CENTRAL ELECTRICITY REGULATORY COMMISSION

NEW DELHI

Petition No. 350/GT/2014

Coram:

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

Date of Hearing : 6.9.2016
Date of Order : 27.9.2016

In the matter of:

Approval of tariff for Bokaro Thermal Power Station, Unit-I to III (3 x 130 MW) for the period from 1.4.2014 to 31.3.2019.

And in the matter of

Damodar Valley Corporation (DVC),
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 BijliVitran 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. Bhattachary, DVC
Shri Subrata Ghosal, DVC
Shri S. Ganguly, DVC
ShriD.K Aich, DVC
ShriA.Biswas, DVC

For Respondents: None

ORDER

This petition has been filed by the petitioner, Damodar Valley Corporation (DVC), for approval of tariff ofBokaro Thermal Power Station, Units I to III (3 x 210 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 the generating station is as under:-

Unit - I :	March, 1986
Unit - II :	November, 1990
Unit - III :	August,1993

3. In Petition No. 268/GT/2012 filed by the petitioner for determination of tariff of the generating station for the period 2009-14, the Commission vide order dated 29.7.2013,

determined the annual fixed charges based on actual additional capital expenditure for the years 2009-10 to 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. 469/GT/2014, has 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	1479.14	978.70	0.00	697.87	839.28
Interest on Loan	11.43	11.05	1.60	14.46	3.46
Return on Equity	5389.65	4508.40	5630.63	5661.35	4575.40
Interest on Working Capital	3018.32	3021.42	3060.12	3104.44	3118.91
O&M Expenses	19750.50	20317.50	20897.10	21495.60	22106.70
Cost of secondary fuel oil (for coal-based & lignite fired generating stations only)	2496.53	2496.53	2503.37	2496.53	2496.53
Compensation Allowance	283.50	283.50	210.00	210.00	210.00
Sub-Total	**32429.07**	**31617.09**	**32302.82**	**33680.24**	**33350.27**
Share of Common Office Expenses	325.07	344.16	201.53	142.16	109.71
Additional O&M on account of Ash Evacuation, Mega Insurance, CISF Security and Share of subsidiary activities	0.00	0.00	0.00	3119.80	2554.29
Pension & Gratuity Contribution	2342.41	2342.41	2342.41	2342.41	2342.41
Share of Sinking Fund	1318.45	1274.13	1219.25	1212.47	1297.34
Adjustment of secondary fuel oil	(-)175.79	308.26	1135.40	2071.47	1877.57
Total Annual Fixed Charges	**36239.20**	**35886.05**	**37201.40**	**42568.55**	**41531.59**

4. The Civil Appeal No. 4289/2008 filed by Central Commission and few others before the Hon'ble Supreme Court are pending. The annual fixed charges determined vide orders dated 9.7.2013, 29.7.2016 and in the instant petition 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	62943.31	62943.31	63322.80	65924.41	66276.02
Additional capital expenditure (Net of de-capitalization)	0.00	379.49	2601.60	351.61	99.82
Closing Capital Cost	62943.31	63322.80	65924.41	66276.02	66375.83
Average Capital Cost	**62943.31**	**63133.06**	**64623.60**	**66100.21**	**66325.92**

Annual Fixed Charges

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Depreciation	605.86	170.77	1533.77	1918.11	222.39
Interest on Loan	0.00	4.91	24.70	22.06	0.00
Return on Equity	5687.15	5878.32	5966.01	6052.88	6066.16
Interest on Working Capital	4141.38	4283.07	4381.81	4462.44	4495.63
O & M Expenses	15057.00	16002.00	17010.00	18081.00	19221.30
Compensation Allowance	630.00	630.00	630.00	630.00	630.00
Capital Spares	0.00	0.00	0.00	0.00	0.00
Share of Common Office Expenditure	131.52	122.62	156.24	229.26	259.77
Share of P&G & impact of pay revision	2104.78	2160.96	2246.58	2316.09	2353.37
Share of Additional O&M	3629.18	7583.50	7583.50	7583.50	7583.50

	2014-15	2015-16	2016-17	2017-18	2018-19
due to ash evacuation, Mega insurance CISF expenditure & expenditure for Subsidiary activity					
Total	**32166.88**	**36836.15**	**39532.61**	**41295.34**	**40832.11**

6. The Commission directed the petitioner to submit additional information. In response, the petitioner, vide affidavit dated 1.9.2016, has submitted the replies. Taking into consideration 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 excludingliability, 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 62943.31lakh as on 1.4.2014 as against the capital cost of 62114.40lakh as on 31.3.2014 admitted by the Commission vide order dated 29.7.2016 in Petition No. 469/GT/2014. As per Clause 3 of Regulation 9 of the 2014 Tariff Regulations, the capital

cost admitted prior to 1.4.2014 is to be considered as opening capital cost. Accordingly, the closing capital cost of ₹62114.40 lakh as on 31.3.2014 as admitted by the Commission in order dated 29.7.2016 has been considered as the opening capital cost as on 1.4.2014.

Projected Additional Capital Expenditure

9. 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:

……

10. The break-up of the projected additional capital expenditure claimed during the tariff period 2014-19 is summarized as under:

(₹ inlakh)

S. No.	Head of Works/ Equipment	Capital expenditure claimed	Claimed Under Regulation	Year of commissioning of old asset	De-capitalization	Depreciation recovered
	2014-15					
	Total	**0.00**			**0.00**	**0.00**
	2015-16					
1	Coal Mill Gear Box one for each Unit (3 nos.)	90.00	54 & 55	2003	51.81	43.52
2	Chartless Recorders for Unit 1	10.00	54 & 55	1987	2.50	2.25
3	PA Fan Motors (6 nos.)	214.29	54 & 55	1990	79.43	71.49
4	Coal Mill Motors (4 Nos.)	125.71	54 & 55	1990	46.66	41.99

