CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI

Petition No. 334/GT/2014

Coram:

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

Date of Hearing : 6.9.2016
Date of Order : 26.9.2016

In the matter of

Approval of tariff of Talcher Thermal Power Station (460 MW) for the period from 1.4.2014 to 31.3.2019

And in the matter of

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

Vs

GRIDCO Limited
24, Janpath,
Bhubaneswar – 751007 **...Respondents**

Parties present:

For Petitioner: Shri Shankar Saran, NTPC
Shri Nishant Gupta, NTPC
Shri Ajay Dua, NTPC
Shri Shailendra Singh, NTPC

For Respondents: Shri Raj Kumar Mehta, Advocate GRIDCO
Ms Himanshi Andley, Advocate GRIDCO
Shri Tapas Pattnaik , GRIDCO
Shri Madhusudan Sahoo, GRIDCO
Shri Abhishek Upadhyay, GRIDCO

ORDER

This petition has been filed by the petitioner, NTPC for approval of tariff of Talcher Thermal Power Station (460 MW) (hereinafter referred to as "the generating station") for the period 2014-19 in accordance with the provisions of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2014 (hereinafter referred to as "the 2014 Tariff Regulations").

2. The generating station with a capacity of 460 MW comprising of four units of 60 MW each and two units of 110 MW each. The dates of commercial operation (COD) of the units of the generating station are as under:

Unit	COD
Unit-I	17.12.1967
Unit-II	28.3.1968
Unit-III	11.7.1968
Unit-IV	11.4.1969
Unit-V	24.3.1982
Unit-VI / Station	24.3.1983

3. The Commission vide order dated 31.8.2016 in Petition No. 273/GT/2014, had revised the tariff of the generating station for the period 2009-14 after truing-up exercise in terms of Regulation 6 (1) of the 2009 Tariff Regulations, considering the capital cost of `100389.87 lakh as on 31.3.2014 (on cash basis) after deduction of un-discharged liabilities of `1844.64 lakh as on 1.4.2009. The annual fixed charge approved by order dated 31.8.2016 is as under:

(₹in lakh)

	2009-10	2010-11	2011-12	2012-13	2013-14
Depreciation	3963.36	4144.34	4321.33	4459.62	4501.27
Interest on Loan	1049.70	892.64	820.79	724.56	496.46
Return on Equity	9468.75	9639.50	9799.75	10011.28	10310.79
Interest on Working Capital	2361.63	2414.09	2474.20	2530.52	2590.09
O&M Expenses	15065.00	15925.20	16836.00	17802.00	18818.60
Secondary fuel oil cost	1006.79	1006.79	1009.55	1006.79	1006.79
Total	**32915.23**	**34022.55**	**35261.61**	**36534.77**	**37724.00**

4. The petitioner has sought approval of tariff for 2014-19 in accordance with the provisions of the 2014 Tariff Regulations. The capital cost and the annual fixed charges claimed by the petitioner for the period 2014-19 are as under:

Capital Cost

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Opening Capital Cost	100389.87	102545.57	108207.77	111436.87	112446.87
Add: Additional capital expenditure	2155.70	5662.20	3229.10	1010.00	0.00
Closing Capital Cost	**102545.57**	**108207.77**	**111436.87**	**112446.87**	**112446.87**
Average Capital Cost	101467.72	105376.67	109822.32	111941.87	112446.87

Annual Fixed Charges

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Depreciation	4770.51	5356.85	6157.07	6633.97	6785.47
Interest on Loan	352.40	207.94	89.80	0.00	0.00
Return on Equity	9173.59	9412.57	9684.35	9813.93	9844.81
Interest on Working Capital	2941.40	3040.82	3144.51	3247.12	3347.65
O&M Expenses	20514.37	21802.93	23176.95	24636.61	26186.68
Compensation Allowance	0.00	0.00	0.00	0.00	0.00
Special Allowance	0.00	0.00	0.00	0.00	0.00
Total	**37752.27**	**39821.11**	**42252.68**	**44331.62**	**46164.60**

5. In compliance with the directions of the Commission, the petitioner has filed additional information and has served copies on the respondents. The respondent GRIDCO has filed its reply in the matter and the petitioner has filed its rejoinder to the said reply. We now proceed to examine the claim of the petitioner based on the submissions of the parties and the documents available on record, as discussed in the subsequent paragraphs.

Capital Cost as on 1.4.2014

6. Clause 3 of Regulation 9 of the 2014 Tariff Regulations provides as under:

"The Capital cost of an existing project shall include the following:

(a) the capital cost admitted by the Commission prior to 1.4.2014 duly trued up by excluding liability, if any, as on 1.4.2014;

(b) additional capitalization and de-capitalization for the respective year of tariff as determined in accordance with Regulation 14; and

(c) expenditure on account of renovation and modernisation as admitted by this Commission in accordance with Regulation 15."

7. The annual fixed charges claimed in the petition are based on opening capital cost of ₹102633.18 lakh as on 1.4.2014, as against ₹100389.87 lakh as on 31.3.2014 as admitted by the Commission vide order dated 31.8.2016 in Petition No. 273/GT/2014. In accordance with the Clause 3 of Regulation 9 of the 2014 Tariff Regulations, the opening capital cost as on 1.4.2014, after removal of un-discharged liabilities of ₹70.04 lakh is worked out as ₹100389.87 lakh (on cash basis) and is allowed.

Actual/ Projected Additional Capital Expenditure during 2014-19

8. Regulation 14 (3) of the 2014 Tariff Regulations, provides as under:

"14.(3) The capital expenditure, in respect of existing generating station or the transmission system including communication system, incurred or projected to be incurred on the following counts after the cut-off date, may 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 of law;

(ii) Change in law or compliance of any existing law;

(iii) Any expenses to be incurred on account of need for higher security and safety of the plant as advised or directed by appropriate Government Agencies of statutory authorities responsible for national security/internal security;

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

(v) Any liability for works executed prior to the cut-off date, after prudence check of the details of such un-discharged liability, total estimated cost of package, reasons for such withholding of payment and release of such payments etc.;

(vi) Any liability for works admitted by the Commission after the cut-off date to the extent of discharge of such liabilities by actual payments;

(vii) Any additional capital expenditure which has become necessary for efficient operation of generating station other than coal / lignite based stations or transmission system as the case may be.The claim shall be substantiated with the technical justification duly supported by the documentary evidence like test results carried out by an independent agency in case of deterioration of assets, report of an independent agency in case of damage caused by natural calamities, obsolescence of technology, up-gradation of capacity for the technical reason such as increase in fault level;

(viii) 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) and due to geological reasons after adjusting the proceeds from any insurance scheme, and expenditure incurred due to any additional work which has become necessary for successful and efficient plant operation;

(ix) 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 due to obsolesce of technology, replacement of switchyard equipment due to increase of fault level, tower strengthening, communication equipment, emergency restoration system, insulators cleaning infrastructure, replacement of porcelain insulator with polymer insulators, replacement of damaged equipment not covered by insurance and any other expenditure which has become necessary for successful and efficient operation of transmission system; and

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

Provided that any expenditure on acquiring the minor items or the assets including tools and tackles, furniture, air-conditioners, voltage stabilizers, refrigerators, coolers, computers, 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. 1.4.2014:

Provided further that any capital expenditure other than that of the nature specified above in (i) to (iv) in case of coal/lignite based station shall be met out of compensation allowance:

Provided also that if any expenditure has been claimed under Renovation and Modernisation (R&M), repairs and maintenance under (O&M) expenses and Compensation Allowance, same expenditure cannot be claimed under this regulation."

9. The break-up of the projected additional capital expenditure claimed during 2014-19 is detailed as under:

(₹ in lakh)

	Assets	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**Total**	**Claimed under Regulation**
1	**R&M Works**							
	R&M Ph-II works							
	TG & Auxiliaries							
(i)	MP Rotor (110 MW unit)	20.00	0.00	0.00	0.00	0.00	20.00	14(3)(vi)
	R&M PHASE-III WORKS							
	TG & Auxiliaries							
(ii)	Guide Wheel (St-	20.00	0.00	0.00	0.00	0.00	20.00	14(3)(vi)

	Assets	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Claimed under Regulation
	II units)							
(iii)	Refurbishment of MP Rotor blades stage-II	17.00	0.00	180.00	0.00	0.00	557.00	14(3)(vi)
(iv)	Refurbishment of LP Rotor blades stage-II	0.00	0.00	0.00	360.00	0.00	360.00	14(3)(vi)
(v)	Replacement of all Extraction NRVs & CRH NRVs with Servo motors (stage-II)	366.00	0.00	0.00	0.00	0.00	366.00	Regulation 14(3) along with Regulation 54 Power to relax
	Sub total R&M Ph-II&III	**423.00**	**0.00**	**180.00**	**360.00**	**0.00**	**963.00**	
II	**Ash Handling System**							
(i)	Construction of Ash Pond I & II	0.00	1000.00	1600.00	600.00	0.00	3200.00	14(3)(iv)
(ii)	Protection Barrier at Pilot Quarry (South Balanda Abandoned Mines)	0.00	2247.30	249.70	0.00	0.00	2497.00	14(3)(iv)&(ii)
(iii)	Laying of 4th ash slurry disposal line from station to mine (South Balanda)	0.00	251.10	27.90	0.00	0.00	279.00	14(3)(iv)&(ii)
(iv)	Construction of Contingency Ash Dyke	237.50	12.50	0.00	0.00	0.00	250.00	14(3)(iv)
(v)	Approach road from MCL main road to quarry-3B for decantation system and storm water drain from quarry 3B to Quarry 2	47.50	2.50	0.00	0.00	0.00	50.00	14(3)(iv)&(ii)
	Sub total Ash dyke/ash handling	**285.00**	**3513.40**	**1877.60**	**600.00**	**0.00**	**6276.00**	
III	**Change of Law & plant safety, security.**							
(i)	Procurement & installation of 4th AAQMS Station	62.55	6.95	0.00	0.00	0.00	69.50	14(3)(ii)
(ii)	Real Time Data Acquisition System as per SPCB Requirement	20.00	0.00	0.00	0.00	0.00	20.00	14(3)(ii)

