel oil cost	606	1212	1209	1209
Compensation allowance	-	-	-	-
Special allowance	-	-	-	-
Total Annual Fixed Charges	**24631**	**49589**	**49189**	**44673**

7. Reply to the petition has been filed by the respondents. In addition to this, separate comments on the petition have been filed by Shri Shanti Prasad and Shri G.L.Sharma, Consumers from Jaipur. The petitioner has filed rejoinder to the replies filed by the respondents and also the response to the comments filed by the said consumers.

Commissioning Schedule

8. The petitioner has submitted that the project was sanctioned by the Govt of India on 15.12.2004 for an approved cost of ₹1114.18 crore with the scheduled date of commercial

operation of Unit-I in December, 2008 and Unit-II in June, 2009. The details of the scheduled and the actual dates of commercial operation of the units of the generating station as per the Investment Approval is summarised as under:

Unit	Schedule COD as per investment Approval dated 15.12.2004	Actual COD	Time overrun (months)
I	15.12.2008	20.1.2012	37
II	15.6.2009	29.12.2011	30.5

9. It is observed from the above that as against the schedule COD as per investment approval, there is a time overrun of about 37 months for Unit-I and 30.5 months for Unit-II of the generating station.

Admissibility of Additional Return on Equity

10. The actual COD of the Unit-I and Unit-II is 20.1.2012 and 29.12.2011 respectively. Accordingly, Unit-II has been declared under commercial operation after 84.5 months and Unit-I has declared under commercial operation after 85 months from the date of LOA (15.12.2004). In order to avail additional ROE of 0.5%, the time line as specified in the 2009 Tariff Regulations for completion of different units of a green filed project for 125 MW unit size (CFBC) is 33 months for the first Unit and subsequent Units at an interval of 4 months from the date of Investment Approval. Since the project has not been completed within the time line specified by the Commission, these units of the generating station are not entitled to additional return on equity of 0.5% in terms of the 2009 Tariff Regulations.

Time Overrun

11. As regards time overrun, the petitioner vide affidavit dated 16.3.2012 while justifying the reasons for time overrun has submitted that the 125 MW CFBC boilers are being installed for the first time and the Circulating Fluidised Bed Combustion (CFBC) boiler are different from the conventional pulverized fuel boiler which are used in other power plants. The petitioner has submitted that the delay of 36 months for Unit-I and 30 months for Unit-II are mainly on account of:

(i) Increased work quantum specific to CFBC in respect of tonnage erection (about 2 times), site welding joints (about 3 times), refractory leading to more time consumption for their erection and operation works as can be seen from the comparative table below:

	CFBC Boiler	**Conventional Boilers**
Erection Quantity	30000 tons	16000 tons
Site Welding Joints	56000 joints	19500 joints
Refractory Application	4720 tons	50 tons

(ii) Delayed execution of works by the Main Plant Package contractor M/s BHEL in the field of engineering, finalization of civil and erection sub-contractors for boiler island and power house, supply of equipments and slow progress of erection works.

(iii) Delay after synchronization (Unit-I synchronized on 27.10.2009 and Unit-II synchronized on 5.6.2010) as a result of frequent and long shutdown of the units due to various reasons such as repeated cyclone chokes, repeated failure of fluidized bed heat exchanger tubes, differential temperature problem in the turbine top and bottom casings.

(iv) Complete replacement of bunker liners with stainless steel material.

12. In addition to the above, the problems faced and the reasons for time overrun as submitted by the petitioner in Annexure-I of the said affidavit dated 16.3.2012 are as under:

(i) Government of India had sanctioned the Barsingsar Mine cum Thermal Power Project on 15.12.2004 with the following stipulations:

	Time stipulation	**Scheduled date**
GOI Sanction	Zero date	15.12.2004
Unit-I Synchronizing	45 months	14.9.2008
Unit-II Synchronizing	51 months	14.3.2009
Unit-I COD	48 months	14.12.2008
Unit-II COD	54 months	14.6.2009

(ii) However due to various delays in design & engineering, manufacture & supplies, erection of equipments from by M/s BHEL units, there had been delay in commissioning

of both the units and after liquidating the issues, the units could be commissioned belatedly as shown under:

		Occurrence date	Quantified delay
	Unit-I Synchronizing		
	i. With oil firing	27.10.2009	14 months
	ii. With lignite firing	29.12.2009	16 months
	Unit-II Synchronizing		
	i. With oil firing	5.6.2010	15 months
	ii. With lignite firing	25.8.2010	18 months
	Unit-I COD	20.1.2012	37 months
	Unit-II COD	29.12.2011	31 months

13. The petitioner has submitted that a delay of 16 to 18 months had occurred for synchronizing the units with the designated fuel (lignite) due to unorganized supplies from various manufacturing units of M/s BHEL on the supply fronts and due to non-availability of skilled man power as well as extreme climatic conditions prevailing in this region on the erection fronts. It has also submitted that even after synchronising the units with the designated fuel (lignite), the performance of the units were far below expectations as both the units had suffered setbacks in reaching the rated capacities of the machine. The outages of the units on account of various constraints have been listed by the petitioner as detailed under:

Unit-I

From	To	Days	Reasons for major outages in Unit-I
10.1.2010	27.1.2010	18	Turbine HP Casing T/B DT high, Insulation changed to Spray type Min wool with sodium silicate
30.1.2010	17.3.2010	63	Right side cyclone Choke
18.3.2010	30.3.2010	13	Left Side cyclone choke
31.3.2010	18.4.2010	19	Left Side cyclone choke
20.4.2010	26.4.2010	7	Left Side cyclone choke
7.8.2010	8.10.2010	65	Lignite Bunkers SS Liners Replacement
13.10.2010	1.11.2010	19	Right Side cyclone choke
14.4.2011	17.2.2011	35	FBHE Evaporator Coils Rifled Tubes Failure
1.3.2011	17.4.2011	48	FBHE Evaporator Coils Rifled Tubes Failure
26.4.2011	29.7.2011	95	FBHE Evaporator Rifled Tubes 282 Tubes (47x6) cutting, inspection, welding, hydro testing, HP Turbine angle rings modification, FBHE/Seal pot partition water walls Riser Tubes modification, (4 nos each left and right), Emergency Boiler Feed Pump Repair etc.

22.9.2011	19.10.2011	27	EBFP restoration (after repair from Sultzer, Caterpillar, Enpro) & Its ARV, Engine servicing etc done. Minor refractory repairs at SUB1 mouth, SA Duct inlet to combustor, combustor to cyclone inlet expansion joint insulation blankets packing done.
10.12.2011	28.12.2011		RT modification (1 No each side RT 63 & 76) of the SPWW Manhole header, header's reorientation (for changing the RT stub position from side to the top) carried out. (Both sides) SPWW Panel SP1 to SH4 header cut, spool pieces added and reorientation done.
30.12.2011	31.12.2011		Initial operation was completed and unit was shut down to attend front MS line thermocouple right leak Thermowell broken inside. Same was replaced.