S. No.	Head of Works/ Equipment	Capital expenditure claimed	Claimed Under Regulation	Year of commissioning of old asset	De-capitalization	Depreciation recovered
5	Gear boxes of conveyor Systems: 5A/5B	30.00	54 & 55	2008	22.04	10.80
6	Gear boxes of conveyor Systems: 2A/2B	25.00	54 & 55	2008	18.37	9.00
7	6.6 kV VCB	60.00	54 & 55	1987	14.70	13.23
8	Procurement & Retrofitting of 220 kV & 132 kV SF6 Circuit Breakers	40.00	54 & 55			
9	Retrofitting of 0.2 Accuracy class PT(6 nos. 220 kV PT + 2 nos. spare) & (3 nos. 132 kV PT + 1 nos. spares)	20.00	14(3)(ii)			
	Total	**615.00**			**235.51**	**192.28**
	2016-17					
1	HP Bypass valve with control systems (AV-6)-2 set	100.00	9(5)	1986	19.40	17.46
2	Revamping of Cooling Tower1 including supply of material	750.00	9(5)	1986	161.75	145.58
3	Main Stream Stop Valve Unit1	200.00	54 & 55	1993	35.26	31.74
4	Energy efficient upgraded BFP cartridge.	250.00	9(5)	1987	52.24	47.01
5	Generator Rotor	1000.00	54 & 55	1986	165.86	149.28
6	Refrigerant type hydrogen drier for 2 & 3	24.00	54 & 55	1987	6.62	5.95
7	IP Nozzle , HP nozzle for Unit 1	85.00	54 & 55	1986	16.49	14.84
8	IP Nozzle for Unit 2	45.00	54 & 55	1990	11.61	10.45
9	Economiser coil 120 nos. for Unit 1	175.00	54 & 55	1986	16.59	14.93
10	Air Pre Heater tube(Cold & hot zone) 24340 nos for Unit 1	307.00	54 & 55	2008	216.43	121.20
11	Refrigerant type Air Drier-3sets	42.00	54 & 55	1991	8.78	7.90
12	Hot Water Distribution pipe of CW system	70.00	54 & 55	1986	13.58	12.22

S. No.	Head of Works/ Equipment	Capital expenditure claimed	Claimed Under Regulation	Year of commissioning of old asset	De-capitalization	Depreciation recovered
13	6.6 kV Vacuum CB	50.00	54 & 55	1991	11.78	10.61
14	Procurement & Retrofitting of 220 kV & 132 kV SF6 Circuit Breakers	160.00	54 & 55			
15	Retrofitting of 0.2 Accuracy class CT(39 nos. 220 kV CT + 6 nos. spare) & (12 nos. 132 kV CT + 3 nos. spares)	60.00	14(3)(ii)			
16	Retrofitting of 0.2 Accuracy class PT(6 nos. 220 kV PT + 2 nos spare) & (3 nos. 132 kV PT + 1 nos. spares)	20.00	14(3)(ii)			
	Total	**3338.00**			**736.40**	**589.17**
	2017-18					
1	Chartless Recordersfor Unit 2 & 3	18.00	54 & 55	1987	5.19	4.67
2	Gear boxes of conveyor Systems:6A/6B	25.00	54 & 55	1986	4.85	4.37
3	6.6 kV Vacuum CB	50.00	54 & 55	1987	11.35	10.21
4	Procurement & Retrofitting of 220 kV & 132 kV SF6 Circuit Breakers.	160.00	54 & 55			
5	Retrofitting of 0.2 Accuracy class CT(39 nos. 220 kV CT + 6 nos. spare) & (12 nos. 132 kV CT + 3 nos. spares)	120.00	14(3)(ii)			
	Total	**373.00**			**21.39**	**19.25**
	2018-19					
1	Hot Water Distribution pipe of CW system	74.00	54 & 55	1986	13.24	11.92
2	6.6 kV Vacuum CB	50.00	54 & 55	1987	10.94	9.84
		124.00			**24.18**	**21.76**
	Total Claimed	**4450.00**			**1017.48**	**822.46**

11. The petitioner, vide affidavit dated 3.9.2014 has submitted that it has projected additional capital expenditure which are considered necessary for efficient operation of generating station. The petitioner in this regard has prayed to allow the claimed additional capital expenditure towards certain assets/items under Regulation 9(5) & 14(3)(ii) of the 2014 Tariff Regulations and certain other assets under Regulation 14 read with Regulation 54 (Power to relax) & 55 (Removal of difficulties) of the 2014 Tariff Regulations.

12. We now examine the claim of the petitioner for additional capital expenditure under Regulation 14 read with Regulation 54 and 55 of the 2014 Tariff Regulations as stated below:

13. 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."*

14. The additional capital expenditure claimed under Regulation 54 and 55 of the 2014 Tariff Regulations are as under:

(₹ in lakh)

Sr. No.	Head of Works/ Equipment	Capital expenditure claimed	De-capitalization	Net Capital expenditure claimed
	2014-15			
	2015-16			
1	Coal Mill Gear Box one for each Unit (3 nos.)	90.00	51.81	38.19
2	Chartless Recorders for Unit 1	10.00	2.50	7.50
3	PA Fan Motors (6 nos.)	214.29	79.43	134.86
4	Coal Mill Motors (4 Nos.)	125.71	46.66	79.05
5	Gear boxes of conveyor Systems: 5A/5B	30.00	22.04	7.96
6	Gear boxes of conveyor Systems: 2A/2B	25.00	18.37	6.63
7	6.6 kV VCB	60.00	14.70	45.30
8	Procurement & Retrofitting of 220 kV & 132 kV SF6 Circuit Breakers	40.00		40.00
	Total	**595.00**	**235.51**	**359.49**
	2016-17			
1	Main Stream Stop Valve Unit1	200.00	35.26	164.74
2	Generator Rotor	1000.00	165.86	834.14
3	Refrigerant type hydrogen drier for 2 & 3	24.00	6.62	17.38
5	IP Nozzle , HP nozzle for Unit 1	85.00	16.49	68.51
6	IP Nozzle for Unit 2	45.00	11.61	33.39
7	Economiser coil 120 nos. for Unit 1	175.00	16.59	158.41
8	Air Pre Heater tube(Cold & hot zone) 24340 nos for Unit 1	307.00	216.43	90.57
9	Refrigerant type Air Drier-3sets	42.00	8.78	33.22
10	Hot Water Distribution pipe of CW system	70.00	13.58	56.42
11	6.6 kV Vacuum CB	50.00	11.78	38.22
12	Procurement & Retrofitting of 220 kV & 132 kV SF6 Circuit Breakers	160.00		160.00
	Total	**2158.00**	**503.00**	**1655.00**
	2017-18			
1	Chartless Recorders for Unit 2 & 3	18.00	5.19	12.81
2	Gear boxes of conveyor Systems: 6A/6B	25.00	4.85	20.15