	Assets	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Claimed under Regulation
(iii)	ESP Augmentation (2 x 110 MW)	1146.00	1762.00	692.00	0.00	0.00	3600.00	14(3)(ii)
(iv)	AFGC (Ammonia flue gas conditioning system) for Stage-I	180.00	20.00	0.00	0.00	0.00	200.00	14(3)(ii)
(v)	Fire Protection & Detection System at Stacker/Reclaimer & R1/ R2 Conveyors of CHP	39.15	4.35	0.00	0.00	0.00	43.50	14(3)(ii)&(iii)
(vi)	Augmentation of Fire Detection and Protection System for UCBs	0.00	184.50	20.50	0.00	0.00	205.00	14(3)(ii)&(iii)
(vii)	Ash Water Recirculation System - Reservoir for Storage of Recirculated Water	0.00	171.00	9.00	0.00	0.00	180.00	14(3)(ii)
(viii)	Effluent Treatment Plant (ETP) and associated facilities.	0.00	0.00	450.00	50.00	0.00	500.00	14(3)(ii)
	Sub total change of law & plant safety ,security.	**1447.70**	**2148.80**	**1171.50**	**50.00**	**0.00**	**4818.00**	
2	Decapitalisation	0.00	0.00	0.00	0.00	0.00	0.00	
	Total Additional Capitalisation Claimed	**2155.70**	**5662.20**	**3229.10**	**1010.00**	**0.00**	**12057.00**	

10. Before we examine the projected additional capital expenditure claimed by the petitioner, we discuss the submissions of parties on regards of R&M Phase-IV works and extension of life thereof. In this regard it is noticed that the Commission in order dated 7.6.2013 in Petition No. 212/2010 had decided as under:

> "20. We have considered the submissions of the parties and examined the documents on record. The generating station is an old station taken over by the petitioner wherein R&M works have been implemented in various phases (Phase-I, II, III and Switchyard). It is noticed that after considering the units' operational experience and environmental & safety considerations, a total of 18 nos of R&M Phase-IV schemes identified by the petitioner were presented and discussed with the respondent on 10.10.2009 and its has been intimated by the respondent that these

schemes under R&M could be taken up as per approval of the Commission. These R&M schemes which are implemented / planned for implementation during the period 2009-14 are mainly towards enhancing the reliability of the unit operation for the designated life of the generating station and improvement of performance of the generating station after R&M to ensure power supply to the consumers. Moreover, comprehensive R&M works required for the generating station have been identified for implementation in phases after prioritization considering the respondents' requirement for carrying out these works during overhaul of units with minimal impact on energy supply from the generating station and Phase-IV R&M works form part of the same. The R&M works in earlier phases have been spread over a span of time depending upon the quantum that could be completed during individual units overhaul. It is noticed that the R&M schemes under Phase-IV have been identified in advance by the petitioner and discussed with the beneficiary for implementation during the period 2009-14. Till the year 2012-13, many of the schemes have already been implemented by the petitioner. Also, these R&M schemes have been planned during scheduled shut down. At the time of filing the petition, the petitioner had planned for implementation of these 18 schemes by 2013-14 after approval of the Commission. However, due to implementation of these works during maintenance overhaul as emphasized by the beneficiary and to have minimum impact on station availability, part of these works (17 schemes) proposed now by the petitioner under R&M Phase-IV are to be continued beyond the tariff period 2009-14, based on which revised phasing of expenditure has been submitted by the petitioner. The petitioner has also submitted that some of the systems have become obsolete due to which availability of spares is difficult and there are frequent failures in some systems /components affecting the unit availability warranting replacement of systems to improve efficiency. In the above background and taking into consideration that the implementation of these schemes requires sufficient lead time for planning, ordering, manufacturing, and execution, etc., the proposal of the petitioner seeking in–principle approval of these works is justified. The grant of in-principle approval for the reasons mentioned above would not in our view amount to extension of the provisions of Regulation 10 of the 2009 Tariff Regulations. Moreover, the expenditure on R&M works beyond 2009-14 could be treated as committed liabilities, to be considered in accordance with the relevant regulations during the next tariff period. Thus, the objection of the respondent is disposed of in terms of the above.

….

22. It is observed from the above table that the availability / PLF of the generating station during 2008-12 varied between 91% to 94%. Under such improved actual operating performance, it can be concluded that in absence of the R&M Phase-IV works, the Stage-I, Stage-II and the generating station has not suffered any serious break-down or generation loss on account of non-reliability or obsolescence of some of the existing components. It appears that the petitioner by undertaking R&M Phase-IV has intended to provide for any exigencies/failure in future. However, it is noted that the extended life of the units are to expire during the year 2021 and the generating station has attained a saturated level of its performance due to extensive additional capitalization of ₹543.32 cores allowed by the Commission in the form of R&M, thereby keeping very little room for further efficiency improvement. Under these circumstances, the consideration of R&M Phase-IV could only be on the premise that the life of the individual units/generating station would be extended beyond the year 2021."

11. The petitioner has submitted that it has not claimed any expenditure towards R&M Phase-IV as after the issuance of order dated 7.6.2013 in Petition No. 212/2010 the impact of the order was studied by the petitioner and it was felt that completion of these R&M Phase-IV scheme would not ensure the reliable operation of Stage-II

units for further extension of life of 15 years from the date of completion of this scheme. The petitioner has further submitted that the comprehensive R&M activities involving substantial investment would be required in certain vital equipments of TG & SG which are nearing their extended life even after R&M works carried out in initial stage and accordingly, the petitioner has not taken up the scheme of R&M phase-IV to be executed after the year 2014.

12. The respondent, GRIDCO has submitted that the discontinuation of R&M Phase-IV by the petitioner after the year 2014 even after the approval of the same by order dated 7.6.2013 is not justifiable and has prayed that the Commission may direct the petitioner to abide by the proposal of R&M phase-IV as was approved in the said order. The respondent has also submitted that the petitioner is silent on the observations of the Commission in order dated 7.6.2013 as regards the extension of life of Stage-II units by 15 years. The respondent has further submitted that Phase-IV R&M works are essential and inevitable for sustainable performance of Stage-II Units, but the petitioner has decided not to take up the same. The respondent has also submitted that in order dated 7.6.2013 in-principal approval of R&M Phase-IV and consequent, the life extension of Stage-II units was permitted only after considering all the information submitted by the petitioner. Accordingly, respondent has submitted that the petitioner is bound to comply with the said order of the Commission. The respondent has further submitted that the useful life of Stage-II units of the petitioner may be extended by another 15 years in line with the direction of the commission in dated 7.6.2013. The respondent has further submitted additional O&M expenses with regards to R&M Phase IV should not be allowed to the petitioner.

13. In response, the petitioner has submitted that R&M of Phase-IV was not envisaged for further life extension of 15 years for stage-II on completion of R&M Phase-IV. The petitioner has submitted that it has been billing the respondent as per tariff order issued by the Commission in respect of this generating station. The petitioner has stated that the respondent has reaped the full benefits of R&M by way of higher generation and operating norms specified by the Commission from time to time as compared to the performance at the time of takeover from OSEB. The petitioner has further submitted that the in-principle approval of R&M Phase-IV activities beyond 2014 was provided by the Commission vide order dated 7.6.2013. After the issuance of the order, the petitioner took a comprehensive view on carrying out the R&M Phase-IV works and concluded that R&M phase-IV scheme would not ensure the reliable operation of Stage-II units for further extended life of 15 years from date of this completion of this scheme further and accordingly decided not to carry out left over R&M schemes (R&M Phase-IV) beyond 2014. The petitioner has further submitted that the O&M expenses claimed are well within the norms specified as per 2014 Tariff Regulation and the contentions of the respondent are devoid of merit and hence may be rejected.