Unit-II

From	To	Days	Reasons for major outages in Unit-II
29.6.2010	9.8.2010	42	Lignite Bunker SS Liner Replacement
30.11.2010	15.1.2011	47	Right Side Cyclone choking
31.3.2011	15.6.2011	77	Seal Pot Panel Water Wall Tubes starvation failure, Refractory Damages, NMEJ Left side repairs, (Ash Cooler Vent bends refractory relined)m Boiler License Renewal Inspection done on 5.5.2011
26.6.2011	13.7.2011	18	FBHE/Sealpot water wall (partition Wall) starvation failure. (Riser Tubes of corresponding headers to drum are to be modified with 1 positive slope towards drum)
18.7.2011	30.9.2011	75	Unit-II Seal pot (left) water wall puncture (hairline crack along fin), Riser tubes slope modifications done. Supports were strengthened in that area. Angle rings modification works in HP Turbine.
1.10.2011	11.10.2011	11	Right side Cyclone Choke (Cyclone to seal pot pr. measurement signal interference was being attended and the same was in forced condition, the sudden drop in Combustor Pressure led to emergency leading to cyclone accumulation). Entire work of removal of choke was done by NLC.
28.10.2011	5.11.2011	10	Left side cyclone choke (dislodged by NLC from 29.11.2011 to 3.11.2011) Cleaning of Seal pot, FBHE, nozzles etc done before light up FBHE1 grate Sync6.11.2011
26.11.2011	15.12.2011	20	Seal Pot water wall Left Side puncture. Due to repetitive nature of the failure, BHEL was referred. BHEL suggested RT modification.
29.12.2011	11.1.2012	13	Both PA fans 2A & 2B were not available due to bearing failure

14. The respondents JVVNL, JoVVNL and AVVNL have submitted that the delay of 37 months in the commissioning of the project is an indication of inefficiency / incompetency / lack of seriousness on the part of generating company. The respondents have also submitted that a similar project in Rajasthan involving more work than this project had completed their units in a period of 36 months from the date of PPA. They have stated that the delay has hit the discoms financially in many ways such as:

(a) Due to the delay in the energy was purchased at a higher rate.

(b) Transmission charges have been borne for no use/partly use of transmission system associated with the project.

(c) The cash flow of the discoms was also affected adversely.

15. Shri G.L. Sharma, Consumer, in his comments has submitted that the principles laid down by the Appellate Tribunal for Electricity in its judgment dated 27.4.2011 in Appeal No.72/2010 may be considered while dealing the issue of time and cost overrun. He has also submitted that the reasons given by the petitioner for delay are nothing but lame excuses and that the petitioner should have foreseen these eventualities while adopting the CFBC technology and giving the schedule for commissioning. Since there is imprudence on the part of the petitioner, it has to bear the additional cost on this account. He has further submitted that the penalties/LD recovered by the petitioner should be deducted from the total capital cost of the project. Shri Shanti Prasad, Consumer, in his comments dated 30.3.2012 has suggested that as part of prudence check, comparative study of time and cost overrun may be carried out through expert bodies like CEA before approving the project cost. He has also submitted that the capital cost to be considered for the purpose of tariff may be reduced by the recovery of ₹129.88 crore as liquidated damages by the petitioner from M/s BHEL and the amount received from the sale of infirm power from the generating station. In response to the reply of the respondents and comments of the consumers, the petitioner has clarified that (a) the increased quantum of work specific to CFBC boilers in respect of tonnage erection (as against conventional boilers) leading to more time consumption (b) delayed execution of works by the main contractor M/s BHEL (c) delay after synchronisation as a result of frequent and long shutdown of the units due to various reasons such as repeated cyclones chokes (d) complete replacement of bunker liners and (d) frequent agitation by local villagers to meet their various demands etc, had all resulted in the delay in COD which are beyond the

control of the petitioner. It has also been submitted that despite these, the petitioner has taken utmost care in the commissioning the project.

16. We have examined the matter. The Appellate Tribunal for Electricity in its judgment dated 27.4.2011 in Appeal No. 72 of 2010 (MSPGCL v MERC & ors) has laid down the following principles for prudence check of time over run and cost overrun of a project as detailed under:

"7.4. The delay in execution of a generating project could occur due to following reasons:

i. Due to factors entirely attributable to the generating company, e.g., imprudence in selecting the contractors/suppliers and in executing contractual agreements including terms and conditions of the contracts, delay in award of contracts, delay in providing inputs like making land available to the contractors, delay in payments to contractors/suppliers as per the terms of contract, mismanagement of finances, slackness in project management like improper co-ordination between the various contractors, etc.

ii Due to factors beyond the control of the generating company e.g. delay caused due to force majeure like natural calamity or any other reasons which clearly establish, beyond any doubt, that there has been no imprudence on the part of the generating company in executing the project.

iii. Situation not covered by (i) & (ii) above.

In our opinion in the first case the entire cost due to time over run has to be borne by the generating company. However, the Liquidated damages (LDs) and insurance proceeds on account of delay, if any, received by the generating company could be retained by the generating company. In the second case the generating company could be given benefit of the additional cost incurred due to time over-run. However, the consumers should get full benefit of the LDs recovered from the contractors/supplied of the generating company and the insurance proceeds, if any, to reduce the capital cost. In the third case the additional cost due to time overrun including the LDs and insurance proceeds could be shared between the generating company and the consumer. It would also be prudent to consider the delay with respect to some benchmarks rather than depending on the provisions of the contract between the generating company and its contractors/suppliers. If the time schedule is taken as per the terms of the contract, this may result in imprudent time schedule not in accordance with good industry practices.

7.5 in our opinion, the above principle will be in consonance with the provisions of Section 61(d) of the Act, safeguarding the consumers ' interest and at the same time, ensuring recovery of cost of electricity in a reasonable manner."

17. The petitioner in compliance with the directions of the Commission has submitted additional information vide affidavit dated 19.7.2012 on the issue of time overrun and cost overrun and has indicated the category-wise increase/decrease in the project cost from the scheduled dates of commissioning upto the actual date of commissioning. It has also

submitted that the actual amount of LD recovered from the EPC contractor M/s BHEL for the delay in the project is Rs 68.36 lakh and Rs 61.52 lakh was released against the Bank Guarantee equal to the LD amount.

18. The petitioner has submitted that the 125 MW CFBC boilers are being installed for the first time by the petitioner and the CFBC boilers are different from the conventional pulverised fuel boilers which are being used in other power plants. The reasons for delay in completion of the project as submitted by the petitioner can be categorised as under:

(a) Delay of 16 months for Unit-I and 18 months for Unit-II for the period during construction till the synchronization of the respective units; and

(b) Delay of 21 months for Unit-I and 13 months for Unit-II from synchronization to actual COD of the respective units.

19. The major reasons for the delay of 16 months for Unit-I and 18 months for Unit-II in construction of the project till synchronization of the units is mainly due to increased work quantum specific to CFBC boiler as compared to conventional boilers of same capacity in respect of tonnage erection (two times), site welding joints (there times) and refractory application etc. It is also noticed that there were recurring problems in CFBC like failure of fluidised bed heat exchanger tubes, differential temperature problem in turbine top and bottom casings. Accordingly, the petitioner has submitted that the reason for such failures is on account of the fact that CFBC boilers are being installed for the first time by the petitioner and are different from the conventional pulverised fuel boilers used in other power plants. It is observed that the petitioner had adopted the CFBC technology keeping in view its suitability for low grade fuel like lignite apart from other advantages like the technology being environment friendly and highly reliable, simplified fuel preparation and feeding with compact plant design and sustainability under cyclic loading. The petitioner having adopted a clean and new technology considering its merits and advantages derived (which outweigh limitations) in the form of higher efficiency, lower environmental

pollution and cheaper power and having engaged M/s BHEL which is the largest and reliable indigenous manufacturer with experience in manufacture, supply and erection of CFBC boiler as EPC contractor and fixed the time schedules accordingly, cannot, in our view, be held fully responsible for the delay in completion of the project on account of various problems faced during design, engineering and manufacturing stage and also in stabilization of CFBC boiler under Indian conditions. According to us, the problems faced in the construction stage could not have been foreseen considering the fact that the development of the technology, apart from being new, is still at a very early stage. It is noticed that the Commission in its order dated 22.8.2013 in Petition No. 28/2011, pertaining to Sipat STPS-I of NTPC had condoned the time overrun considering various factors associated with the execution of the project based on super critical technology. Applying the said principle for this case, we find that the delay of 16 months for Unit-I and 18 months for Unit-II (i.e. during the construction of the project till the synchronisation of the units) is for reasons associated with the adoption of new technology. Accordingly, we are inclined to condone the said delay on this count.

