CENTRAL ELECTRICITY REGULATORY COMMISSION

NEW DELHI

Petition No. 348/GT/2014

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

Date of Order : 20.7.2017

In the matter of:

Determination of tariff for Durgapur Thermal Power Station, Units 3 and 4 (350 MW) for the period from 1.4.2014 to 31.3.2019.

And in the matter of

Damodar Valley Corporation,
DVC Towers, VIP Road
Kolkata **………Petitioner**

Versus

1. West Bengal State Electricity Distribution Company Limited
Block 'DJ' Sector-11, Salt Lake City,
Kolkata-700 091

2. Jharkhand Bijli Vitran Nigam Limited
Engineering Building, HEC, Dhurwa,
Ranchi- 834 004 **……….Respondents**

Parties present:

For Petitioner: Shri M.G Ramachandran, Advocate, DVC
Ms Anushree Bardhan, Advocate, DVC
Shri P.Bhattacharya, DVC
Shri Subrata Ghosal, DVC
Shri A.Biswas, DVC
Shri D.K Aich, DVC
Shri S.Ganguly, DVC

For Respondents: None

ORDER

This petition has been filed by the petitioner, Damodar Valley Corporation (DVC), for approval of tariff of Durgapur Thermal Power Station, Units 3 and 4 (1x140 MW + 1x210 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 petitioner is a statutory body established by the Central Government under the Damodar Valley Corporation Act, 1948 (hereinafter referred to as the 'DVC Act') for the development of the Damodar Valley, with three participating Governments, namely, the Central Government, the Government of West Bengal and the Government of Jharkhand. The dates of commercial operation of the different units of this generating station is as under:-

Unit - 3 :	December,1966
Unit - 4 :	September, 1982

3. In Petition No. 276/GT/2012 filed by the petitioner for determination of tariff of the generating station for the period 2009-14, the Commission vide order dated 7.8.2013, has determined the annual fixed charges based on actual additional capital expenditure for the years 2009-10, 2010-11 and 2011-12 and projected additional capital expenditure for the years 2012-13 and 2013-14. Thereafter, the Commission vide order dated 29.7.2016 in Petition No. 471/GT/2014 had revised the annual fixed charges of the generating station for the period 2009-14 after truing-up exercise in terms of Regulation 6(1) of the 2009 Tariff Regulations, as summarized under:-

(₹ in lakh)

	2009-10	2010-11	2011-12	2012-13	2013-14
Depreciation	1092.00	1414.64	1700.41	1824.95	721.13
Interest on Loan	28.37	17.41	33.99	36.42	0.00
Return on Equity	1831.33	1580.25	2089.43	2189.43	1768.06
Interest on Working Capital	2180.51	2199.49	2238.64	2257.97	2244.53
O&M Expenses	10972.50	11287.50	11609.50	11942.00	12281.50
Cost of secondary fuel oil (for coal-based & lignite fired generating stations only)	2420.62	2420.62	2427.25	2420.62	2420.62
Sub-Total	**18525.33**	**18919.92**	**20099.22**	**20671.39**	**19435.84**
Common Office Expenditure	180.59	191.20	111.96	78.98	60.95
Additional O&M on account of Ash evacuation, Mega insurance, CISF security and Share of subsidiary activities	1198.38	1222.99	1343.15	1270.28	1316.42
Pension & Gratuity Contribution	780.13	780.13	780.13	780.13	780.13
Sinking Fund Contribution	436.91	422.23	404.04	401.79	429.92
Adjustment of secondary fuel oil	(-)92.03	(-)134.39	293.43	439.04	542.60
Sub-Total	**2503.99**	**2482.15**	**2932.71**	**2970.22**	**3130.02**
Total Annual Fixed Charges	**21029.32**	**21402.07**	**23031.93**	**23641.62**	**22565.86**

4. The annual fixed charges determined vide orders dated 7.8.2013 and 29.7.2016 are subject to the final outcome of the Civil Appeals pending before the Hon'ble Supreme Court in respect of the determination of tariff of the generating stations and inter-state transmission systems of the petitioner by the Commission for the periods 2006-09 and 2009-14.

5. The petitioner vide affidavit dated 3.9.2014 has sought approval of tariff of the generating station for the period 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:

Capital Cost

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Opening Capital Cost	26557.11	30877.26	34105.68	35639.55	36420.61
Additional capital expenditure	4362.74	3613.97	1682.30	905.00	560.00
De-capitalization during the year/ period	42.59	385.54	148.44	123.94	32.59
Closing Capital Cost	**30877.26**	**34105.68**	**35639.55**	**36420.61**	**36948.02**
Average Capital Cost	**28717.18**	**32491.47**	**34872.62**	**36030.08**	**36684.31**

Annual Fixed Charges

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Depreciation	2079.07	2352.32	2524.71	2377.32	700.36
Interest on Loan	48.40	93.03	44.14	0.00	0.00
Return on Equity	2422.31	2644.35	2784.44	2852.53	2891.02
Interest on Working Capital	3399.21	3505.46	3558.59	3603.88	3618.06
O&M Expenses	10042.20	10673.60	11345.60	12059.60	12819.10
Compensation Allowance	350.00	350.00	350.00	350.00	350.00
Capital Spares	0.00	60.00	40.00	50.00	0.00
Sub-Total	**18341.19**	**19678.76**	**20647.48**	**21293.33**	**20378.54**
Pension & Gratuity Contribution	2016.21	4213.05	4213.05	4213.05	4213.05
Common office expenditure	73.07	68.12	86.80	127.37	144.32
Additional O&M Expenses	2522.47	2624.68	2873.23	2985.77	3222.76
Sub-Total	**4611.75**	**6905.86**	**7173.09**	**7326.19**	**7580.14**
Total	**22952.93**	**26584.62**	**27820.56**	**28619.52**	**27958.67**

6. In compliance with the directions of the Commission, the petitioner has filed additional information and has served copies on the respondents. None of the respondents have filed replies to the petition. In response to the directions of the Commission, the petitioner vide affidavit dated 1.9.2016 has submitted additional information with copies to the respondents. Taking into consideration the submissions and the documents available on record, we proceed to consider the claims of the

petitioner and determine the tariff in respect of this generating station for the period 2014-19.

Capital cost as on 1.4.2014

7. Clause (1) of Regulation 9 of the 2014 Tariff Regulations provides that the capital cost as determined by the Commission after prudence check, in accordance with this regulation shall form the basis of determination of tariff for existing and new projects. 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 modernization as admitted by this Commission in accordance with Regulation 15."*

8. The annual fixed charges claimed by the petitioner are based on opening capital cost of ₹26557.11 lakh as on 1.4.2014. Since the petitioner's claim was prior to the true up order dated 29.7.2016, the petitioner's claim is varying from the admitted capital cost in true up order. In accordance with Clause 3 of Regulation 9 of the 2014 Tariff Regulations, the capital cost admitted by the Commission prior to 1.4.2014 is to be considered as opening capital cost. Accordingly, the closing capital cost of ₹25700.10 lakh as on 31.3.2014 as admitted in the order dated 29.7.2016 in Petition No. 471/GT/2014 has been considered as the opening capital cost as on 1.4.2014 for the purpose of tariff determination during tariff period 2014-19.

Additional Capital Expenditure

9. The petitioner has claimed the additional capital expenditure towards certain assets/items for the period 2014-19 under Regulation 9(5) and Regulation 14(3) of the

2014 Tariff Regulations. Also, expenditure for certain other assets has been claimed under Regulation 14 read with Regulation 54 (Power to relax) & 55 (Removal of difficulties) of the 2014 Tariff Regulations.

10. 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:

……

11. In Petition No. 276/GT/2012 filed by the petitioner for the period 2009-14, the Commission vide order dated 7.8.2013 had undertaken truing-up of tariff for the years 2009-10, 2010-11 and 2011-12 and had allowed the additional capital expenditure for the said period as under:-

(₹ in lakh)

	2009-10	**2010-11**	**2011-12**
Power House Plant & Machinery	1472.37	1153.53	3545.50
Renovation of residential buildings	204.03	0.00	0.00
Roads, Culverts & Railway siding	97.04	0.00	0.00
Less: De-capitalization	207.97	217.34	555.80
Net Additional capital Expenditure allowed	**1565.48**	**936.18**	**2989.70**
Less : Liabilities included in additional capital expenditure	4.37	6.67	0.00
Add: Discharge of liabilities	98.22	0.00	0.00
Total Additional capital expenditure allowed	**1659.33**	**929.51**	**2989.70**

12. Thereafter, the Commission in order dated 29.7.2016 in Petition No. 471/GT/2014 had revised the tariff of the generating station after truing-up of expenditure for the years

2012-13 and 2013-14 and had allowed the following additional capital expenditure as under:-

(₹ in lakh)

	2012-13	2013-14
Power House Plant & Machinery	519.93	215.02
Miscellaneous power plant equipments	0.00	152.92
De-capitalization	(-)62.87	(-)93.77
Total	**457.06**	**274.17**
Liability Discharges	(-)6.31	(-)6.62
Total	**450.75**	**267.55**

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

(₹ in lakh)

Year	Additional capital Expenditure claimed	De-capitalization	Depreciation recovered on de-capitalized assets
2014-15	4362.74	42.59	38.26
2015-16	3613.97	385.54	281.02
2016-17	1682.30	148.44	133.51
2017-18	905.00	123.94	111.55
2018-19	560.00	32.59	29.25
Total Claimed	**11124.01**	**733.10**	**593.59**

14. It is observed that the additional capital expenditure claimed by the petitioner for different packages can be categorized under the following heads:-

A. Claims under Regulation 14(3) of the 2014 Tariff Regulations.

B. Claims under Regulation 9(5) of the 2014 Tariff Regulations.

C. Claims under Regulation 54 and 55 of the 2014 Tariff Regulations.

D. Deferred works spilled over from the period 2009-14 to period 2014-19 claimed under Regulations 54 & 55, 14(3)(ii) and 9(5) of the 2014 Tariff Regulations.

15. The claims of the petitioner under different provisions of the various packages are examined as stated in the subsequent paragraph.

Regulation 14(3)

A. Control and Instrumentation Package

16. The petitioner has claimed projected additional capital expenditure of ₹8.00 lakh in 2015-16 for installation of flame monitoring system for Unit-3 and ₹20.00 lakh each for the years 2015-16 and 2018-19 in respect of modernization of turbine, BFP, ID, FD and PA fan vibration monitoring system and installation of new vibration monitoring system in CT Fans for unit-4 and unit-3 respectively under Regulation 14(3)(iii) of the 2014 Tariff Regulations. In justification, the petitioner has submitted that there is no flame scanning system in Unit-3. The petitioner has also submitted that one photo voltaic cell was in service earlier for safe operation of boiler. It has further submitted that one flame camera has been installed in 2012-13 for viewing the actual flame on one side of the boiler. The petitioner has further submitted that it has proposed to install another flame camera on other side of boiler as the same in necessary for safe and reliable operation of the boiler. As regards modernization of turbine, BFP, ID, FD and PA fan vibration monitoring system and installation of new vibration monitoring system in CT Fans, the petitioner has submitted that vibration measurement system of ID, FD, PA Fan & BFP are in use since inception of the unit and outlived its useful life. Accordingly, the petitioner has proposed for replacement of the same with latest online vibration measurement and machinery protection system which will enable the user to operate the equipment with safety and reliability and shall also enable predictive / condition based maintenance of equipment. Regarding CT fans, the petitioner has submitted that it is recommended by the enquiry

committee report constituted to investigate failure of one CT Fan, to install online vibration monitoring system. The petitioner has also claimed the de-capitalization of ₹1.68 lakh each for the year 2015-16 and 2018-19 in respect of the modernization of Turbine, BFP, ID, FD & PA Fan Vibration Monitoring system and Installation of New Vibration Monitoring system in CT Fans for unit 3 and 4 respectively.

17. On scrutiny of the submission of the petitioner, it is observed that the claim for said additional capital expenditure is on account of safety and security of the plant and is based on directions of appropriate Government Agencies or Statutory authorities. However, the petitioner has not furnished any documentary evidence in support of the said claim nor has demonstrated that the requirement of the said assets is based on any advice / direction of any statutory agency responsible for security. It has also not furnished any report of the Technical Committee for replacement of the said assets. In this background, we are not inclined to allow the claim of the petitioner during the years 2015-16 and 2018-19. Consequently, the de-capitalization claimed has also not considered.

B. Electrical Package

18. The petitioner has claimed projected additional capital expenditure of ₹30.00 lakh, in 2016-17 towards replacement of electronic energy meter for Unit-4 under Regulation 14(3)(ii) of the 2014 Tariff Regulations. In justification of the same, the petitioner has furnished that the old asset has outlived its useful life and the same is required to be replaced as per the norms specified by the Central Electricity Authority. The petitioner has also claimed de-capitalization amount of ₹1.58 lakh in respect of said asset.

19. It is observed that the petitioner has not indicated the specific provision of the CEA regulations under which the additional capital expenditure has been claimed based on which the said assets have been replaced. In this background, we are not inclined to consider the claim of the petitioner for additional capital expenditure. Consequently, the de-capitalization claimed has also not been considered.

C. Coal Handling Plant

20. The petitioner has claimed projected additional capital expenditure of ₹100.00 lakh in 2015-16 towards replacement of top stop arm assembly of wagon tippler for unit-4 and ₹30.00 lakh, ₹50.00 lakh and ₹20.00 lakh each during the years 2015-16, 2016-17 and 2017-18, respectively towards Loco refurbishing in Unit-4, under Regulation 14(3)(x) of the 2014 Tariff Regulations. The petitioner in justification of the same, has submitted that these replacements are proposed for safe and smooth haulage of coal and oil wagons of the stations. The petitioner has also claimed de-capitalization amount of ₹9.84 lakh in 2015-16 towards replacement of top stop arm assembly of wagon tippler for Unit-4 and ₹2.23 lakh, ₹4.02 lakh and ₹1.54 lakh each during the years 2015-16, 2016-17 and 2017-18, respectively towards Loco refurbishing in Unit-4.