14. We have examined the submissions of the parties. It is noticed that the Commission in its order dated 7.6.2013 in Petition No. 212/2010 while approving the expenditure for R&M Phase-IV schemes pertaining to Stage-II of the generating station had observed as under:

> *"23. The Commission in its order dated 19.6.2002 in Petition No. 62/2000 had extended the life of the generating station by 20 years with effect from 1.4.2001 i.e upto 31.3.2021 based on the agreed expenditure of `436.5 crores under R&M Phase-I & Phase-II. The petitioner had formulated R&M Phase-I, Phase-II and Phase-III and Switchyard scheme in consultation with the respondent, the expenditure of which was allowed by the Commission during 2001-04 and 2004-09 tariff periods. The benefit of life extension and improved operational performance has been passed on to the respondent in the form of sustained generation and improved operational norms, in consideration of which, the operational norms had been revised twice by the Commission based on actual performance during the implementation of R&M. As*

stated, some of the works under Phase-III are still under implementation. While considering the extension of life of the generating station earlier, the petitioner had also not indicated that without the implementation of the works under Phase- IV, it would not be possible to extend the life of the units by 20 years or to sustain generation with improved performance. The Stage-I units of the generating are very old and is are in operation for more than 41 to 42 years. Accordingly, there is no justification for the petitioner to take up further R&M in Stage-I units. Instead, the petitioner is well advised to file a phasing out scheme for Stage-I units in line with policy decision of the CEA with regard to old units sizes of 110 MW and below. Any requirement for replacement of any components/system on need basis during the normal operation during the remaining life of these units could be booked under O&M expenses rather than capitalization of the expenditure considering the fact that increase in tariff particularly when the units are to be phased out in next 6-7 years period, would not be desirable.

24. In so far as R&M Phase-IV works proposed for Stage-II, the petitioner has not indicated any linkage with further extension of life. The Stage-II units are also in operation for more than 30 years and its extended life would expire in 6-7 years (approx). However, the Stage-II units are relatively new and are of higher capacity as compared to Stage-I units. In this background, we are of the considered view that R&M Phase-IV schemes which pertain to Stage-II of the generating station could only be considered, subject to the condition that the petitioner would recover the cost of R&M Phase-IV in 15 years from the date of completion of the said R&M. The present tariff period 2009-14 is nearing completion and hence these schemes in all likelihood would be implemented only during the next tariff period as stated by the petitioner. However, keeping in view that in-principle approval would facilitate the process of tendering, issuance of work order, execution, etc., these schemes in all probability would materialize during the initial years of the next tariff period. The original R&M schemes and other new schemes of `64.97 crore (`38.75 core for original schemes and `26.22 crore for new schemes) could be considered as Stage-II schemes and these include `58.45 crore specifically envisaged for Stage-II units (including the apportionment amount of `2.36 crore for Fire detection and protection system for Stage-II) and `6.52 crore towards cost of common facilities such as rerouting of raw water pipelines, replacement of switchyard of CHP mine and passenger lift).

25. The petitioner has furnished the estimated gross value of replaced assets as 1/8th of current value of new assets for de-capitalization wherever replacement has been proposed. The petitioner is directed to furnish the actual value of old assets as when it approaches the Commission with a petition for approval of tariff on the basis of actual capital expenditure incurred against the in-principle approval granted by this order.
Xxxxxxxxxxx

26. As regards the schemes which have already been initiated and planned to be capitalized by the petitioner during the period 2009-14, in respect of this generating station, the same would be considered for recovery in tariff in Petition No. 304/2009 which is pending before the Commission."

15. It is evident from the above direction of the Commission that the in-principal approval of R&M Phase-IV schemes pertaining to Stage-II of the generating station was subject to the condition that the petitioner would recover the cost of R&M in 15 years from the date of completion of the said R&M. In the said order the petitioner

was also directed to furnish the actual value of old assets at the time of approval of tariff on the basis of actual capital expenditure incurred against the in-principal approval granted in the said order. It is however noticed that the petitioner despite the grant of in-principal approval of the R&M Phase-IV schemes, has not decided to carry out the left over schemes and has not claimed any expenditure for capitalization during the period 2014-19 on the ground that the scheme would not ensure the reliable operation of the stage-II units for further extended life of 15 years from the date of completion of the scheme, beyond 2014. The Commission after considering the proposal of the petitioner for R&M Phase-IV schemes to be continued beyond the tariff period 2009-14 and based on revised phasing of expenditure submitted by the petitioner, had by order dated 7.6.2013 granted in principal approval of the said works. In this background, the submissions of the petitioner that it has decided not to carry out R&M Phase-IV schemes (Stage-II) beyond 2014 will not be justifiable in the absence of any proper justification. In the event of non compliance of the directions of the Commission, the petitioner should have approached the Commission proactively informing the status of the implementation of directions. Hence, the petitioner is directed to submit additional information as to :

(a) Whether due-diligence and approval of Board regarding the viability of the R&M scheme and life extension thereof was undertaken before in-principal approval was granted by the Commission. If yes, the reasons for not continuing with the R&M Phase-IV scheme beyond 2014 may be elaborated.
(b) Details of the agenda note indicating justification as regards deciding not to continue with the R&M Phase-IV Scheme and approval of the same by the Board of the petitioner`s Company.
(c) Expenditure, if any, capitalized for the R&M scheme along with the details of the work already undertaken and for the balance work remaining.

16. The above information shall be submitted on affidavit by the petitioner at the time of truing-up of tariff of the generating station in terms of 2014 Tariff Regulation

for consideration of the same by the Commission in accordance with law. Since, capitalization of R&M Phase-IV scheme has not been sought by the petitioner, the scheme has not been considered in this order.

17. We now proceed to examine the claim of the petitioner for the projected additional capital expenditure for the generating station in the succeeding paragraphs.

18. The petitioner has claimed the projected additional capital expenditure broadly categorized as under:-

(i) Ash Handling System

(ii) Plant safety and security (Change in law)

(iii) R&M works

Ash Handling System

19. The petitioner vide affidavit dated 19.8.2014 has claimed total projected additional capital expenditure of `6276.00 lakh for the period 2014-19 towards Ash handling System under various head. Out of this, the petitioner has claimed projected additional capital expenditure of `3200.00 lakh towards construction of Ash Pond I & II, `2497.00 lakh towards Protection Barrier at Pilot Quarry (South Balanda Abandoned Mines), `279.00 lakh towards Laying of 4th ash slurry disposal line from station to mine (South Balanda), `250.00 lakh towards Construction of Contingency Ash Dyke and `50.00 lakh towards Laying of 4th Approach road from MCL main road to quarry-3B for decantation system and storm water drain from quarry 3B to Quarry 2 for the period 2014-19 under Regulation 14(3)(iv)& 14(3)(ii) of the 2014 Tariff Regulations. In justification of the same, the petitioner has submitted that the construction of Ash pond I & II and Construction of Contingency Ash Dyke was previously approved by the respondent, GRIDCO and the same is planned now for

Ash disposal due to mine filling. The petitioner has further submitted that the expenditure against the Protection Barrier at Pilot Quarry (South Balanda Abandoned Mines, Laying of 4th ash slurry disposal line from station to mine (South Balanda and Laying of 4th Approach road from MCL main road to quarry-3B for decantation system and storm water drain from quarry 3B to Quarry 2 is as per the guidelines of State Pollution Control Board (SPCB) vide letter dated 25.4.2013 ,which directs for disposal of solid waste i.e., fly ash of quantity 3000 TPD in South Balanda open cast mine.

20. In response to the direction of the Commission to explain the reasons for simultaneous expenditure for Ash mine back filling and Ash pond being contradictory in nature, the petitioner vide affidavit dated 19.9.2016 has submitted that for TTPS generating station, the ash generated in units is fully utilized in ash filling of mines, but lately there has been issues in mine back filling as regards to MOEF clearance for Forest land re-diversion etc. It has also stated that in the 52nd meeting of Expert Appraisal Committee (EAC) on Environment Impact Assessment of Thermal power and coal mining projects under MoEF, GoI, the issue regarding TTPS generating station using mine voids for ash disposal was discussed. In the meeting, EAC expressed that fly ash disposal is not environmentally friendly due to reduction in ground water charging in area and leeching of heavy metals in to ground water due to fly ash disposal in mine void etc. The EAC in the meeting extended permission to the generating station for ash disposal in South Balonda mines further up to one year from March-2016 (i.e. March 2017) subject to regular monitoring and review of continuing study by National Environment Engineering Research Institute (NEERI) regarding various effects of ash disposal in mines on environment and in view of the same, the petitioner has planned to construct Ash pond I&II for disposing of ash in case the permission for ash disposal in mines is not granted beyond March 2017 due

to environmental consideration. The petitioner has further submitted that the development of Ash pond has been approved by GRIDCO under R&M phase-III and thus it is part of Ash handling / Ash disposal works covered under originally approved works to discharge Ash generated from the plant and the land required for the ash pond has already been capitalised and approved in 2004-09 period. However, due to delay in physical possession of land, construction work for ash dyke/pond could not be started. The generating station`s extended useful life is up to year 2021, therefore ash dyke/pond for fly ash disposal is necessary for successful and reliable operation of station. In support of its claim, the petitioner has also submitted the excerpt of 52nd meeting of Expert Appraisal Committee (EAC) on Environment Impact Assessment of Thermal power and coal mining projects in support. The petitioner has further submitted that there exists a small ash dyke referred as contingency ash dyke with 3 month capacity for ash disposal of TTPS for meeting emergency requirements. As the capacity of contingency ash dyke was nearing completion, the work of raising of contingency ash dyke has been taken-up and completed in 2014-15.