20. It is observed that the delay of 21months for Unit-I and 13 months for Unit-II from the synchronization of the units till the actual COD of the units as stated by the petitioner is on account of the frequent and long shutdown of the units due to frequent cyclone chokes in both the units, HP casing temperature differential problems, Evaporator coil rifled tubes failure, PA fan 2A vibration problem. Also, being a new technology, the cause analysis and remedial measures attempted by M/s. BHEL (by trying successive attempts) has consumed more time leading to outages for longer periods. It is further noticed that other problems like frequent shearing of polymer liners, refractory damages in both the units, Emergency boiler feed pump failure, VFD drive problem in ID fans, frequent failure of SA Fans, failure of excitation over voltage protection, turbine speed measurement problem, compressors problem, over loading of SA fans, super heater problems, main ejector

flange gasket failure, plate heat exchanger chocking, DMCW vibration, HFO pump failure etc. have also contributed to the delay in the commissioning of the units. Accordingly, the petitioner has submitted that in order to facilitate the modification / rectification of defects, various measures / repairs were undertaken in both the units by M/s. BHEL and in all occasions, BHEL had to fix up a suitable agency which took considerable time in mobilizing the manpower from their sub-vendors. It is evident from the said submissions of the petitioner that the delay from synchronization of units till actual COD of the units is on account of a long time taken by the agency for fixing the problems and also the delay in fault rectification. Though this can be attributed to the use of new technology and the exposure of manpower available with petitioner and M/s. BHEL with lesser expertise, a considerable extent of delay could have been avoided if there was proper planning and project management with better co-ordination between the contractor and sub-contractors involved in the project. The delay due to lack of project management, co-ordination, planning, un-organised work structure during the execution of project is not beyond the control of the petitioner and the petitioner cannot escape responsibility for the said delay. In our view, the problems resulting in delay cannot be said to be associated with the execution of new technology in the project. Accordingly, we find no reason to condone the time overrun of 21 months for Unit-I and 13 months for Unit-II in the execution of the project.

21. From the discussions above, it emerges that the problems faced by the petitioner in design, construction and manufacture stage and in stabilisation of CFBC boilers was on account of adoption of new environment friendly technology which was intended for better utilization of the scarce resources. As the development of this technology was still at an early stage, these problems could not have been foreseen by the petitioner. However, the factors such as the delay in supply of equipments, execution of work and slow progress of erection works by the main plant contractor faced during the commissioning of the units

and the time taken for fixing/rectifying the defects by the contractors/sub-contractors were attributable to the petitioner. The reasons such as the adoption of new technology by the petitioner which was still in an early stage coupled with the lack of co-ordination with the contractors /sub-contractors leading to delay in execution of the project when examined in the background of the judgment of the Tribunal dated 27.4.2011 as stated above, lead us to the conclusion that the situation does not fall under the principles laid down in para 7.4 (i) and (ii) of the said judgment. Hence, the principle laid down in situation (iii) of the said judgment is applicable in the present case. Accordingly, the impact of time and cost overrun of 37 months for Unit I and 31 months for Unit II along with LD and Insurance proceeds are required to be shared equally by the petitioner and the respondents. We hold accordingly.

Capital Cost

22. Regulation 7(1) of the 2009 Tariff Regulations, provides as follows:

> *"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 finds deployed, by treating the excess equity as normative loan, or (i) being equal to the actual amount of loan in the event of the actual equal 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;*
>
> *Capitalized initial spares subject of the ceiling rates specified in regulation 8; and*
>
> *Additional capital expenditure determined under regulation 9:*
>
> *Provided that the assets forming part of the project, but in use shall be taken out of the capital cost.*
>
> *The capital cost admitted by the Commission after prudence check shall form the basis for determination of tariff;*
>
> *Provided that in case of the thermal generating station and the transmission system, prudence check of capital cost may be carried out based on the benchmark norms to be specified by the Commission from time to time.*

23. The petitioner vide affidavit dated 20.7.2012 has submitted that the original estimated capital cost including IDC is ₹1114.18 crore approved on 15.12.2004 is based on March, 2004 price level. The Revised Cost Estimate (RCE-I) of ₹1626.09 crore was approved by

the Govt. of India on 25.8.2009 based on June, 2007 price level. The petitioner has also submitted that the difference between original estimated cost and revised cost is due to variations such as price escalation, FC variation, additional taxes and duties, increase in IDC and additional scope changes. Apart from these variations, boom in the infrastructure development in power sector, market forces and remote locations of the project, there is increase in cost despite initiative of petitioner for competitive bidding. It has therefore stated that the Revised Cost Estimate (RCE-I) is 45.9% higher than the approved cost. The main plant package cost as on March, 2004 price level was at ₹669.39 crore whereas, the cost surged to ₹909.26 crore at June, 2007 price level. This package alone accounts for 21.53% increase. The petitioner has added that similarly, Lignite Handling System accounts for 11.65% increase and the increase in other packages, overheads and IDC accounts to 12.76% increase. The petitioner has further stated that the Revised Cost Estimate (RCE-II) of ₹1868.71 crore as approved by the Board of the petitioner company is ₹242.62 crore higher than RCE-I dated 25.8.2009, which is mainly due to increase in IDC on account of the delay in commissioning.

24. The capital cost as per RCE-II after abatement of capital cost due to income from sale of infirm power before COD, fly ash and miscellaneous receipts etc. is as under:

(₹in crore)

Project cost excluding IDC	1664.73
IDC	304.88
Project cost including IDC	1969.61
Less abatement: Infirm power sales & Fly ash Interest on advance Misc. receipts	 88.23 7.85 4.82
Project cost including IDC after abatement of capital cost	**1868.71**

25. The category wise increase/decrease in project cost from the schedule date of commissioning up to the actual date of commissioning as submitted in affidavit dated 20.7.2012 is as under:

(₹in crore)

	RCE-I	RCE-II
Base	June, 2007	April, 2011
Project cost	1626.09	1868.71
Price escalation	1.53	
Change in F.E.	2.47	
Statutory levies	(-)11.44	
Scope Change/price increase	11.37	
Time overrun	304.88	
Net increase in Project Cost	242.62	

26. The actual capital cost as certified by the Auditor as on COD of Unit-I and Unit-II and considered for the purpose of tariff is as under:

(₹in crore)

	Unit-II as on COD 29.12.2011	Unit-I/ generating station as on COD 20.1.2012
Capital cost excluding IDC	720.16	1447.34
IDC	151.17	303.30
Capital cost including IDC	871.34	1750.64

27. Considering the fact that the impact of time and cost overrun for 37 months for Unit-I and 31months for Unit-II is to equally shared by the parties, the IEDC claimed by the petitioner is to be adjusted on *pro rata* basis. Accordingly, the *pro rata* reduction in IEDC due to time overrun of Unit-I and II is worked out as under:

	Total period taken from zero date to actual COD (months)	Time overrun disallowed (months)	Overheads(Establishment, Audit& Accounts, Design and Contingencies) *(₹in crore)*	Pro-rata reduction **(Col. 4 X Col. 5 / Col.2)** *(₹in crore)*	Total reduction *(₹in crore)*
Unit-II	84.5	30.5	97.66	35.25	17.625
Unit-I/ generating station	85	37	202.33	88.07	44.035

Infirm power

28. The petitioner vide affidavit dated 16.3.2012 has submitted that the value of infirm power and fly ash is ₹88.23 crore. In response to the directions of the Commission to provide the details of revenue earned from sale of infirm power after accounting for the fuel expenses and from sale of fly ash separately from the date of synchronization up to COD of the generating station, the petitioner vide affidavit dated 20.7.2012 has submitted

that infirm power bills of August, 2010, December, 2011and January, 2012 are yet to be paid by the respondent discoms and the details will be furnished after receipt of payment of infirm power bills and excess rebate availed by the respondents. In view of this, the revenue earned from sale of infirm power and fly ash amounting to ₹88.23 crore has been deducted from the capital cost of the generating station as on COD of the generating station subject to truing-up. The petitioner is directed to furnish the details of revenue earned from infirm power and fly ash (unit-wise) at the time of revision of tariff based on truing-up exercise in terms of Regulation 6(1) of the 2009 Tariff Regulations.