21. We have examined the submissions and the documents available on record. It is observed that the petitioner has not furnished any documentary evidence as regards the claim made in respect of these assets. Moreover, no technical report substantiating the need for replacement of these assets on account of obsolescence has been furnished. Accordingly, additional capital expenditure claimed has not been allowed. Consequently, the de-capitalization of assets claimed by the petitioner has also not been considered.

D. Security and fire package and advanced O&M tools/ system for safety and protection of personnel

22. The petitioner has claimed year-wise gross additional capital expenditure as summarized under.

(₹ in lakh)

Head of Works/ Equipment		2015-16	2016-17	2017-18
Unit-4	**Security and Fire Package (CISF)**			
	Procurement of Fire Tender - 1 No.	35.00	0.00	0.00
	Procurement of high capacity Portable fire pump - 1 No.	8.50	0.00	0.00
	Rescue/cutting & other tools	0.00	3.00	0.00
	Procurement of Motorcycle- 3 Nos.	0.00	1.80	0.00
	Procurement of Night Vision Devices- 4 Nos.	0.00	0.00	12.00
Unit-4	**Advanced O & M tools/ system for Safety & protection of personnel.**			
	Installation of smoke detection & alarm system in 6 kV Switch Gears.	0.00	10.00	0.00
	DG Sets with emergency MCC	0.00	103.00	103.00

23. As regards Security and fire package, the petitioner has claimed projected additional capital expenditure of ₹43.50 lakh in 2015-16, ₹4.80 lakh in 2016-17 and ₹12.00 lakh in 2017-18 for Unit-4, towards procurement of 1 no. of fire tender, high capacity 1 no. of portable fire pump, rescue/cutting and other tools, 3 no. of motorcycles, 4 nos. of night vision devices under Regulation 14(3)(iii) of the 2014 Tariff Regulations. As regards advanced O & M tools/ system for safety and protection of personnel, the petitioner has claimed projected additional capital expenditure of ₹113.00 lakh in 2016-17 and ₹103.00 lakh in 2017-18 for Unit-4 towards installation of smoke detection and alarm system in 6 kV switchgear and DG sets with emergency MCC under Regulation 14(3)(iii) of the 2014 Tariff Regulations. In justification of the same, the petitioner has

submitted that these assets are proposed for providing better security coverage and fire protection services in the generating station.

24. On scrutiny of the submissions of the petitioner, it is observed that the additional capital expenditure claimed towards safety and security of the plant is based on directions of appropriate Government Agencies or statutory authorities. However, the petitioner has not furnished any documentary evidence in support of the said claim. In this background, we are not considering the claim of the petitioner during the years 2015-16 and 2018-19 at this stage. However, the petitioner may provide documentary evidence at the time of truing-up for necessary consideration.

Regulation 9(5)

25. Regulation 9(5) of the 2014 Tariff Regulations provides as under:

> *"9. Capital Cost*
>
> *(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."*

A. Electrical Package

26. The petitioner has claimed year wise additional capital expenditure of ₹50 lakh each during the years 2016-17 and 2017-18 for Unit-4 and ₹50 lakh in 2018-19 for Unit-3 towards electrical package for replacement of old luminairs by installing new energy efficient luminairs such as LEDs, T5, CFLs, solar power operated luminaries, Timers, Occupancy Switches. The petitioner was directed to furnish the details of the benefits envisaged on account of additional capitalization proposed under PAT scheme in terms

of said replacements. In justification of the same, the petitioner has submitted that the above replacement/ installation of assets would result in improvement in TG heat rate, improvement in reliability of machine, improvement of condenser vacuum by approximately 20 mm HG, withdrawal of hogging ejector/starting ejector, reduction of steam consumption and saving in DM water, increase in reliability of boiler feed pump, etc. As regards the up-gradation of energy efficient illumination system, the petitioner has submitted that such activities would result in improvement in TG heat rate. The petitioner has further submitted that it was decided to replace 1300 nos. of FTL / HPSV / HPMV of different wattage ratings with LED Luminaries thereby reducing approximately 0.81% APC per year. The petitioner has also claimed de-capitalization amount of ₹0.33 lakh each in 2016-17 and 2017-18 for unit 4 and ₹0.33 lakh in 2016-17 for unit-3 in respect of the said assets.

B. Boiler and Auxiliary Package

27. The petitioner has claimed projected additional capital expenditure of ₹45.00 lakh and ₹15.00 lakh during the years 2014-15 and 2015-16, respectively, towards installation of rotary vane wheel assembly in 6 nos. coal mill XRP 763 in Unit-4 and ₹100.00 lakh in 2015-16 for CAVT & CFD modeling spares of Duct of Boiler in Unit-4. As regards to installation of rotary vane wheel assembly in 6 nos. coal mill XRP 763 the petitioner has submitted that the same will lead to uniform erosion of wear parts and improved coal fineness and consequently reduction in combustibles. As regards CAVT & CFD modeling spares of Duct of Boiler, the petitioner has submitted that based on the test and reports submitted by M/s CPRI, Bangalore regarding the CAVT and CFD on the duct from the eco outlet to chimney inlet, procurement of baffle plates, dampers and

other related accessories is under process. It has also submitted that the availability of material at site is expected within six months from the date of issuance of purchase order. The petitioner has further submitted that material fitment schedule is during next capital over-hauling and fund of ₹100.00 lakh has been kept in BE 2014 -15 for payment action. The petitioner has also claimed de-capitalization amount of ₹1.49 lakh and ₹0.47 lakh in 2014-15 and 2015-16 respectively, for Unit-4 towards installation of rotary vane wheel assembly in 6 nos. Coal Mill XRP 763.

C. Turbine and Auxiliary Package

28. The petitioner has claimed projected additional capital expenditure of ₹297.80 lakh in 2014-15 towards various activities like alumina blasting of turbine internals, replacement of spill strips and packing rings N1 to N5, wield repair of diaphragms and steam flow path audit in Unit-3. In justification, the petitioner has submitted that such activities would result in improvement in TG heat rate. Further, the petitioner has claimed projected additional capital expenditure of ₹21.50 lakh in 2014-15 towards replacement of age old Steam Jet Air Ejector (SJAE) by new one in Unit-3. In justification, the petitioner has submitted that the age old ejector has completed useful life of more than 25 years and was affecting condenser vacuum and, therefore, the asset is proposed to be replaced to improve condenser vacuum.

29. The petitioner has claimed projected additional capital expenditure of ₹70.00 lakh in 2015-16 towards replacement of tube bunch for LP Htr#4 in Unit-3. In justification, the petitioner has submitted that asset has completed useful life of more than 25 years. The petitioner has further submitted that its performance deteriorated due to plugging of tube

by around 30%. The petitioner has further submitted that in anticipation of further running of the unit by at least by 5-6 years, the proposal may be considered with the fitment program during next major overhauling of the unit expected in 2016-17.

30. The petitioner has claimed projected additional capital expenditure of ₹40.64 lakh in 2015-16 towards replacement of generator hydrogen cooler of TG in Unit-4. In justification, the petitioner has submitted that it will benefit the generator hydrogen cooling system by maintaining slot temperature within permissible range at a sustained unit load. The petitioner has further submitted that three coolers out of four have already been replaced by new one and the single age old cooler has been planned for replacement in next capital over-hauling of Unit-4.

31. The petitioner has also claimed projected additional capital expenditure of ₹262.50 lakh in 2016-17 towards replacement of upgraded energy efficient cartridge for boiler feed pump. In justification, the petitioner has submitted that such replacement will save auxiliary power consumption for a considerable amount i.e. 300 kWh, as established in BFP#4C, where upgraded version energy efficient cartridge has already been used in 2009 and planned for replacement for BFP#4B. The petitioner has also claimed de-capitalization of ₹3.50 lakh in 2014-15 towards replacement of age old Steam jet air Ejector (SJAE) for unit-3, ₹6.89 lakh in 2015-16 towards replacement of tube bunch for LP Htr#4 of Unit#3 and ₹1.28 lakh in 2015-16 towards replacement of Generator Hydrogen Cooler of TG for Unit #4 and ₹7.36 lakh in 2016-17 for replacement of Upgraded Energy Efficient Cartridge for Boiler Feed Pump in unit-4.

Analysis and Decision

32. We have examined the submissions of the petitioner on the claims made in respect of the packages A, B and C above under this head. It is observed that the justification furnished by the petitioner is common without any quantifiable details of the benefits envisaged on account of capitalization of these assets. In terms of Regulation 9(5)(b) of the 2014 Tariff Regulations, the petitioner is required to furnish the benefits arising out of the expenditure under the PAT scheme so that the same can be shared with the beneficiaries. As quantifiable details such as improvement in the heat rate along with other performance parameters has not been submitted by the petitioner with datas, we are not inclined to allow the capitalization of the assets under PAT scheme in respect of the said packages (Electrical, Boiler and Auxiliary and Turbine and Auxiliary packages).

Regulation 54 and 55

33. Regulation 54 and 55 of the 2014 Tariff Regulations provides as under:

> *"54. Power to Relax: The Commission, for reasons to be recorded in writing, may relax any of the provisions of these regulations on its own motion or on an application made before it by an interested person.*
>
> *55. Power to Remove Difficulty:*
>
> *If any difficulty arises in giving effect to the provisions of these regulations, the Commission may, by order, make such provision not inconsistent with the provisions of the Act or provisions of other regulations specified by the Commission, as may appear to be necessary for removing the difficulty in giving effect to the objectives of these regulations."*

A. Control and Instrumentation Package

34. The petitioner has claimed year wise gross additional capital expenditure towards control and instrumentation package and has submitted that the same is required for phasing out obsolete technology as there are no specific provisions under the 2014

Tariff Regulations for additional capital expenditure. Accordingly, the additional capital expenditure claimed by the petitioner under this head is as under:-

(₹ in lakh)

Head of Works/ Equipment		2014-15	2015-16	2016-17	2017-18	2018-19
Unit-3	**Control and Instrumentation Package**					
	Chart less recorders for Boiler, Turbine & for other critical parameters	6.00	10.00	10.00	0.00	0.00
	Transmitter/indicator/Recorder/Controller /CV positioner/ actuators /PLC based system / Annunciation system	8.00	5.00	5.00	0.00	10.00
	Retrofitting of new positioner in place of old & obsolete positioner of existing power cylinders & control valves.	10.00	10.00	0.00	0.00	0.00
	Conductivity type electronic drum level measurement system	0.00	0.00	20.00	0.00	0.00
	Installation of precision testing instruments & calibrators for C&I lab	0.00	0.00	0.00	0.00	10.00
Unit-4	**Control and Instrumentation Package**					
	Installation of Precision testing Instruments & calibrators for C&I lab	20.00	0.00	0.00	0.00	0.00
	Chartless recorders for critical parameters.	6.00	12.00	12.00	0.00	0.00
	Transmitter/indicator/Recorder/Controller /CV positioner/ actuators / Pneumatic converter/ annunciation system/PLC etc	8.50	15.00	10.00	10.00	0.00
	Conductivity type electronic drum level measurement system	20.00	0.00	0.00	0.00	0.00

35. In justification of the projected additional capital expenditure claimed for replacement/retrofitting of chartless recorders, transmitter, indicator, recorder, controller, CV positioner, actuators, PLC based system, annunciation system for Units 3 and 4, the petitioner has submitted that some of the old and obsolete chart recorders have been replaced with the Chartless recorder in phased manner during the period 2009-14. It has also submitted that due to higher lead time some of the works have spilled over from the period 2009-14 to the tariff period 2014-19. It has also submitted that the replacement of balance old chart recorder with the latest chartless recorder with better display quality,

trending, data storage, retrieving facility & reliability of measurement has been proposed during 2014-19 for better quality of measurement, control and overall reliability in the operation of the plant. As regards retrofitting of new positioner in place of old & obsolete positioner of existing power cylinders & control valves projected for Unit-3 and Unit-4, the petitioner has submitted that retrofitting of new positioner will reduce downtime and improve efficiency of the unit. As regards installation of precision testing instruments and calibrators for C&I lab for Unit-3 and Unit-4, the petitioner has submitted that there was no C&I lab for calibration of various instruments and the same was required to support plant operation and maintenance. The petitioner has also claimed projected additional capital expenditure towards replacement of conductivity type electronic drum level measurement system for Unit-3 and Unit-4 on the ground that the spares for the old system are not available and that the system is required to achieve better operational efficiency and boiler/turbine safety. The petitioner has also claimed de-capitalization amount in respect of the said assets as detailed under:

(₹ in lakh)

Head of Works/ Equipment		**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**
Unit-3	**Control and Instrumentation Package**					
	Chart less recorders for Boiler, Turbine & for other critical parameters	0.23	0.36	0.34	0.00	0.00
	Transmitter/indicator/Recorder/Controller /CV positioner/ actuators /PLC based system / Annunciation system	0.30	0.18	0.17	0.00	0.74
	Retrofitting of new positioner in place of old & obsolete positioner of existing power cylinders & control valves.	0.38	0.36	0.00	0.00	0.00
	Conductivity type electronic drum level measurement system	0.00	0.00	0.67	0.00	0.00
	Installation of precision testing instruments & calibrators for C&I lab	0.00	0.00	0.00	0.00	0.00
Unit-4	**Control and Instrumentation Package**					

Head of Works/ Equipment		2014-15	2015-16	2016-17	2017-18	2018-19
	Installation of Precision testing Instruments & calibrators for C&I lab	0.00	0.00	0.00	0.00	0.00
	Chartless recorders for critical parameters.	0.59	1.18	1.18	0.00	0.00
	Transmitter/indicator/Recorder/Controller /CV positioner/ actuators / Pneumatic converter/ annunciation system/PLC etc	0.74	1.26	0.80	0.77	0.00
	Conductivity type electronic drum level measurement system	1.48	0.00	0.00	0.00	0.00

36. We have examined the submissions and the documents available on record. It is noticed that the petitioner has not furnished any documentary evidence in respect of the claims made for these assets. Moreover, no technical report substantiating the need for replacement of these assets on account of obsolescence has been furnished. In our view, the submission of the petitioner make it clear that the expenditure claimed is in respect of assets which are minor in nature and the same can be met from the O&M expenditure allowed to the generating station. In this background, the claim of the petitioner has not been allowed. Also, no case has been made out by the petitioner justifying the need to exercise the Power to relax, the provisions of Regulation 14 of the 2014 Tariff Regulations. Accordingly, the additional capital expenditure claimed by the petitioner under this head is not allowed. Consequently, the de-capitalization of assets claimed by the petitioner has also not been considered.