21. We have examined the matter. It is observed from the minutes of meeting of the 52nd meeting of Expert Appraisal Committee (EAC) on Environment Impact Assessment of Thermal power and coal mining projects held on 29.2.2016 and 1.3.2016 that due to environmental constraints, the permission to the generating station for ash disposal in South Balonda mines is only up to March 2017 and the petitioner has therefore considered the construction of ash pond and corresponding projected capital expenditure after March, 2017. It is also observed that since the ash disposal is not allowed beyond March 2017, the petitioner has claimed huge capital expenditure towards the Ash mine back filling and related works during the period 2014-17. It is our considered view that as the ash disposal is not allowed after March 2017, the projected expenditure in this regard just before 2017 is not justifiable as it

will serve no purpose and the consumer/beneficiaries cannot be burdened for the same. Considering the above facts, we are not inclined to allow the expenditure of `2497.00 lakh towards Protection Barrier at Pilot Quarry (South Balanda Abandoned Mines), `279.00 lakh towards Laying of 4th ash slurry disposal line from station to mine (South Balanda) and `50.00 lakh towards Laying of 4th Approach road from MCL main road to quarry-3B for decantation system and storm water drain from quarry 3B to Quarry 2 and we direct accordingly. However, as regards the claim of the projected additional capital expenditure towards the Ash pond and contingency ash dyke, the capital expenditure towards the land for Ash pond was approved during the period 2004-09 vide order dated 3.9.2012 in Petition No.184/2009 and since the work of ash disposal and mine filling is not allowed beyond March 2017, the expenditure of `3200.00 lakh towards the construction of Ash pond and the expenditure of `250.00 lakh towards the contingency ash dyke for meeting emergency requirements for the period 2014-19 is allowed**.**

<u>Works under Plant safety & security (Change of Law)</u>

Ambient Air Quality Monitoring System (AAQMS) and Real Time Data Acquisition System

22. The petitioner has claimed projected additional capital expenditure `69.50 lakh towards Procurement & Installation of 4th AAQMS Station and `20.00 lakh towards Real Time Data Acquisition System as per the guidelines of State Pollution Control Board (SPCB). In justification of the same, the petitioner vide affidavit dated 19.9.2016 has submitted that three AAQMS station were installed earlier as per Environment Action Plan on direction of SPCB and were approved by the Commission vide order dated 15.5.2014 in Petition No. 304/2009 for capitalization in period 2009-14. The petitioner has stated that subsequently, SPCB vide letter dated 30.5.2012 has directed the petitioner to install one more AAQMS station and a real

time data acquisition system for transmitting real time Ambient Air Quality & Opacity data to their server (AAQMS). The petitioner has further submitted that the work has been awarded on 25.2.2014 and the same is in progress and is expected to be completed during 2014-15. The petitioner vide affidavit dated 26.8.2016 has also submitted the consent order of SPCB, Orissa dated 15.2.2016 in justification of its claim.

23. We have examined the matter. It is noticed that installation of one more AAQMS station and a real time data acquisition system for transmitting real time Ambient Air Quality & Opacity data to their server (AAQMS) is in compliance to SPCB direction also in this regard, Commission vide order dated 15.5.2014 in Petition No. 304/2009 had approved the cost towards AAQMS and stated as under:

> *"The actual expenditure of ₹96.52 lakh (₹95.49 lakh in 2009-10 and ₹1.03 lakh in 2010-11) for AAQMS has been allowed in order to meet the requirements under the MOE&F, Govt. of India notification towards environmental norms. It is observed that the Commission in some of its orders for the period 2009-14 pertaining to other generating stations of the petitioner had not allowed the capitalization of expenditure towards EMS on the ground that the benefit of reduction in auxiliary power consumption is not passed on to the beneficiaries. In line with this, the actual capital expenditure of ₹17.16 lakh towards EMS has not been allowed. The projected capital expenditure of ₹516.54 lakh in 2013-14 for Ash water recirculation system has been allowed as the same is in compliance with the directions of the Orissa State Pollution Control Board."*

24. Considering the fact that the additional capital expenditure towards Procurement & installation of 4th AAQMS Station & Real Time Data Acquisition System is in compliance of the directions/guidelines of SPCB vide letter dated 30.5.2012 to install one more AAQMS station and a real time data acquisition system for transmitting real time Ambient Air Quality & Opacity data to their server (AAQMS), the same is allowed under Regulation 14(3)(ii) of 2014 Tariff Regulations .

Ammonia Flue Gas Conditioning system (AFGC) for Stage-I and ESP Augmentation

25. The petitioner has also claimed a projected additional capital expenditure of `200 lakh towards Ammonia Flue Gas Conditioning system (AFGC) for Stage-I and `3600 lakh towards ESP Augmentation. The petitioner has submitted that Talcher Angul area has been classified under clusters of industries area wise which are critically polluted and it has also submitted the CPCB directives dated 3.12.2012 and SPCB consent order in support of its claim. It has further submitted that the Central Pollution Control Board (CPCB) has developed Comprehensive Environmental Pollution Index (CEPI) for evaluating pollution level of industrial clusters, Angul-Talcher being one of them. It has also submitted that the CEPI action plan prepared by CPCB mandates to bring down the SPM level to below 50 mg/Nm3 by all Thermal Power Plants in Talcher Angul area. Accordingly, the petitioner has submitted that CPCB has directed all the stakeholders to take necessary steps for implementing the CEPI action. Based on this, the petitioner has submitted that the works in this regard are planned for Stage-II and stage-I in order to meet the prescribed emission standard to meet the environment norms as per SPCB action plan for abatement of pollution in critically polluted industrial cluster Angul (CEPI action plan) and CPCB directives dated 3.12.2012. It has further submitted that retrofitting of ESP stage-II is being carried out and Centralised Ammonia Flue Gas Conditioning System (CAFGC) is planned for ESP Stage-I and accordingly works have been awarded at an amount of `3600 lakh approx for ESP Stage-II and `200 lakh for AFGC system in Stage-I. The petitioner has submitted that an amount of `1522 lakh as 31.3.2014 is for CWIP against the retrofitting of ESP stage-II and the work is in progress and is required to be capitalised in phases based on work schedule from the period 2014-17.

26. We have examined the submissions. Considering the fact that the additional capital expenditure of `200 lakh towards AFGC (Ammonia flue gas conditioning system) for Stage-I and `3600 lakh towards ESP Augmentation (2 x 110 MW) is in

compliance of the directions/guidelines of CPCB and with consent of SPCB, the same is allowed under Regulation 14(3)(ii) of 2014 Tariff Regulations. The petitioner is however directed to submit the details of the actual expenditure along with the de-capitalisation at the time of revision of tariff based on truing up exercise in terms of Regulation 8 of the 2014 Tariff Regulations.

Augmentation of Fire Detection and Protection System

27. The petitioner has claimed additional capital expenditure of `205 lakh towards Augmentation of Fire Detection and Protection System for UCBs, `43.5 lakh towards Fire Protection & Detection System at Stacker/Reclaimer & R1/ R2 Conveyors of CHP. In justification of the claim for Fire Protection & Detection System at Stacker/Reclaimer & R1/ R2 Conveyors of CHP, the petitioner has submitted that assessment of availability, reliability and design adequacy of Fire detection and Protection system of all coal based thermal stations of the petitioner was carried out in-line with Regulation 12(5) of Central Electricity Authority (Technical Standards for construction of Electrical Plants and Electric Lines) Regulations, 2010. It has submitted that based on the above, these works were identified with respect to fire detection and protection system at the generating station. The petitioner has submitted that the installation of Fire Protection & Detection System (MVW) in the balance area for safety of plant & machinery viz. i) R1/R2 Conveyor and Stacker/Reclaimer is presently not available. It has further submitted that the majority of Fire Protection/Detection Works for CHP have been completed in past which was allowed by the Commission.

28. As regards the claim of additional capital expenditure for Augmentation of Fire Detection and Protection System for UCBs, the petitioner has submitted that Halon fire protection system is provided for permanent fire fighting system and uses

substances which are Ozone depleting in nature. The petitioner has further submitted that as per the Environment (Protection) Act 1986, the Central Government has laid down rules for Ozone Depleting Substances (Regulation and Control) Rules, 2000 and as per the rules, no enterprise shall engage in any activity that uses ozone depleting substances unless he is registered with the authority and the generating companies are allowed to continue with the existing fire fighting system for a period of 10 years (Upto 1.1.2010) after which the production and servicing of the same was stopped (Vide Schedule IV). It has also submitted that as per the Montreal Protocol on substances that deplete the Ozone layer, plants using Ozone depleting substances must phase out these systems and adopt systems which use substances that do not deplete the Ozone layer. Accordingly, the petitioner has proposed to replace Halon gas fire protection system with alternate inert gas in line with Central Electricity Authority (Technical Standards for construction of Electrical Plants and Electric Lines) Regulation, 2010.

