CENTRAL ELECTRCITY REGULATORY COMMISSION
NEW DELHI

Petition No. 336/GT/2014

Coram:
Shri Gireesh B. Pradhan, Chairperson
Shri A.K. Singhal, Member
Shri A.S. Bakshi, Member
Dr. M.K. Iyer, Member

Date of Order: 21.3.2017

In the matter of

Approval of tariff of Tanda Thermal Power Station (440 MW) for the period from 1.4.2014 to 31.3.2019.

And

In the matter of

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

Vs

Uttar Pradesh Power Corporation Ltd.
Shakti Bhawan, 14, Ashok Marg
Lucknow- 226001 **…….Respondent**

Parties Present:

Shri Ajay Dua, NTPC
Shri T. Vinod Kumar, NTPC
Shri Bhupinder Kumar, NTPC
Shri Rajeev Choudhary, NTPC
Shri E.P. Rao, NTPC
Shri Rajanikant, NTPC
Shri S.P. Kesarwani, NTPC
Shri Sameer Aggarwal, NTPC
Shri Nishant Gupta, NTPC
Shri Manish Garg, UPPCL

ORDER

This petition has been filed by the petitioner, NTPC Limited for determination of tariff of Tanda Thermal Power Station (440 MW) (‘the generating station”) for the period from 1.4.2014 to 31.3.2019 in accordance with the provisions of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2014 ("the 2014 Tariff Regulations").

2. The generating station with a capacity of 440 MW comprises of four units of 110 MW each. The dates of commercial operation of the different units of the generating station are as under:

Unit-I	21.3.1988
Unit-II	11.3.1989
Unit-III	28.3.1990
Unit-IV/ Generating station	20.2.1998

3. The Commission by order dated 17.10.2012 in Petition No. 229/2009 had approved the tariff for the generating station for the period from 1.4.2009 to 31.3.2014 based on admitted capital cost of ₹94506.05 lakh as on 1.4.2009. Thereafter, by order dated 11.12.2015 in Petition No. 235/GT/2013 revised the tariff of the generating station for the period 2009-14, after truing-up exercise based on the actual additional capital expenditure incurred for the period 2009-12 and projected capital expenditure for 2012-14. Subsequently, in Petition No. 329/GT/2014, the Commission vide order dated 23.8.2016 had revised the tariff of the generating station after truing- up based on the actual additional capital expenditure for the period 2009-14. Accordingly, the capital cost and the annual fixed charges approved by order dated 23.8.2016 is as under:

Capital Cost

(₹. in lakh)

	2009-10	2010-11	2011-12	2012-13	2013-14
Opening Capital cost	94506.05	97885.96	105477.34	106998.88	114299.57
Additional Capital Expenditure Allowed	3379.91	7591.37	1521.54	7300.69	1381.32
Closing Capital cost	**97885.96**	**105477.34**	**106998.88**	**114299.57**	**115680.89**
Average Capital cost	96196.00	101681.65	106238.11	110649.22	114990.23

Annual Fixed Charges

(₹. in lakh)

	2009-10	2010-11	2011-12	2012-13	2013-14
Depreciation	4950.41	5241.04	5482.86	2594.39	2947.14
Interest on Loan	511.82	67.69	500.92	33.73	653.33
Return on Equity	6776.34	7080.09	7312.58	7616.21	8100.26
Interest on Working Capital	4227.90	4268.17	4335.56	4304.45	4378.63
O&M Expenses	11550.00	12210.00	12909.60	13648.80	14427.60
Cost of secondary fuel oil	1694.99	1694.99	1699.64	1694.99	1694.99
Total	**29711.46**	**30561.98**	**32241.17**	**29892.57**	**32201.94**

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

Annual Fixed Charges:

(₹. in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Depreciation	3294.89	3610.86	3876.18	4187.68	4337.13
Interest on Loan	738.69	694.30	724.58	687.95	337.30
Return on Equity	7340.71	7550.84	7709.26	7874.09	7943.03
Interest on Working Capital	5946.14	6032.59	6096.56	6177.21	6249.12
O&M Expenses	15965.43	16971.15	18039.19	19173.99	20380.00
Total	**33285.87**	**34859.74**	**36445.77**	**38100.92**	**39246.58**

Capital Cost:

(₹. in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Opening Capital Cost	117482.85	122663.04	124356.90	127845.65	129749.30
Add: Additional capital expenditure	5180.19	1693.86	3488.75	1903.65	351.50
Closing Capital Cost	**122663.04**	**124356.90**	**127845.65**	**129749.30**	**130100.80**
Average Capital Cost	**120072.95**	**123509.97**	**126101.28**	**128797.48**	**129925.05**

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

Opening capital cost as on 1.4.2014

6. Clause 3 of Regulation 9 of the Tariff Regulations, 2014 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 modernization as admitted by this Commission in accordance with Regulation 15.

7. The petitioner has claimed opening capital cost of ₹117482.85 lakh as on 1.4.2014 after adjustment of an amount of ₹1618.99 lakh in the admitted capital cost of ₹115863.86 lakh as per Commission's order dated 25.5.2012 in Petition No.229/2009. However, the Commission by order dated 23.8.2016 in Petition No. 329/GT/2014 approved the closing capital cost of ₹115680.89 lakh as on 31.3.2014. The closing capital cost of ₹115680.89 lakh has been considered as the opening capital cost as on 1.4.2014 for determination of tariff of the generating station for the period 2014-19.

Additional Capital Expenditure

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 or 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. Regulation 15 of the 2014 Tariff Regulations provides as under:

15. Renovation and Modernization: (1) The generating company or the transmission licensee, as the case may be, for meeting the expenditure on renovation and modernization (R&M) for the purpose of extension of life beyond the originally recognized useful life for the purpose of tariff of the generating station or a unit thereof;

Or, the transmission system or an element thereof, shall make an application before the Commission for approval of the proposal with a Detailed Project Report giving complete scope, justification, cost-benefit analysis, estimated life extension from a reference date, financial package, phasing of expenditure, schedule of completion, reference price level, estimated completion cost including foreign exchange component, if any, and any other information considered to be relevant by the generating company or the transmission licensee.

10. The projected additional capital expenditure towards capital additions claimed by the petitioner for the period 2014-19 is as under:

(₹ in lakh)

Sl. No	Head of Work/ equipment	2014-15	2015-16	2016-17	2017-18	2018-19	Total
1	R&M of MP rotor Unit-I	5.72	-	-	-	-	5.72
2	R&M of MP Rotor of Unit-II	427.00	-	-	-	-	427.00
3	Set of Guide Wheels LP Turbine Unit-IV	41.98	-	-	-	-	41.98
4	Air Washer System for Units- III and IV	154.00		-	-	-	154.00
5	Dry Fly Ash Extraction System	2830.00	200.00	400.00	-	-	3430.00
6	2nd Raising of Ash Dyke	1000.00	50.00	-	-	-	1050.00
7	Air conditioning of Thyristor Room	4.67	-	-	-	-	4.67
8	Supply of Electricity in 5Km radius	697.00	-	-	-	-	697.00
9	R & M of SG Package	-	100.00	-	-	-	100.00
10	R & M of ESP Package	-	10.00	-	-	-	10.00
11	Additional HT, LT & control Cable for SG + C&I	-	12.00	-	-	-	12.00
12	R & M of LP Rotor Unit-III	-	53.00		-	-	53.00
13	Digital Distributed Control &management Information System	-	40.00	-	-	-	40.00
14	Stacker &Reclaimer	-	20.00	-	-	-	20.00
15	3rd Raising of Ash Dyke	-	200.00	2000.00	1400.00	-	3600.00
16	Construction of 32 nos. Residential Building Type# D and 16 nos. of Type C quarters	-	-	452.30	-	335.00	787.30
17	Replacement of fluid coupling with Magnadrive Coupling	7.14	-	-	-	-	7.14
18	Ash Slurry Pump Upgradation	12.68	-	-	-	-	12.68
19	PA System in CHP Area	-	18.00	-	-	-	18.00
20	Renovation of Lift in Boiler Area	-	84.00	-	-	-	84.00
21	Automatic GCV Analyser for Coal Lab	-	14.00	-	-	-	14.00
22	Procurement of Metal Analyzer	-	20.00	-	-	-	20.00
23	Procurement of 2 nos. of Dozers	-	332.00	-	-	-	332.00
24	Procurement of 1 no. of Payloader	-	33.81	-	-	-	33.81
25	Procurement of 1 no. of Front End Loader	-	17.39	-	-	-	17.39
26	Procurement of 01 no. of Skid Steer Loader	-	18.90	-	-	-	18.90
27	Procurement of 02 nos. of Trippers/ Dumpers	-	33.52	-	-	-	33.52
28	Ash Slurry Pump Up-gradation (PAT)	-	28.00	-	-	-	28.00