B. Electrical Package

37. The gross additional capital expenditure claimed by the petitioner for Unit-4 is ₹65.00 lakh in 2016-17 and ₹50.00 lakh in 2017-18 towards Up-gradation of Auxiliary Switchyard Package (replacement of LT switchgear MCC's PCC including associated cables), ₹600.00 lakh in 2017-18 for replacement of old ATRs and ₹40.00 lakh in 2017-

18 for replacement of 220 kV & 132 kV Isolators in phase wise manner towards Electrical package.

38. As regards replacement of LT switchgear MCC's PCC including associated cables, the petitioner has submitted that existing two MCCs are very age old and showing sign of fatigue. It has also submitted that most critical drives like AC seal oil PP, barring gear, scanner air fan, AC lube oil pump, APH, etc. are being fed through these MCCs. The petitioner has further submitted that failure of any of the module will lead to loss of generation and therefore it is found prudent to shift all these drives to an emergency MCC to ensure system reliability. As regards the replacement of 220 kV & 132 kV Isolators for Unit 4, the petitioner has submitted that old Isolators have outlived their useful life and frequent failure in recent past affected grid stability and therefore, the replacement of the isolators was required for successful & efficient operation of associated transmission system. As regards replacement of old ATRs for Unit 4, the petitioner has submitted that the ATRs 1 and 2 have traversed a useful service life of 30 years. It has also submitted that ATR 1 developed internal failure during 2008 and was put back into service with patch repair. It has also stated that OEM, M/s TELK expressed its inability to undertake any comprehensive repair job due to its age and therefore the replacement of the same was considered prudent for reliability of auxiliary system of the said Unit after commissioning of ATR 2. Accordingly, it has prayed that the additional capital expenditure claimed may be allowed. The petitioner has also claimed de-capitalization amount of ₹12.80 lakh in 2016-17 and ₹12 lakh in 2017-18 for up-gradation of Auxiliary Switchyard Package (replacement of LT switchgear MCC's PCC including associated cables), ₹93.91 lakh in 2017-18 for replacement of Old ATRs and ₹9.09 lakh in

2017-18 for replacement of 220 kV & 132 kV Isolators in phase wise manner towards electrical package for Unit-4.

39. We have considered the submissions and the documents on record. It is evident from the submissions of the petitioner that these assets have completed almost 30 years of useful life. The projected additional capital expenditure has been claimed by the petitioner on the ground that these assets are essential for efficient operation and sustenance of operation of the generating station. Regulation 14(3)(vii) of the 2014 Tariff Regulations provides for consideration of expenditure due to any additional work which has become necessary for successful and efficient plant operation for generating station other than coal/lignite based stations. In other words, the said regulation is applicable for consideration of additional capital expenditure necessary for efficient operation of the generating station in respect of hydro generating stations only and the claim is required to be substantiated with the technical justification duly supported by documentary evidence like test results/ technical report warranting the replacement of the assets due to obsolescence. In the present case, the petitioner has claimed projected additional capital expenditure towards replacement of the old assets due to obsolescence on the ground that the same is necessary for efficient operation of the generating station. Considering the fact that these assets are necessary for efficient operation of the generating station and have outlived their useful life and have become obsolete, their replacement is considered necessary for sustenance and efficient operation of the generating station. In this background, we in exercise of the Power under Regulation 55 of the 2014, Tariff Regulations, relax the provisions of Regulation 14(3)(vii) of the 2014, Tariff Regulation as a special case, and allow the claim of the petitioner for additional capital expenditure of ₹52.20 lakh and ₹575.00 lakh for the years 2016-17 and 2017-18,

respectively, for Electrical Package for Unit 4. We direct accordingly. However, the expenditure allowed is subject to the petitioner furnishing the OEM/technical committee report for replacement of these assets due to obsolescence at the time of truing up in terms of Regulation 8 of the 2014 Tariff Regulations. Based on the above discussions, the net additional capital expenditure allowed in respect of the above assets is as under:

(₹ in lakh)

Head of Works/ Equipment		2016-17	2017-18
Unit-4	**Electrical Package**		
	Replacement of 220 kV & 132 kV Isolators in phase wise manner	0.00	30.91
	Replacement of Old ATRs	0.00	506.09
	Upgradation of Auxiliary Switchyard Package: replacement of LT switchgear MCC's PCC including associated cables	52.20	38.00

C. Boiler and Auxiliary Package

40. The petitioner has claimed projected additional capital expenditure of ₹63.35 lakh in 2014-15 towards modular replacement of final SH coil during annual over-hauling of boiler of Unit-3, ₹38.00 lakh in 2015-16 towards installation of water wall intermediate header (inside goose neck chamber) of boiler of Unit-3 and ₹150.00 lakh (including supply and erection cost) in 2015-16 towards replacement of vertical and horizontal buckstays in LHSH zone and above of boiler of Unit-4 as the bowing is beyond design limits. The petitioner in justification of the same, has submitted that the tubes of SH are in service since inception and as per CPRI findings during over-hauling, it was detected that oxide scale thickness was in the range of 300 to 800 microns and tubes and bends having oxide scale thickness above 500 microns are being replaced in over-hauling in 2014. Accordingly, the petitioner has submitted that it has proposed for replacement of the item/asset. As regards justification for the claim for water wall immediate header, the

petitioner has submitted that one of the water wall intermediate headers has developed a crack at the reducing end (both sides), as the outage may force the unit for long shut down, installation of water wall with intermediate header is proposed by the petitioner. Also, in justification of the claim towards replacement of vertical and horizontal buckstays in LHSH zone and above of boiler of Unit-4, the petitioner has submitted that this asset is proposed to be installed against the replacement of old asset that had become obsolete as the assets were in operation for around more than 25 years. The petitioner has also claimed de-capitalization amount of ₹2.10 lakh in 2014-15 towards modular replacement of final SH coil during annual over-hauling of boiler of Unit-3, ₹1.19 lakh in 2015-16 towards installation of water wall intermediate header (inside goose neck chamber) of boiler of Unit-3 and ₹4.71 lakh in 2015-16 in respect of replacement of vertical and horizontal buckstays in LHSH zone and above of boiler of Unit-4.

41. We have considered the submissions and the documents on record. It is observed that the SH coil is under operation since inception and has already lived its useful life and is experiencing scaling. However, it is observed that the petitioner has not furnished the test report of CPRI suggesting for replacement of the tubes. In this background and due to absence of any documentary evidence suggesting requirement of this item, we are not inclined to allow the additional capital expenditure under this head.

42. As regards installation of water wall intermediate header, it is noticed that the intermediate header has already been under operation since inception (in the year 1966) and has already completed 50 years and is therefore necessary for efficient operation of the generating station. Since the assets are considered necessary for sustenance and efficient operation of the generating station. In this background, we in exercise of the

Power under Regulation 55 of the 2014, Tariff Regulations, relax the provisions of Regulation 14(3)(vii) of the 2014, Tariff Regulation as a special case, and allow the claim of the petitioner for additional capital expenditure of ₹36.81 lakh for the years 2015-16 for Boiler & Auxiliary Package for Unit-3. We direct accordingly. However, the expenditure allowed is subject to the petitioner furnishing the OEM/technical committee report for replacement of these assets due to obsolescence at the time of truing up in terms of Regulation 8 of the 2014 Tariff Regulations.

43. As regards the replacement of vertical and horizontal buckstays in LHSH zone and above of boiler of Unit-4, it is observed that the petitioner has not furnished any documentary evidence in support of the claim bowing crossing design limits. In the absence of any technical/test report in support of bowing crossing design limits, we are not inclined to allow the additional capital expenditure claimed by the petitioner.

D. Turbine and Auxiliaries Package

44. The petitioner has claimed projected additional capital expenditure of ₹890.00 lakh towards complete replacement of condenser tubes of Unit-4 in 2015-16. In justification, the petitioner has submitted that based on eddy current test for thickness assessment of condenser tubes, acid cleaning followed by hydro-jetting of condenser tubes during annual over-hauling in 2012, almost 10 % tubes got plugged. It has also submitted that the existing tubes have already completed more than 30 years. The petitioner has further submitted that the replacement of full set of condenser tubes has been recommended by the NTPC Technical Audit team, in 2011. It has further submitted that in accordance with the recommendations, procurement action for complete set of Condenser tubes has been taken in 2013. The petitioner has also submitted that

material fitment schedule is during next capital over-hauling of the Unit, to be carried out in 2015-16. The petitioner has also claimed de-capitalization of ₹27.93 lakh towards complete replacement of condenser tubes of Unit-4 in 2015-16.

45. It is observed that the petitioner has proposed to undertake these replacement works based on the specific recommendations made by the Audit team of the petitioner's Company. The petitioner has however not furnished the technical report of the said Audit which had recommended the replacement of condenser tubes. In the absence of any documentary evidence, we are not inclined to consider the additional capital expenditure claimed towards replacement of condenser tubes.

E. Out Side Maintenance

46. The petitioner has claimed projected additional capital expenditure of ₹9.00 lakh in 2014-15 towards replacement of one back-wash pump for Unit-4 and replacement of DM transfer pump for Unit-3. In justification, the petitioner has submitted that replacement of these assets will result in improvement in filter water quality and heat rate.

47. The petitioner has claimed projected additional capital expenditure of ₹25.00 lakh in 2015-16 and ₹25.00 lakh in 2018-19, respectively, towards replacement of 3 no. of CW pump discharge valves with power pack system for Unit-4. In justification, the petitioner has submitted that all three discharge valves of CW Pumps are in service since inception. It has however, submitted that the same had developed gland leakage along the shaft due to prolonged service. The petitioner has further submitted that in peak summer, all three CW Pumps are run at a time under compulsion to have requisite CW flow in condenser cooling system and therefore, the CW pump discharge valves are

required to be made leak proof. Accordingly, the petitioner has submitted that it has proposed to replace one of the CW discharge valves by new one so that the age old valves can be serviced /made available one after another. The petitioner has further submitted that phase wise replacement of three valves can be done though a program.

48. The petitioner has also claimed projected additional capital expenditure of ₹10.00 lakh and ₹10.00 lakh in 2015-16 and 2018-19, respectively, towards replacement of 2 nos. of CT fan gear box for Unit-4. In justification, the petitioner has submitted that for reliable operation of CT fans, vibration and noise free operation of the gear boxes is necessary. The petitioner has submitted that for optimum output from the fan, the blade angle should be kept at a maximum of 17 degree, whereas in such weak gear boxes, the blade angles under compulsion are to be kept as low as 14 degree, resulting in low output as being reflected from motor amps.

49. The petitioner has claimed projected additional capital expenditure of ₹3.00 lakh in 2015-16 towards replacement of 2 nos. of acid dozing pump for acid dozing in CW sump basin of Unit-4. In justification, the petitioner has submitted that the scheme of incorporating 2 nos. of acid dozing pumps (one running and other is standby) for feeding sulphuric acid in CW sump of Unit-4 is need based. The petitioner has also submitted that sulphuric acid storage tank near CW sump of Unit-4 has been installed and at present acid is being fed manually in the system. The petitioner has further submitted that the newly installed acid dosing system in CW sump of Unit-4 for dosing acid in regulated fashion is required for prevention of scale deposition in condenser cooling tubes and for safer operation, the feeding pumps, as proposed is required.