29. We have considered the submissions of the petitioner. On perusal of Schedule IV of the said Rules (Regulation on consumption of ozone depleting substances on end use basis) it is noticed that the phase out time and for switching over to non ozone depleting substance technology in respect of fire extinguishers and fire extinguishing systems is 10 years. In the circumstances, since the expenditure incurred is on account of replacement due to statutory compliance with the provisions of the rules as aforesaid, the expenditure falls within the scope of Regulation 14(3)(ii) of the 2014 Tariff Regulations, hence the same is allowed. As regards the claim for projected additional capital expenditure towards Augmentation of fire fighting system in for UCBs, Stacker/Reclaimer & R1/ R2 Conveyors of CHP etc. based on the Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric lines) Regulations, 2010. It is clear from the submissions of the petitioner

that the installation of Fire Protection & Detection System (MVW) is in the balance area for safety of plant & machinery i.e. i) R1/R2 Conveyor and Stacker/Reclaimer, which are presently not available and the majority of Fire Protection/Detection Works for CHP has already been completed in past. Accordingly, we are inclined to allow the works towards augmentation of a fire fighting system for balance area for safety of plant & machinery under Regulation 14(3)(ii) of 2014 Tariff Regulations.

Effluent Treatment Plant (ETP) and associated facilities, Ash Water Recirculation System

30. The petitioner has claimed the projected additional capital expenditure of `500.00 lakh towards Effluent Treatment Plant (ETP) and associated facilities and `180 lakh towards Ash Water Recirculation System (AWRS)- Reservoir for Storage of Re circulated Water under Regulation 14(3)(ii) & 14(3)(iii) of the 2014 Tariff Regulations. In justification towards ETP, the petitioner has submitted that SPCB Orrisa vide its letter dated 25.4.2013 directed the petitioner to maintain special condition for water pollution control to recycle effluent generated in the generating station and to meet the statutory SPCB requirement to stop discharge of effluent to outside the premises of the generating station, accordingly ETP and associated facilities have been planned by the petitioner. As regards AWRS, the petitioner has submitted that as per the directives of SPCB with respect to the air water pollution control 100% ash water is to be recycled. The petitioner has submitted the letter of SPCB dated 25.4.2013 which directs the petitioner to recycle ash water completely. The petitioner has further submitted that the additional capital expenditure of `516.54 lakh was allowed in 2013-14 foe works related to AWRS system order dated 15.5.2014 in Petition No 304/2009 against which the actual expenditure was `501.79 lakh and accordingly the reservoir for storage of re-circulated water in AWRS system has been planned in the period 2014-19.

31. We have considered the submissions made by the petitioner and as the expenditure of `500 lakh towards Effluent Treatment Plant ( ETP ) and associated facilities and `180.00 lakh towards Ash Water Recirculation System-Reservoir for Storage of Recirculated Water is in compliance of the directions/guidelines of SPCB vide its letter dated 25.4.2013 to maintain special condition for water pollution control to recycle effluent generated in the generating station and to meet the statutory SPCB requirement to stop discharge of effluent to outside the premises of the generating station as well as recycling of ash water completely, the same is allowed under Regulation 14(3)(ii) of Tariff Regulation 2014.

R&M works

32. The petitioner has claimed projected additional capital expenditure of `963.00 lakh for the period 2014-19 towards TG and auxiliaries under Regulation 14(3)(vi) along with Regulation 54 of Power to Relax of the 2014 Tariff Regulations which includes additional capital expenditure of `20.00 lakh towards the MP motor(2X110) under R&M phase-II, `20.00 lakh towards the Guide wheels, `197.00 lakh towards the Refurbishment of MP Rotor blades Stage-II, `360.00 lakh towards the Refurbishment of LP Rotor blades Stage-II and `366.00 lakh towards Replacement of all Extraction NRVs & CRH NRVs with Servo motors (stage-II) under R&M phase-III. In justification of its claim the petitioner has submitted that works has already been allowed in order dated 304/2009 and the expenditure projected are towards the same work. Also the capital expenditure of `366.00 lakh claimed by the petitioner towards Replacement of all Extraction NRVs & CRH NRVs with Servo motors (Stage-II) is towards the balance work as was projected by the petitioner and allowed in vide order dated 31.8.2016 in Petition No. 273/GT/2014.

33. We have examined the submissions of the petitioner. It is observed that the Commission vide its order dated 19.6.2002 in Petition No. 62/2000 had extended the life of the generating station up to the year 2021 and allowed the R&M works under Phase-I, Phase-II and Phase-III schemes. The works claimed are within the scope of works allowed under R&M Phase II & III accordingly the expenditure of `963.00 lakh for expenditure toward TG and auxiliaries under R&M works are allowed for the period of 2014-19.

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

(₹ in lakh)

	Assets	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Allowed under Regulation
1	**R&M Works**							
	R&M Ph-II works							
	TG & Auxiliaries							
(i)	MP Rotor (110 MW unit)	20.00	0.00	0.00	0.00	0.00	20.00	14(3)(vi)
	R&M Phase-III Works							
	TG & Auxiliaries							
(ii)	Guide Wheel (St-II units)	20.00	0.00	0.00	0.00	0.00	20.00	14(3)(vi)
(iii)	Refurbishment of MP Rotor blades stage-II	17.00	0.00	180.00	0.00	0.00	197.00	14(3)(vi)
(iv)	Refurbishment of LP Rotor blades stage-II	0.00	0.00	0.00	360.00	0.00	360.00	14(3)(vi)
(v)	Replacement of all Extraction NRVs & CRH NRVs with Servo motors (stage-II)	366.00	0.00	0.00	0.00	0.00	366.00	Regulation14(3) along with Regulation 54 Power to relax
	Sub total R&M Ph-II&III	**423.00**	**0.00**	**180.00**	**360.00**	**0.00**	**963.00**	
II	**Ash Handling System**							
(i)	Construction of Ash Pond I & II	0.00	1000.00	1600.00	600.00	0.00	3200.00	14(3)(iv)
(ii)	Protection Barrier at Pilot Quarry (South	0.00	0.00	0.00	0.00	0.00	0.00	14(3)(iv)&(ii)

	Assets	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Allowed under Regulation
	Balanda Abandoned Mines)							
(iii)	Laying of 4th ash slurry disposal line from station to mine (South Balanda)	0.00	0.00	0.00	0.00	0.00	0.00	14(3)(iv)&(ii)
(iv)	Construction of Contingency Ash Dyke	237.50	12.50	0.00	0.00	0.00	250.00	14(3)(iv)
(v)	Approach road from MCL main road to quarry-3B for decantation system and storm water drain from quarry 3B to Quarry 2	0.00	0.00	0.00	0.00	0.00	0.00	14(3)(iv)&(ii)
	Sub total Ash dyke/ash handling	**237.50**	**1012.50**	**1600.00**	**600.00**	**0.00**	**3450.00**	
III	**Change of Law & plant safety, security.**							
(i)	Procurement & installation of 4th AAQMS Station	62.55	6.95	0.00	0.00	0.00	69.50	14(3)(ii)
(ii)	Real Time Data Acquisition System as per SPCB Requirement	20.00	0.00	0.00	0.00	0.00	20.00	14(3)(ii)
(iii)	ESP Augmentation (2 x 110 MW)	1146.00	1762.00	692.00	0.00	0.00	3600.00	14(3)(ii)
(iv)	AFGC (Ammonia flue gas conditioning system) for Stage-I	180.00	20.00	0.00	0.00	0.00	200.00	14(3)(ii)
(v)	Fire Protection & Detection System at Stacker/Reclaimer & R1/ R2 Conveyors of CHP	39.15	4.35	0.00	0.00	0.00	43.50	14(3)(ii)&(iii)
(vi)	Augmentation of Fire Detection and Protection System for UCBs	0.00	184.50	20.50	0.00	0.00	205.00	14(3)(ii)&(iii)
(vii)	Ash Water	0.00	171.00	9.00	0.00	0.00	180.00	14(3)(ii)

	Assets	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Allowed under Regulation
	Recirculation System - Reservoir for Storage of Recirculated Water							
(viii)	Effluent Treatment Plant (ETP) and associated facilities.	0.00	0.00	450.00	50.00	0.00	500.00	14(3)(ii)
	Sub total change of law & plant safety , security.	**1447.70**	**2148.80**	**1171.50**	**50.00**	**0.00**	**4818.00**	
2	Decapitalisation	0.00	0.00	0.00	0.00	0.00	0.00	
	Total Additional Capitalisation Allowed	**2108.20**	**3161.30**	**2951.50**	**1010.00**	**0.00**	**9231.00**	

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

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Opening Capital Cost	100389.87	102498.07	105659.37	108610.87	109620.87
Add: Additional capital expenditure	2108.20	3161.30	2951.50	1010.00	0.00
Closing Capital Cost	102498.07	105659.37	108610.87	109620.87	109620.87

Debt-Equity Ratio

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

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

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

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

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

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

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

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

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

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

37. Accordingly, the gross normative loan and equity amounting to `56370.16 lakh and `44019.71 lakh, respectively as on 31.3.2014 as considered in order dated 31.8.2016, has been considered as gross normative loan and equity as on 1.4.2014. The normative debt equity ratio of 70:30 has been considered in the case of additional capital expenditure. This is subject to truing-up in terms of the 2014 Tariff Regulations.