Initial Spares

29. The petitioner has submitted that a sum of ₹22.83 crore towards cost of initial spares is included in the project cost as on the actual date of commercial operation of the generating station (20.1.2012) and there is no addition of cost on account of initial spares. The cost of initial spares capitalised as on COD of the generating station works out to 1.3% of the capital cost of ₹1750 crore claimed by the petitioner. Since the cost of spares claimed is within the ceiling limit of 2.5% of the project cost as per Regulation 8 of the 2009 Tariff Regulations, the same has been allowed.

Liquidated Damages

30. The petitioner vide affidavit dated 20.7.2012 has submitted that an amount of ₹129.88 crore (i.e LD for ₹68.36 crore and ₹61.52 crore for BG against LD amount) has been recovered from M/s BHEL on account of the delay in the execution of the project. Since the LD amount is to be equally shared by the petitioner and the respondents on account of cost overrun due to time overrun, as decided above, the petitioner is at liberty to retain only 50% of the amount recovered from the contractor.

31. Based on the above discussions and in consideration of the *pro rata* reduction of IEDC and deduction of 50% of LD amount recovered, the capital cost (excluding IDC) based on audited accounts works out as under:

(₹in crore)

	Unit-II as on COD 29.12.2011	Unit-I / generating station as on COD 20.1.2012
Capital cost Including IDC	871.34	1750.64
IDC	151.17	303.30
Capital cost excluding IDC	720.16	1447.34
Pro-rata reduction in IEDC (Overheads: Establishment, Audit & Accounts, Design and Contingencies)	17.035	44.035
Capital cost (excluding IDC) after *pro rata* reduction in IEDC	703.125	1403.305
Adjustment due to infirm power (provisional)		(-)88.23
Adjustment of LD recovered (50%)		(-)64.94
Capital cost for purpose of tariff	**703.125**	**1250.135**

Un-discharged liabilities

32. The amount of un-discharged liabilities as per Form-5B submitted vide affidavit dated 17.10.2012 is ₹118.08 crore and as per affidavit dated 13.6.2014 is ₹120.11 crore as on COD of the generating station (20.1.2012). The petitioner was directed to furnish the Balance Sheet as on COD of the generating station and the same has not yet been furnished by the petitioner .Accordingly, the amount of ₹120.11 crore as on COD has been considered towards un-discharged liabilities. The petitioner is however directed to submit the actual details of un-discharged liabilities as on the COD of the units along with asset-wise and party-wise details, the reconciliation of the un-discharged liabilities claimed vide Form 5B with the balance sheet along with discharge of liabilities duly certified by the Auditor at the time of revision of tariff based on truing up exercise in terms of Regulation 6(1) of the 2009 Tariff Regulations.

Loan position

33. The loan position as on COD of the generating station (20.1.2012) is as under:

(₹ in lakh)

	RTL-I	RTL-II	NLC BOND	Total
Source of Loan	**Consortium of Banks led by Canara Bank**			
Amount of Gross Loan drawn upto COD as per Form-7 and Form-8	67342.35	36632.00	14700.00	**118674.35**
Amount of gross loan drawn upto COD as per the calculations of actual and normative IDC furnished by the petitioner vide affidavit dated16.3.2012 duly certified	67342.35	36000.00	14700.00	**118042.00**
Rate of Interest type	Fixed	Fixed	Fixed	-
Rate of Interest as on the sanction date as per loan agreement/ disclosure document	7.30%	8.85%	8.83%	-
Reset of Interest rate	Fixed for a period of 5 years from the date of 1st drawl	Fixed for a period of 3 years from the date of 1st drawl	-	-
1st drawl date/ allotment date	23.2.2006	10.6.2010	23.1.2009	-

34. It is evident from the above table that the total amount of loan drawn as on COD in case of RTL-II differs from the details submitted in the Form and calculations for actual/ Normative IDC furnished by the petitioner.The bank statements furnished by the petitioner provide the disbursals of loan amounts. As both the loans (RTL-I and RTL-II) are not project specific loans but are only part of corporate loans allocated to the project, therefore, the exact amount allocated to the project could not be ascertained from the bank statement.The loan amount against RTL-II amounting to ₹36000.00 lakh as stated in the Auditors certified statement has been considered for the purpose of tariff instead of the amount of ₹36632.00 lakh furnished in Form-7 and Form-8. Since the details of repayment of both the loans (RTL-I and RTL-II) from Canara Bank are available only upto 20.1.2012, for the purpose of calculation of weighted average rate of interest, the repayments have been considered as per the loan agreement for the period upto 31.3.2014. The petitioner is directed to furnish the hard copies of loan agreement entered into with the bank, the copies of all the correspondences/ communications with the bank regarding interest rate reset / repayment rescheduling if any, interest calulation on the loan, indicating the exact date of each drawal and repayment till 31.3.2014.

Rate of Interest

35. As per the documents submitted by the petitioner, the rate of interest applicable to both the loans RTL-I and RTL-II is as under:

RTL-I	RTL-II
7.30% p.a.	8.85% p.a.

36. In case of RTL-I, the loan agreement provides that the loan shall carry a fixed rate of interest @ 7.30% p.a. fixed for a period of 5 years from the date of 1st drawl. Similarly, in case of RTL-II, the rate of interest is subject to reset after 3 years from the date of 1st drawl (10.6.2013). Though the petitioner has furnished a letter dated 12.2.2011 from the Canara bank informing that the rate reset to 10.35% (BPLR-3.40%) with effect from 23.2.2011 with respect to RTL-I, no documentary evidence has been submitted by the petitioner substantiating the actual rate reset in case of RTL-II. It is also observed that in case of RTL-II, the petitioner has submitted the minutes of meeting dated 5.9.2012 held between Canara bank and the petitioner in which the bank has requested the petitioner to consider the reset of Interest as base rate + 0.85%, i.e. 11.35%. However, no subsequent correspondences from the Bank have been furnished in confirmation of such reset of rate of interest. The rate of interest as furnished by the petitioner in Form 7 and Form 8 is as under:

	RTL-I	RTL-II
Form-7	8.97% p.a.	9.36% p.a.
Form-8	10.76% p.a.	9.22%p.a.

37. While arriving at the Weighted Average Rate of Interest for calculation of actual IDC and Normative IDC, it is observed that the rate of interest as applied by the petitioner is at variance with the rates furnished in the documents available on record. The rate of interest @ 7.30% (fixed for 5 years) as mentioned in the loan agreement and the reset rate of interest @ 10.35% beyond 5 years with respect to RTL-I has been applied for the purpose of calculation of weighted average rate. However, in the absence of any documentary

evidence in confirmation of the reset rate in case of RTL-II, the rate of interest as per loan agreement @ 8.85% has been considered. For NLC bond, the rate of interest @8.83% as per documents furnished by the petitioner has been considered for the purpose of tariff calculations.