50. The petitioner has claimed projected additional capital expenditure of ₹60.00 lakh in 2018-19 towards installation of bowl assembly of CW pump of Unit-3. In justification, the petitioner has submitted that CW pumps take raw water directly from intake canal. It has also submitted that due to severe fluctuation in raw water intake level (From 208 to 211 meter), foreign materials ingress at pump suction causing enormous vibration and causes friction between pump impeller and bowl which could lead to outage. The petitioner has also submitted that in the event of such unpredicted outage, the station has to suffer generation loss. The petitioner has further submitted that at present there is no Bowl Assembly of pump to meet any such eventuality. The petitioner has submitted that instant proposed procurement is necessary to meet any eventuality as well as to cater component failure. The petitioner has also claimed de-capitalization in respect of above assets as under:

(₹ in lakh)

Head of Works/ Equipment		**2014-15**	**2015-16**	**2018-19**
Unit-3&4	**Out Side Maintenance (MS-II Section)**			
	Backwash Pump for Unit#4	0.35	0.00	0.00
	DM Transfer Pump for Unit#3	0.44	0.00	0.00
	CW Pump Discharge Valve with Power Pack System for Unit#4, 2 Nos.	0.00	4.33	3.83
	CT Fan Gear Box, 2 Nos.	0.00	4.47	4.12
	Acid Dozing Pump for Acid dozing in CW Pump basin of U#4 - 2 Nos.	0.00	0.26	0.00
	Bowl Assembly of CW Pump of Unit#3	0.00	0.00	4.45

51. We have examined the submissions and the documents on record. It is observed that the petitioner has not furnished any specific justification for replacement of above mentioned assets i.e. one back-wash pump for Unit-4 and replacement of DM transfer pump for Unit-3, replacement of 2 nos. of acid dozing pump for acid dozing in CW sump basin of Unit-4, replacement of 3 no. of CW pump discharge valves with power pack

system for Unit-4 and replacement of 2 nos. of CT fan gear box for Unit-4 neither the replacement have been substantiated by any technical report or recommendation for such replacement. Even otherwise, the expenditure claimed is in the nature of minor assets and in our view, it can be met from the O&M expenses allowed to the generating station. In this background, the additional capital expenditure claimed is not allowed.

52. As regards the installation of bowl assembly of CW pump of Unit-3, it is observed that the petitioner's claim is for maintaining a spare set of bowl assembly in its inventory as emergency spares. In this background, we are not inclined to allow the additional capital expenditure towards such spares. Accordingly, the capital expenditure claimed under the head is not allowed.

F. Coal Handling Plant

53. The petitioner has claimed projected additional capital expenditure of ₹75.00 lakh in 2018-19 towards one additional stream of conveyor of Unit-3. In justification, the petitioner has submitted that feeding system of Unit-3 after double stream of 49/65 converges into single stream of 18 & 27 conveyers. The petitioner has also submitted that due to outage of any single stream conveyer, bunker feeding of Unit-3 gets disrupted. Therefore, the petitioner has submitted that it has proposed one additional stream of conveyer 18 & 27 for reliable operation of coal feeding to bunker. The petitioner has also claimed de-capitalization amount of ₹5.57 lakh towards one additional stream of conveyor of Unit-3 of the generating station.

54. We have examined the submissions. It is observed that the petitioner has not furnished any technical report in support of the claim for additional capital expenditure in

terms of Regulation 14(3)(vii) of the 2014 Tariff Regulations. In this background, we are not inclined to permit the additional capital expenditure claimed for the assets.

Deferred Works

A. Electrical Package

55. The year wise gross additional capital expenditure claimed towards Electrical package under Regulation 54 and 55 and Regulation 14(3)(ii) of the 2014 Tariff Regulations is as under:-

(₹ in lakh)

Head of Works/ Equipment		Regulation	2014-15	2015-16	2016-17	2017-18	2018-19
Unit-3	**Electrical Package**						
	Up-gradation of Switchyard package:						
	132 kV Isolator	54 &55	20.00	20.00	0.00	0.00	0.00
	25 kV CB to replace Old CBS	54 &55	10.00	0.00	0.00	0.00	0.00
	Replacement of old Lightning Arrestor (LA) for 132 kV Switch Yard	54 &55	10.00	0.00	10.00	0.00	0.00
	Replacement of Old ATRs	54 &55	0.00	0.00	550.00	0.00	0.00
	Replacement of age old 50 MVA Station Transformer (ST)	54 &55	0.00	0.00	300.00	0.00	300.00
	Replacement of existing synthetic oil Tr by CRT transformer	54 &55	0.00	0.00	120.00	0.00	0.00
	Upgradation & Augmentation of Electrical Auxiliary System of Unit# 3:						
	Battery charger for battery bank no. 2	54 &55	0.00	15.00	0.00	0.00	0.00
	Replacement of HT Motors PA Fan Motor, FD Fan Motor etc.	54 &55	0.00	25.00	0.00	0.00	0.00
	Upgradation of Electrical Protection system						
	132/33/25 kV CT/PT	54&55	50.00	150.00	0.00	0.00	0.00
	Replacement of 132 kV CB	54 &55	0.00	40.00	0.00	0.00	0.00
Unit-4	**Electrical Package**						
	Upgradation of Switchyard package:						

Head of Works/ Equipment		Regulation	2014-15	2015-16	2016-17	2017-18	2018-19
	Replacement of 220 kV & 132 kV Isolators in phasewise manner	54&55	0.00	0.00	70.00	0.00	0.00
	Replacement of 132 kV & 220 kV CT's of DTPS Switchyard	14(3)(ii)	0.00	50.00	0.00	20.00	0.00
	Replacement of 198 kV LA's for 220 kV Switch yard and 120 kV LA for 132 kV System.	54&55	0.00	3.00	0.00	0.00	0.00
	Replacement of existing age old 12 Nos. 220 kV & 3 Nos. 132 kV MOCB with SF6 Breakers	54&55	0.00	190.00	0.00	0.00	0.00

56. As regards up-gradation of Switchyard and Electrical auxiliary system which include replacement of old equipments with new isolators, circuit breakers, lightning arrestors, MOCBs with SF6 breakers, ATRs, station transformers, CRT transformers, HT motors, PA fan motors, FD fan motors, etc., the petitioner has submitted that such old equipments have outlived their useful life. The petitioner has also submitted that some part of the replacement was already approved by the Commission during the period 2009-14, but some of the work has spilled over from the period 2009-14 to the tariff period 2014-19. The petitioner has submitted that it has accordingly proposed the replacement of these balance works during the period 2014-19. As regards, up-gradation of electrical protection system consisting of replacement of old CTs/PTs, the petitioner has submitted that old CTs/PTs have completed 30-45 years of useful life and are having low accuracy class metering core. It has submitted that as per CEA (Installation and Operation of Meters), Regulations, 2006 and for implementation of System Energy Measurement (Accounting & Audit) scheme for better energy management, 0.2 class accuracy PTs are required. The petitioner has further submitted that some part of the replacement work of old CTs/PTs and circuit breakers were already

approved by the Commission during the period 2009-14 and, some of the work has spilled over from the period 2009-14 to the tariff period 2014-19. The petitioner has submitted that it has therefore proposed the replacement of the balance works during the period 2014-19.

57. The petitioner has claimed de-capitalization in respect of above assets as under:

(₹ in lakh)

Head of Works/ Equipment		**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**
Unit-3	**Electrical Package**					
	Up-gradation of Switchyard package:					
	132 kV Isolator	0.79	0.79	0.00	0.00	0.00
	25 kV CB to replace Old CBS	4.44	0.00	0.00	0.00	0.00
	Replacement of old Lightning Arrestor (LA) for 132 kV Switch Yard	0.40	0.00	0.40	0.00	0.00
	Replacement of Old ATRs	0.00	0.00	86.09	0.00	0.00
	Replacement of age old 50 MVA Station Transformer (ST)	0.00	0.00	11.87	0.00	11.87
	Replacement of existing synthetic oil Tr by CRT transformer	0.00	0.00	4.92	0.00	0.00
	Up-gradation & Augmentation of Electrical Auxiliary System of Unit# 3:					
	Battery charger for battery bank no. 2	0.00	0.79	0.00	0.00	0.00
	Replacement of HT Motors PA Fan Motor, FD Fan Motor etc.	0.00	3.96	0.00	0.00	0.00
	Up-gradation of Electrical Protection system					
	132/33/25 kV CT/PT	1.58	4.75	0.00	0.00	0.00
	Replacement of 132 kV CB	0.00	1.64	0.00	0.00	0.00
Unit-4	**Electrical Package**					
	Up-gradation of Switchyard package:					
	Replacement of 220 kV & 132 kV Isolators in phase wise manner	0.00	0.00	15.91	0.00	0.00
	Replacement of 132 kV & 220 kV CT's of DTPS Switchyard	0.00	15.71	0.00	6.29	0.00

Head of Works/ Equipment		2014-15	2015-16	2016-17	2017-18	2018-19
	Replacement of 198 kV LA's for 220 kV Switch yard and 120 kV LA for 132 kV System.	0.00	1.00	0.00	0.00	0.00
	Replacement of existing age old 12 Nos. 220 kV & 3 Nos. 132 kV MOCB with SF6 Breakers	0.00	42.00	0.00	0.00	0.00

58. We have examined the submission and the documents furnished by the petitioner. It is observed that expenditure claimed under deferred works in respect of these assets are against the replacement of old equipments with new isolators, circuit breakers, lightning arrestors, MOCBs with SF6 breakers, ATRs, station transformers, CRT transformers, HT motors, PA fan motors, FD fan motors, on the ground that these assets have become obsolete as these were in operation for more than 25 years and considered necessary for successful and efficient operation of the generating station. With regard to replacement of old CTs/PTs, it is noticed that Schedule, Part-I of the CEA Regulations, 2006 provides that the accuracy class of meters in generation and transmission system shall not be inferior to that of 0.2S Accuracy Class and the petitioner, in compliance with the provisions of the said regulation has claimed the expenditure towards retrofitting of 0.2 S accuracy class CT. In this regard, it is noticed that the petitioner had claimed additional capital expenditure for these assets with replacement including transformers, in Petition No. 276/GT/2012 and the Commission in its order dated 7.8.2013 in exercise of the Power to relax under Regulation 44 of the 2009 Tariff Regulations had allowed the capitalization of these assets during the period 2009-14. The relevant portion of the order is extracted as under:

*"**Plant & Machineries***

33. The petitioner has been incurring additional capital expenditure for renovation and modernization of the old units in order to achieve the benchmark norms specified by the Commission. The additional capital expenditure incurred/proposed to be incurred may be recovered over a period of 20 years from the terminal year of this tariff period. We however, make in clear that in case of any improvement in the actual operating performance beyond the norms specified by the Commission after completion of R&M, the benefit of better performance would be passed on to the respondents/beneficiaries during the next tariff period in the form of improved norms. In the above background, we now consider the claims of the petitioner for additional capital expenditure on this count in relaxation under Regulation 44 of the 2009 Tariff Regulations, as stated in the subsequent paragraphs….

…

…

*36. It is noticed that major expenditure of additional capital expenditure has been incurred by the petitioner towards Plant & Machineries. The petitioner has claimed actual capital expenditure of ₹1472.37 lakh during 2009-10, ₹1153.53 lakh during 2010-11 and ₹3545.50 lakh during 2011-12 towards Power House, Plant & Machinery. The assets capitalized towards replacement of Boiler & accessories equipment such as Bunker level measurement system, Stack SPM Analyzer, Economizer fine coil & protective sleeve, Air Motor complete assembly along with coupling for APH, supply & erection of ID fan, cold end basket & hot end basket; Boiler Feed Pump such as Total Vibration Monitoring System for FD & PA Fans and BFP, Two way splitter for PF line, coal burner nozzle tip for inter tube burner, Platen Super Heater & secondary super heater bends for boiler, boiler straight tubes & panel attachments etc., Turbo Generator & accessories such as Turbo-supervisory system complete with Hardware software for C&I, plate Type heat exchanger, Erection of HP-LP bypass control system , condenser tubes, Solid state excitation system, 36 kV Vacuum circuit breaker, LT 415 V distribution switchgear, erection, testing & commissioning of SF6 circuit breakers, Chartless Recorder; **Transformers,** Coal handling plant, Ash handling equipments, Replacement of outlived battery bank, erection & commissioning of CW pumps, procurement of Miscellaneous power plant equipment etc. Against the replacement of these assets, the gross value of old assets has also been furnished by the petitioner. Keeping in view the need to consider the additional capital expenditure for this generating station as discussed in paras 30 to 33 above, the expenditure claimed is examined and considered for the respective years as under:*

37. After prudence check, and keeping in view the need to consider the additional capital expenditure for this generating station as discussed in paras 30 to 33 above, an expenditure of ₹1264.41 lakh during 2009-10 has been considered for capitalization for replacement of old assets along with the corresponding de-capitalisation value of ₹207.97 lakh and for capitalisation of new assets…"

"45. It is observed that the projected additional capital expenditure claimed for ₹9453.86 lakh during 2012-13 and ₹8800.50 lakh during 2013-14 include works for refurbishment of turbo generators, BFP, Replacement of HP heaters, Diaphragms of HP turbine, Replacement & refurbishment of LP heater, Refurbishment of LP Rotor,

etc. Boiler & Auxiliaries viz. replacement of super heaters coil, water wall panel, replacement of BFP Cartridge assembly, Hanger & support for critical piping.ID fan impeller, SWAS and replacement of breakers, HT motors such as PA fan, ID fan, CW system, Replacement of old FSSS & other C&I sys, Up-gradation of ESPs, Replacement of old ATRs, Replacement of 220 kV and 132 kV MOCBs, Isolators, Replacement of age old electromagnetic static relays etc. Schemes as per the requirement of Pollution Control Board such as Ash water re-circulation scheme, raising of ash dyke, Ash utilization etc. have also been claimed as projected additional capital expenditure. The respondent, JSEB has submitted that the claim of the petitioner cannot be permitted under Regulation 9(2) of the 2009 Tariff Regulations. The objector/HT consumers have also submitted that the capitalization of expenditure beyond the provisions of the 2009 Tariff Regulations cannot be permitted. In response, the petitioner has submitted that the additional capitalization under Regulation 9 also includes additional capitalization. It has also submitted that the claim for additional capitalization during the period 2009-14 is as per the 2009 Tariff Regulations and the details regarding actual capital expenditure claimed during 2009-12 is as per accounts duly audited by C&AG.