29	Energy Efficient Cartridge of upgraded design for boiler feed pump-200KHI (PAT)	-	189.24	-	-	-	189.24
30	Energy Efficient Cartridge with casing & barrel of upgraded design for boiler feed pump-200KHI (PAT)	-	220.00	-	-	-	220.00
31	Fire Fighting System for CHP Area	-	-	90.00	10.00	-	100.00
32	Replacement of ABT Energy Meter	-	-	58.00	-	-	58.00
33	Renovation of Lift in Boiler Area	-	-	42.00	-	-	42.00
34	Construction Of Lab Building	-	-	20.00	-	-	20.00
35	Universal Testing Machine	-	-	18.00	-	-	18.00
36	Turbine Orthogonal Vibration Monitoring Probes	-	-	16.50	16.50	16.50	49.50
37	Dissolved Gas Analyser for Transformer oil	-	-	25.50	-	-	25.50
38	Procurement of 1 set of Synchronous Jack	-	-	55.30	-	-	55.30
39	Procurement of 1 set of Rerailing Equipment	-	-	69.15	-	-	69.15
40	Procurement of 1 no. of Foam Cum Water Tender	-	-	44.00	-	-	44.00
41	Procurement of 1 no. of Trailor Fire Pump	-	-	9.00	-	-	9.00
42	Replacement of 1 no. BFP cartridge by Energy Efficient cartridge (PAT)	-	-	189.00	425.00	-	614.00
43	Dust Extraction System of Crusher House & bunker Floor	-	-	-	52.15	-	52.15
	Total	5180.19	1693.86	3488.75	1903.65	351.50	12617.95

11. The petitioner has claimed total projected additional capital expenditure of ₹12617.95 lakh during the period 2014-19 under the provisions of Regulations 14 and 15 read with Regulation 54 (Power to relax) of the 2014 Tariff Regulations, which includes an amount of ₹1655.67 lakh for existing R&M schemes, ₹ 981.04 lakh towards new R&M schemes, ₹8080.00 lakh for Ash Handling system, ₹1041.24 lakh for PAT related works, ₹697.00 lakh for supply of electricity within 5 km radius scheme and ₹153.00 lakh towards fire fighting system.

12. As regards additional capital expenditure claimed by the petitioner, the respondent, UPPCL has pointed out that there is significant cost escalation over the approved amount. Accordingly, it has prayed that petitioner may be directed to provide reasons for surplus capital expenditure and to disallow the expenditure as considered appropriate. In response, the petitioner has clarified that the projected additional capital expenditure claimed for the period 2014-19 is based on the expected completion cost and any variation in the estimated cost as against the actual cost incurred shall be settled with interest from the respective date at the time of truing- up of the generating station. Accordingly, the petitioner has stated that the submissions of the respondent are liable to be rejected.

13. We now examine the claim of the petitioner for additional capital expenditure under Regulation 14 and Regulation 15 read with Regulation 54 of the 2014 Tariff Regulations in the subsequent paragraphs.

R & M Schemes (Existing scheme of Phase-II)

14. The Commission by its orders dated 17.10.2012 and 11.12.2015 had allowed the capitalization of R &M schemes for the period 2009-14 along with the corresponding de-capitalization value of 11.5% as claimed by the petitioner in exercise to the Power to relax in terms of Regulation 44 of 2009 Tariff Regulations mainly on the ground that the R &M schemes are required for sustenance of efficient performance of the generating station. The petitioner in this petition has claimed additional capital expenditure of ₹1655.67 lakh (₹633.37 lakh during 2014-15, ₹235.00 lakh during 2015-16, ₹452.3 lakh during 2016-17 and ₹335.00 lakh during 2018-19) towards R & M of the generating station. The said work includes renovation and modernization works of the existing scheme of phase-II, such as MP rotor Unit-I, R&M of MP Rotor of Unit-II, Set of Guide Wheels LP Turbine Unit-IV, Air Washer System for Unit- III and IV,R & M of SG Package, R & M of ESP Package, Additional HT- LT & control Cable for SG + C&I, R & M of LP Rotor Unit-III, Digital Distributed Control &Management Information System (DDCMIS), Stacker & Re-claimer, Construction of 32 nos. residential Building Type# D and 16 nos. of Type C quarters and Air conditioning of thyristor Room under Regulation 15(1) read with Regulation 54 of the 2014 Tariff

Regulations. In justification of the said claim, the petitioner has submitted that these expenditures were approved by the Commission vide order dated 17.10.2012 in Petition No. 229/2009, but these assets / items could not be capitalized on account of the following:

a) MP rotor of Unit-1&2: balance material is expected to be supplied by supplier in the 2014-15,

b) Air Washer System for Unit- 3 &4: the petitioner has furnished that the work has been completed in 2012-13 and has not been put in to service due to vibration problem and likely to be capitalized in 2014-15,

c) S.G package and ESP package: the petitioner has submitted that P.G test is completed and shall be capitalized in 2015-16 after evaluation,

d) Air conditioning of thyristor Room: the P.G test for the equipment is pending and shall be done in 2014-15,

e) R&M of LP rotor unit-3: the petitioner has submitted that the delivery of material is expected in 2015-16

f) Construction of 32 nos. Residential Building Type# D and 16 nos of Type C quarters: CWIP balance of ₹519.00 lakh and likely to be capitalized during 2016-19 period.

g) Set of guide wheels LP Turbine Unit #4: The material is in stock and will be capitalised in 2014-19.

h) Additional HT & LT control cable: Material not received due to delay in supply. Expected to be capitalised in 2015-16.

i) Digital Distributed Control & Management Information System (DDCMIS): The delay is due to deferment of PG test of Unit-2. Expected to be capitalised in 2015-16.

15. The matter has been examined. The R &M schemes in respect of the generating station had started during the year 2000 and the schemes are being continued. It is noticed that the petitioner had claimed expenditure in respect of some of the R &M schemes which were allowed in order dated 17.10.2012 in Petition No. 229/2009 but could not be completed during the period 2009-14. In respect of expenditure claimed on R &M schemes for the period 2012-14, the Commission vide order dated 23.8.2016 in Petition No. 329/GT/2014 had allowed the same as under:

"18. The matter has been examined. As stated, the Commission in its order dated 17.10.2012 in Petition No.229/2009 and 11.12.2015 in Petition No. 235/GT/2013 had allowed the capitalisation of the R&M schemes along with the corresponding decapitalization value of 11.5% as claimed by the petitioner, under Regulation 9(2) in exercise of the "Power to Relax" in terms of Regulation 44 of the 2009 Tariff Regulations,

mainly on the ground that these R&M schemes are required for the sustenance of efficient performance of the generating station. Though the petitioner has claimed the additional capital expenditure on these R&M schemes, it has not furnished the gross block of the old assets replaced by new assets under the R&M schemes. It is observed that the petitioner vide affidavit dated 6.7.2015 has clarified that the generating station was taken over by the petitioner on 14.1.2000 from the erstwhile Uttar Pradesh Electricity Board (UPSEB) and hence the capitalization values for the old items are not available. In line with our decisions in orders dated 17.10.2012 and 11.12.2015 and considering the fact that these R&M schemes are necessary for sustenance of the performance of the generating station, we allow the capitalisation of the expenditure claimed by the petitioner. Also, in line with the methodology adopted in our earlier orders, the corresponding de-capitalization value of 11.5% as claimed by the petitioner has been considered in cases where the gross value of old asset replaced by the new assets are not available. Also, the de-capitalized value of old assets has been derived from the gross block of the new assets wherever applicable.