Sr. No.	Head of Works/ Equipment	Capital expenditure claimed	De-capitalization	Net Capital expenditure claimed
3	6.6 kV Vacuum CB	50.00	11.35	38.65
4	Procurement & Retrofitting of 220 kV & 132 kV SF6 Circuit Breakers.	160.00		160.00
	Total	**253.00**	**21.39**	**231.61**
	2018-19			
1	Hot Water Distribution pipe of CW system	74.00	13.24	60.76
2	6.6 kV Vacuum CB	50.00	10.94	39.06
	Total	**124.00**	**24.18**	**99.82**
	Total Claimed	**3130.00**	**784.08**	**2345.92**

Coal Mill Gear Box for each Unit (3 Nos.)

15. The petitioner has claimed projected additional capital expenditure of ₹90.00 lakh along with de-capitalization of ₹ 51.81 lakh in 2015-16 towards replacement of 3 numbers of coal mill Gear Box under Regulation 54 & 55 of the 2014 Tariff Regulations. In justification of the same, the petitioner has submitted that it is a committed expenditure backlash of Gear Box has increased due to cyclic operation over a prolonged time and also the failure of Coal Mill Gearbox is being experienced due to ageing. The petitioner has further submitted that average life of Coal mill Gear Box is 5 years and therefore has proposed replacement of this asset for sustained & reliable generation.

Chartless Recorder

16. The petitioner has claimed projected additional capital expenditure of ₹ 10.00 lakh along with de-capitalization of ₹ 2.50 lakh in 2015-16 and projected additional capital expenditure of ₹ 18.00 lakh along with de-capitalization of ₹ 5.19 lakh in 2017-18 towards

replacement of Chartless Recorders for Unit 1, 2 & 3 under Regulation 54 & 55 of the 2014 Tariff Regulations.

PA Fan and Coal mill motor

17. The petitioner has claimed projected additional capital expenditure of ₹214.29 lakh along with de-capitalization of ₹79.43 lakh towards replacement of 6 numbers of PA fan motors in 2015-16 and projected additional capital expenditure of ₹ 125.71 lakh along with de-capitalization of ₹46.66 lakh towards replacement of 4 numbers of coal mill motorsin 2015-16 under Regulation 54 & 55 of the 2014 Tariff Regulations. In justification of the same, the petitioner has submitted that the motors of Unit 2 will almost complete 25 years of service life during the end of this tariff period and has also experienced winding failure of PA fan, Coal Mill, ID Fan motors etc. resulting in generation loss in the past. The petitioner has submitted that 6.6 KV electrical system of this generating station is ungrounded type and during this prolonged service life of the unit, fault generated in electrical system had cascading effect to the parent equipment connected to the bus resulting in degraded IR of major electrical equipments/ components. Therefore, the petitioner has proposed comprehensive replacement of existing HT motors with new one in a phased manner for sustenance in generation and also submitted that 6.6 kV grounding system is being implemented simultaneously to minimize the fault level in electrical system. The petitioner has further submitted that all the Coal Mills & PA Fan motors are NGEF make and the company is non-existent now & the spares are not easily available.

Gear boxes of conveyor systems (5A/5B) and (2A/2B)

18. The petitioner has claimed projected additional capital expenditure of ₹30.00 lakh along with de-capitalization of ₹22.04 lakh towards replacement of Gear boxes of conveyor systems (5A/5B) in 2015-16 and projected additional capital expenditure of ₹ 2500 lakh along with de-capitalization of ₹18.37 lakh towards replacement of Gear boxes of conveyor systems (2A/2B) in 2015-16 under Regulation 54 & 55 of the 2014 Tariff Regulations. In justification of the same, the petitioner has submitted that existing Conveyors- 5A/5B and 2A/2B is having MAMC make gear boxes and the company MAMC has been closed down and therefore has procured gearboxes for above stated conveyors from M/s Vulcan Industrial Engineering Company Private Limited, through open tender and the same have been installed and commissioned. The petitioner has proposed to procure two more gear boxes each for conveyor system 5A/5B and 2A/2B for reliable and sustainable operation.

6.6 kV Vacuum circuit breaker

19. The petitioner has claimed projected additional capital expenditure of ₹60.00 lakh along with de-capitalization of ₹14.70 lakh in 2015-16, projected additional capital expenditure of ₹ 5000 lakh along with de-capitalization of ₹11.78 lakh in 2016-17, projected additional capital expenditure of ₹ 5000 lakh along with de-capitalization of ₹11.35 lakh in 2017-18, projected additional capital expenditure of ₹ 5000 lakh along with de-capitalization of ₹10.94 lakh in 2018-19 towards replacement of 6.6 kV vacuum circuit breaker (VCB) under Regulation 54 & 55 of the 2014 Tariff Regulations. In justification of the same, the petitioner has submitted that Minimum Oil Circuit Breakers (MOCB) is running since 1987 i.e. more than 25 years and is required to be replaced

with improved version Vacuum Circuit Breakers (VCB) to address the frequent failure of MOCBs / fire hazard. The petitioner has further submitted that MOCBs have become obsolete and are in use for the last 28 years and also the spares of these MOCBs are not readily available.

Procurement & retrofitting of 220 kV & 132 kV SF6 Circuit Breakers

20. The petitioner has claimed projected additional capital expenditure of ₹40.00 lakh in 2015-16 and projected additional capital expenditure of ₹ 160.00 lakh each in 2016-17 and 2017-18 towards procurement & retrofitting of 220 kV & 132 kV SF6 Circuit Breakers under Regulation 54 & 55 of the 2014 Tariff Regulations. In justification of the same, the petitioner has submitted that this asset is required for overcoming technology obsolescence as the manufacturer, BHEL has stopped its production.