Return on Equity

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

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

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

Provided that:

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

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

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

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

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

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

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

“Tax on Return on Equity

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

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

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

40. The petitioner has claimed return on equity considering base rate of 15.5% and effective tax rate of 23.9394%.. This issue being not confined to a single petition and being generic in nature as the issue is applicable to all NTPC petitions uniformly need deliberation. On this issue against specific query through ROP, the petitioner vide its affidavit dated 8.1.2016 in Petition no. 280/GT/2014 (Farakka STPS, Stage-III) has filed Auditor's Certificate regarding deposit of advance tax on generation business for the year 2014-15 as well as Income Tax return for the financial year 2014-15 (Assessment Year 2015-16). We have examined the documents submitted and observed that the regulation prescribe computation of effective tax rate on the basis of tax paid, still we deem it proper to allow grossing up on MAT rate considering the fact that the matter is getting decided in the year 2016-17. Accordingly, the effective tax rate (MAT) of 20.961% has been considered for the year 2014-15 and 21.342% for the year 2015-16 onwards up to the year 2018-19 for the purpose of grossing up of base rate of 15.5%. Accordingly, the rate of Return on Equity works out to 19.610% for the year 2014-15 and 19.705% for the year 2015-16 onwards. This is however, subject to true-up. Accordingly, return on equity has been worked out as under:

(₹ in lakh)

	2014-15	**2015-16**	**2016-17**	**2017-18**	**2018-19**
Notional Equity- Opening	44019.71	44652.17	45600.56	46486.01	46789.01

Addition of Equity due to additional capital expenditure	632.46	948.39	885.45	303.00	0.00
Normative Equity-Closing	44652.17	45600.56	46486.01	46789.01	46789.01
Average Normative Equity	44335.94	45126.36	46043.28	46637.51	46789.01
Return on Equity (Base Rate)	15.500	15.500	15.500	15.500	15.500
Tax Rate for the year	20.961	21.342	21.342	21.342	21.342
Rate of Return on Equity (Pre Tax)	19.610	19.706	19.706	19.706	19.706
Return on Equity(Pre Tax) annualised	**8694.45**	**8892.38**	**9073.06**	**9190.15**	**9220.01**

Interest on Loan

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

*"**26. Interest on loan capital:** (1)The loans arrived at in the manner indicated in regulation 19 shall be considered as gross normative loan for calculation of interest on loan.*
(2) The normative loan outstanding as on 1.4.2014 shall be worked out by deducting the cumulative repayment as admitted by the Commission up to 31.3.2014 from the gross normative loan.

(3) The repayment for each of the year of the tariff period 2014-19 shall be deemed to be equal to the depreciation allowed for the corresponding year/period. In case of de-capitalization of assets, the repayment shall be adjusted by taking into account cumulative repayment on a pro rata basis and the adjustment should not exceed cumulative depreciation recovered upto the date of de-capitalization of such asset.

(4) Notwithstanding any moratorium period availed by the generating company orthe transmission licensee, as the case may be, the repayment of loan shall be considered from the first year of commercial operation of the project and shall be equal to the depreciation allowed for the year or part of the year.

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

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

Provided further that if the generating station or the transmission system, as the case may be, does not have actual loan, then the weighted average rate of interest of the generating company or the transmission licensee as a whole shall be considered.
(6) The interest on loan shall be calculated on the normative average loan of the year by applying the weighted average rate of interest.

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

generating company or the transmission licensee, as the case may be, in the ratio of 2:1.

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

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

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

42. Interest on loan has been worked out as under:

(a) The gross normative loan of ₹56370.16 lakh as on 1.4.2014 has been considered.

(b) Cumulative repayment of loan of ₹56370.16lakh as on 31.3.2014 as considered in order dated 31.8.2016 in Petition No.273/GT/2014 has been considered as on 1.4.2014.

(c) Accordingly, the net normative opening loan as on 1.4.2014 works out to "nil".

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

(e) Depreciation allowed for the period has been considered as repayment of normative loan during the respective year for the period 2014-19.

(f) In line with the provisions of the regulation, the weighted average rate of interest has been calculated applying the actual loan portfolio existing as on 1.4.2014 along with subsequent additions during the period 2014-19, if any, for the generating station. In case of loans carrying floating rate of interest the rate of interest as provided by the petitioner has been considered for the purpose of tariff. The calculations for weighted average rate of interest on loan have been enclosed as Annexure-I to this order.

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

(₹ in lakh)

	2014-15	**2015-16**	**2016-17**	**2017-18**	**2018-19**
Gross opening loan	56370.16	57845.90	60058.81	62124.86	62831.86
Cumulative repayment of loan upto previous year	50857.83	55354.61	60058.81	62124.86	62831.86
Net Loan Opening	5512.33	2491.29	0.00	0.00	0.00
Addition due to additional capital expenditure	1475.74	2212.91	2066.05	707.00	0.00
Repayment of loan during the year	4496.79	4704.20	2066.05	707.00	0.00
Less: Repayment adjustment on	0.00	0.00	0.00	0.00	0.00

account of de-capitalization					
Add: Repayment adjustment on account of discharges corresponding to un-discharged liabilities deducted as on 1.4.2009	0.00	0.00	0.00	0.00	0.00
Net Repayment	4496.79	4704.20	2066.05	707.00	0.00
Net Loan Closing	2491.29	0.00	0.00	0.00	0.00
Average Loan	4001.81	1245.64	0.00	0.00	0.00
Weighted Average Rate of Interest of loan	6.6147	6.9311	7.7971	8.6368	8.5640
Interest on Loan	**264.71**	**86.34**	**0.00**	**0.00**	**0.00**

Depreciation

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

> ***"27. Depreciation:*** *(1) Depreciation shall be computed from the date of commercial operation of a generating station or unit thereof or a transmission system including communication system or element thereof. In case of the tariff of all the units of a generating station or all elements of a transmission system including communication system for which a single tariff needs to be determined, the depreciation shall be computed from the effective date of commercial operation of the generating station or the transmission system taking into consideration the depreciation of individual units or elements thereof.*
>
> *Provided that effective date of commercial operation shall be worked out by considering the actual date of commercial operation and installed capacity of all the units of the generating station or capital cost of all elements of the transmission system, for which single tariff needs to be determined.*
>
> *(2) The value base for the purpose of depreciation shall be the capital cost of the asset admitted by the Commission. In case of multiple units of a generating station or multiple elements of transmission system, weighted average life for the generating station of the transmission system shall be applied. Depreciation shall be chargeable from the first year of commercial operation. In case of commercial operation of the asset for part of the year, depreciation shall be charged on pro rata basis.*
>
> *(3) The salvage value of the asset shall be considered as 10% and depreciation shall be allowed up to maximum of 90% of the capital cost of the asset:*
>
> *Provided that in case of hydro generating station, the salvage value shall be as provided in the agreement signed by the developers with the State Government for development of the Plant:*
>
> *Provided further that the capital cost of the assets of the hydro generating station for the purpose of computation of depreciated value shall correspond to the percentage of sale of electricity under long term power purchase agreement at regulated tariff:*
>
> *Provided also that any depreciation disallowed on account of lower availability of the generating station or generating unit or transmission system as the case may be,*

shall not be allowed to be recovered at a later stage during the useful life and the extended life.

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

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

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

(7) The generating company or the transmission license, as the case may be, shall submit the details of proposed capital expenditure during the fag end of the project(five years before the useful life) along with justification and proposed life extension. The Commission based on prudence check of such submissions shall approve the depreciation on capital expenditure during the fag end of the project.

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

45. The cumulative depreciation amounting to `57727.16 lakh as on 31.3.2014 as considered in order dated 31.8.2016 has been considered for the purpose of tariff. Further, the value of freehold land included in the average capital cost has been adjusted while calculating depreciable value for the purpose of tariff. Accordingly, the balance depreciable value (before providing depreciation) for the year 2014-15 works out to `31498.88 lakh. Since the used life of the generating station as on 1.4.2014 exceed 12 years from the effective station COD, the depreciation for the period 2014-19 shall be calculated using spreading of the remaining depreciable value over the balance useful life for respective years

46. Accordingly, depreciation has been computed as follows:

(₹ in lakh)

	2014-15	**2015-16**	**2016-17**	**2017-18**	**2018-19**

	2014-15	2015-16	2016-17	2017-18	2018-19
Opening Capital Cost	100389.87	102498.07	105659.37	108610.87	109620.87
Add: Additional Capital Expenditure	2108.20	3161.30	2951.50	1010.00	0.00
Closing Capital Cost	102498.07	105659.37	108610.87	109620.87	109620.87
Average Capital Cost	101443.97	104078.72	107135.12	109115.87	109620.87
Balance useful life at the beginning year	7.00	6.00	5.00	4.00	3.00
Depreciable value (excluding land)@ 90%	89204.67	91575.94	94326.70	96109.38	96563.88
Balance depreciable Value	31477.51	29352.00	27210.76	23551.28	18117.96
Depreciation (annualized)	**4496.79**	**4892.00**	**5442.15**	**5887.82**	**6039.32**
Cumulative depreciation up to previous year	57727.16	62223.94	67115.94	72558.10	78445.92
Cumulative depreciation (at the end of the period)	62223.95	67115.94	72558.09	78445.92	84485.24

O&M Expenses

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

(₹in lakh)

2014-15	2015-16	2016-17	2017-18	2018-19
43.16	45.87	48.76	51.83	55.09

48. The respondent GRIDCO has raised the issue regarding the O&M expenses claimed by the petitioner. The O&M expenses claimed by the petitioner are as per the Regulation 29 (1) (c) of the 2014 Tariff Regulations. Accordingly, the year-wise O&M expenses claimed by the petitioner in terms of the above said norms are allowed as under:

(₹in lakh)

2014-15	2015-16	2016-17	2017-18	2018-19
19853.60	21100.20	22429.60	23841.80	25341.40

Water Charges

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

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

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

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

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

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

(₹ in lakh)

2014-15	**2015-16**	**2016-17**	**2017-18**	**2018-19**
660.77	702.73	747.35	794.81	845.28

52. The respondents GRIDCO has raised the issue of unavailability of data of actual water consumption for the last five years (i.e. 2009-10 to 2013-14) and the escalation rate of 6.35% considered on yearly basis for calculation of water charges by the petitoner. The petitioner vide affidavit dated 26.8.2016 has furnished the details of the water consumption along with the rate of actual water charges for the last five years (i.e. 2009-10 to 2013-14) along with relevant notification in support of the same. However in the submission the petitioner has clearly mentioned that the data for actual water consumption is not available for last five years. The details in respect of water charges such as type of cooling water system, water consumption, rate of water charges as applicable for 2013-14 have been furnished by the petitioner as under:

Description	**Remarks**
Type of Plant	Coal
Type of cooling water system	Closed Circuit Cooling
Total water charges in 2013-14	₹660.77 lakh*
**water charges paid as per allocated water quantity*	

53. In compliance with the above, the petitioner vide affidavit dated 28.8.2016 has furnished the copy of agreements entered into between the State Govt of Orissa and the. The details of the year-wise water consumption and water charges for last 5 years as detailed below:-

	2009-10	2010-11	2011-12	2012-13	2013-14
Allocated Water Quantity for station (Cusec)	16.49	16.49	16.49	16.49	16.49
Allocated Water Quantity for station (M3) for year	14526318	14526318	14526318	14526318	14683032
Actual Water drawl Station Stage (Cusec)	NA	NA	NA	NA	NA
Rate or Water Charges.	From 1.4.2009 to 30.9.2010 rate of water charges:- i) Industrial Water (@ Rs 250/- per One Lakh gallon) ii) Drinking Water (@ Rs 30/- per Ten Thousand cubic feet) From 1.10.2010 till date water charges are 4.5`/M3				
Actual Water Charges paid for station (Rs Cr) Based on allocation of water	0.77	3.65	6.54	6.54	6.61

54. The petitioner has further submitted that the payment of water charges is as per quantity of water drawn or allocated whichever is higher. It has submitted that where drawl of water is more than the allocated quantity, the penal rate is six times the rate on the quantity of excess drawl in addition to the water charges on the allocated quantity. The total water charges claimed by the petitioner during the year 2014-15 is based on the water consumption and water charges paid during the year 2013-14 and the same has been escalated the same @ 6.35% as per the escalation rate in O&M norms specified by the Commission for the tariff period 2014-19. This escalation rate of 6.35% considered by the petitioner is not in line with the water supply agreement signed with Department of water resources, Govt of Odisha which does not specify any escalation rate. Accordingly, water charges have been allowed without the annual escalation during 2014-19. Based on which water charges allowed as given here under:-

(₹ in lakh)

Year	Water charges allowed
2014-15	660.77
2015-16	660.77
2016-17	660.77
2017-18	660.77
2018-19	660.77

55. The petitioner is directed to furnish the details such as the contracted quantity, allocation of water, the actual water consumed during 2014-19, the basis of calculation of quantity of CW and computation of water charges at the time of truing-up of tariff in terms of the 2014 Tariff Regulations. In addition, the petitioner shall also confirm / clarify as to whether the water charges have been paid on the basis of contracted quantity or on the basis of allocation.

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

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
O&M Expenses as claimed	19853.60	21100.20	22429.60	23841.80	25341.40
O&M Expenses as allowed	19853.60	21100.20	22429.60	23841.80	25341.40
Water charges as claimed	660.77	702.73	747.35	794.81	845.28
Water charges as allowed	660.77	660.77	660.77	660.77	660.77
Total O&M Expenses as claimed (including Water charges)	20514.37	21802.93	23176.95	24636.61	26186.68
Total O&M Expenses as allowed(including Water charges)	**20514.37**	**21760.97**	**23090.37**	**24502.57**	**26002.17**

Capital spares

57. The petitioner has not claimed capital spares on projection basis during the period 2014-19. Accordingly, the same has not been considered in this order. The

claim of the petitioner, if any, at the time of truing-up, shall be considered on merits, after prudence check.

Operational Norms

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

Target Availability (%)	83.00
Heat Rate (kcal/kWh)	2850.00
Auxiliary Energy Consumption (%)	10.50
Specific Oil Consumption (ml/ kWh)	0.50

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

Normative Annual Plant Availability Factor (NAPAF)

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

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

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

61. The petitioner has considered the target availability norm of 83% during 2014-19. In respect of the coal availability situation during previous years, the petitioner has submitted as below:

"It is submitted that TTPS Station is having coal Linkage form Mahanadi Coalfield Limited (MCL), subsidiary of Coal India ltd. Details of coal linkage and Coal made available by CIL during the period 2014-15 & 2015-16 for TTPS is as under:-

Name of Station	***Annual Contracted Quantity***	***Coal supplied (Lakh Metric Tonnes)***

		2014-15	2015-16
TTPS (4x60MW+2x110MW)	*25*	*31.80*	*29.05*

62. In view of the above submissions of the petitioner it is noticed that the petitioner`s claim for 83% NAPAF is in contradiction with the data provided as the Coal supplied to the generating station is more that the annual contracted quantity and there seems to be no shortage of Coal. Hence, based on above facts the target availability of 85% is considered for the period 2014-19 in terms of the Regulation 36(A) (a) of the 2014 Tariff Regulations.

Heat Rate (kCal/kWh)

63. Regulation 36(C)(a) of the 2014 Tariff Regulations, provides Gross Station Heat Rate of 2850 kCal/kWh for TTPS. Hence, the heat rate considered by the petitioner is as per norms and is allowed.

Auxiliary Energy Consumption

64. The petitioner has claimed Auxiliary Energy Consumption at 10.50% during 2014-19 period. Regulation 36(E)(b) of Tariff Regulations, 2014 provides Auxiliary Energy Consumption of 10.50% for TTPS Accordingly, the Auxiliary Energy Consumption to be considered is 10.50% as per the norms and the same is allowed for the purpose of tariff computations.

Specific Oil Consumption

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

Interest on Working Capital

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

> *"28. Interest on Working Capital:*
> *(1) The working capital shall cover*
>
> *(a) Coal-based/lignite-fired thermal generating stations*
>
> *(i) Cost of coal or lignite and limestone towards stock, if applicable, for 15 days for pit-head generating stations and 30 days for non-pit-head generating stations for generation corresponding to the normative annual plant availability factor or the maximum coal/lignite stock storage capacity whichever is lower;*
>
> *(ii) Cost of coal or lignite and limestone for 30 days for generation corresponding to the normative annual plant availability factor;*
>
> *(iii) 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 secondary fuel oil, cost of fuel oil stock for the main secondary fuel oil;*
>
> *(iv)Maintenance spares @ 20% of operation and maintenance expenses specified in regulation 29;*
>
> *(v) Receivables equivalent to two months of capacity charges and energy charges for sale of electricity calculated on the normative annual plant availability factor; and*
>
> *(vi) Operation and maintenance expenses for one month.*

Fuel Components and Energy Charges in working capital

67. The petitioner has claimed cost for fuel components in working capital based on "as fired" GCV of coal procured and burnt for the preceding three months of January, 2014, February, 2014 and March, 2014 and secondary fuel oil for the preceding three months of January, 2014, February, 2014 and March, 2014, as under:

(₹ in lakh)

Particulars	2014-15	2015-16	2016-17	2017-18	2018-19
Cost of Coal for Stock for 15 days	1341.80	1345.48	1341.80	1341.80	1341.80
Cost of Coal for Generation for 30 days	2683.61	2690.96	2683.61	2683.61	2683.61
Cost of Main Secondary Fuel Oil for 2 months	145.56	145.96	145.56	145.56	145.56

68. The petitioner vide affidavit dated 19.8.2014 and 28.10.2014 has submitted the details of GCV of coal as billed for period from January, 2014 to March 2014.

69. The issue of "as received" GCV for computation of energy charges was challenged by NTPC and other generating companies through writ petition in the Hon'ble High Court of Delhi. The writ petition was heard on 7.9.2015 and Hon'ble High Court of Delhi had directed that the Commission shall decide the place from where the sample of coal should be taken for measurement of GCV of coal on as received basis within 1 month on the request of petitioners.