19. In this background and in line with the decisions in Commission"s orders dated 17.10.2012 and 11.12.2015, we allow the actual additional capital expenditure of `5761.90 lakh and `868.39 lakh with corresponding de-capitalization of `682.80 lakh and 100.45 lakh for 2012-13 and 2013-14 respectively. Accordingly, on net basis, the actual capital expenditure of `5079.10 lakh (5761.90- 682.80) in 2012-13 and `767.94 lakh (868.39 - 100.45) in 2013-14 is allowed under Regulation 9(2) in exercise of "Power to Relax" under Regulation 44 of the 2009 Tariff Regulations."

16. The Commission in the order dated 29.4.2011 in Petition No. 186/2009 noted that the petitioner was allowed an estimated amount of ₹51550.00 lakh for R & M works (₹19950 lakh for Phase-I and ₹31600 for Phase-II). The actual R &M expenditure allowed to the petitioner upto 31.3.2014 is as under:

(₹In lakh)

	Expenditure allowed for R&M
2009-14	15856.85
2006-09	12955.18
2004-06	4689.00
14.1.2000-2004	17382.59
TOTAL	**50883.62**

17. As stated, the total projected additional capital expenditure claimed for existing R &M schemes is ₹1655.67 lakh for the period 2014-19 and the R &M expenditure allowed by the Commission for the period 2000-14 is ₹50883.62 lakh. Thus, the total amount allowed for the period upto 31.3.2014 including the projected expenditure claimed for the period 2014-19 works out to be ₹52539.29 lakh (1655.67 + 50883.62). This exceeds the approved amount by ₹989.29 lakh as against the amount of ₹51550.00 lakh approved for R &M of Phase- I and II. Considering the fact that R &M work has been carried out on a long span of time in a phased manner matching with the planned shutdown of the units of the generating station, the escalation in the cost of the R &M schemes is in the order of 1.92% and in our view is

marginal. Accordingly, the projected additional capital expenditure of ₹1655.67 lakh for continuation of R & M schemes during the period 2014-19 is justified and is allowed under Regulation 15 (1) of the 2014 Tariff Regulations. Also, in line with the methodology adopted in our order dated 23.8.2016, the corresponding de-capitalization value of 11.5% has been considered. Accordingly, we allow the net actual additional capital expenditure of ₹560.53 lakh in 2014-15, ₹207.98 lakh in 2015-16, ₹400.28 lakh in 2016-17 and ₹296.47 lakh in 2018-19 totalling to Rs 1465.27 lakh after deduction of estimated de- capitalization of 11.5%.

R & M scheme (New schemes)

18. The petitioner has claimed projected additional capital expenditure of ₹981.04 lakh during the period 2014-19 (₹19.82 lakh in 2014-15, ₹571.62 lakh in 2015-16, ₹304.5 lakh in 2016-17, ₹68.65 lakh in 2017-18 and ₹16.50 lakh in 2018-19) under Regulation 15(1) read with Regulation 54 of 2014 Tariff Regulations towards R&M of various new schemes such as Replacement of fluid coupling with Magna drive Coupling, Ash Slurry Pump Up-gradation, PA System in CHP Area, Renovation of Lift in Boiler Area, Automatic GCV Analyser for Coal Lab, Procurement of Metal Analyser, Procurement of 2 nos. of Dozers, Procurement of 1 no. of Pay loader, Procurement of 1 no. of Front End Loader, Procurement of 1 no. of Skid Steer Loader, Procurement of 2 nos. of Trippers/ Dumpers, Replacement of ABT Energy Meter, Renovation of Lift in Boiler Area, Construction of Lab Building, Universal Testing Machine, Turbine Orthogonal Vibration Monitoring Probes, Dissolved Gas Analyser for Transformer oil, Procurement of 1 set of Synchronous Jack, Procurement of 1 set of Re-railing Equipment, Dust Extraction System of Crusher House and bunker floor. In justification of the same, the petitioner has submitted that compensation allowance or special allowance have not been considered as the station was undergoing R &M. It has also submitted that the most of the assets/ items have become old and obsolete and replacement of the same is required for successful and efficient running of the generating station. Accordingly, the petitioner has prayed that the capitalization of the said expenditures may be allowed.

19. We have examined the claim of the petitioner. The assets such as Automatic GCV Analyser for coal lab, Procurement of Metal Analyser, PA system in CHP area, Replacement

of ABT Energy Meter, Universal Testing Machine, Turbine Orthogonal Vibration Monitoring Probes, Dissolved Gas Analyser for Transformer oil, Procurement of 1 set of Synchronous Jack are minor assets and are not allowable under the provisions of Regulation 14(3) of the 2014 Tariff Regulations.

20. Assets/ work like replacement of fluid coupling, Construction of Lab Building, Procurement of 1 set of Re-railing equipment and Dust Extraction System of crusher House and Bunker floor appears to be of maintenance nature and expenditure on these works may be met from O & M expenses.

21. However, with respect to assets like Renovation of Lift in Boiler area, procurement of 2 nos. Of Dozers, Procurement of 1 no. Of Pay loader, procurement of 1 no. Of Front End loader, procurement of 1 no. Of Skid Steel loader and Procurement of 2 nos. Of Trippers/ Dumpers, the petitioner is directed to submit the justification for procuring these assets/ undertaking these works based on the requirement for remaining life of station upto 2025. Further the gross block of Dozers, Pay Loader, Front end loader, Skid Steel Loader and Trippers/ Dumpers etc. At the time of truing-up of tariff of the generating station. Accordingly, liberty is granted to the petitioner to approach the Commission at the time of truing-up for Dozers, Pay Loader, Front end loader, Skid steel loader and Trippers/ Dumpers and Renovation of lift in Boiler area, etc. with the above details/ justification.

Ash Handling System

Dry Fly ash Extraction system

22. The petitioner has claimed total projected additional capital expenditure of ₹3430.00 lakh for the period 2014-19 (₹ 2830.00 lakh in 2014-15, ₹200.00 lakh in 2015-16, ₹400.00 lakh in 2016-17) towards Dry Fly Ash Extraction System (DAES). In justification of the same, the petitioner has submitted that the said expenditure was approved by the Commission by order dated 17.10.2012 in Petition No. 229/2009. It has also submitted that the contract for the said work had commenced from 15.7.2010, but got delayed by more than 2 years on account of delay in submission of drawings, mobilization of equipment, supply of materials

by the agency. It has further submitted that the work of DAES for Units- I and II was commissioned during May 2014 and for Units- III and IV in August, 2014. Accordingly, it has prayed for condonation of delay and capitalization of the expenditure. In addition to the above, the petitioner has stated that the expenditure towards Ash Handling System was claimed in Petition No. 235/GT/2013 and the Commission vide order dated 11.12.2015 in had allowed the projected additional capital expenditure of ₹3000.02 lakh in 2013-14 in terms of the 2014 Tariff Regulations. The petitioner has however submitted that the expenditure has not been allowed.