Main steam Stop valve

21. The petitioner has claimed projected additional capital expenditure of ₹200.00 lakh along with de-capitalization of ₹35.26 lakh in 2016-17 towards main steam stop valve for Unit 1 under Regulation 54 and 55 of the 2014 Tariff Regulations. In justification of the same, the petitioner has submitted that this generating station has two main steam stop valves along with their bypass valves of Unit I, II and III. Therefore, the petitioner has proposed comprehensive replacement of these valves to ensure controlled steam admission during rolling in partial & full arc admission.

Generator Rotor

22. The petitioner has claimed projected additional capital expenditure of ₹ 1000.00 lakh along with de-capitalization of ₹ 165.86 lakh in 2016-17 towards generator rotor under

Regulation 54 and 55 of the 2014 Tariff Regulations. In justification of the same, the petitioner has submitted that generator rotor of Unit 1 was replaced during overhauling in September, 2010 as per the recommendation of PIE programme and it was also apprehended that inner & outer layer of conductor slot is having blockage. The petitioner submitted that for future use of the replaced rotor, it was sent to BHEL-Haridwar for joint inspection. The petitioner has further submitted that since it is a committed expenditure and therefore it has proposed additional capital expenditure towards this asset.

Refrigerant type hydrogen drier

23. The petitioner has claimed projected additional capital expenditure of ₹24.00 lakh along with de-capitalization of ₹6.62 lakh in 2016-17 towards refrigerant type hydrogen drier under Regulation 54 and 55 of the 2014 Tariff Regulations. In justification of the same, the petitioner has submitted that for effective moisture separation, existing silica gel gas drier is not sufficient therefore the refrigerant type hydrogen drier along with R-22 refrigerant is required in Unit 2 & 3 for improving cooling efficiency/purity of hydrogen gas as well as ensuring safety of the generator. The petitioner has further submitted that this is a committed expenditure under PIE programme.

IP nozzle and HP nozzle of Unit 1

24. The petitioner has claimed projected additional capital expenditure of ₹85.00 lakh along with de-capitalization of ₹16.49 lakh in 2016-17 towards IP nozzle and HP nozzle for Unit 1 under Regulation 54 and 55 of the 2014 Tariff Regulations. In justification of the same, the petitioner has submitted that the IP nozzle block of Unit 1 has undergone thermal stress, operational cycling stress & solid particle erosion during this prolonged operation. The petitioner has submitted that the vanes of nozzle block has also gone thin

& roughness has increased and therefore has proposed comprehensive replacement of IP nozzle block to ensure sustained generation. Further, with respect to HP nozzle block the petitioner has submitted that blades of Unit 1has undergone dent due to foreign material found stuck up and further erosion & thinning were also observed. The petitioner also submitted that the cylinder efficiency of both HP & IP are lower than their design value and therefore has taken up this work in line with the recommendation of BHEL.

IP nozzle of Unit 2

25. The petitioner has claimed projected additional capital expenditure of ₹ 45.00 lakh along with de-capitalization of ₹ 11.61 lakh in 2016-17 towards IP nozzle of Unit 2 under Regulation 54 and 55 of the 2014 Tariff Regulations. In justification of the same, the petitioner has submitted that the IP nozzle block of Unit 2 is running since inception and has undergone thermal stress, operational cycling stresses & solid particle erosion during this prolonged operation resulting in IP cylinder efficiency of 75% instead of design value 85%. The petitioner further submitted that the vanes of nozzle block has also got thinned therefore has proposed comprehensive replacement of IP nozzle block to ensure sustained generation.

Economizer coils of Unit 1

26. The petitioner has claimed projected additional capital expenditure of ₹ 175.00 lakh along with de-capitalization of ₹ 16.59 lakh in 2016-17 towards replacement of 120 numbers of economizer coils of Unit 1 under Regulation 54 and 55 of the 2014 Tariff Regulations. In justification of the same, the petitioner has submitted that the economiser tubes in the second pass are prone to erosion and this has further

aggrevated due to gradual degradation of coal quality from the design (with the receipt of high ash content coal). The petitioner has submitted that economiser tube thickness has reduced to 3.6 mm which is very low compared to standard thickness of 210 MW units, and therefore has proposed comprehensive replacement of economiser tube banks to reduce tube leakages in the economiser.

Air Pre Heater tube

27. The petitioner has claimed projected additional capital expenditure of 307.00 lakh along with de-capitalization of 216.43 lakh in 2016-17 towards replacement of 24340 numbers of Air Pre Heater tube (APH) Cold & hot zone of Unit 1 under Regulation 54 and 55 of the 2014 Tariff Regulations. In justification of the same, the petitioner has submitted that useful life of Air Pre Heater (APH) tube is approximately 5-6 years and also due to high sulphur content in coal it has lead to APH cold end corrosion. The petitioner has submitted that with prolonged operation of the system, APH Hot & Cold section tube has got damaged due to erosion, corrosion & turbulence of flue gas at entry & exit of each tube. The petitioner has submitted that in consequence of APH tube failure, sufficient combustion air is not available in furnace, leading to loss of ignition as well as partial combustion. The petitioner submitted that it also leads to increase in ID fan loading causing high auxiliary power consumption. The petitioner further submitted that above process deteriorates the Boiler efficiency over the time causing huge financial loss and therefore has proposed additional capital expenditure towards APH tube for maintaining sustained & reliable generation from efficiency or heat rate point of view.

Refrigerant type Air Drier

28. The petitioner has claimed projected additional capital expenditure of ₹ 42.00 lakh along with de-capitalization of ₹ 8.78 lakh in 2016-17 towards 3 sets of refrigerant type air drier under Regulation 54 and 55 of the 2014 Tariff Regulations. In justification of the same, the petitioner has submitted that existing purge type air drier has become obsolete & defective and due to non availability of air drier performance of pneumatic instruments has deteriorated. Therefore, the petitioner has projected the additional capital expenditure towards this asset for better performance of the instrumentation.