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

> *"58. In view of the above discussion, the issues referred by the Hon'ble High Court of Delhi are decided as under:*
> *(a) There is no basis in the Indian Standards and other documents relied upon by NTPC etc. to support their claim that GCV of coal on as received basis should be measured by taking samples after the crusher set up inside the generating station, in terms of Regulation 30(6) of the 2014 Tariff regulations.*
> *(b) The samples for the purpose of measurement of coal on as received basis should be collected from the loaded wagons at the generating stations either manually or through the Hydraulic Auger in accordance with provisions of IS 436(Part1/Section1)-1964 before the coal is unloaded. While collecting the samples, the safety of personnel and equipment as discussed in this order should be ensured. After collection of samples, the sample preparation and testing shall be carried out in the laboratory in accordance with the procedure prescribed in IS 436(Part1/Section1)-1964 which has been elaborated in the CPRI Report to PSERC."*

71. Further, the petitioner has claimed Energy Charge Rate (ECR) of 110.499 Paise/kWh based on the weighted average price, GCV of coal (as fired basis) & oil procured and burnt for the preceding three months. It is observed that the petitioner has not placed on record the GCV of coal on "as received" basis though the petitioner was statutorily required to furnish such information with effect from 1.4.2014. In compliance with the direction of the Hon'ble High Court of Delhi, the Commission in its order dated 25.1.2016 in Petition No. 283/GT/2014 has clarified that the measurement of GCV of coal on as received basis shall be taken from the

loaded wagons at the unloading point either manually or through the Hydrolic Augur. The petitioner has not submitted the required data regarding measurement of GCV of coal in compliance with the directions contained in the said order dated 25.1.2016. The present petition cannot be kept pending till the petitioner submits the required information. Hence, the Commission has decided to compute fuel components and the energy charges in the working capital by provisionally taking the GCV of coal on as "billed basis" and allowing an adjustment for total moisture as per the formula given as under:

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

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

72. In view of the above, the cost for fuel components in working capital have been computed at 85% NAPAF for the year 2014-19 and based on "as billed" GCV of coal and price of coal procured and secondary fuel oil for the preceding three months from January 2014 to March 2014 and allowed as under:

(` in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Cost of Coal for stock– 15 days	1,242.42	1,245.82	1,242.42	1,242.42	1,242.42
Cost of Coal for generation– 30 days	2,484.84	2,491.65	2,484.84	2,484.84	2,484.84
Cost of secondary fuel oil – two months	149.06	149.47	149.06	149.06	149.06

73. Similarly, the ECR based on operational norms specified in 2014 Regulations and on "as billed" GCV of coal for preceding 3 months i.e. March to January 2014 is worked out as under:

	Unit	2014-19
Capacity	MW	460.00
Gross Station Heat Rate	kCal/kWh	2850.00
Aux. Energy Consumption	%	10.50%

Weighted average GCV of oil (As fired)	kCal/lt.	9730.70
Weighted average GCV of Coal (As Billed)	kCal/kg	3811.33
Adjustment on account of coal received at the generating station for equilibrated basis (Air dried) in the billed GCV Of Coal India		*
Weighted average price of oil	Rs./KL	52224.37
Weighted average price of Coal	Rs./MT	1166.2
Rate of energy charge ex-bus	Paise/kWh	110.187**

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

*** To be revised as per the figures at Sr. No. 6*

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

Maintenance spares

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

(₹ in lakh)

2014-15	2015-16	2016-17	2017-18	2018-19
4102.87	4360.59	4635.39	4927.32	5237.34

76. Regulation 28(1)(a)(iv) of the 2014 Tariff Regulations provide for maintenance spares @ 20% of the operation & maintenance expenses as specified in Regulation 29. As specified in Regulation 29 (2) of the 2014 Tariff Regulations and as allowed by the Commission in order dated 6.10.2015 in Petition No. 186/GT/2014 (Sugen Power Plant), the maintenance spares @ 20% of the operation & maintenance expenses including water charges, allowed are as under:

(₹ in lakh)

2014-15	2015-16	2016-17	2017-18	2018-19
4102.87	4352.19	4618.07	4900.51	5200.43

Receivables

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

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Variable Charges (two months)	5118.75	5132.77	5118.75	5118.75	5118.75
Fixed Charges (two months)	6132.88	6424.84	6769.50	7115.45	7411.84
Total	**11251.62**	**11557.61**	**11888.25**	**12234.19**	**12530.58**

O&M Expenses

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

(₹ in lakh)

2014-15	2015-16	2016-17	2017-18	2018-19
1709.53	1816.91	1931.41	2053.05	2182.22

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

(₹ in lakh)

2014-15	2015-16	2016-17	2017-18	2018-19
1709.53	1813.41	1924.20	2041.88	2166.85

Rate of interest on working capital

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

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

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

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Cost of coal towards stock-15 days	1242.42	1245.82	1242.42	1242.42	1242.42
Cost of coal towards generation-30 days	2484.84	2491.65	2484.84	2484.84	2484.84
Cost of secondary fuel oil-2 months	149.06	149.47	149.06	149.06	149.06

Maintenance Spares	4102.87	4352.19	4618.07	4900.51	5200.43
Receivables- 2 months	11251.62	11557.61	11888.25	12234.19	12530.58
O & M expenses- 1 Month	1709.53	1813.41	1924.20	2041.88	2166.85
Total Working Capital	**20940.35**	**21610.16**	**22306.84**	**23052.91**	**23774.19**
Rate of Interest	13.50	13.50	13.50	13.50	13.50
Interest on Working Capital	**2826.95**	**2917.37**	**3011.42**	**3112.14**	**3209.52**

82. Accordingly, annual fixed charges approved for the generating station for the period from 1.4.2014 to 31.3.2019 is summarized as under:

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Depreciation	4496.79	4892.00	5442.15	5887.82	6039.32
Interest on Loan	264.71	86.34	0.00	0.00	0.00
Return on Equity	8694.45	8892.38	9073.06	9190.15	9220.01
Interest on Working Capital	2826.95	2917.37	3011.42	3112.14	3209.52
O&M Expenses	20514.37	21760.97	23090.37	24502.57	26002.17
Compensation Allowance	0.00	0.00	0.00	0.00	0.00
Total	**36797.27**	**38549.05**	**40617.00**	**42692.69**	**44471.01**

Month to Month Energy Charges

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

"6. Energy charge rate (ECR) in Rupees per kWh on ex-power plant basis shall be determined to
three decimal place in accordance with the following formula:
(a) For coal based and lignite fired stations
ECR = {(GHR – SFC x CVSF) x LPPF / CVPF+SFC x LPSFi + LC x LPL} x 100 / (100 – AUX)
Where,
AUX = Normative auxiliary energy consumption in percentage.
CVPF = Gross calorific value of primary fuel as received, in kCal per kg, per litre
or per standard cubic metre, as applicable.
CVSF = Calorific value of secondary fuel, in kCal per ml.
ECR = Energy charge rate, in Rupees per kWh sent out.
GHR = Gross station heat rate, in kCal per kWh.
LC = Normative limestone consumption in kg per kWh.
LPL = Weighted average landed price of limestone in
Rupees per kg.
LPPF = Weighted average landed price of primary fuel, in Rupees per kg

84. The petitioner shall compute and claim the Energy Charges on month to month basis from the beneficiaries based on the formulae given under Regulation 30(6)(a) of the 2014 Tariff Regulations, 2014 read with Commission's order dated 25.1.2016 in Petition No. 283/GT/2014.

85. The petitioner has been directed by the Commission in its order dated 19.2.2016 in Petition No. 33/MP/2014, to introduce helpdesk to attend to the queries of the beneficiaries with regard to the Energy Charges. Accordingly, contentious issues if any, which arise regarding the Energy Charges, should be sorted out with the beneficiaries at the Senior Management level.

Application Fee and Publication Expenses

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

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

88. Petition No. 334/GT/2014 is disposed of in terms of the above.

(Dr. M.K.Iyer)
Member

(A. S. Bakshi)
Member

Annexure – 1

DETAILS OF LOAN BASED ON ACTUAL LOAN PORTFOLIO (2014-19)

(₹ in lakh)

Particulars	Interest Rate	Loan deployed as on 1.4.2014	Additions during the tariff period	Total
	2014-19			
PFC I Dr I	9.5000%	5600.00	0.00	5600.00
PFC I Dr II	9.0000%	90.00	0.00	90.00
PFC I Dr III	9.0000%	110.57	0.00	110.57
PFC II Dr I	9.5000%	4000.00	0.00	4000.00
PFC II Dr II	9.0000%	1470.00	0.00	1470.00
PFC II Dr III	9.0000%	1292.34	0.00	1292.34
LIC-III T-2 D-3	8.5388%	2000.00	0.00	2000.00
LIC-III T-2 D-6	8.7439%	1700.00	0.00	1700.00
KFW ESP	3.1900%	327.25	0.00	327.25
SBI –VII	10.2575%	1500.00	0.00	1500.00
KFW consolidated	1.0000%	3708.14	0.00	3708.14
Total		21798.30	0.00	21798.30

Weighted Average Rate of Interest on Loan for the period 2014-19

(₹ in lakh)

Particulars	2014-15	2015-16	2016-17	2017-18	2018-19
Gross Loan	21798.30	21798.30	21798.30	21798.30	21798.30
Cum Repayment	16474.02	17986.58	19073.82	20161.05	20574.46
Total					
Net Loan	5324.28	3811.72	2724.48	1637.25	1223.84
Drawl	0.00	0.00	0.00	0.00	0.00
Pre Payment	0.00	0.00	0.00	0.00	0.00
Repayment	1512.56	1087.23	1087.23	413.41	228.41
Net Loan Closing	3811.72	2724.48	1637.25	1223.84	995.44
Avg net loan	4568.00	3268.10	2180.87	1430.55	1109.64
Rate of Interest	**6.6147%**	**6.9311%**	**7.7971%**	**8.6368%**	**8.5640%**
Interest	302.16	226.52	170.04	123.55	95.03