23. Accordingly, the Commission vide ROP of the hearing dated 24.5.2016 had directed the petitioner to furnish justification as regard to cost escalation/ cost variation in respect of the claim for ₹3430.00 lakh as against the estimated cost of ₹2694.36 lakh. In response to the same, the petitioner vide affidavit dated 20.6.2016 has submitted that long shutdown of units was required for Erection and Commissioning of DAES system to match with the overhauling schedules of the units. Accordingly, it has submitted that the work could not be completed during the period 2009-14 and the variation in the figures is on account of the difference between the estimated and the actual implementation cost based on bidding process.

24. We have examined the matter. In our view, the variations in the cost due to long implementation process associated with shutdown of units of the generating station appear reasonable. It is noticed that the expenditure in respect of this work was allowed by the Commission in order dated 17.10.2012 in Petition No. 229/2009 on the ground that the same is in compliance with environmental laws. In this background, the claim of the petitioner for total projected additional capital expenditure of ₹3430.00 lakh is allowed for the period 2014-19 under Regulation 14 (3) (ii) of the 2014 Tariff Regulations.

2nd and 3rdraising of Ash Dyke

25. The petitioner has claimed projected additional capital expenditure of ₹1050.00 lakh (₹ 1000.00 lakh in 2014-15 and ₹50.00 lakh in 2015-16) for 2nd raising of Ash Dyke and ₹ 3600.00 lakh (₹200.00 lakh in 2015-16, ₹2000.00 lakh in 2016-17 an₹1400.00 lakh in 2017-

18) for 3rd raising of Ash Dyke during the period 2014-19 under Regulation 14 (3)(iv) and Regulation 15(1) read with Regulation 54 of the 2014 Tariff Regulations. In justification of the same, the petitioner has submitted that the Commission vide order dated 17.10.2012 in Petition No. 229/2009 had approved the expenditure for 2ndraising of Ash Dyke-B in 2013-14. It has further submitted that the actual date of commencement of the work was 1.6.2013 and the scheduled completion date was 30.4.2014 which was further extended to 31.7.2014 due to non-availability of sand and fugitive dust. The petitioner has submitted that as on 31.3.2014, the balance in CWIP is ₹713.79 lakh and the work is under execution and is likely to be completed and capitalized during the years 2014-15 and 2015-16. Based on this the petitioner has prayed that the delay may be condoned and the expenditure may be allowed. In respect of 3rd raising of Ash Dyke A and B, the petitioner has submitted that the same has been done twice and the proposed work is for the 3rd raising of both the Ash dykes. Accordingly, the petitioner has prayed that the expenditure claimed may be allowed.

26. The matter has been considered. It is observed that the Commission vide order dated 17.10.2012 had allowed the projected additional capital expenditure of ₹1500.00 lakh in 2013-14 towards 2ndraising of Ash Dyke-B. In our view, the process of Ash Dyke raising is continuous in nature and accordingly, the reasons furnished by the petitioner with respect to the delay in execution of work is justified. Accordingly, the projected additional capital expenditure of ₹1050.00 lakh (Rs 1000.00 lakh in 2014-15 and ₹50.00 lakh in 2015-16) for 2nd raising of Ash dyke- B and ₹3600.00 lakh (Rs 200.00 lakh in 2015-16, ₹2000.00 lakh in 2016-17, ₹1400.00 lakh in 2017-18) for 3rd raising of Ash dyke of A and B is allowed under Regulation 14 (3) (iv) of the 2014 Tariff Regulations. The petitioner is however directed to furnish the actual capital expenditure incurred along with justification at the time of truing- up of tariff of the generating station in terms of Regulation 8 of the 2014 Tariff Regulations.

PAT related works

27. The petitioner has claimed additional capital expenditure of ₹28.00 lakh in 2015-16 towards Ash Slurry Pump up-gradation, ₹189.24 lakh in 2015-16 for Energy Efficient Cartridge of upgraded design for boiler feed pump-200KHI, ₹220.00 lakh in 2015-16 for

Energy Efficient Cartridge with casing & barrel of upgraded design for boiler feed pump-200KHI and ₹614.00 lakh (₹189.00 lakh in 2016-17 and ₹425.00 lakh in 2017-18) towards Replacement of 1 no. BFP cartridge by Energy Efficient cartridge under Regulation 14(3)(ii) and Regulation 15(1) read with Regulation 54 of the 2014 Tariff Regulations. In justification of the same, the petitioner has submitted that in line with the energy conservation and efficiency policy of Bureau of Energy Efficiency under the Ministry of Power, GOI, Perform, Achieve & Trade (PAT) scheme has been launched in terms of the National Mission for Enhance Energy Efficiency. Under this scheme, the GOI has notified 478 industrial units on 30.3.2012 as target under the Energy Conservation Act, 2001. Accordingly, the petitioner has submitted that for compliance with the PAT scheme the generating station has taken up schemes for improvement of energy efficiency and the capitalization of expenditure claimed may be allowed.

28. The matter has been examined. As stated, the petitioner has claimed the said expenditure under Regulation 14 (3) (ii), and Regulation 15 (1) read with Regulation 54 of the 2014 Tariff Regulations. As regards the claim of the petitioner for capitalization of the expenditure under the PAT scheme, Regulation 9(5) of the 2014 Tariff Regulations provides as under:

> *"9 (5) The capital cost with respect to thermal generating station, incurred or projected to be incurred on account of the Perform, Achieve and Trade (PAT) scheme of Government of India will be considered by the Commission on case to case basis and shall include:*
>
> *a) cost of plan proposed by developer in conformity with norms of PAT Scheme; and*
> *b) sharing of the benefits accrued on account of PAT Scheme."*

29. The petitioner in this tariff petition has not furnished the quantifiable details of improvement in the heat rate along with other performance parameters by replacement of old equipment with the energy efficient new ones. It has also not submitted the analysis of the energy saved on this count and the benefits accrued and passed on to the beneficiaries. It is noticed that similar claim for expenditure under PAT scheme was made by DVC in Petition No. 350/GT/2014 (tariff of Bokaro TPS unit- I to III) and the Commission by order dated 27.9.2016 had disallowed the said claim with liberty to the petitioner to claim the

expenditure with proper details/ justification at the time of truing- up of tariff. The relevant portition of the said order is extracted as under:

> *"47. We have examined the matter. Regulation 9(5)(b) of the 2014 Tariff Regulations provides that the petitioner is required to submit the benefits arising out of the expenditure under the PAT scheme so that the same can be shared with the beneficiaries. As the quantifiable details of improvement in the heat rate along with other performance parameters has not been submitted by the petitioner, we are not inclined to permit the additional capital expenditure towards replacement of two HP Bypass valve with control systems (AV-6) and revamping of cooling tower 1 under PAT scheme.*
>
> *However, the petitioner is granted liberty to submit proper justification along with the details of benefit arising out of the expenditure for claiming this asset at the time of truing-up of tariff in terms of Regulation 8 of the 2014 Tariff Regulations and the same will be considered in accordance with law."*

30. In line with the above decision, the expenditure claimed by the petitioner for works under the PAT scheme is not allowed. The petitioner is however granted liberty to claim the expenditure with proper justification along with the details of the benefits arising out of the expenditure claimed for the assets at the time of truing-up of tariff in terms of Regulation 8 of the 2014 Tariff Regulations.

Implementation of scheme for supply of electricity within 5 km radius

31. The petitioner has claimed projected additional capital expenditure of ₹697.00 lakh in 2014-15 for implementation of scheme for supply of electricity within 5 km radius of the generating station under Regulation 14 (3) (ii) of the 2014 Tariff Regulations. In justification of the same, the petitioner has submitted that the Commission vide order dated 17.10.2012 had observed that the capitalization of the expenditure shall be considered at the time of actual expenditure being incurred by the petitioner. It has also submitted that the Ministry of Power, GOI had allowed the implementation this scheme in respect of 8 other generating stations of the petitioner including this generating station. Accordingly, it has prayed that the projected additional capital expenditure may be allowed.