Hot Water Distribution pipe of CW system

29. The petitioner has claimed projected additional capital expenditure of ₹ 70.00 lakh along with de-capitalization of ₹ 13.58 lakh in 2016-17 and projected additional capital expenditure of ₹ 74.00 lakh along with de-capitalization of ₹ 13.24 lakh in 2018-19 towards hot water distribution pipe of CW system under Regulation 54 and 55 of the 2014 Tariff Regulations. In justification of the same, the petitioner has submitted that hot distribution pipes of CW system located at cooling tower 1, 2 & 3 are in service since inception of the plant and has completed its service more than 30years. The petitioner has submitted that wall thickness of theses pipes has reduced to 3-4 mm due to corrosion & erosion over a prolonged time in service and therefore has proposed replacement in phased manner for sustained & reliable operation of the system.

Gear boxes of conveyor systems (6A/6B)

30. The petitioner has claimed projected additional capital expenditure of ₹ 25.00 lakh along with de-capitalization of ₹ 4.85 lakh towards replacement of gear boxes of conveyor systems (6A/6B) in 2017-18 under Regulation 54 and 55 of the 2014 Tariff Regulations. In justification of the same, the petitioner has submitted that this asset is

running since 1986 i.e. more than 25 years & it is projected that these may require replacement by year 2017-18 and has therefore proposed replacement of two gear box in 2017-18 for reliability &sustainability point of view.

31. We have examined the additional capital expenditure claimed by the petitioner under Regulation 54 and 55 of the 2014 Tariff Regulations. The petitioner has claimed projected additional capital expenditure for this generating station after the cut-off date on the ground that these 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 additional capital expenditure which are necessary for efficient operation of the generating station is applicable for hydro generating stations. The said Regulation provides that 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 as replacement of the old assets due to obsolescence as the same is necessary for the generating station. However it has not submitted any document like technical report etc. substantiating the need for replacement of the asset. Considering the fact that the assets has outlived its useful life and has become obsolete and hence their replacement is necessary for efficient operation of the generating station, we are inclined to allow the capitalization of expenditure by relaxing the Regulation 14(3)(vii) of the 2014 Tariff Regulations, in exercise of its Power to relax under Regulation 54 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.

32. As regards the capitalization of ₹10.00 lakh towards Chartless recorder, it is observed that the claimed projected additional capital expenditure is minor in nature. Hence we are of the view that the same is to be met through the O&M expenses allowed to the generating station. Hence the claimed expenditure for Unit 1, 2 & 3 for the years 2015-16 and 2017-18 is not allowed.

33. As regards the projected additional capital expenditure of ₹55.00 lakh claimed towards Gear boxes of conveyor systems (2A/2B) & (5A/5B), it is observed that the asset has been commissioned during 2008 and had completed 7 years of service. However, the petitioner has not submitted any justification due to obsolescence. In this background, we are not inclined to allow the additional capital expenditure claimed for the said asset in the year 2015-16.

34. As regards the claimed projected additional capital expenditure of ₹ 360.00 lakh for procurement & retrofitting of 220 kV & 132 kV SF6 circuit breakers, it is noticed that the said claim is for overcoming technological obsolescence. As the petitioner has not submitted any details along with de-capitalization of assets which it has sought to replace on account of obsolescence we are not inclined to allow the capitalization. Moreover, it is not clear as to whether the additional capital expenditure claimed is

pertaining to replaced asset or new asset. In this background, we do not allow the capitalization of the said asset.

35. As regards the capitalization of ₹24.00 lakh towards refrigerant type hydrogen drier for Unit 2 & 3, the petitioner has not substantiated the claim with adequate justification to show that the existing system is not adequate for effective moisture separation and why the said asset is only required for Unit 2 and 3. In the absence of any proper justification for replacement of the asset, we are not inclined to consider the additional capital expenditure towards this asset for Unit 2 & 3 for the year 2016-17.

36. The prayer for projected additional capital expenditure claimed above has not been allowed in this order on the ground that relevant justification/documentary evidance has not been furnished by the petitioner. However, the petitioner is granted liberty to claim the said expenditure in respect of these assets at the time of truing up of tariff in terms of Regulation 8 of the 2014 Tariff Regulations, with proper justification & documentary evidence for consideration of the Commission in accordance with the law.

Other Assets

37. The additional capital expenditure for 2014-19 claimed by the petitioner under Regulation 14(3)(ii) of the 2014 Tariff Regulations is as under:

(₹ in lakh)

S. No.	Head of Works/ Equipment	Capital expenditure claimed	De-capitalization	Net additional capital expenditure claimed
	2014-15			
	2015-16			
1	Retrofitting of 0.2 Accuracy class PT(6 nos. 220 kV PT + 2 nos. spare) & (3 nos.	20.00		20.00

S. No.	Head of Works/ Equipment	Capital expenditure claimed	De-capitalization	Net additional capital expenditure claimed
	132 kV PT + 1 nos. spares)			
	Total	**20.00**		**20.00**
	2016-17			
1	Retrofitting of 0.2 Accuracy class CT(39 nos. 220 kV CT + 6 nos. spare) & (12 nos. 132 kV CT + 3 nos. spares)	60.00		60.00
2	Retrofitting of 0.2 Accuracy class PT(6 nos. 220 kV PT + 2 nos spare) & (3 nos. 132 kV PT + 1 nos. spares)	20.00		20.00
	Total	**80.00**		**80.00**
	2017-18			
1	Retrofitting of 0.2 Accuracy class CT(39 nos. 220 kV CT + 6 nos. spare) & (12 nos. 132 kV CT + 3 nos. spares)	120.00		120.00
	Total	**120.00**		**120.00**
	2018-19			
	Total Claimed	**220.00**		**220.00**

Retrofitting of 0.2 Accuracy class Potential Transformer (PT)

38. The petitioner has claimed projected additional capital expenditure of □ 20.00 lakh each during 2015-16 and 2016-17 towards Retrofitting of 0.2 accuracy class PT (6 nos. 220 kV PT + 2 nos. spare) & (3 nos. 132 kV PT + 1 spares) under Regulation 14(3)(ii) of the 2014 Tariff Regulations. In justification of the same, the petitioner has submitted that old PTs are of 0.5 and 1.0 class accuracy however as per CEA (Installation and Operation of Meters), Regulation, 2006 and implementation of system energy measurement (Accounting & Audit) scheme for better energy management, 0.2 class accuracy PTs are required.