46. We have examined the matter. From the justification submitted by the petitioner, it is observed that most of these components are in service since inception and due to prolonged operation, these assets have been affected due to thermal stress, erosion, material deformity, etc., Further some of the equipment's/systems have also become obsolete and spares are also not available. As a result, these old assets have become prone to frequent failures and due to underperformance, these assets are proposed to be replaced by the petitioner on the advice of M/s BHEL or under the PIE programme. The petitioner has furnished the gross value of the old assets to be replaced. In the backdrop of our discussions in paras 30 and 33 above as regards the requirement for capitalisation of expenditure by the petitioner to achieve the operational norms specified by the Commission, and on prudence check, we allow the net additional capital expenditure of ₹8412.97 lakh during 2012-13 and ₹8131.86 lakh during 2013-14, after considering the de-capitalization value of the old assets. Out of this expenditure, an expenditure of ₹1624.00 lakh during 2012-13 and ₹2098.00 lakh during 2013-14 have been proposed to be incurred on schemes such as Ash water re-circulation scheme, raising of ash dyke, ash utilization etc. in compliance with the directions of Pollution Control Board. After deduction of these expenditures, the projected additional capital expenditure allowed towards Plant & Machinery is ₹6788.17 lakh and ₹6033.16 lakh for the years 2012-13 and 2013-14 respectively.

47. Regulation 9(2)(iv) of the 2009 Tariff Regulations provides for consideration of expenditure incurred due to any additional work which has become necessary for successful and efficient plant operation for hydro projects only. Considering the fact that these assets are required for required for successful operation of the generating station and in order to achieve the operational norms specified by the Commission, we, as a special case, and in exercise of the power under Regulation 44 of the 2009 Tariff Regulations, relax the provision under Regulation 9(2)(iv) of the 2009 Tariff Regulations and allow the capitalization of the said expenditure towards "Power House, Plant & Machinery" as stated above."

59. In line with the above decision, and since these assets are considered necessary for efficient operation of the generating operation, we in exercise of the Power to relax under Regulation 54 of the 2014 Tariff Regulations, relax the provisions of Regulation 14(3)(vii) of the 2014 Tariff Regulations and allow the capitalization of the assets. However, the expenditure allowed is subject to the petitioner furnishing the OEM/technical committee report for replacement of these assets due to obsolescence at the time of truing up in terms of Regulation 8 of the 2014 Tariff Regulations.

60. Also, since the replacement of old CTs/PTs are necessary in compliance with Schedule, Part-I of the CEA (Installation and Operation of Meters), Regulations, 2006, we are inclined to allow the additional capital expenditure along with de-capitalization of these assets for the years 2015-16 and 2017-18 under Regulation 14(3)(ii) of the 2014 Tariff Regulations. Accordingly, the net additional capital expenditure allowed in respect of the above assets is as under:

(₹ in lakh)

Head of Works/ Equipment		**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**
Unit-3	**Electrical Package**					
	Up-gradation of Switchyard package:					
	132 kV Isolator	19.21	19.21	0.00	0.00	0.00
	25 kV CB to replace Old CBS	5.56	0.00	0.00	0.00	0.00
	Replacement of old Lightning Arrestor (LA) for 132 kV Switch Yard	9.61	0.00	9.61	0.00	0.00
	Replacement of Old ATRs	0.00	0.00	463.91	0.00	0.00
	Replacement of age old 50 MVA Station Transformer (ST)	0.00	0.00	288.14	0.00	288.14
	Replacement of existing synthetic oil Tr by CRT transformer	0.00	0.00	115.08	0.00	0.00

Head of Works/ Equipment		2014-15	2015-16	2016-17	2017-18	2018-19
	Up-gradation & Augmentation of Electrical Auxiliary System of Unit# 3:					
	Battery charger for battery bank no. 2	0.00	14.21	0.00	0.00	0.00
	Replacement of HT Motors PA Fan Motor, FD Fan Motor etc.	0.00	21.04	0.00	0.00	0.00
	Up-gradation of Electrical Protection system					
	132/33/25 kV CT/PT	48.42	145.25	0.00	0.00	0.00
	Replacement of 132 kV CB	0.00	38.36	0.00	0.00	0.00
Unit-4	**Electrical Package**					
	Up-gradation of Switchyard package:					
	Replacement of 220 kV & 132 kV Isolators in phase wise manner	0.00	0.00	54.09	0.00	0.00
	Replacement of 132 kV & 220 kV CT's of DTPS Switchyard	0.00	34.29	0.00	13.71	0.00
	Replacement of 198 kV LA's for 220 kV Switch yard and 120 kV LA for 132 kV System.	0.00	2.00	0.00	0.00	0.00
	Replacement of existing age old 12 Nos. 220 kV & 3 Nos. 132 kV MOCB with SF6 Breakers	0.00	148.00	0.00	0.00	0.00

B. Boiler and Auxiliary Package

61. **T**he petitioner has claimed projected additional capital expenditure of ₹757.59 lakh (including supply and erection cost) towards replacement of water wall panel (front and rear) of Unit-3 in 2014-15. In justification, the petitioner has submitted that this asset was approved under additional capital expenditure for period 2009-14 and procured at a price of ₹525.00 lakh. It has also submitted that the asset is being erected in 2014-15 during capital over-hauling of Unit-3 at a total cost of ₹232.59 lakh.

62. As regards Unit-4, the petitioner has claimed additional capital expenditure of ₹297.38 lakh towards replacement of platen water wall coil, hangers and supports for critical piping, ID fan shaft impeller with conical cover plate during 2015-16. The petitioner has also submitted that some part of the replacement was already approved by the Commission during 2009-14 and some of the work has spilled over from period 2009-14 to the tariff period 2014-19. Accordingly, the petitioner has submitted that it has proposed for replacement of balance works during period 2014-19.

63. The petitioner has also claimed de-capitalization amount of ₹23.78 lakh in 2014-15 for replacement of water wall panel (front and rear) of U#3, ₹2.71 lakh in 2015-16 for replacement of Platen water wall coil during COH of Boiler U#4, ₹1.98 lakh in 2015-16 for Hangers & Supports for critical piping of Boiler U#4 and ₹119.18 lakh in 2015-16 for ID fan Shaft impeller with conical cover plate type: NDZV-31B one set for Boiler Unit-4.

64. We have examined the submissions of the petitioner and the documents on record. It is observed that the above assets have been claimed under deferred works as against the replacement of water wall panel, platen water wall coil, hangers and supports for critical piping and ID fan shaft impeller with conical cover plate, which had become obsolete as the assets necessary for successful and efficient operation of the generating station were in operation for more than 25 years. It is pertinent to mention that the claim of the petitioner for capitalization of these items during the period 2009-14 under Regulation 9(2)(iv) of the 2009, Tariff Regulations in Petition No. 276/GT/2012 was allowed by the Commission in order dated 7.8.2013 in relaxation of the provisions of Regulation 9(2)(vi) of the 2009 Tariff Regulations as extracted in para 60 above.

65. In line with the above decision and considering the fact that these assets are required for efficient operation of the generating station. We are inclined to allow the above capitalization in exercise of Power under Regulation 54 of the 2014 Tariff Regulations as a special case relax the provisions of Regulation 14(3)(vi) and permit the additional capital expenditure claimed by the petitioner. This is however, subject to the petitioner furnishing the OEM/technical committee report for replacement of these assets due to obsolescence at the time of truing up in terms of Regulation 8 of the 2014 Tariff Regulations. Accordingly, the net additional capital expenditure allowed in respect of the above assets is as under:

(₹ in lakh)

Head of Works/ Equipment		**2014-15**	**2015-16**
Unit-3	**Boiler and Auxiliary Package**		
	Replacement of water wall panel (front and rear) of U#3	733.81	0.00
Unit-4	**Boiler and Auxiliary Package**		
	Replacement of Platen water wall coil during COH of Boiler U#4	0.00	83.67
	Hangers & Supports for critical piping of Boiler U#4,DTPS.	0.00	61.02
	ID fan Shaft impeller with conical cover plate type: NDZV-31B one setfor Boiler U #4.	0.00	28.82

C. Turbine and Auxiliaries Package

66. The petitioner has claimed projected additional capital expenditure of ₹662.25 lakh in 2015-16 towards (a) procurement of boiler feed pump complete rotor assembly to replace existing age old one for reliable performance, (b) procurement of gear box to replace the age old gear box having high back lash with enormous noise and vibration, (c) lube oil cooler of boiler feed pump to replace age old coolers of more than 15-20% plugging, (d) procurement of lube oil pumps to replace age old pumps of inadequate

discharge and for reliable performance in Unit-4. The petitioner in justification has submitted that the assets were approved by the Commission during 2009-14 and the same has been claimed in 2015-16 as spill over item of work.

67. As regards additional capital expenditure claimed for Unit 4 for replacement of 27th and 31st stage diaphragms as ₹452.60 lakh, HPT 1st stage blades as ₹99.20 lakh and peak seals for HPT and IPT diaphragms with new ones as ₹14.40 lakh in 2015-16, the petitioner has submitted that the same are proposed to be replaced on the basis of RLA study carried out by M/s BHEL in 2007-08 and also through re-inspection of the diaphragms during annual over-hauling of Unit-4 in 2012. The petitioner has further submitted that proposed replacement of these assets was already approved by the Commission during period 2009-14. The petitioner further submitted that due to several factors, the work has spilled over from period 2009-14 to 2014-19 tariff period. We have considered the petitioner's submissions. The petitioner has also claimed de-capitalization amount of ₹106.00 lakh towards refurbishment of Boiler Feed Pumps-jobs of unit-3, ₹13.18 lakh towards replacement of 27th and 31st stage diaphragms by new one, ₹2.86 lakh towards replacement of HPT 1st stage Blades by new one and ₹0.39 lakh towards replacement of Peak Seals for HPT & IPT Diaphragms by new one in 2015-16 for unit-4.

68. We have examined the matter. It is observed that the expenditure claimed under deferred works is against the replacement of 27th and 31st stage diaphragms, HPT 1st stage blades and peak seals for HPT and IPT diaphragms, which have become obsolete since the assets which are necessary for successful and efficient operation of the generating station were in operation for more than 25 years. It is also noticed that the

Commission in its order dated 7.8.2013 in Petition No. 276/GT/2012 had allowed the capitalization of these items under Regulation 9(2)(iv) in exercise of the power to relax under Regulation 44 of the 2009 Tariff Regulations.

69. Accordingly, in line with the decision of the Commission in order dated 7.8.2013 in Petition No. 276/GT/2012 (as quoted above) we are inclined to allow the capitalization of the expenditure claimed by relaxation of the provision of Regulation 14(3)(vii) of the 2014 Tariff Regulations. However, the expenditure allowed is subject to the petitioner furnishing the OEM/technical committee report for replacement of these assets due to obsolescence at the time of truing up in terms of Regulation 8 of the 2014 Tariff Regulations.

70. As regards refurbishment of boiler feed pumps in Unit-3, it is observed that the Commission vide order dated 7.8.2013 in Petition No. 276/GT/2012 had allowed the expenditure under Regulation 9(2)(iv) in exercise of the power to relax under Regulation 44 of the 2009 Tariff Regulations. As noticed in the said order, the capitalization was allowed on the ground that the said assets were in service since inception and due to prolonged operation, these assets have been affected due to thermal stress, erosion, material deformity, etc. In line with the decision in order dated 7.8.2013 and since these assets are required for efficient operation of the plant, we as special case, in exercise of the Power to relax under Regulation 54 of the 2014, Tariff Regulations allow the additional capital expenditure of ₹662.25 lakh along with de-capitalization of ₹106.00 lakh in 2015-16 towards refurbishment of boiler feed pumps in Unit-4, in relaxation of the provision of the Regulation 14(3)(vii) of the 2014 Tariff Regulations. The petitioner is however directed 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.

D. Common Services

71. The petitioner has claimed projected additional capital expenditure of ₹3000.00 lakh during 2014-15 towards installation of dry fly ash collection system compatible with the existing wet ash handling system. In justification, the petitioner has submitted that more than 90% payment has been made against the asset and is expected to be in operation in 2014-15. The petitioner has submitted that the execution of the system is in line with the pollution control norms. The petitioner has further submitted that the asset was already approved by the Commission during period 2009-14 and the same has spilled over from period 2009-14 to period 2014-19. It has therefore submitted that the installation of dry ash collection system has been proposed during period 2014-19.

72. With regard to additional capital expenditure claimed for common services, it is observed that dry fly ash collection system is considered necessary for meeting the environment and pollution control norms, and it is further noticed that the claim of the petitioner during the period 2009-14 in Petition No. 276/GT/2012 was allowed by the Commission in order dated 7.8.2013 in exercise of the Power to relax. The relevant portion of the order is extracted as under:

> *"66. The matter has been examined. In respect of this generating station, it has been submitted that at present there is only wet slurry Ash disposal system. It has also submitted that in absence of dry fly ash system and the capacity of ash pond, if existing ash ponds are not evacuated on regular basis, the ash slurry would overflow to the low lying area/river causing river bed pollution. Accordingly, the petitioner has submitted that Ash evacuation was required during 2006-09 for compliance of*

pollution norms and the expenditure on ash evacuation pertains to evacuation of ash from the already filled up ash ponds in case of old stations like this generating station. The petitioner has further submitted that the Commission had allowed additional O&M expenses after being satisfied that the Ash evacuation was necessary for meeting the environment and pollution control norms as specified and also since the expenditure relating to ash evacuation in abandoned mines was not part of the normal O&M expense norms specified by the Commission. Considering the fact that Ash evacuation is still being carried out in the absence of any dry fly ash system and keeping in view that the normative O&M expenses allowed to this generating station for the period 2009-14 do not include expenditure on this count, we allow the additional O&M on Ash evacuation system as prayed for by the petitioner in relaxation of the provisions of the 2009 Tariff Regulations."