Interest During Construction (IDC)

38. The actual loans availed for the generating station and the interest during the construction period on the debt availed for the project is calculated at the actual rates as discussed in above paras. It is observed that the petitioner has not furnished the methodology adopted for the unit-wise allocation of IDC and therefore, the ratio in which the total IDC is apportioned by the petitioner between Units-I and II as on COD of the generating station, has been applied for apportionment of IDC as of now. The petitioner is however directed to furnish the details indicating the basis of the unit-wise allocation of IDC at the time of revision of tariff through truing-up exercise. As such, in this order, 100% of the accrued IDC has been considered till the scheduled COD of the units, whereas from the scheduled COD of the units till the actual COD of the generating station only 50% of the accrued IDC has been considered based on our observations at para 22 above. Accordingly, the unit-wise IDC has been worked out and allowed for the purpose of tariff is as under:

(₹in lakh)

Units	**IDC allowed up to scheduled COD**		**IDC allowed during scheduled COD to actual COD (time over-run)**	
	Scheduled COD	100% of IDC allowed	Scheduled COD to actual COD	50% of the IDC allowed
Unit-I	14.12.2008	2640.45	15.12.2008 to 20.1.2012	5804.42
Unit-II	14.6.2009	4120.34	15.6.2009 to 29.12.2011	4790.14
	IDC allowed (a)	**6760.79**	**IDC allowed (b)**	**10594.57**
	Total IDC allowed (a+b) = 17355.36			

Normative IDC

39. The petitioner had not claimed Normative IDC in original petition vide affidavit dated 16.3.2012. However, the petitioner vide affidavit dated 13.6.2014 has submitted the revised Form-14A showing the actual cash expenditure along with the calculation sheet showing the calculations of actual as well as Normative IDC. The petitioner has claimed the Normative IDC on the amount of equity in excess of 30% of the project cost on the basis of the weighted average rate of interest of the loan portfolio of the project. It is observed that the rate of interest considered by the petitioner while arriving at the weighted average rate of interest is filled with inconsistencies. Accordingly, the rate of interest for the calculation of Normative IDC considered and allowed is as under:

	RTL-I	**RTL-II**	**NLC Bond**
Rate of Interest	7.30% p.a.	8.85% p.a.	8.83%
After reset of rate with effect from 23.2.2011(RTL-I)	10.35% p.a.	-	-

40. For the calculation of Normative IDC allowed in tariff, the excess equity is calculated by deducting the cumulative gross loan availed from 70% of the cumulative total expenditure.

41. Regulation 16(5) of the 2009 Tariff Regulations provides as under:

> "*(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."*

42. In terms of above regulations, the petitioner has claimed the Normative IDC on the expenditure incurred till December, 2004 and thereafter. The first drawl of actual loan was made in February, 2006. The petitioner has worked out the Normative IDC for the period prior to February, 2006 by considering the rate of interest @ 7.30% p.a. applicable to the

first drawl of loan. However, there was no actual loan for the generating station prior to February, 2006. Hence, no weighted average rate of interest is available to work out the Normative IDC prior to the actual drawl of the loan. Accordingly, no IDC has been allowed prior to the actual drawl of the loan. The petitioner is directed to submit the weighted average rate of interest for the company as a whole for the period prior to February, 2006 at the time of revision of tariff based on truing-up in order to work out the Normative IDC. The cost overrun due to time overrun involved in the commissioning of the project has been disallowed to the extent of 50% and this has been considered in respect of Normative IDC allowed. Accordingly, the unit-wise Normative IDC is worked out and allowed as under:

(₹ in lakh)

Units	**Normative IDC allowed up to scheduled COD**		**Normative IDC allowed during time over-run**		
	Scheduled COD	100% of IDC allowed	Scheduled COD to actual COD	50% of the IDC allowed	**Unit-wise Total**
Unit-I	14.12.2008	564.96	15.12.2008 to 20.1.2012	223.07	**788.03**
Unit-II	14.6.2009	592.99	15.6.2009 to 29.12.2011	190.84	**783.83**
	Normative IDC allowed (a)	**1157.94**	**Normative IDC allowed(b)**	**413.92**	**1571.86**
	Total Normative IDC allowed (a+b)= 1571.86				

43. Interest on normative loan is to be treated as income in the Financial Statement i.e Profit & Loss A/c and Balance Sheet by the petitioner as it form part of capital cost for the purpose of allowing tariff.

Comparison of Capital Cost (Hard Cost) with benchmark capital cost

44. The capital cost worked out in para 31 above is based on the data submitted by the petitioner which works out to ₹5.08 crore/MW. For the 125 MW unit (CFBC) no benchmark cost has been specified by Commission**.** In respect of a Green field project of 500 MW unit size with conventional boilers, the benchmark capital cost is ₹5.07 crore for the first unit

and ₹4.71 crore for the second unit. Since, the capital cost of ₹1750.64 crore incurred by the petitioner is within the limits of the approved RCE of ₹1868.71 crore, the capital cost of the generating station is acceptable.

Additional Capital Expenditure

45. Regulation 9 of the 2009 Tariff Regulations, as amended on 21.6.2011 and 31.12.2012, provides as under**:**

*"9. **Additional Capitalization.**(1) The capital expenditure 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) Un-discharged liabilities;

(ii) Works deferred for execution;

(iii) Procurement of initial capital spares within the original scope of work, subject to the provisions of regulation 8;

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

(v) Change in law:

Provided that the details of works included in the original scope of work along with estimates of expenditure, un-discharged liabilities and the works deferred for execution shall be submitted along with the application for determination of tariff.

(2) The capital expenditure incurred or projected to be incurred on the following counts after the cut-off date may, in its discretion, be admitted by the Commission, subject to prudence check:

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

(ii) Change in law;

(iii) Deferred works relating to ash pond or ash handling system in the original scope of work;

(iv) In case of hydro generating stations, any expenditure which has become necessary on account of damage caused by natural calamities (but not due to flooding of power house attributable to the negligence of the generating company) including due to geological reasons after adjusting for proceeds from any insurance scheme, and expenditure incurred due to any additional work which has become necessary for successful and efficient plant operation; and

(v) In case of transmission system any additional expenditure on items such as relays, control and instrumentation, computer system, power line carrier communication, DC batteries, replacement of switchyard equipment due to increase of fault level, emergency restoration system, insulators cleaning infrastructure, replacement of damaged equipment not covered by insurance and any other expenditure which has become necessary for successful and efficient operation of transmission system:

Provided that in respect sub-clauses (iv) and (v) above, any expenditure on acquiring the minor items or the assets like tools and tackles, furniture, air-conditioners, voltage stabilizers, refrigerators, coolers, fans, washing machines, heat convectors, mattresses, carpets etc. brought after the cut-off date shall not be considered for additional capitalization for determination of tariff w.e.f. 1.4.2009.

(vi)In case of gas/liquid fuel based open/ combined cycle thermal generating stations, any expenditure which has become necessary on renovation of gas turbines after 15 year of operation from its COD and the expenditure necessary due to obsolescence or non-availability of spares for successful and efficient operation of the stations.

Provided that any expenditure included in the R&M on consumables and cost of components and spares which is generally covered in the O&M expenses during the major overhaul of gas turbine shall be suitably deducted after due prudence from the R&M expenditure to be allowed.

(vii) Any capital expenditure found justified after prudence check necessitated on account of modifications required or done in fuel receipt system arising due to non-materialisation of full coal linkage in respect of thermal generating station as result of circumstances not within the control of the generating station.