Retrofitting of 0.2 Accuracy class Current Transformer (CT)

39. The petitioner has claimed projected additional capital expenditure of ₹ 60.00 lakh and ₹ 120.00 lakh during 2016-17 and 2017-18 respectively towards retrofitting of 0.2 accuracy class current transformer (CT)(39 nos. 220 kV CT + 6 nos. spare) & (12 nos. 132 kV CT + 3 nos. spares) under Regulation 14(3)(ii) of the 2014 Tariff Regulations. In justification of the same, the petitioner has submitted that it has proposed retrofitting of CTs to avoid inadvertent failure of CTs causing system disturbance/tripping, fire hazard etc. and also the old CTs are of lower short time rating. Further, submitted that old PTs are of 0.5 class accuracy and as per CEA (Installation and Operation of Meters), Regulation, 2006 and implementation of system energy measurement (Accounting & Audit) scheme for better energy management, 0.2 class accuracy CTs are required.

40. As regards to capitalization of expenditure towards retrofitting of 0.2 accuracy class PT and retrofitting of 0.2 accuracy class CT, the petitioner was directed to submit the supporting documents with respect to the projected expenditure under Regulation 14(3)(ii) of the 2014 Tariff Regulations. In response, the petitioner has submitted that the additional capital expenditure has been claimed as per the CEA (Installation and Operation of meters) Regulations, 2006.

41. We have examined the matter. 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. The petitioner has accordingly, in compliance with the provisions of the existing law has claimed the expenditure towards retrofitting of 0.2 S accuracy class CT & PT. In view of the above regulations specified by CEA and as submitted by the petitioner, the additional capital

expenditure claimed is allowed for the years 2015-16 and 2016-17 under Regulation 14(3)(ii) of the 2014 Tariff Regulations.

42. The additional capital expenditure for 2014-19 claimed under Regulation 9(5) of the 2014 Tariff Regulations are as follows.

43. 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 PATScheme; and
b) sharing of the benefits accrued on account of PAT Scheme."

(□ in lakh)

S. No.	Head of Works/ Equipment	Capital expenditure claimed	De-capitalization	Net additional capital expenditure claimed
	2014-15			
	2015-16			
	2016-17			
1	HP Bypass valve with control systems (AV-6)-2 set	100.00	19.40	80.60
2	Revamping of Cooling Tower1 including supply of material	750.00	161.75	588.25
3	Energy efficient upgraded BFP cartridge.	250.00	52.24	197.76
	Total	**1100.00**	**233.39**	**866.61**
	2017-18			
	2018-19			
	Total Claimed	**1100.00**	**233.39**	**866.61**

PAT scheme

44. The petitioner has claimed projected additional capital expenditure of ₹ 100.00 lakh along with de-capitalization of ₹ 19.40 lakh in 2016-17 towards replacement of two HP Bypass valve with control systems (AV-6) under Regulation 9(5) of the 2014 Tariff Regulations. In justification of the same, the petitioner has submitted that due to increase in TG Cycle heat rate by more than 250 kCal with respect to the design value, HP bypass valve of Unit 1 is facing passing problem. Therefore, the petitioner has proposed the replacement of HP Bypass valve along with composite AV-6 control system for improvement of Turbine cycle heat rate closer to the PAT benchmark under PAT scheme. The petitioner has further submitted that existing AV-6 control system have become obsolete.

45. The petitioner has claimed projected additional capital expenditure of ₹750.00 lakh along with de-capitalization of ₹161.75 lakh in 2016-17 towards revamping of cooling tower 1 including supply of material under Regulation 9(5) of the 2014 Tariff Regulations. In justification of the same, the petitioner has submitted that revamping of Cooling Tower 1 was last done in the year 2003. The petitioner has further submitted that after physical inspection damage was found in many places including, beams, eliminator posts, louvers etc.,cooling approach was found 8.5 instead of design value 4.3 &effectiveness of the tower is 56.3 % instead of design value 67.67 %.

46. The petitioner has claimed projected additional capital expenditure of ₹ 250.00 lakh along with de-capitalization of ₹ 52.24 lakh in 2016-17 towards energy efficient upgraded BFP cartridge under Regulation 9(5) of the 2014 Tariff Regulations. In justification of the same, the petitioner has submitted that BFP amps will be reduced by at least 40 Amp

i.e., saving of 5.7 MWhr per day which in turn will reduce the (Average Power Consumption) APC of the Unit & will help in achievement of net heat rate under PAT Scheme. The petitioner further vide affidavit dated 1.9.2016 has submitted that it has deferred the additional capital expenditure and has submitted that it may club this with comprehensive R&M in future addressing major inefficient fronts like high TG cycle heat rate, low turbine cycle efficiency, high unburnt carbon, high APC etc.

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

48. As regards to capital expenditure of ₹ 250.00 lakh towards energy efficient upgraded BFP cartridge the submissions of the petitioner that the same will be clubbed with comprehensive R&M is considered and accordingly, the expenditure towards energy efficient upgraded BFP cartridge is not allowed for the year 2016-17.