73. In this background, we are inclined to allow the capitalization of expenditure incurred on installation of dry fly ash collection system by relaxing the provisions of Regulation 14(3)(vii) of the 2014 Tariff Regulations, as a special case. However, the expenditure allowed is subject to the petitioner furnishing the OEM/technical committee report for replacement of these assets due to obsolescence at the time of truing up in terms of Regulation 8 of the 2014 Tariff Regulations. The petitioner is also directed to furnish the pollution control norms under which the said capital expenditure has been claimed.

74. Based on the above, discussions, the depreciation recovered on the de-capitalized assets are summarized as under:

(₹ in lakh)

Head of Works/ Equipment		**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**
Unit-4	**Electrical Package**					
	Replacement of 220 kV & 132 kV Isolators in phase wise manner	0.00	0.00	0.00	8.18	0.00
	Replacement of Old ATRs	0.00	0.00	0.00	84.52	0.00
	Upgradation of Auxiliary Switchyard Package: replacement of LT switchgear MCC's PCC including associated cables	0.00	0.00	11.52	10.80	0.00
Unit-3	**Electrical Package**					
	Upgradation of Switchyard package:					

Head of Works/ Equipment		2014-15	2015-16	2016-17	2017-18	2018-19
	132 kV Isolator	0.71	0.71	0.00	0.00	0.00
	25 kV CB to replace Old CBS	3.98	0.00	0.00	0.00	0.00
	Replacement of old Lightning Arrestor (LA) for 132 kV Switch Yard	0.36	0.00	0.36	0.00	0.00
	Replacement of Old ATRs	0.00	0.00	77.48	0.00	0.00
	Replacement of age old 50 MVA Station Transformer (ST)	0.00	0.00	10.60	0.00	10.60
	Replacement of existing synthetic oil Tr by CRT transformer	0.00	0.00	4.43	0.00	0.00
	Upgradation & Augumentation of Electrical Auxiliary Sytem of Unit# 3					
	Battery charger for battery bank no. 2	0.00	0.71	0.00	0.00	0.00
	Replacement of HT Motors PA Fan Motor, FD Fan Motor etc.	0.00	3.56	0.00	0.00	0.00
	Upgradation of Electrical Protection system					
	132/33/25 kV CT/PT	1.42	4.26	0.00	0.00	0.00
	Replacement of 132 kV CB	0.00	1.48	0.00	0.00	0.00
Unit-4	**Electrical Package**					
	Upgradation of Switchyard package:					
	Replacement of 220 kV & 132 kV Isolators in phasewise manner	0.00	0.00	14.32	0.00	0.00
	Replacement of 132 kV & 220 kV CT's of DTPS Switchyard	0.00	14.14	0.00	5.66	0.00
	Replacement of 198 kV LA's for 220 kV Switch yard and 120 kV LA for 132 kV System.	0.00	0.90	0.00	0.00	0.00
	Replacement of existing age old 12Nos. 220 kV & 3 Nos.132 kV MOCB with SF6 Breakers	0.00	37.80	0.00	0.00	0.00
Unit-3	**Boiler and Auxiliary Package**					
	Water wall intermediate header (inside goose neck chamber) of Boiler, U#3	0.00	1.07	0.00	0.00	0.00
Unit-3	**Boiler and Auxiliary Package**					
	Replacement of water wall panel (front and rear) of U#3	21.40	0.00	0.00	0.00	0.00
Unit-4	**Boiler and Auxiliary Package**					
	Replacement of Platen water wall coil during COH of Boiler U#4	0.00	2.44	0.00	0.00	0.00

Head of Works/ Equipment		2014-15	2015-16	2016-17	2017-18	2018-19
	Hangers & Supports for critical piping of Boiler U#4,DTPS.	0.00	1.78	0.00	0.00	0.00
	ID fan Shaft impeller with conical cover plate type: NDZV-31B one setfor Boiler U #4.	0.00	41.71	0.00	0.00	0.00
Unit-3	**Turbine and Auxiliaries Package**					
	Refurbishment of Boiler Feed Pumps-job includes :-	0.00	95.00	0.00	0.00	0.00
	a) Procurement of BFP Complete Rotor assembly to replace existing age old one for reliable performance					
	b) Procurement of Gear Box to replace the age old Gear box having high back lash, resulting enormous noise & vibration					
	c) Lube Oil Cooler of Boiler Feed Pump to replace age old coolers(more than 15-20% plugging)					
	d) Procurement of lube oil Pumps to replace age old pumps of inadequate discharge & for reliable performance.					
Unit-4	**Turbine and Auxiliaries Package**					
	Replacement of 27th and 31st stage diaphragms by new one based on RLA Study Report carried out by BHEL in 2007-08 and also through re-inspection of the diaphragms during AOH of the Unit in 2012.	0.00	11.86	0.00	0.00	0.00
	Replacement of HPT 1st stage Blades by new one based on RLA Study Report carried out by BHEL in 2007-08.	0.00	2.58	0.00	0.00	0.00
	Replacement of Peak Seals for HPT & IPT Diaphragms by new one based on RLA Study Report carried out by BHEL in 2007-08.	0.00	0.35	0.00	0.00	0.00
	Total	**27.87**	**220.36**	**118.70**	**109.16**	**10.60**

75. Accordingly, the projected additional capital expenditure allowed for the period 2014-19 are summarized as under:

(₹ in lakh)

Head of Works/ Equipment		Additional Capital Expenditure allowed	De-capitalization allowed	Depreciation recovered on de-capitalized assets	Net additional capital expenditure allowed
2014-15					
Unit-3	**Electrical package**				
	Upgradation of Switchyard package	40.00	5.63	5.05	34.38
	Upgradation of Electrical Protection system	50.00	1.58	1.42	48.42
Unit-3	**Boiler and auxiliary package**				0.00
	Replacement of water wall panel (front and rear) of U#3	757.59	23.78	21.40	733.81
Unit-3&4	**Common services**	**3000.00**	**0.00**	**0.00**	**3000.00**
	Sub-total	**3847.59**	**30.99**	**27.87**	**3816.60**
2015-16					
Unit-3	**Turbine and auxiliaries package**				
	Refurbishment of Boiler Feed Pumps-job includes :- a) Procurement of BFP Complete Rotor assembly to replace existing age old one for reliable performance b) Procurement of Gear Box to replace the age old Gear box having high back lash, resulting enormous noise & vibration c) Lube Oil Cooler of Boiler Feed Pump to replace age old coolers(more than 15-20% plugging) d) Procurement of lube oil Pumps to replace age old pumps of inadequate discharge & for reliable performance.	662.25	106.00	95.00	556.25
Unit-4	**Turbine and auxiliaries package**				
	Replacement of 27th and 31st stage diaphragms by new one based on RLA Study Report carried out by BHEL in 2007-08 and also through re-inspection of the diaphragms during AOH of the Unit in 2012.	452.60	13.18	11.86	439.42

Head of Works/ Equipment		Additional Capital Expenditure allowed	De-capitalization allowed	Depreciation recovered on de-capitalized assets	Net additional capital expenditure allowed
	Replacement of HPT 1st stage Blades by new one based on RLA Study Report carried out by BHEL in 2007-08.	99.20	2.86	2.58	96.34
	Replacement of Peak Seals for HPT & IPT Diaphragms by new one based on RLA Study Report carried out by BHEL in 2007-08.	14.40	0.39	0.35	14.01
Unit-3	**Electrical package**				
	Upgradation of Switchyard package	20.00	0.79	0.71	19.21
	Upgradation & Augumentation of Electrical Auxiliary Sytem of Unit# 3	40.00	4.75	4.27	35.25
	Upgradation of Electrical Protection system	190.00	6.39	5.74	183.61
Unit-4	**Electrical package**				
	Upgradation of Switchyard package				
	Replacement of 132 kV & 220 kV CT's of DTPS Switchyard	50.00	15.71	14.14	34.29
	Replacement of 198 kV LA's for 220 kV Switch yard and 120 kV LA for 132 kV System.	3.00	1.00	0.90	2.00
	Replacement of existing ageold 12 Nos. 220 kV & 3 Nos. 132 kV MOCB with SF6 Breakers	190.00	42.00	37.80	148.00
Unit-3	**Boiler and auxiliary package**				
	Water wall intermediate header (inside goose neck chamber) of Boiler, U#3	38.00	1.19	1.07	36.81
Unit-4	**Boiler and auxiliary package**				
	Replacement of Platen water wall coil during COH of Boiler U#4	86.38	2.71	2.44	83.67
	Hangers & Supports for critical piping of Boiler U#4,DTPS.	63.00	1.98	1.78	61.02
	ID fan Shaft impeller with conical cover plate type: NDZV-31B one setfor Boiler U #4.	148.00	119.18	41.71	28.82
	Sub-total	**2056.83**	**318.14**	**220.36**	**1738.69**
2016-17					
Unit-3	**Electrical package**				

Head of Works/ Equipment		Additional Capital Expenditure allowed	De-capitalization allowed	Depreciation recovered on de-capitalized assets	Net additional capital expenditure allowed
	Upgradation of Switchyard package	980.00	103.27	92.86	876.73
Unit-4	**Electrical package**				
	Upgradation of Switchyard package	70.00	15.91	14.32	54.09
	Upgradation of auxiliary switchgear package	65.00	12.80	11.52	52.20
	Sub-total	**1115.00**	**131.98**	**118.70**	**983.02**
2017-18					
Unit-4	**Electrical package**				
	Upgradation of Switchyard package:				
	Replacement of 132 kV & 220 kV CT's of DTPS Switchyard	20.00	6.29	5.66	13.71
	Replacement of 220 kV & 132 kV Isolators in phasewise manner	40.00	9.09	8.18	30.91
	Replacement of Old ATRs	600.00	93.91	84.52	506.09
	Upgradation of auxiliary switchgear package	50.00	12.00	10.80	38.00
	Sub-total	**710.00**	**121.29**	**109.16**	**588.71**
2018-19					
Unit-3	**Electrical package**				
	Upgradation of Switchyard package	300.00	11.87	10.60	288.14
	Sub-total	**300.00**	**11.87**	**10.60**	**288.14**
	Total approved	**8029.42**	**614.26**	**486.68**	**7415.16**

Capital cost for 2014-19

76. As stated above, the opening capital cost considered in order dated 29.7.2016 in Petition No. 471/GT/2014 is ₹25700.10 lakh as on 1.4.2014. Accordingly, the same capital cost is considered for working out the capital cost for the period 2014-19 as under:

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Opening Capital Cost	25700.10	29516.71	31255.40	32238.42	32827.13
Net Additions Allowed	3816.60	1738.69	983.02	588.71	288.14
Closing Capital Cost	29516.71	31255.40	32238.42	32827.13	33115.26
Average Capital Cost	27608.41	30386.05	31746.91	32532.77	32971.20

Debt-Equity Ratio

77. 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 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 modernization expenditure for life extension shall be serviced in the manner specified in clause (1) of this regulation.

78. Accordingly, the gross normative loan and equity amounting to ₹14253.10 lakh and ₹11446.99 lakh respectively, as on 31.3.2014 as admitted in order dated 29.7.2016 in Petition No. 471/GT/2014 has been considered as 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 Regulation 8 of the 2014 Tariff Regulations. The opening and closing debt and equity is as under.

(₹ in lakh)

Asset	**As on 1.4.2014**		**Net Additional capitalization during 2014-19**		**As on 31.3.2019**	
	Amount	**(%)**	**Amount**	**(%)**	**Amount**	**(%)**
Debt	14253.10	55.46%	5190.61	70.00%	19443.71	58.72%
Equity	11446.99	44.54%	2224.55	30.00%	13671.54	41.28%
Total	**25700.10**	**100.00%**	**7415.16**	**100.00%**	**33115.26**	**100.00%**

Return on Equity

79. 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.

80. 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."