(viii) Any un-discharged liability towards final payment/withheld payment due to contractual exigencies for works executed within the cut-off date, after prudence check of the details of such deferred liability, total estimated cost of package, reason for such withholding of payment and release of such payments etc.

(ix) Expenditure on account of creation of infrastructure for supply of reliable power to rural households within a radius of five kilometres of the power station if, the generating company does not intend to meet such expenditure as part of its Corporate Social Responsibility."

46. The petitioner has claimed additional capital expenditure under Regulation 9 (1) (i) of the 2009 Tariff Regulations as under:

(₹ in lakh)

2011-12	**2012-13**
101.00	12011.00

47. The petitioner's claim of additional capital expenditure amounting to ₹101.00 lakh during 2011-12 is towards expenditure on certain infrastructure facilities such as residential accommodation, vehicles etc., to be provided to CISF deployed at the generating station the cost of which is to be borne by the petitioner. The petitioner has submitted that considering the remote location of the project and its proximity to the border CISF is mandated to provide security and the cost incurred for providing infrastructural facilities may be allowed as additional capital expenditure for 2011-12. In view of the submissions the expenditure of ₹101.00 lakh in 2011-12 is allowed. For the period 2012-13, the petitioner has claimed an amount of ₹12011.00 lakh towards discharge of liabilities

on projected basis in respect of the balance work within original scope of work to be completed within the cut-off date of 31.3.2015. This claim has been considered and allowed for the purpose of tariff. The petitioner is however directed to submit the asset-wise, party-wise and year-wise details of discharge of liabilities at the time of revision of tariff based on truing-up exercise in terms of Regulation 6(1) of the 2009 Tariff Regulations.

48. Based on the above, the capital cost considered for the purpose of tariff is as under:

(₹in lakh)

	Unit-II (as on 29.12.2011)	**Unit-I & II (as on 20.1.2012)**
Capital Cost on cash basis (excluding IDC)	70312.50	125013.50
Add: IDC	8910.48	17355.36
Add: Normative IDC	788.03	1571.86
Opening Capital Cost (including IDC)	**80011.01**	**143940.71**

Debt-Equity Ratio

49. Regulation 12 of the 2009Tariff Regulations provides as under:

'(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.

50. In line with the above regulations, the debt equity ratio as on COD is worked out as under:

(₹ in lakh)

Actual Loan	118042.00	67.43%
Equity	57022.00	32.57%
Project Cost as on COD	175064.00	

However, the debt equity ratio of 70:30 has been considered on the capital cost and the admitted additional capital expenditure.

Return on Equity

51. Regulation 15 of the 2009 Tariff Regulations, as amended on 21.6.2011, 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 charges 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 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."*

52. The petitioner has claimed corporate tax for grossing up the Return on Equity. In this context, it is observed that in Petition No.521/MP/2014 filed by the petitioner, the petitioner has submitted that the income was subject to Minimum Alternate Tax for the period 2012-13. As such, for the period 2012-13, MAT has been considered for grossing-up of the Return on Equity. The petitioner is however granted liberty to approach the Commission with the Tax Audit Reports for each of the financial year for which tariff is being claimed (2011-14) at the time of revision of tariff based on truing-up exercise in terms of Regulation 6(1) of the 2009 Tariff Regulations. Accordingly, return on equity has been worked out as under:

(₹ in lakh)

	2011-12		2012-13	2013-14
	29.12.2011 to 19.1.2012	20.1.2012 to 31.3.2012		
Gross Normative Equity	24003.30	43182.21	43182.21	46785.51
Addition due to Additional Capitalisation	-	30.30	3,603.30	-
Closing Equity	24,003.30	43,212.51	46,785.51	46,785.51
Average Equity	24,003.30	,197.36	44,983.86	46,785.51
Return on Equity (Base Rate)	15.500%	15.500%	15.500%	15.500%
Tax rate (Corp. Tax/ MAT*)	32.450%	32.450%	20.008%	32.450%
Rate of Return on Equity (Pre Tax)	22.946%	22.946%	19.377%	22.946%
Return on Equity (Pre-Tax)	**331.07**	**1949.91**	**8716.50**	**10735.39**

Interest on loan

53. 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.

54. Interest on loan has been worked out as mentioned below:

(i) The weighted average rate of interest has been worked out on the basis of the actual loan portfolio at the beginning of respective year applicable to the project.

(ii) The repayment for the year of the tariff period 2009-14 has been considered equal to the depreciation allowed for that year.

(iii) Interest on loan has been calculated on the normative average loan of the year by applying the weighted average rate of interest. The calculation of weighted Average Rate of Interest on loan is enclosed as Annexure-I to this order.

55. The necessary calculations for the interest on loan are as under:

(₹ in lakh)

	2011-12		**2012-13**	**2013-14**
	29.12.2011 to 19.1.2012	**20.1.2012 to 31.3.2012**		
Gross Notional loan	56007.71	100758.50	100758.50	109166.20
Cumulative Repayment of Loan upto previous year	-	393.05	2707.50	13873.03
Net Opening loan	56007.71	100365.45	98051.00	95293.17
Addition due to Additional Capitalisation	-	70.70	8407.70	-
Repayment of loan during the period	393.05	2314.45	11165.53	7759.23

Net Closing loan	55614.66	98121.70	95293.17	87533.94
Average Loan	55811.18	99243.57	96672.08	91413.55
Weighted Average Rate of Interest on Loan	9.71%	9.71%	9.71%	9.70%
Interest on Loan	**325.71**	**1895.47**	**9384.22**	**8870.46**

Depreciation

56. 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 long-term 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 3[the cumulative depreciation including Advance against Depreciation] as admitted by the Commission up to 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."

57. The weighted Average Rate of depreciation as considered by the petitioner has been considered for the purpose of tariff. The necessary calculations in support of depreciation are as shown below:

(₹ in lakh)

	2011-12		**2012-13**	**2013-14**
	29.12.2011 to 19.1.2012	**20.1.2012 to 31.3.2012**		
Opening Gross Block	80011.01	143940.71	143940.71	155951.71
Addition during 2009-14 due to Actual/ Projected Additional Capitalisation	-	101.00	12011.00	-
Closing Gross Block	**80011.01**	**144041.71**	**155951.71**	**155951.71**
Average Gross Block	80011.01	143991.21	149946.21	155951.71
Rate of Depreciation	0.49%	1.61%	7.45%	4.98%

Depreciable Value	71932.51	129438.19	134797.69	140202.64
Depreciation (for the period)	**393.05**	**2314.45**	**11165.53**	**7759.23**
Cumulative Depreciation (at the end of the year)	393.05	2707.50	13873.03	21632.26

Operation & Maintenance Expenses

58. The 2009 Tariff Regulations provides for the following O&M expense norms in respect of 125 MW sets for lignite fired generating station as under:

(₹in lakh)

	2011-12		2012-13	2013-14
	29.12.2011 to 19.1.2012	20.1.2012 to 31.3.2012		
O&M expenses (annualised)	26.82	26.82	28.36	29.98

59. The O&M expenses claimed by the petitioner based on above norms and is allowed as under:

(₹in lakh)

	2011-12		2012-13	2013-14
	29.12.2011 to 19.1.2012	20.1.2012 to 31.3.2012		
O&M expenses (annualised)	3352.50	6705.0	7090.00	7495.00
O&M expenses (pro rata)	201.52	1319.02	7090.00	7495.00

Additional expenditure incurring to the work of Operation and Maintenance and Security Patrolling activities to External water carrier system