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

(₹ in lakh)

S. No.	Head of Works/ Equipment	Additional capital expenditure allowed	De-capitalization approved	Net additional capital expenditure allowed
	2014-15			
	Total	**0.00**	**0.00**	**0.00**
	2015-16			
1	Coal Mill Gear Box one for each Unit (3 nos.)	90.00	51.81	38.19
2	Chartless Recorders for Unit 1	0.00	0.00	0.00
3	PA Fan Motors (6 nos.)	214.29	79.43	134.86
4	Coal Mill Motors (4 Nos.)	125.71	46.66	79.06
5	Gear boxes of conveyor Systems: 5A/5B	0.00	0.00	0.00
6	Gear boxes of conveyor Systems: 2A/2B	0.00	0.00	0.00
7	6.6 kV VCB	60.00	14.70	45.30
8	Procurement & Retrofitting of 220 kV & 132 kV SF6 Circuit Breakers	0.00	-	0.00
9	Retrofitting of 0.2 Accuracy class PT(6 nos. 220 kV PT + 2 nos. spare) & (3 nos. 132 kV PT + 1 nos. spares)	20.00	-	20.00
	Total	**510.00**	**192.60**	**317.40**
	2016-17			
1	HP Bypass valve with control systems (AV-6)-2 set	0.00	0.00	0.00
2	Revamping of Cooling Tower1 including supply of material	0.00	0.00	0.00
3	MS Stop Valve Unit1	200.00	35.26	164.74
4	Energy efficient upgraded BFP cartridge.	0.00	0.00	0.00
5	Generator Rotor	1000.00	165.86	834.14
6	Refrigerant type hydrogen drier for 2 & 3	0.00	0.00	0.00
7	IP Nozzle , HP nozzle for Unit 1	85.00	16.49	68.51
8	IP Nozzle for Unit 2	45.00	11.61	33.39
9	Economiser coil 120 nos. for Unit 1	175.00	16.59	158.41

S. No.	Head of Works/ Equipment	Additional capital expenditure allowed	De-capitalization approved	Net additional capital expenditure allowed
10	Air Pre Heater tube(Cold & hot zone) 24340 nos for Unit 1	307.00	216.43	90.57
11	Refrigerant type Air Drier-3sets	42.00	8.78	33.23
12	Hot Water Distribution pipe of CW system	70.00	13.58	56.42
13	6.6 kV Vacuum CB	50.00	11.78	38.22
14	Procurement & Retrofitting of 220 kV & 132 kV SF6 Circuit Breakers	0.00	-	0.00
15	Retrofitting of 0.2 Accuracy class CT(39 nos. 220 kV CT + 6 nos. spare) & (12 nos. 132 kV CT + 3 nos. spares)	60.00	-	60.00
16	Retrofitting of 0.2 Accuracy class PT(6 nos. 220 kV PT + 2 nos spare) & (3 nos. 132 kV PT + 1 nos. spares)	20.00	-	20.00
	Total	**2054.00**	**496.39**	**1557.61**
	2017-18			
1	Chartless Recorders for Unit 2 & 3	0.00	0.00	0.00
2	Gear boxes of conveyor Systems: 6A/6B	25.00	4.85	20.15
3	6.6 kV Vacuum CB	50.00	11.35	38.65
4	Procurement & Retrofitting of 220 kV & 132 kV SF6 Circuit Breakers.	0.00	-	0.00
5	Retrofitting of 0.2 Accuracy class CT(39 nos. 220 kV CT + 6 nos. spare) & (12 nos. 132 kV CT + 3 nos. spares)	120.00	-	120.00
	Total	**195.00**	**16.20**	**178.80**
	2018-19			
1	Hot Water Distribution pipe of CW system	74.00	13.24	60.76
2	6.6 kV Vacuum CB	50.00	10.94	39.06
		74.00	**24.18**	**99.82**
	Total Allowed	**2883.00**	**729.37**	**2153.63**

Capital cost for the period 2014-19

50. As stated above, the opening capital cost considered is 62114.40 lakh as on 1.4.2014. Accordingly, the capital cost considered for the purpose of tariff for the period 2014-19 is as under:

(in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Opening Capital Cost	62114.40	62114.40	62431.80	63989.42	64168.21
Net Additions Allowed	0.00	317.40	1557.61	178.80	99.82
Closing Capital Cost	62114.40	62431.80	63989.42	64168.21	64268.03
Average Capital Cost	62114.40	62273.10	63210.61	64078.82	64218.12

Debt-Equity Ratio

51. 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.

52. Accordingly, the gross normative loan and equity amounting to ₹32444.57 lakh and ₹ 2966983 lakh respectively, as on 31.3.2014 as considered in order dated 29.7.2016 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 are as under.

Asset	**As on 1.4.2014**		**Net Additional capitalization during 2014-19**		**As on 31.3.2019**	
	Amount (₹ in lakh)	**(%)**	**Amount (₹ in lakh)**	**(%)**	**Amount (₹ in lakh)**	**(%)**
Debt	32444.57	52.23%	1507.54	70.00%	33952.11	52.83%
Equity	29669.83	47.77%	646.09	30.00%	30315.92	47.17%
Total	**62114.40**	**100.00%**	**2153.63**	**100.00%**	**64268.03**	**100.00%**

Return on Equity

53. 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.

54. 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."

55. 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. It is also observed from the Annual Accounts of 2014-15 and 2015-16 that tax liability is nil for the petitioner's company as a whole.

56. Accordingly, the actual tax rate of 2013-14 to 2015-16 has been considered as 'NIL' tax rate for grossing up of the base for the period 2014-15 to 2018-19. This is however, subject to truing-up and shall be considered 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	29669.83	29669.83	29765.05	30232.33	30285.97
Addition of Equity due to Additional Capitalization	0.00	153.00	616.20	58.50	37.20
Adjustment on account of de-capitalization	0.00	57.78	148.92	4.86	7.26
Normative Equity- Closing	29669.83	29765.05	30232.33	30285.97	30315.92
Average Normative Equity	29669.83	29717.44	29998.69	30259.15	30300.95
Return on Equity (Base Rate)	15.500%	15.500%	15.500%	15.500%	15.500%
Tax rate for the year	0.00%	0.00%	0.00%	0.00%	0.00%
Rate of Return on Equity (Pre Tax)	15.500%	15.500%	15.500%	15.500%	15.500%
Return on Equity	**4598.82**	**4606.20**	**4649.80**	**4690.17**	**4696.65**