81. The petitioner has claimed return on equity considering the base rate of 15.50% and effective tax rate (MAT rate) of 20.961%. However, the actual tax rate of 2013-14 is

"NIL" as per annual audited accounts of 2013-14 submitted by the petitioner. It is also observed from the Annual Accounts for the years 2014-15 and 2015-16, that the tax liability is 'nil' in respect of the petitioner's company as a whole. In view of this, the actual tax rate of 2013-14 to 2018-19 has been considered 'NIL' for grossing up of the base rate. This is however, subject to truing-up and shall be raised as per the actual effective tax rate applicable for the financial year. 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	11446.99	12591.97	13113.58	13408.49	13585.10
Addition of Equity due to Additional Capitalization	1154.28	617.05	334.50	213.00	90.00
Adjustment on account of de-capitalization	9.30	95.44	39.59	36.39	3.56
Normative Equity- Closing	12591.97	13113.58	13408.49	13585.10	13671.54
Average Normative Equity	12019.48	12852.78	13261.03	13496.79	13628.32
Return on Equity (Base Rate)	15.50%	15.50%	15.500%	15.500%	15.500%
Tax rate for the year	0.00%	0.00%	0.000%	0.000%	0.000%
Rate of Return on Equity (Pre Tax)	15.50%	15.50%	15.500%	15.500%	15.500%
Return on Equity	**1863.02**	**1992.18**	**2055.46**	**2092.00**	**2112.39**

Interest on Loan

82. 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:"

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

a. The gross normative loan of ₹14253.10 lakh has been considered on 1.4.2014 in order dated 29.7.2016 in Petition No. 471/GT/2014. In addition to this, loan component towards additional capitalization has been considered as per the approved debt equity ratio.

b. Cumulative repayment of loan as on 31.3.2014 has been considered as cumulative repayment as on 1.4.2014.

c. Addition to normative loan on account of additional capital expenditure approved above has been considered on year to year basis.

d. Depreciation allowed has been considered as repayment of normative loan during the respective year of the tariff period 2014-19. Proportionate adjustment has been made to the repayments on account of de-capitalizations considered in the additional capital expenditure approved above.

e. The petitioner has claimed the weighted average rate of interest of 10.2433%, 10.3499%, 10.3547%, 11.5453% and 11.6025% during 2014-15, 2015-16, 2016-17, 2017-18 and 2018-19, respectively, which is quite higher. In line with the provisions of the regulations, 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 petitioner company. In case of loans carrying floating rate of interest, the rate of interest as furnished 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. The necessary calculations for interest on loan is as under:

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Gross Notional Loan for the purpose of tariff in the instant petition	14253.10	16924.72	18141.80	18829.92	19242.02
Cumulative repayment of loan up to previous year	14253.10	16069.28	18046.47	18829.92	19242.02
Net opening loan	0.00	855.44	95.33	0.00	0.00
Addition due to Net Additional Capitalization	2671.62	1217.08	688.12	412.10	201.69
Repayment of Loan during the period	1837.87	2199.89	875.83	497.00	210.00
Add: Repayment adjustment on account of de-capitalization	21.69	222.70	92.38	84.90	8.31
Less: Repayment on account of adjustment in discharge in liabilities	0.00	0.00	0.00	0.00	0.00
Net Closing Loan	855.44	95.33	0.00	0.00)	0.00
Average Loan	427.72	475.39	47.67	0.00	0.00
Weighted Average Rate of Interest on Loan (%)	10.2433%	10.3499%	10.3547%	11.5453%	11.6025%
Interest on Loan	**43.81**	**49.20**	**4.94**	**0.00**	**0.00**

Depreciation

84. 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 up to 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."

85. Regulation 53(2)(iii) of the 2014 Tariff Regulations provides as under:

*"**53. Special Provisions relating to Damodar Valley Corporation.** (1) Subject to clause (2), these regulations shall apply to determination of tariff of the projects owned by Damodar Valley Corporation (DVC).*

(2) The following special provisions shall apply for determination of tariff of the projects owned by DVC:
(i)….
(ii)….
(iii) Depreciation: The depreciation rate stipulated by the Comptroller and Auditor General of India in terms of section 40 of the Damodar Valley Corporation Act, 1948 shall be applied for computation of depreciation of projects of DVC.

86. The rate of depreciation has been arrived at by considering the weighted average of depreciation computed on the gross value of asset as on 31.3.2014 and at the rates approved by C&AG which works out to 7.240%. Further, the proportionate adjustment has been made to the cumulative depreciation corresponding to de-capitalization during the period 2014-19 for the purpose of tariff. The necessary calculations in support of depreciation are as under:-

(₹ in lakh)

	2014-15	**2015-16**	**2016-17**	**2017-18**	**2018-19**
Opening Capital Cost	25700.10	29516.71	31255.40	32238.42	32827.13
Net Additional Capitalization	3816.60	1738.69	983.02	588.71	288.14
Closing Capital Cost	29516.71	31255.40	32238.42	32827.13	33115.26
Average capital cost	27608.41	30386.05	31746.91	32532.77	32971.20
Value of freehold land	78.51	78.51	78.51	78.51	78.51
Rate of depreciation	7.240%	7.240%	7.240%	7.240%	7.240%
Depreciable value	24776.91	27276.79	28501.56	29208.84	29603.42
Balance depreciable value	1837.87	2527.75	1772.98	825.98	503.74
Depreciation	**1837.87**	**2199.89**	**1772.98**	**825.98**	**503.74**
Cumulative depreciation at the end of the period (before adjustment)	24776.91	26948.93	28501.56	29208.84	29603.42
Less: Cumulative depreciation adjustment on account of de-capitalization	27.87	220.36	118.70	109.16	10.60
Cumulative depreciation after adjustment (at the end of the period)	24749.05	26728.58	28382.86	29099.68	29592.82

Compensation Allowance

87. Regulation 17(1) of the 2014 Tariff Regulations provides as under:

> ***"17. Compensation Allowance:*** *(1) In case of coal-based or lignite-fired thermal generating station or a unit thereof, a separate compensation allowance shall be admissible to meet expenses on new assets of capital nature which are not admissible under Regulation 14 of these regulations, and in such an event, revision of the capital cost shall not be allowed on account of compensation allowance but the compensation allowance shall be allowed to be recovered separately*
> *(2) The Compensation Allowance shall be allowed in the following manner from the year following the year of completion of 10, 15, or 20 years of useful life:*

Years of operation	*Compensation Allowance (lakh/MW/year)*
0-10	*Nil*
11-15	*0.20*
16-20	*0.50*
21-25	*1.00*

88. The petitioner has claimed compensation allowance (unit-wise) to meet the expenses on new assets of capital nature including the nature of minor assets as under:

(₹ in lakh)

2014-15	**2015-16**	**2016-17**	**2017-18**	**2018-19**
350.00	350.00	350.00	350.00	350.00

89. In terms of above regulations, all the units of the generating station are in commercial operation for more than 25 years from their respective date of CODs. Accordingly, no compensation allowance has been allowed for the generating station.

Operation & Maintenance Expenses

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

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Unit 3 of 140 MW	5023.20	5339.60	5675.60	6032.60	6412.00
Unit 4 of 210 MW	5019.00	5334.00	5670.00	6027.00	6407.10
Total	**10042.20**	**10673.60**	**11345.60**	**12059.60**	**12819.10**

91. In addition to above, the petitioner has claimed additional O&M expenses towards Ash evacuation, Mega insurance and Share of Subsidiary activity.

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Ash Evacuation	1039.00	1039.00	1168.00	1168.00	1312.00
Mega Insurance	46.30	46.30	50.93	59.94	65.93
CISF Security	1257.00	1328.00	1399.00	1471.00	1542.00
Share of Subsidiary activity	180.16	211.38	255.30	286.83	302.83
Total	**2522.47**	**2624.68**	**2873.23**	**2985.77**	**3222.76**

92. We have considered the submissions of the petitioner. In the Statement of Reasons in support of the 2014 Tariff Regulations, it has been observed by the Commission as under:

"…29.39 Some of the generating stations have suggested that site specific factors should be taken into account and additional O&M expenses should be allowed. The Commission is of the view that the site specific norms in case of thermal generating stations may not serve much purpose as there is a set of advantages and disadvantages associated with every site, which average out, and the proposed norms are also based on multiple stations with wide geographical spread and therefore, such aspects are already factored in the norms…"

93. In line with the above observations and in accordance with the 2014 Tariff Regulations, the additional O&M expenses claimed by the petitioner under the above head has not been allowed.

Water Charges

94. 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 capitalization or consumption of stores and spares and renovation and modernization"

95. In terms of the above regulations, 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. The petitioner has submitted that at present water charges have not been claimed for the generating station. However, the petitioner has sought liberty to approach the Commission as and when the same is billed by the Authority and paid by the petitioner. In view of the above submissions, we are inclined to grant liberty to the petitioner to claim water charges as and when billed by the Authority, along with proper documentary evidence / justification and the same will be considered in accordance with law.

Capital spares

96. The petitioner has also submitted that the actual year-wise capital spares along with adequate justification will be submitted at the time of truing up. In view of this, the claim of the petitioner 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, prudence check in terms of the provisions of the 2014 Tariff Regulations.

Operational Norms

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

Target Availability (%)	74.00
Heat Rate (kCal/kWh)	2820.00
Auxiliary Energy Consumption (%)	10.50
Specific Oil Consumption (ml/kWh)	2.40

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

Normative Annual Plant Availability Factor (NAPAF)

99. Regulation 36 (A) (c) of the 2014 Tariff Regulations provides as under:

"(c) Following Thermal Generating Stations of DVC:

Bokaro TPS	*75%*
Chandrapura TPS	*75%*
Durgapur TPS	*74%*

100. We have considered Target Availability of 74% during 2014-19 same as claimed by the petitioner in accordance with above regulation.

Station Heat Rate (kCal/kWh)

101. Regulation 36(C)(a)(iii) of the 2014 Tariff Regulations provides the Gross Station Heat Rate of 2820 kCal/kWh for this generating station. The petitioner has considered heat rate of 2820 kCal/kWh. Hence, the heat rate considered by the petitioner as per norms is in order and is allowed.

Auxiliary Energy Consumption

102. Regulation 36(E)(b) of the 2014 Tariff Regulations provides the Auxiliary Energy Consumption of 10.50% for this generating station. The petitioner has considered

Auxiliary Energy Consumption of 10.50%. Hence, the Auxiliary Energy Consumption considered by the petitioner as per norms is in order and is allowed.

Specific fuel Oil Consumption

103. Regulation 36(D)(c) of the 2014 Tariff Regulations provides secondary fuel oil consumption of 2.40 ml/kWh for this coal-based generating station of the petitioner. Accordingly, the secondary fuel oil consumption considered by the petitioner as per norms is in order and is allowed.

104. The prayer of the petitioner to grant liberty to approach the Commission seeking relaxation of operating norms under Regulation 54 and Regulation 55 of the 2014 Tariff Regulations as per the actuals, will be considered in accordance with law as and when the petitioner approaches the Commission with proper application and justification thereafter.

Interest on working capital

105. 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

106. The petitioner has claimed cost for fuel components in working capital based on "as received" GCV of coal procured 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)

	2014-15	2015-16	2016-17	2017-18	2018-19
Cost of Coal/Lignite- 2 months	8730.06	8730.06	8730.06	8730.06	8730.06
Cost of Main Secondary Fuel Oil- 2 months	524.22	525.66	524.22	524.22	524.22
Total	**9254.28**	**9255.72**	**9254.28**	**9254.28**	**9254.28**

107. The petitioner was directed to submit the coal yard stocking capacity for the generating station in million tones. In response, the petitioner vide affidavit 1.9.2016 has submitted that the total coal yard storage capacity for this generating station is 204000.00 MT. However, it is submitted that the average coal consumption per month for this generating station is 148024.94 MT. It is therefore evident that the petitioner can meet the average coal consumption per month from the coal yard storage capacity for this generating station. Thus, the generating station has sufficient coal storage capacity available for 1 month. Accordingly, the coal stock for one month has been considered.

108. It is observed that the petitioner has claimed weighted average GCV of coal on “as received basis” as 3585.28 kCal/kg for the period from January, 2014 to March, 2014 and the same is lesser than the weighted average GCV of coal on “as fired basis” of 4670.76 kCal/kg for the period from January, 2009 to March, 2009 submitted in the truing up petition (Petition No. 471/GT/2014) for period 2009-14 in respect of this generating station. In this regard, the petitioner is directed to provide the justification for such variation in GCV of coal at the time of truing up of tariff for the period 2014-19.

109. 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.

110. 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."

111. Further, the petitioner has claimed Energy Charge Rate (ECR) of ₹2.770 /kWh based on the weighted average price, GCV of coal & 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 taken from the loaded wagons at the unloading point, 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 sample for 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. Hence, 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 total 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

112. In view of the above, the cost for fuel components in working capital have been computed at 74% for the period from 2014-15 to 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 towards stock- 30 days	4073.37	4073.37	4073.37	4073.37	4073.37
Cost of coal/lignite for generation- 30 days	4073.37	4073.37	4073.37	4073.37	4073.37
Cost of Main Secondary Fuel Oil- 2 months	524.22	525.66	524.22	524.22	524.22
Total	**8670.96**	**8672.39**	**8670.96**	**8670.96**	**8670.96**

Maintenance spares

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

(₹ in lakh)

2014-15	2015-16	2016-17	2017-18	2018-19
2008.44	2134.72	2269.12	2411.92	2563.82

114. Maintenance spares claimed by the petitioner is as per the provision of the 2014 Tariff Regulations and hence allowed.

Receivables

115. Receivables equivalent to two months of capacity charge and energy charge for sale of electricity has been calculated on normative plant availability factor. Accordingly, receivables have been worked out on the basis of two months of fixed and energy charges (based on primary fuel only) as under:

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Variable Charges -2 months	8784.11	8808.17	8784.11	8784.11	8784.11
Fixed Charges - 2 months	2817.98	3015.01	3063.83	3034.15	3117.13
Total	**11602.08**	**11823.18**	**11847.94**	**11818.26**	**11901.24**

O&M expenses for 1 month

116. O & M expenses for 1 month as claimed by the petitioner for the purpose of working capital is allowed as under:

(₹ in lakh)

2014-15	2015-16	2016-17	2017-18	2018-19
836.85	889.47	945.47	1004.97	1068.26

Rate of interest on working capital

117. 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."*

118. In terms of the above regulations, SBI PLR of 13.50% (Bank rate 10.00% + 350 bps) has been considered for the purpose of calculating the 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-30 days	4073.37	4073.37	4073.37	4073.37	4073.37
Cost of coal for generation-30 days	4073.37	4073.37	4073.37	4073.37	4073.37
Cost of secondary fuel oil – 2 month	524.22	525.66	524.22	524.22	524.22
O&M expenses – 1 month	836.85	889.47	945.47	1004.97	1068.26
Maintenance Spares	2008.44	2134.72	2269.12	2411.92	2563.82
Receivables – 2 months	11602.08	11823.18	11847.94	11818.26	11901.24
Total working capital	23118.33	23519.76	23733.48	23906.10	24204.27
Rate of interest (%)	13.50%	13.50%	13.50%	13.50%	13.50%
Interest on working capital	**3120.97**	**3175.17**	**3204.02**	**3227.32**	**3267.58**

Other Elements of tariff

119. In addition, the petitioner has claimed expenditure towards Pension & Gratuity contribution and Cost of Common Offices. We now discuss and decide these elements as detailed below:

Pension & Gratuity Contribution

120. The petitioner has claimed pension and gratuity contribution for the period 2014-19 and has submitted that it has considered the actuarial valuation as on 31.3.2014, for liability towards pension and gratuity fund and projected P&G liability for the tariff period 2014-19 including impact of pay revision.