60. The petitioner vide affidavit dated 16.3.2012 has submitted that the generating station is located about 25 km southwest of Bikaner town and is totally devoid of any natural surface water resources. It has submitted that the table water occurs at about 120m below surface and the source of ground water is only precipitation which is meagre and sporadic. It has also submitted that infiltration to the zone of saturation is minimum because the average rainfall in the area is very little and the rate of evaporation of precipitated water is high. Accordingly, it has submitted that the amount of ground water is insufficient to meet the water requirement of the entire project and it is therefore necessary to bring water from outside source. The petitioner has also submitted that the outside

source should have potential to ensure a continuous supply of about 20-22 cusecs of water to the project site and the average water requirement is 1250 m3/hr. Considering 18 hours working of the pump houses, the flow rate will be 1667m3/hr. However during reservoir filling period of about 40 days the flow rate will be 2000m3/hr. The petitioner has stated that Indira Gandhi Nahar Panyojana (IGNP) is the only source of water for this project. It has also submitted that Piping corridor (30m wide and 56 km long) from RD-800 (IGNP) to the power plant is used for laying the pipeline for raw water and a jeepable Kuchcha road is also provided all along the corridor for maintenance of pipeline. It has further submitted that three pump houses are provided along the piping route and security patrolling activities of water carrier system is a necessity for such a long distance to ensure un-interrupted water supply to the power plant. Hence, it has submitted that a contract was awarded for Security patrolling activities round the clock along with Operation and Maintenance activities for a total value of ₹ 54604054/- to M/s IVRCL Limited, Jaipur for a period of 3 years. Accordingly, the petitioner has prayed that this expenditure may be allowed as a special case over and above the normative Operation and Maintenance expenses taking into consideration the security concerns (close to International Border) involving patrolling round the clock. The petitioner vide affidavit dated 12.7.2012 and 20.7.2012 has reiterated the above submissions and has prayed that the expenditure on Raw water drawn from IGNP canal and O&M expenditure of water carrier system may be allowed as additional O&M expenses as claimed in the petition.

61. The respondents and the Consumers have objected to the claim of the petitioner for additional O&M expenses and have submitted that the expenses should be borne from the normative O&M expenses allowed to the generating station under the 2009 Tariff Regulations.

62. We have examined the matter. Considering the fact that IGNP is the only source of water for this project and that the security patrolling activities of water carrier system is a

necessity to ensure un-interrupted water supply to the power plant, we are inclined to allow the expenditure claimed by the petitioner over and above the normative O&M expenses allowed to the generating station. We order accordingly.

Interest on Working Capital

63. 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.

64. 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.

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

Fuel components in working capital

66. The petitioner has submitted that the year-wise Lignite Transfer Price has been fixed based on the GOI, Ministry of Coal (MOC) guidelines dated 11.6.2009 and the Transfer Price so determined has been certified by the Statutory Auditor. The Lignite Transfer Price as determined by the petitioner and certified by Auditor are as under:-

	2009-10	2010-11	2011-12		2012-13	2013-14
Production at 100% capacity (LTs)	21.00					
Production at 85% capacity (LTs)	17.85					
Lignite Price (Rs/Ts)	443	631	696*	837**	853	890

*Lignite price before commissioning of the generating station. **Lignite price after commissioning of the generating station.*

67. The petitioner has claimed the fuel component in working capital based on price and GCV of Lignite & Oil for the preceding three months i.e. for the year 2011-12 and the Landed Price of Limestone based on the procurement price of Limestone inclusive of royalty, taxes & duties and transportation charges as under:

(₹in lakh)

	2011-12		**2012-13**	**2013-14**
	29.12.2011 to 19.1.2012	**20.1.2012 to 31.3.2012**		
Cost of Lignite for 1½ months	644.79	1289.58	1286.06	1286.06
Cost of Limestone for 2 months	84.47	168.94	168.48	168.48
Cost of Secondary Fuel oil for 2 months	101.03	202.07	201.52	201.52

68. The petitioner has claimed the cost of limestone for 2 months. However as per the 2009 Tariff Regulations, cost of limestone for 1½ months is only applicable. Based on the norms specified, the cost of fuel components in working capital, based on price and GCV of Lignite, Limestone & Oil for the preceding three months is worked out as under:-

(₹in lakh)

	2011-12		**2012-13**	**2013-14**
	29.12.2011 to 19.1.2012	**20.1.2012 to 31.3.2012**		
Cost of Lignite for 1½ months (annualised)	638.76	1277.52	1274.03	1274.03
Cost of Lignite for 1½ months (pro rata)	38.40	251.32	1274.03	1274.03
Cost of Limestone for $1^{1/2}$ months (annualised)	63.35	126.70	126.36	126.36
Cost of Limestone for $1^{1/2}$ months (pro rata)	3.81	24.93	126.36	126.36
Cost of Secondary Fuel oil for 2 months (annualised)	101.03	202.07	201.52	201.52
Cost of Secondary Fuel oil for 2 months (pro rata)	6.07	39.75	201.52	201.52

O&M Expenses for 1 month

69. O & M expenses for 1 month claimed by the petitioner in Form-13 B and allowed for the purpose of computation of interest on working capital (pro-rata) are as under:

(₹in lakh)

	2011-12		2012-13	2013-14
	29.12.11 to 19.1.2012	**20.1.2012 to 31.3.2012**		
O & M for 1 month (annualized)	279.38	558.75	590.83	624.58
O & M for 1 month (pro rata)	**16.79**	**109.92**	**590.83**	**624.58**

Maintenance Spares

70. The petitioner has claimed the following maintenance spare in the working capital:

(₹in lakh)

	2011-12		**2012-13**	**2013-14**
	29.12.11 to 19.1.2012	**20.1.2012 to 31.3.2012**		
Maintenance spares (annualised)	670.50	1341.00	1418.00	1499.00
Maintenance spares (pro rata)	40.30	263.80	1418.00	1499.00

71. The 2009 Tariff Regulations provides for maintenance spares @ 20% of the operation & maintenance expenses as specified in Regulation 19. Accordingly, the maintenance spares as claimed by the petitioner as above are in order and hence considered for the purpose of tariff.

Receivables

72. Receivables on the basis of two months (pro rata) of fixed and energy charges have been worked out as under:

(₹in lakh)

	2011-12		**2012-13**	**2013-14**
	29.12.11 to 19.1.2012	**20.1.2012 to 31.3.2012**		
Fixed Charges (pro-rata)	222.15	1333.05	6495.37	6243.32
Energy Charges (annualised)	936.15	1872.30	1867.18	1867.18
Energy Charges (pro-rata)	56.27	368.32	1867.18	1867.18

73. SBI Base Rate plus 350 basis points as on 1.4.2011 amounting to 11.75% p.a. (8.25% + 350 basis point) has been considered on all the above components of working capital for the purpose of calculating interest on working capital on pro rata as under:

(₹in lakh)

	2011-12		2012-13	2013-14
	29.12.11 to 19.1.2012	20.1.2012 to 31.3.2013		
O&M expenses (1 month)	16.79	109.92	590.83	624.58
Receivables (Fixed Charges)	222.15	1333.05	6495.37	6243.32
Receivables (Energy charges)	56.27	368.32	1867.18	1867.18
Maintenance Spare	40.30	263.80	1418.00	1499.00
Secondary fuel oil cost	6.07	39.75	201.52	201.52
Fuel cost	42.20	276.24	1400.39	1400.39
Total Working Capital	**383.79**	**2391.09**	**11973.29**	**11835.99**
Interest Rate	11.75%	11.75%	11.75%	11.75%
Interest on Working Capital	**45.10**	**280.95**	**1406.86**	**1390.73**