32. We have examined the matter. It is observed that the claim of the petitioner in Petition No. 329/GT/2014 was examined and the Commission in order dated 23.8.2016 had allowed Rs 775.70 lakh on actual basis out of the projected expenditure of Rs 14.10 crore and had observed as under:

> *"40. In line with the above decision and since the expenditure has been incurred and capitalized by the petitioner for creation of the infrastructure, we are of the view that the said expenditure of ₹775.70 lakh should be reimbursed by the beneficiaries in proportion to their share, in the remaining three years of the tariff period 2014-19, in equal monthly installments along with regular bills, with the weighted average rate of interest on loan applicable for* the relevant years as indicated in the table under para 63 of this order till the *date of capitalization of asset. As regards the claim for balance expenditure during 2014-19, the same will be considered in accordance with law based on the justification and the documentary evidence in support of the handing over the said entire assets to the state utility. The petitioner shall also ensure the security and safety of assets till the same is formally handed over to the State utility so that the said assets capitalized are neither removed nor destroyed."*

33. It is evident from the above that the claim of the petitioner for balance expenditure during the period 2014-19 shall be considered by the Commission after handing over the entire assets to the State utility and producing documentary evidence in this regard. As the petitioner has not furnished documents which suggest that the entire assets have been handed over to State utility, we are not inclined to allow the projected additional capital expenditure of Rs 697.00 lakh. However, liberty is granted to the petitioner to claim the said expenditure with proper justification and documentary evidence in support of handing over the assets to State utility at the time of truing- up of the tariff in terms of the Regulation 8 of the 2014 Tariff Regulations.

Fire Fighting System for CHP Area

34. The petitioner has claimed projected additional capital expenditure of ₹90.00 lakh in 2016-17 and ₹10.00 lakh in 2017-18 towards fire fighting system for CHP area under Regulation 14 (3) (ii) read with Regulation 54 of the 2014 Tariff Regulations. In justification of the same, the petitioner has submitted that assessment of availability, reliability & design adequacy of fire detection & protection system of all coal based thermal stations of the petitioner was carried out in in terms of the Regulation 12(5) of Central Electricity Authority (Technical Standards for construction of Electrical Parts & Electrical Lines) Regulations, 2010. It has further submitted that the augmentation of fire detection and protection system for stacker reclaimer & coal conveyors area of CHP has been identified and taken. It has also submitted that the same is essentially required to prevent any catastrophic damage in case of fire breaks out in CHP as existence of coal in CHP area makes it vulnerable to fire

hazard and mobile fire protection equipments not sufficient to control the spread of fire. Accordingly, it has prayed that the expenditure may be allowed.

35. We have examined the matter. It is observed that similar claim of the petitioner in Petition No. 293/GT/2014 (tariff of Talcher STPS-II for the period 2014-19) had been disposed of by the Commission by order dated 16.2.2017 as under:

> *"27.....Accordingly, the Commission has decided to consult the CEA in this regard. Therefore, the Staff of the Commission is directed to refer the matter to CEA for necessary clarification. Pending clarification in the matter, the claim of the petitioner has not been decided in this order. If on the basis of the report of the CEA, the Commission comes to a decision to allow the expenditure for augmentation of fire fighting/protection system under Change in law and for Safety and security of the plant, and in that event, the claim of the petitioner shall be considered at the time of truing-up of tariff in terms of Regulation 8 of the 2014 Tariff Regulations. The petitioner shall also place on record the confirmation that the expenditure on augmentation of fire fighting system/protection system is in compliance with the TAC guidelines and the discount, if any, received from the Insurance companies at the time of truing-up."*

36. In line with the above decision, the claim of the petitioner shall be considered at the time of truing- up in terms of Regulation 8 of the 2014 Tariff Regulations. The petitioner shall also place on record the confirmation that the expenditure is in compliance with the TAC guidelines and the discount, if any, received at the time of truing-up.

Foam cum water tender and trailer fire pump

37. The petitioner has claimed projected additional capital expenditure of ₹44.00 lakh in 2016-17 for procurement of Foam cum Water Tender and ₹9.00 lakh in 2016-17 for procurement of Trailer Fire Pump under Regulation 14 (3) (iii) read with Regulation 54 of the 2014 Tariff Regulations. In justification of the same, the petitioner has submitted that the generating station is a taken over plant from the erstwhile UPSEB. Accordingly, it has submitted that it has inherited Foam cum water tender, trailer fire pump for its fire station as the same was very old and obsolete. It has further submitted that the DIG (Fire) of CISF, New Delhi, in its letter dated 20.2.2013 has annexed the status report on Fire appliances and observed that these appliance are very old/ obsolete and was prone to frequent breakdowns and in view of the fire risks, sensitivity and vulnerability of the plant, it was necessary to take care of the deficiencies and keep the equipments in such a position that

they are available for fire-fighting. Accordingly, it has prayed that expenditure under the same may be allowed.

38. The matter has been considered. From the submissions of the petitioner, it is not clear as to how the expenditure incurred for the above work is on account of change in law or on account of compliance with directions of statutory agency responsible for safety and security of the plant. A proper well serviceable and healthy working system was the requirement in any thermal power station even prior to the letter of CISF indicating the necessity to keep the equipment serviceable. The petitioner after taking all the plant in the year 2000 has undertaken extensive R &M of the plant in phases to improve the condition of the equipment. At this stage when most of the R &M activities are nearing completion, the reference to old and obsolete equipment on the ground that the plant is a taken over plant is not acceptable. However, as the equipment is related to fire fighting system, the same shall be considered at the time of truing- up in terms of the decision considering the expenditure for fire fighting system for CHP area in para 36 above.

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

(₹in lakh)

Sl. No.		Additional capital expenditure					
		2014-15	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**Total**
A	**R&M (existing scheme)**						
1	R&M of MP rotor Unit-1	5.72	0.00	0.00	0.00	0.00	5.72
2	R&M of MP Rotor of Unit-2	427.00	0.00	0.00	0.00	0.00	427.00
3	Set of Guide Wheels LP Turbine Unit - 4	41.98	0.00	0.00	0.00	0.00	41.98
4	Air Washer System for Unit - 3 &4	154.00	0.00	0.00	0.00	0.00	154.00
5	Air conditioning of Thyristor Room	4.67	0.00	0.00	0.00	0.00	4.67
6	R & M of SG Package	0.00	100.00	0.00	0.00	0.00	100.00
7	R & M of ESP Package	0.00	10.00	0.00	0.00	0.00	10.00
8	Additional HT, LT & control Cable for SG + C&I	0.00	12.00	0.00	0.00	0.00	12.00
9	R & M of LP Rotor Unit - 3	0.00	53.00	0.00	0.00	0.00	53.00

10	Digital Distributed Control & Management Information System (DDCMIS)	0.00	40.00	0.00	0.00	0.00	40.00
11	Stacker & Reclaimer	0.00	20.00	0.00	0.00	0.00	20.00
12	Construction of 32 nos. Residential Building Type- D and 16 nos. of Type C quarters	0.00	0.00	452.30	0.00	335	787.30
	Total of A	**633.37**	**235**	**452.3**	**0.00**	**335**	**1655.67**
	Estimated de-capitalization @11.50%	72.84	27.03	52.01	0	38.53	190.40
	Net Additional capital .allowed	560.53	207.98	400.28	0	296.47	1465.27
B	**Ash Handling System**						
1	2nd Raising of Ash Dyke-B	1000.00	50.00				1050.00
2	3rd Raising of Ash Dyke-A & B	0.00	200.00	2000.00	1400	0.00	3600.00
	Total B	1000.00	250.00	2000.00	1400.00	0.00	4650.00
C	**Change in Law**						
1	Dry Fly Ash Extraction System	2830.00	200.00	400.00	0.00	0.00	3430.00
	Total	**2830.00**	**200.00**	**400.00**	**0.00**	**0.00**	**3430.00**
	Total A+B+C	**4390.53**	**657.98**	**2800.29**	**1400.00**	**296.48**	**9545.27**

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

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Opening capital cost	115680.89	120071.42	120729.40	123529.69	124929.69
Projected additional capital expenditure admitted	4390.53	657.98	2800.29	1400.00	296.48
Closing capital cost	**120071.42**	**120729.40**	**123529.69**	**124929.69**	**125226.17**

Debt–Equity Ratio

41. 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:equityration 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.