121. We have examined the matter. It is observed that the liability claimed by the petitioner pertains to the period 2009-14 and does not pertain to the tariff period 2014-19. In this regard it is observed that the Commission in its order dated 29.7.2016 in Petition No. 471/GT/2014, has disallowed the claim of the petitioner and had observed as under:

> *"101. As stated, the Commission in order dated 7.8.2013 in Petition No. 275/GT/2012 had allowed the recovery of 40% of the difference in liability as per Actuarial valuation 31.3.2009 and 31.3.2006 in five equal installments. The Commission in the said order had allocated the same on its generating stations except Mejia Unit 5 & 6. The Commission has revised the allocation and has also allocated share of P&G liability to Mejia Unit 5 and 6 on the basis of capital cost of ₹205946.66 lakh admitted by it as on 31.3.2009. It is observed that the O&M expenses norms specified by the Commission under the 2009 Tariff Regulations applicable for the period 2009-14 had taken into consideration the P&G liability as part of O&M expenses. The statement of reason of the 2009 Tariff Regulations, at para 20.3 clearly states that O&M cost for purpose of tariff covers expenditure incurred on the employees including gratuity, CPF, medical, education allowances etc. The expenses on account of CPF considered in Public Sector Undertakings take care of pension liability applicable in Government Undertaking."*

122. In line with the above decision, these expenses may be met from the normative O&M expenses allowed to the generating station. In view of this, the share of pension and gratuity is not allowed.

Common Office Expenditure

123. The petitioner has submitted that the expenditure pertaining to common office expenditure such as Direction Office, Central Office, Other Offices, Subsidiary activities,

IT centre and R&D caters services to all generating stations as well as composite transmission and distribution systems. It has also submitted that the total cost of common assets computed is based on capital cost as on 31.3.2014 as per Audited Accounts for the year 2013-14 which have been apportioned based on the opening cost of all generation and T&D system as on 1.4.2014 and apportionment thereof to each of the productive generating station in proportion to their installed capacities in MW as per directive of the Commission vide its order dated 29.7.2013 in Petition No. 268/GT/2013. Accordingly, the additional capital expenditure claimed by the petitioner towards various offices is as under.

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Direction office	-	-	-	-	-
Subsidiary activities	-	-	-	-	-
Other offices	-	-	-	-	-
R&D	-	-	-	-	-
IT	698.90	685.00	4508.00	4508.00	300.00
Central Office	-	-	-	-	-
Total expenditure	**698.90**	**685.00**	**4508.00**	**4508.00**	**300.00**

124. The petitioner has computed Return on Equity, Interest on Loan and Depreciation on the Common Assets for the period 2014-19 based on the opening capital cost as on 1.4.2014 and projected additional capitalization during the period 2014-19 towards different offices and has apportioned them to each generating stations and T&D system in proportion to the capital cost approved as on 31.3.2014. Further, the petitioner has allocated the cost of common offices among generating stations on the basis of installed capacity. Accordingly, the annual fixed charges claimed towards Common Assets are as under:-

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Direction office	181.64	83.17	60.36	60.36	60.36
Subsidiary activities	169.44	89.54	58.91	58.91	58.91

Other offices	126.07	122.24	122.24	105.32	48.81
R&D	280.10	270.44	260.17	253.34	241.98
IT	100.99	219.39	667.10	1497.65	1893.35
Central Office	554.87	532.74	509.91	487.66	487.66
Total expenditure	**1413.11**	**1317.51**	**1678.69**	**2463.24**	**2791.07**

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Generating Stations claimed	1327.15	1237.37	1576.58	2313.41	2621.29
T&D claimed	85.96	80.14	102.11	149.83	169.78
Total	**1413.11**	**1317.51**	**1678.69**	**2463.24**	**2791.07**

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Durgapur TPS Unit-3 and 4	73.07	68.12	86.80	127.37	144.32

125. In response to the directions of the Commission, it is observed that the petitioner has not submitted any details with regard to additional capitalization claimed under IT offices. In view of this, the additional capitalization claimed under IT office is not allowed. However, the petitioner is granted liberty to submit detailed justification on the said claim at the time of revision of tariff based on truing-up exercise in terms of Regulation 8 of the 2014 Tariff Regulations.

126. It is noticed that the claim of the petitioner for common office expenditure is in line with the Commission's order dated 6.8.2009 in Petition No. 66/2005 and order dated 8.5.2013 in Petition No. 272/2010. Accordingly, the annual fixed charges for Common offices have been worked out by considering as the admitted opening capital cost as on 1.4.2014 in order dated 29.7.2016 in Petition No. 471/GT/2014. The annual fixed charges of Common offices as worked out have been apportioned to the generating stations / T&D systems as considered as on 31.3.2014.

127. Accordingly, the fixed charges have been computed as per the admitted capital cost as on 1.4.2014 (as approved in order dated 29.7.2016 in 471/GT/2014)and has been allocated to various generating stations as under.

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Depreciation	438.37	390.47	331.22	331.22	331.22
Interest on loan	130.32	105.00	93.73	92.63	81.03
Return on Equity	573.79	573.79	573.79	573.79	573.79
Total	**1142.48**	**1069.27**	**998.75**	**997.65**	**986.05**

(₹ in lakh)

	Capital cost as on 1.4.2014	2014-15	2015-16	2016-17	2017-18	2018-19
Entire generating station	574165.23	989.45	926.04	864.97	864.01	853.97
T&D	88805.81	153.04	143.23	133.78	133.64	132.08
Total	**662971.04**	**1142.48**	**1069.27**	**998.75**	**997.65**	**986.05**

(₹ in lakh)

	Capacity (MW)	2014-15	2015-16	2016-17	2017-18	2018-19
Bokaro TPS	630	99.64	91.77	85.72	85.62	84.63
Chandrapura TPS	390	61.68	56.81	53.06	53.01	52.39
Durgapur TPS	**350**	**55.36**	**50.98**	**47.62**	**47.57**	**47.02**
Mejia TPS #1 to 3	630	99.64	91.77	85.72	85.62	84.63
Mejia TPS #4	210	33.21	30.59	28.57	28.54	28.21
Mejia TPS #5 & 6	500	79.08	72.83	68.03	67.96	67.17
Maithon HS	63.2	10.00	9.21	8.60	8.59	8.49
Panchet HS	80	12.65	11.65	10.88	10.87	10.75
Tilaiya HS	4	0.63	0.58	0.54	0.54	0.54
Total	**2857.2**	**451.91**	**416.20**	**388.75**	**388.32**	**383.81**
Chandrapura TPS #7 & 8	500	79.08	72.83	68.03	67.96	67.17
Mejia TPS 7 & 8	1000	158.16	145.67	136.06	135.91	134.33
Durgapur Steel TPS # 1 & 2	1000	158.16	145.67	136.06	135.91	134.33
Koderma TPS	898.63	142.13	145.67	136.06	135.91	134.33
Total	**3398.63**	**537.54**	**509.84**	**476.21**	**475.69**	**470.16**
Grand Total	**6255.83**	**989.45**	**926.04**	**864.97**	**864.01**	**853.97**

128. 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	1837.87	2199.89	1772.98	825.98	503.74
Interest on Loan	43.81	49.20	4.94	0.00	0.00
Return on Equity	1863.02	1992.18	2055.46	2092.00	2112.39
Interest on Working Capital	3120.97	3175.17	3204.02	3227.32	3267.58
O&M Expenses	10042.20	10673.60	11345.60	12059.60	12819.10
Sub-Total	**16907.88**	**18090.04**	**18383.00**	**18204.91**	**18702.81**
Share of Common Office Expenses	55.36	50.98	47.62	47.57	47.02
Additional O&M on account of Ash Evacuation, Mega Insurance, CISF Security and Share of subsidiary activities	0.00	0.00	0.00	0.00	0.00
Share of Pension & Gratuity Contribution	0.00	0.00	0.00	0.00	0.00
Sub-Total	**55.36**	**50.98**	**47.62**	**47.57**	**47.02**
Total Annual Fixed Charges	**16963.23**	**18141.02**	**18430.62**	**18252.48**	**18749.82**

Energy Charge Rate (ECR)

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

> *"6. Energy charge rate (ECR) in Rupees per kWh on ex-power plant basis shall be determined to three decimal place in accordance with the following formulae*:
>
> *(a) For coal based and lignite fired stations*
>
> *ECR = {(GHR – SFC x CVSF) x LPPF / CVPF+SFC x LPSFi + LC x LPL} x 100 / (100 – AUX)*
>
> *Where,*
> *AUX = Normative auxiliary energy consumption in percentage.*
> *CVPF = (a) Weighted Average Gross calorific value of coal as received, in kCal per kg, for coal based stations.*
>
> *(b)….*

(c)In case of blending of fuel from different sources, the weighted average Gross calorific value of primary fuel shall be arrived in proportion to blending ratio.

CVSF = Calorific value of secondary fuel, in kCal per ml.
ECR = Energy charge rate, in Rupees per kWh sent out.
GHR = Gross station heat rate, in kCal per kWh.
LC = Normative limestone consumption in kg per kWh.
LPL = Weighted average landed price of limestone in Rupees per kg.
LPPF = Weighted average landed price of primary fuel, in Rupees per kg, per litreor per standard cubic metre, as applicable, during the month. (In case of blending of fuel from different sources, the weighted average landed price of primary fuel shall be arrived in proportion to blending ratio)
SFC = Normative Specific fuel oil consumption, in ml per kWh.
LPSFi=Weighted Average Landed Price of Secondary Fuel in Rs./ml during the month."

130. The petitioner has claimed an Energy Charge Rate (ECR) of ₹2.770 /kWh.

131. The Energy Charge Rate (ECR) based on operational norms specified under the 2014 Tariff Regulations and on "as billed" GCV of coal for preceding 3 months i.e. January, 2014 to March, 2014 is worked out as under:-

Description	Unit	2014-19
Capacity	MW	350 MW
Gross Station Heat Rate	kCal/kWh	2820.00
Auxiliary Energy Consumption	%	10.50%
Specific Fuel Oil Consumption	ml/kWh	2.40
Weighted Average GCV of Oil	Kcal/L	8630.00
Weighted Average GCV of Coal	kCal/kg	3842.00
Weighted Average Price of Coal	₹/MT	2998.00
Weighted Average Price of Oil	₹/ml	0.0578
Rate of Energy Charge ex-bus per kWh	₹/kWh	2.596

132. The petitioner shall compute and claim the Energy Charges on month to month basis from the beneficiaries based on the above formulae.

133. 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, in terms of the above order, contentious issues if any, which arise regarding the Energy Charges in respect of this generating station, should be sorted out with the beneficiaries at the Senior Management level.

Application Fee and Publication Expenses

134. 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 2014-17 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 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 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.

135. The annual fixed charges determined as above are subject to truing-up in terms of Regulation 8 of the 2014 Tariff Regulations.

136. Petition No. 348/GT/2014 is disposed of in terms of the above.

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

Annexure-I

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

(₹ in lakh)

	Interest Rate					Loan deployed as on 1.4.2014	Additions during the tariff period	Total
	2014-15	2015-16	2016-17	2017-18	2018-19			
Loan- 1 DVC BONDS	8.95	8.95	8.95	8.95	8.95	30000.00	0.00	30000.00
Loan-2 PFC	6.91	6.91	6.91	6.91	0.00	8451.00	0.00	8451.00
Loan-3 GOI RVP	9.00	9.00	9.00	9.00	9.00	500.00	0.00	500.00
Loan 4 US Exim $Loan$	2.00	2.00	2.00	2.00	2.00	6177.00	0.00	6177.00
Loan 5-DVC Bonds- For T&D	8.95	8.95	8.95	8.95	8.95	34000.00	0.00	34000.00
Loan - 6 REC Loan (For T&D)	11.68	11.66	11.66	11.66	11.66	63499.00	15500.00	78999.00
Total						**142627.00**	**15500.00**	**158127.00**

WEIGHTED AVERAGE RATE OF INTEREST ON LOAN DURING 2009-14 TARIFF PERIOD

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Gross Opening Loan	142643.00	158143.00	158143.00	158143.00	158143.00
Cumulative Repayments of Loans upto Previous Year	12659.00	13119.00	20163.00	91207.00	98238.00
Net Loans Opening	129984.00	145024.00	137981.00	66936.00	59905.00
Add: Drawl(s) during the year	15500.00	0.00	0.00	0.00	0.00
Increase/Decrease due to FERV	0.00	0.00	0.00	0.00	0.00
Increase/Decrease due to ACE	0.00	0.00	0.00	0.00	0.00
Less: Repayment(s) of Loan during the year	460.00	7043.00	71044.00	7031.00	7002.00
Net Closing Loan	145024.00	137981.00	66937.00	59905.00	52903.00
Average Net Loan	135059.00	142443.00	129613.00	64355.00	57324.00
Interest on Loan	13834.49	14742.66	13421.00	7430.00	6651.00
Rate of Interest on Loan (%)	10.2433%	10.3499%	10.3547%	11.5453%	11.6025%