Operational Norms

74. The following norms of operation have been considered by the petitioner:

Normative Annual Plant Availability Factor (NAPAF) %	75
Gross Station Heat Rate (GSHR) (kcal/kWh)	2620.97
Auxiliary Power Consumption (APC) %	11.5
Specific Fuel Oil Consumption (ml/kwh)	1.25

75. The operational norms considered by the petitioner towards NAPAF, APC and Specific Fuel Oil Consumption are in accordance with the 2009 Tariff Regulations and hence allowed. However, the Gross Station Heat Rate (GSHR) of 2620.97 kcal/kWh considered by the petitioner is at variance with the 2009 Tariff Regulations. The petitioner has considered the normative heat rate as per the ceiling limit of maximum heat rate. Shri G.L.Sharma, Consumer has submitted that in respect of unit where the boiler feed pumps are electrically operated the maximum design unit heat rate shall be 40 kcal/kWh lower than the maximum design unit heat rate specified with turbine driven BFP. He has also submitted that the maximum design unit heat rate specified with turbine driven BFP is 2294 kcal/kWh and therefore in the present case, it should be 2254 (2294 – 40). Accordingly, the Consumer has submitted that the GSHR works out as 2400.51 kcal/kWh

and by applying the correction factor of 1.07 the GSHR works out as 2568.55 kcal/kWh which may be considered. We have examined the matter. The maximum ceiling heat rate is considered only if the design heat rate along with the deviation allowed is more than the ceiling value. In the present case, the Guaranteed Turbine Cycle Heat Rate as submitted by petitioner is 1994.60 kCal/kWh and the guaranteed boiler efficiency is 81.81%. Hence, the design GSHR would be 2438.08 kCal/kWh. Considering the multiplying factor of 1.065 in respect of the generating station which has achieved COD after 2009, the GSHR works out to 2596.56 kcal/kWh (1.065x2438.08). Accordingly, the Gross Station Heat Rate of 2596.56 kCal/kWh has been considered for the generating station.

Fixed Charges

76. Accordingly, the fixed charges allowed for the generating station (pro rata) for the period 2011-14 is summarised as under:

(₹in lakh)

	2011-12		**2012-13**	**2013-14**
	29.12.11 to 19.1.2012	**20.1.2012 to 31.3.2012**		
Return on Equity	331.07	1949.91	8716.50	10735.39
Interest on Loan	325.71	1895.47	9384.22	8870.46
Depreciation	393.05	2314.45	11165.53	7759.23
Interest on Working Capital	45.10	280.95	1406.86	1390.73
O&M Expenses	201.52	1319.02	7090.00	7495.00
Secondary fuel oil cost	36.44	238.51	1209.11	1209.11
Total Annual Fixed Charges	**1332.88**	**7998.31**	**38972.21**	**37459.91**

Energy Charge Rate (ECR)

77. The petitioner has claimed Energy Charge Rate (ECR) of ₹0.777/ kWh based on the weighted average price and GCV of lignite and coal procured and burnt for the preceding three months i.e. October, November and December, 2011 and the landed price of limestone as per the 2009 Tariff Regulations. ECR is worked out and allowed as under:

	Unit	2011-14
Capacity	MW	2X125
Gross Station Heat Rate	Kcal/kWh	2596.56
Aux. Energy Consumption	%	11.50
Weighted average GCV of oil	Kcal/lit	10000
Weighted average GCV of Lignite	Kcal/kg	2898.33
Weighted average price of oil	₹/KL	58891
Landed price of Lime stone	Rs/MT	1099
Weighted average price of Lignite	Rs/MT	696
Rate of energy charge ex-bus	**Paise/kWh**	**77.07**

78. The Energy Charge on month to month basis shall be billed by the petitioner as per Regulation 21 (6) (a) of the 2009 Tariff Regulations due to monthly variation in actual GCVs as the Lignite Transfer Price (Primary Fuel) is determined year-wise.

Supply of electricity within 5km radius

79. The petitioner has submitted that the Ministry of Power, Government of India has notified a Scheme for implementation of the provision for supply of electricity within 5 km radius around the Central Power generating stations and for this purpose the petitioner has to create infrastructure for supply of power. It has also submitted that the Detailed Project Report (DPR) for implementation of the said scheme is under preparation and it is not possible to estimate the projected expenditure at this stage. The petitioner has submitted that the expenditure incurred towards implementation of the said scheme may be considered in tariff. Admittedly, the petitioner is yet to incur any expenditure on the said scheme. Though the scheme for supply of electricity in 5 km area around central power plants was launched by the Ministry of Power, Govt. of India during 2010 (27.4.2010), the Ministry of Power, GOI vide notification dated 25.3.2013 has withdrawn the scheme. Considering this, the prayer of the petitioner has not been considered.

Application fee and the publication expenses

80. The petitioner has prayed for recovery of expenditure incurred towards filing fees and publication expenses from the respondents in respect of the petition filed by the petitioner. The petitioner has also incurred an amount of ₹455312/- for publication of tariff in the

newspapers in terms of Regulation 3(6) of the CERC (Procedure for making of application for determination of tariff, publication of application and other related matters) Regulations, 2004. 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 period from 2011-14 and the expenses incurred for publication of notices in connection with the petition shall be directly recovered from the beneficiaries, on *pro rata* basis based on documentary proof.

81. The petitioner is already billing the respondents on provisional basis in accordance with the provisional tariff granted vide order dated 4.10.2012. The provisional billing of tariff shall be adjusted in terms of proviso to Regulation 5(3) of the 2009 Tariff Regulations as amended on 21.6.2011.

82. Petition No. 197/GT/2013 is disposed of in terms of the above.

-Sd/-
(A.K.Singhal)
Member

-Sd/-
(Gireesh B Pradhan)
Chairperson

Annexure-I

Calculation of Weighted Average Rate of Interest on Loan

(₹ in Lakh)

	31.3.2005	1.4.2005 to 22.2.2006	23.2.2006 to 31.3.2006	1.4.2006 to 31.3.2007	1.4.2007 to 31.3.2008	1.4.2008 to 31.3.2009	1.4.2009 to 31.3.2010	1.4.2010 to 31.3.2011	1.4.2011 to 28.12.2011	29.12.2011 to 19.1.2012	20.1.2012 to 31.3.2012	1.4.2012 to 31.3.2013	1.4.2013 to 31.3.2014
Opening loan Balance													
Canara-1	0	0	6242	7642	16042	50942	67342	63974.88	57240.64	53873.52	53873.52	50506.4	43772.16
Rate of Interest	7.30%	7.30%	7.30%	7.30%	7.30%	7.30%	10.35%	10.35%	10.35%	10.35%	10.35%	10.35%	10.35%
Canara-2	0	0	0	0	0	0	0	11562.5	18050.5	25187.2	25187.2	22823.9	18097.3
Rate of Interest	8.85%	8.85%	8.85%	8.85%	8.85%	8.85%	8.85%	8.85%	8.85%	8.85%	8.85%	8.85%	8.85%
NLC Bond	0	0	0	0	0	0	0	14700	14700	14700	14700	14700	14700
Rate of Interest	8.83%	8.83%	8.83%	8.83%	8.83%	8.83%	8.83%	8.83%	8.83%	8.83%	8.83%	8.83%	8.83%
Total Op. Loan	0	0	6242	7642	16042	50942	67342	90237.38	89991.14	93760.72	93760.72	88030.3	76569.46
Weighted Average Rate of Interest on Opening Balance		**0.00%**	**7.30%**	**7.30%**	**7.30%**	**7.30%**	**10.35%**	**9.91%**	**9.80%**	**9.71%**	**9.71%**	**9.71%**	**9.70%**