42. Accordingly, gross normative loan and equity amounting to ₹80976.62 lakh and ₹ 34704.27 lakh respectively as on 31.3.2014 as considered in order dated 23.8.2016 in Petition No. 329/GT/2014 has been considered as gross normative loan and equity as on 1.4.2014. Further, the additional capital expenditure approved above has been allocated in debt- equity ratio of 70:30.

Return on Equity

43. 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) additionalRoE shall not be admissible for transmission line having length of less than 50 kilometers"

44. 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."

45. The petitioner has claimed Return on Equity considering the base rate of 15.5% and effective tax rate of 23.939%. However, it is observed that in terms of the directions of the Commission in Petition No. 290/GT/2014 (tariff of Singrauli TPS for 2014-19) and based on the actual profit and tax paid for the year 2014-15, it has worked out the effective tax rate as 22.584%. Though the above regulation specify the computation of effective tax rate on the basis of tax paid, we deem it proper to allow the grossing up on MAT rate, considering the fact that the petition is disposed of in 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 15.500%.Based on the above, the rate of ROE works out to 19.610% for 2014-15 and

19.705% for 2015-16 onwards. This is, however, subject to truing- 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	34704.27	36021.43	36218.82	37058.90	37478.90
Addition of Equity due to ACE	1,317.16	197.39	840.09	420.00	88.94
Normative Equity - Closing	36021.43	36218.82	37058.90	37478.90	37567.85
Average Normative Equity	35362.85	36120.12	36638.86	37268.90	37523.38
Return on Equity (Base Rate)	15.500%	15.500%	15.500%	15.500%	15.500%
Tax Rate for respective years	20.961%	21.342%	21.342%	21.342%	21.342%
Rate of Return on Equity (Pre Tax)	19.610%	19.705%	19.705%	19.705%	19.705%
Return on Equity (Pre Tax)- Annualised	**6,934.65**	**7,117.47**	**7,219.69**	**7,343.84**	**7,393.98**

Interest on Loan

46. 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 re-financing.

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

Provided that the 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."

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

i) As stated above gross normative loan amounting to ₹80976.62 lakh has been considered as on 1.4.2014.

ii) Cumulative repayment amounting to ₹69244.85 lakh as on 31.3.2014 as considered in order dated 23.8.2016 in Petition 329/GT/2014.

iii) Addition to normative loan on account of additional capital expenditure approved above has been considered.

iv) Depreciation allowed has been considered as repayment of normative loan during the respective year of the tariff period 2014-19. Further proportionate adjustment has been made to the repayments corresponding to discharges and reversals of liabilities considered during the respective years on account of cumulative repayment adjusted as on 1.4.2014.

v) In line with the provisions of the regulation, the weighted average rate of interest has been calculated by 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.

48. 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	80976.62	84049.99	84510.58	86470.78	87450.78
Cumulative repayment of loan upto previous year / period	69244.85	72395.61	75809.31	79385.03	83241.60
Net Loan Opening	11731.77	11654.38	8701.27	7085.75	4209.18
Addition due to ACE	3,073.37	460.58	1,960.20	980.00	207.53
Repayment of loan during the year	3193.90	3430.45	3609.48	3856.58	3969.07
Less: Repayment adjustment on account of de-caps	43.14	16.76	33.76	0.00	26.97
Add: Repayment adjustment on discharges corresponding to un-discharged liabilities deducted as on 01.04.2014	0.00	0.00	0.00	0.00	0.00
Net Repayment	3150.76	3413.70	3575.72	3856.58	3942.10
Net Loan Closing	11654.38	8701.27	7085.75	4209.18	474.60
Average Loan	11693.08	10177.83	7893.51	5647.46	2341.89

Weighted Average Rate of Interest on Loan	6.2040%	7.0404%	8.5864%	10.1711%	10.2029%
Interest on Loan	**725.44**	**716.56**	**677.77**	**574.41**	**238.94**

Depreciation

49. Regulation 27of 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."

50. The cumulative depreciation amounting to ₹70131.62lakh as on 31.3.2014 as considered in order dated 23.8.2016 in Petition No. 329/GT/2014 has been considered for the purpose of tariff. Depreciation has been calculated by spreading over the balance depreciable value. Since, the balance useful life works out to 10.79 years as on 1.4.2014, the same has been considered for calculation of depreciation. The petitioner is however directed to furnish information in respect of un-recovered depreciation at the time of truing-up of tariff of the generating station in terms of Regulation 8 of the 2014 Tariff Regulations. Accordingly, depreciation has been computed as under:

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Average Capital Cost	117876.15	120400.41	122129.54	124229.68	125077.92
Depreciable value (ex. land)@ 90%	104581.30	106853.13	108409.35	110299.48	111062.89
Balance useful life of the assets	10.79	9.79	8.79	7.79	6.79
Balance depreciable value	34449.68	33570.75	31713.27	30027.68	26934.52
Depreciation (annualized)	**3193.90**	**3430.45**	**3609.48**	**3856.58**	**3969.07**
Cumulative depreciation at the end	73325.52	76712.83	80305.56	84128.37	88097.44
Less: Cumulative Depreciation adjustment on a/c of un-discharged liabilites	0.00	0.00	0.00	0.00	0.00
Less: Cumulative Depreciation reduction due to decapitalization	43.14	16.76	33.76	0.00	27.38
Cumulative depreciation (at the end of the period)	**73282.38**	**76696.07**	**80271.79**	**84128.37**	**88070.06**

O&M Expenses

51. Regulation 29 (1) (b) of the 2014 Tariff Regulation provides the O&M expense norms based on which the petitioner has claimed the O &M expenses for the generating station as under:

(₹in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19	Total
O&M Expenses under Regulation 29(1)	15787.20	16781.60	17837.60	18959.60	20152.00	89518.00

52. The petitioner has claimed year-wise O&M expenses comprising of Normative O&M and Water Charges. The claim for normative O&M expenses is found to be in order and accordingly allowed. Water charges claimed is discussed below.

Water Charges

53. Regulation 29(2) of the 2014Tariff 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"*

54. 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.

55. The water charges claimed by the petitioner for the period 2014-19 are as under:

(₹in lakh)

2014-15	2015-16	2016-17	2017-18	2018-19
178.23	189.55	201.59	214.39	228.00

56. The petitioner has claimed same water charges in 2014-15 as per actuals of 2013-14 (Rs 178.23 lakh) and thereafter escalating the same at 6.35% for each year of the tariff period from 2015-16 to 2018-19.

57. In order to examine the trend of the actual water consumption and rate of water charges, the petitioner was directed vide ROP of the hearing dated 24.5.2016 to furnish the details of the actual water consumption along with the rate of water charges for the last five years (i.e 2009-10 to 2013-14) along with relevant notification in support of the same. The details in respect of water charges such as type of cooling water system, water consumption, rate of water charges as applicable for 2009-14 have been furnished by the petitioner as under:

	Quantity of water (Cu-feet)	Rate (₹ /1000 Cu-feet)	Royalty charges (₹. 1.5-6.00 lakh/cusec/ year)	Total Water Charges (₹ lakh)
2009-10	1285859232	3.12	61.16	101.28
2010-11	1311144192	3.12	62.36	103.27
2011-12	1254373344	3.12/12.48	185.26	312.10
2012-13	940301332	12.48	249.66	367.01
2013-14	760311755	12.48	179.68	274.57

58. As per Regulation 29(2) of the 2014 Tariff Regulations, the water charges is allowed based on water consumption depending upon type of plant, type of cooling water system etc., subject to prudence check. The details in respect of the same has been furnished by the petitioner as under:

	Remarks
Type of Plant	Coal
Type of cooling water system	Closed circuit cooling
Consumption of water	760311755 Cu-feet/Annum
Rate of water charges	₹.12.48/1000 Cu-feet
Total water charges in 2013-14	₹.274.57 lakh

59. The petitioner has submitted that the contracted quantity and allocated quantity of water are same for the generating station which is 45 cusec and works out to 1419120000 cu feet water per year. It has further submitted that the payment of water charges in the generating station is based on the actual water consumption and contracted or allocated quantity has no impact on the same. It has also submitted that Uttar Pradesh Irrigation Department vide notification dated 15.7.2011 has increased water charges from ₹3.12 per 1000 cu ft to ₹12.48/1000 cu ft as well as royalty charges from ₹1.50 lakh/cusec/year to ₹6.00 lakh/cusec/year. However, there is no mention of the annual escalation of water charges/Royalty in the notification.

Consumption of water

60. The petitioner has furnished the actual consumption of water as 760311755 cu ft per annum in 2013-14. It is observed that the actual water consumption of 760311755 cu-ft is below the allocated/contracted quantum and also the least consumed during the period 2009-14. Accordingly, water consumption of 760311755 cu ft has been considered for allowing water charges during the period 2014-19.

Water charges based on water consumption and water charges rate

61. The petitioner has computed water charges as actual water consumption **x** rate of water charges (760311755cu-feet **x**₹12.48/(1000 cu feet) for the year 2013-14 which works out to ₹94.89 lakh. The same is found to be in order and hence allowed.

Royalty Charges in Water consumption

62. The petitioner has claimed Royalty charges of ₹179.68 lakh @ ₹6.00 lakh/cusec/year for the actual consumption of 760311755 cu feet in 2013-14. Total water charges including royalty works out as under:

*Water consumption in Cusec= 760311755/(8760*3600) = 24.109 Cusec*

Rate: ₹6.00 lakh/Cusec/year

Royalty Charges: 24.109 x 6.00 = 144.65 lakh

Total water charges in the year 2014-15: water charges + royalty Charges = 94.89+144.65 = 239.54 lakh

63. As there is no provision in the notification dated 15.7.2011 of the Uttar Pradesh Irrigation Department as regards escalation (year-wise) in water charges, we do not allow any increase in the water charges for the year 2014-15. Thus, the water charges for 2014-19 remain the same.

64. Based on the above discussions, the water charges allowed for the period 2014-19 is as under:-

	Projected Quantity Considered (cu-feet) (1)	Quantity In Cusec (2)	Rate ₹./1000 cu ft (3)	Water Charges (₹. lakh) 4=(2*3/1000) (4)	Rate of Royalty Charges ₹. lakh/ Cusec /year (5)	Royalty Charges (₹.lakh) 6=(2*5) (6)	Projected Water charge Computed (₹ in lakh) (7)= (4)+(6)
2014-15	760311755	24.109	12.48	94.89	6.00	144.65	239.54 lakh
2015-16	760311755	24.109	12.48	94.89	6.00	144.65	239.54 lakh
2016-17	760311755	24.109	12.48	94.89	6.00	144.65	239.54 lakh
2017-18	760311755	24.109	12.48	94.89	6.00	144.65	239.54 lakh
2018-19	760311755	24.109	12.48	94.89	6.00	144.65	239.54 lakh

65. The water charges allowed as above is subjected to truing-up at the end of the tariff period for which the petitioner is directed to place on record all relevant information.

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

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
O&M Expenses claimed under Regulation 29(1)	15787.20	16781.60	17837.60	18959.60	20152.00
O&M Expenses allowed under Regulation 29(1)	**15787.20**	**16781.60**	**17837.60**	**18959.60**	**20152.00**
Water Charges claimed	178.23	189.55	201.59	214.59	228.00
Water Charges allowed	**239.54**	**239.54**	**239.54**	**239.54**	**239.54**
Total O&M Expenses claimed	**15965.43**	**16971.15**	**18039.19**	**19173.99**	**20380.00**
Total O&M Expenses allowed	**16026.74**	**17021.14**	**18077.17**	**19199.14**	**20391.54**

Capital Spares

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

Operational Norms

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

Target Availability (%)	83
Heat Rate (kcal/kwh)	2750
Auxiliary Energy Consumption (%)	12
Specific Oil Consumption (ml/ kwh)	0.50

69. The operational norms claimed by the petitioner are discussed as under.

Target Availability

70. Regulation 36 of the 2014Tariff 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.

71. The petitioner has considered the Target Availability of 83% for the period 2014-19. The Commission due to shortage of domestic coal supply has relaxed the Target Availability norm to 83% for first 3 years from 1.4.2014 and the same shall be reviewed after 3 years. Accordingly, in terms of the Regulation 36(A) of the 2014 Tariff Regulations, the Target Availability of 83% is considered for the period 2014-17 and 85% for the period 2017-19.

Heat Rate (kcal/kwh)

72. Regulation 36(C) (c) of the 2014 Tariff Regulations as under:

> *'36 (C) Gross Station Heat Rate:-*
> *(c) Thermal Generating Station having COD on or after 1.4.2009 till 31.3.2014*
> *(i) Coal-based and lignite-fired Thermal Generating Stations*
> *= 1.045 x Design Heat Rate (kCal/kWh)*
> *Where the Design Heat Rate of a generating unit means the unit heat rate guaranteed by the supplier at conditions of 100% MCR, zero percent make up, design coal and design cooling water temperature/back pressure:*
>
> *Provided that the heat rate norms computed as per above shall be limited to the heat rate norms approved during FY 2009-10 to FY 2013-14'.*

73. As per Regulation 36 (C) (c) of the 2014 Tariff Regulations, the Gross Heat Rate of 2750 kcal/kWh. Accordingly, the Station Heat Rate of 2750 kcal/kWh is considered for the purpose of tariff for the period 2014-19.

Auxiliary Power Consumption

74. Regulation 36(E)(a) of the 2014 Tariff Regulations provides the Auxiliary Energy Consumption of 12 % for the generating station. Hence, the Auxiliary Energy Consumption considered by the petitioner is as per norms and is allowed.

Specific Oil Consumption

75. Regulation 36(D)(a) of the 2014 Tariff Regulations provides for 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

76. Sub-section (a) 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 towards stock for 15 days for pit-head generating stations and 30 days for non-pit-head generating station for generation corresponding to the normative annual plant availability factor or the maximum coal stock storage capacity whichever is lower.

ii) Cost of coal for 30 days for generating corresponding to the normative annual plant availability factor.

iii) Cost of secondary fuel oil for two month for generating 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 charge and energy charge for sale of electricity calculated on normative plant availability factor; and

vi) Operation and maintenance expenses for one month."

(2) 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.

(3) *Interest on working capital shall be payable on normative basis notwithstanding that the generating company or the transmission licensee has not taken loan for working capital from any outside agency."*

Maintenance spares

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

(₹in lakh)

2014-15	**2015-16**	**2016-17**	**2017-18**	**2018-19**
3193.09	3394.23	3607.84	3834.80	4076.00

78. 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. In terms of Regulation 29(2) of the 2014 Tariff Regulations and in line with Commission's order dated 6.10.2015 in Petition No. 186/GT/2014, the maintenance spares @ 20% of O & M expenses allowed is as under:

(₹in lakh)

2014-15	**2015-16**	**2016-17**	**2017-18**	**2018-19**
3205.35	3404.23	3615.43	3839.83	4078.31

Receivables

79. 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
VariableCharges-2 months	11092.10	11122.49	11092.10	11359.38	11359.38
Fixed Charges - 2 months	5194.97	5441.70	5669.27	5925.79	6107.41
Total	**16287.07**	**16564.19**	**16761.37**	**17285.17**	**17466.79**

O & M Expenses

80. O&M expenses for 1 month claimed by the petitioner for the purpose of working capital in Form-13 B, including water charges is as under:

(₹ in lakh)

2014-15	2015-16	2016-17	2017-18	2018-19
1330.45	1414.26	1503.27	1597.83	1698.33

81. Regulation 28 (a) (vi) of the 2014 Tariff Regulations provides for O & M expenses for one month for coal based generating station. Accordingly, O&M expenses for 1 month is allowed as under:

(₹ in lakh)

2014-15	2015-16	2016-17	2017-18	2018-19
1335.56	1418.43	1506.43	1599.93	1699.29

Fuel Components and Energy Charges in working capital

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

(₹in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Cost of coal for 2 months	16831.88	16878.00	16831.88	16831.88	16831.88
Cost of Secondary fuel oil for 2 months	155.29	155.71	155.29	155.29	155.29

83. The Commission vide ROP of the hearing dated 27.2.2015 in Petition No. 283/GT/2014 had directed the petitioner to submit the GCV of coal on 'as received' basis. In compliance to the directions, the petitioner vide affidavit dated 4.6.2015 has submitted that

they did not have suitable infrastructure for measurement of representative GCV on 'as received' basis. In response, the respondent has submitted that the Energy Charge Rate (ECR) of generating station is required to be calculated in accordance with the 2014 Tariff Regulations. It has also submitted that the petitioner may realize that the substantial change in ECR would ultimately impact the Merit order Dispatch (MOD) principle.

84. The issue of "as received" GCV for computation of Energy Charges was challenged by NTPC and other generating companies through writ petition in the High Court of Delhi. The writ petition was heard and Delhi High Court 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.

85. 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.*"

86. The petitioner has claimed ECR of 362.038 Paise/ k Wh 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 Hydraulic 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. Accordingly, the Commission has decided to compute the energy charges by provisionally taking the GCV of coal on as 'billed basis' and allowing on adjustment for inherent moisture as per the formula given as under:

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

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

87. However, we have not considered the adjustment of moisture in the fuel components and energy charges in the working capital in the absence of the data of total moisture and inherent moisture in Form- 15 of the petition.

88. In view of the above, the cost for fuel components in working capital have been computed at 83% NAPAF for the years 2014-15, 2015-16 and 2016-17 and at 85% NAPAF for the year 2017-18 & 2018-19 and based on 'as billed' GCV of coal and price of coal procured and secondary fuel oil for the preceding three months from 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-30 Days	5393.90	5393.90	5393.90	5523.87	5523.87
Cost of Coal for Generation-30 Days	5393.90	5393.90	5393.90	5523.87	5523.87
Cost of Secondary fuel oil 2 months	155.29	155.71	155.29	159.03	159.03

89. The GCV of coal as computed above shall be adjusted in the light of GCV of coal on 'as received' basis computed by the petitioner in accordance with the direction in order dated 25.1.2016 in Petition No. 283/GT/2014. The ECR based on operational norms under 2014 Tariff Regulation and on 'as billed' GCV of coal for preceding 3 months (January, 2014 to March, 2014) is worked out as under:

Sl. No.		Unit	2014-19
1	Capacity	MW	440
2	weighted average Gross Station Heat Rate	Kcal/kWh	2750
3	weighted average Aux. Energy Consumption	%	12
4	Weighted average GCV of oil (As fired)	Kcal/lit	9340.00
5	Weighted average GCV of Coal (As Billed)	Kcal/kg	5387.09
6	Adjustment on account of coal received at the generating station for equilibrated basis (Air dried) in the billed GCV of Coal India		*
7	Weighted average price of oil	₹/KL	58248.61
8	Weighted average price of Coal	₹/MT	4025.31
9	**Rate of energy charge ex-bus**	**Rs/kWh**	**2.364****

** to be calculated by the petitioner based on the adjustment formulae*
*** to be revised as per the figures at Sl. No. 6*

90. Energy Charges for 2 months on the basis of as billed GCV for the purpose of Interest in working capital has been worked out as under:

(₹in lakh)

2014-15	2015-16	2016-17	2017-18	2018-19
11092.92	11092.92	11123.31	11360.22	11360.22

91. Accordingly, fuel components and Energy charges allowed in the working capital is as under:

(₹in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Cost of coal for 60 days	10787.80	10787.80	10787.80	11047.75	11047.75
Cost of secondary fuel oil for 2 months	155.29	155.71	155.29	159.03	159.03
Energy charges for 2 months	11092.10	11122.49	11092.10	11359.38	11359.38

Rate of interest on working capital

92. 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."*

93. In terms of the above regulations, SBI PLR of 13.50% has been considered for the purpose of calculating interest on working capital. Accordingly, Interest on working capital has been computed as under:

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Fuel Cost (Coal) - 60 days	10787.80	10787.80	10787.80	11047.75	11047.75
Liquid Fuel Cost - 60 days	155.29	155.71	155.29	159.03	159.03

O & M	1335.56	1418.43	1506.43	1599.93	1699.29
Maintenance spares	3205.35	3404.23	3615.43	3839.83	4078.31
Receivables - 2 months	16287.07	16564.19	16761.37	17285.17	17466.79
Total Working Capital	**31771.07**	**32330.36**	**32826.32**	**33931.70**	**34451.17**
Rate of interest	13.5000%	13.5000%	13.5000%	13.5000%	13.5000%
Interest on Working Capital	**4289.09**	**4364.60**	**4431.55**	**4580.78**	**4650.91**

94. 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	3193.90	3430.45	3609.48	3856.58	3969.07
Interest on Loan	725.44	716.56	677.77	574.41	238.94
Return on Equity	6934.65	7117.47	7219.69	7343.84	7393.98
Interest on Working Capital	4289.09	4364.60	4431.55	4580.78	4650.91
O&M Expenses	16026.74	17021.14	18077.14	19199.14	20391.54
Total	**31169.82**	**32650.22**	**34015.63**	**35554.74**	**36644.44**

Note: All figures are on annualised basis. All figures under each head have been rounded. The figure in total column each year is also rounded. As such, the sum of individual items may not be equal to the arithmetic total of the column.

Month to Month Energy Charges

95. Clause 6 (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"*

96. 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 read with Commission's order dated 25.1.2016 in Petition No. 283/GT/2014.

97. The petitioner has been directed in 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

98. The petitioner has sought the reimbursement of filing fee and also the expenses incurred towards publication of notices for application of tariff for the period 2014-19. The petitioner has deposited the filing fees of ₹1936000/- each for the year 2014-15, 2015-16 and 2016-17 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, we direct that the petitioner shall be entitled to recover *pro rata,* the filing fees and the expenses of ₹ 26009.00 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 2017-19 shall be recovered *pro rata* after deposit of the same and production of documentary proof.

99. 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.

100. Petition No. 336/GT/2014 is disposed of in terms of the above.

Sd/-	***Sd/-***	***Sd/-***	***Sd/-***
(Dr. M.K.Iyer)	**(A. S. Bakshi)**	**(A. K. Singhal)**	**(Gireesh B. Pradhan)**
Member	**Member**	**Member**	**Chairperson**