Interest on Loan

57. 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:*

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

a. The gross normative loan of ₹32444.57 lakh has been considered on 1.4.2014. In addition tothis,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. 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 generating station. In case of loans carrying floating rate of interest the rate of interest as provided by the petitioner has been considered for the purpose of tariff. The calculations for weighted average rate of interest on loan have been enclosed as Annexure-I to this order.The necessary calculation 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	32444.57	32444.57	32666.75	33757.08	33882.24
Cumulative repayment of loan up to previous year	32173.43	32329.94	32508.18	33377.64	33882.24
Net opening loan	271.14	114.63	158.57	379.44	0.00
Addition due to Net Additional Capitalization	0.00	222.18	1090.33	125.16	69.87
Repayment of Loan during the period	156.51	313.06	1216.92	515.94	86.80
Add: Repayment adjustment on a/c of de-capitalization	0.00	134.82	347.47	11.34	16.93
Less: Repayment on account of adjustment in discharge in liabilities	0.00	0.00	0.00	0.00	0.00
Net Closing Loan	**114.63**	**158.57**	**379.44**	**0.00**	**0.00**
Average Loan	192.89	136.60	269.00	189.72	0.00
Weighted Average Rate of Interest on Loan (%)	10.2433%	10.3499%	10.3547%	11.5453%	11.6025%
Interest on Loan	**19.76**	**14.14**	**27.85**	**21.90**	**0.00**

Depreciation

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

*"**27. Depreciation:** (1) Depreciation shall be computed from the date of commercial operation of a generating station or unit thereof or a transmission system including*

communication system or element thereof. In case of the tariff of all the units of a generating station or all elements of a transmission system including communication system for which a single tariff needs to be determined, the depreciation shall be computed from the effective date of commercial operation of the generating station or the transmission system taking into consideration the depreciation of individual units or elements thereof.
Provided that effective date of commercial operation shall be worked out by considering the actual date of commercial operation and installed capacity of all the units of the generating station or capital cost of all elements of the transmission system, for which single tariff needs to be determined.

(2) The value base for the purpose of depreciation shall be the capital cost of the asset admitted by the Commission. In case of multiple units of a generating station or multiple elements of transmission system, weighted average life for the generating station of the transmission system shall be applied. Depreciation shall be chargeable from the first year of commercial operation. In case of commercial operation of the asset for part of the year, depreciation shall be charged on pro rata basis

(3) The salvage value of the asset shall be considered as 10% and depreciation shall be allowed up to maximum of 90% of the capital cost of the asset:

Provided that in case of hydro generating station, the salvage value shall be as provided in the agreement signed by the developers with the State Government for development of the Plant:

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

Provided also that any depreciation disallowed on account of lower availability of the generating station or generating unit or transmission system as the case may be, shall not be allowed to be recovered at a later stage during the useful life and the extended life.

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

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

Provided that the remaining depreciable value as on 31st March of the year closing after a period of 12 years from the effective date of commercial operation of the station shall be spread over the balance useful life of the assets.

(6) In case of the existing projects, the balance depreciable value as on1.4.2014 shall be worked out by deducting the cumulative depreciation as admitted by the Commission upto 31.3.2014 from the gross depreciable value of the assets.

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

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

60. 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.

61. The rate of depreciation has been arrived at by considering the weighted average of depreciation computed on the gross value of asset as on 31.3.2009 and at the rates approved by C&AG which works out to 6.8687%. 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	62114.40	62114.40	62431.80	63989.42	64168.21
Net Additional Capitalization	0.00	317.40	1557.61	178.80	99.82
Closing Capital Cost	62114.40	62431.80	63989.42	64168.21	64268.03
Average capital cost	62114.40	62273.10	63210.61	64078.82	64218.12
Value of freehold land	657.51	657.51	657.51	657.51	657.51
Rate of depreciation	6.8687%	6.8687%	6.8687%	6.8687%	6.8687%
Depreciable value	55311.20	55454.03	56297.79	57079.17	57204.55
Balance depreciable value	156.51	313.06	1216.92	795.96	147.14
Depreciation	**156.51**	**313.06**	**1216.92**	**795.96**	**147.14**

Cumulative depreciation at the end of the period (before adjustment)	55311.20	55454.03	56297.79	57079.17	57204.55
Less: Cumulative depreciation adjustment on account of de-capitalization	170.23	373.17	14.58	21.76	
Cumulative depreciation after adjustment (at the end of the period)	55140.97	55080.86	56283.21	57057.42	57204.55

Compensation Allowance

62. Regulation 17of 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

63. The petitioner has claimed compensation allowance as under:

(₹ in lakh)

2014-15	2015-16	2016-17	2017-18	2018-19
630.00	630.00	630.00	630.00	630.00

64. The Unit-I has completed 25 years during the year 2010-11. Accordingly, compensation allowance for Unit 1 has not been allowed. Further, Unit 2 will complete 25 years of operation in 2015-16 and Unit 3 will complete 25 years of operation in 2018-

19. Therefore, compensation allowance for Unit 2 & 3 of this generating station has been allowed in accordance with above regulation as follows:

(₹ in lakh)

Name of Unit	2014-15	2015-16	2016-17	2017-18	2018-19
Unit-I	-	-	-	-	-
Unit-II	210.00	210.00	-	-	-
Unit-III	210.00	210.00	210.00	210.00	210.00
	420.00	**420.00**	**210.00**	**210.00**	**210.00**

Operation &Maintenance Expenses

65. The O&M expense allowed for this generating station in accordance with Regulation 29 (1) (a) of the 2014 Tariff Regulations is as under:

(₹ in lakh)

2014-15	2015-16	2016-17	2017-18	2018-19
15057.00	16002.00	17010.00	18081.00	19221.30

66. In addition to above, the petitioner has claimed additional O&M expensestowards Ash evacuation, Mega insurance, CISF security and Share of Subsidiary activity.

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Ash Evacuation	1714.93	1714.93	1714.93	1714.93	1714.93
Mega Insurance	65.55	65.55	72.11	84.86	93.34
CISF Security	0.00	0.00	0.00	0.00	0.00
Share of Subsidiary activity	324.29	380.48	459.54	516.30	545.10
Total	**2104.78**	**2160.96**	**2246.58**	**2316.09**	**2353.37**

67. The petitioner has claimed additional O&M towards ash evacuation, CISF Security, Mega insurance and share of subsidiary activity for the tariff period 2014-19 and has submitted that it is necessary expenditure and required for successful operation of the plant. In the statement of reasons in support of the 2009 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…"

68. 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 have not been allowed.

Water Charges

69. 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 consumptiondepending 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"

70. In terms of the above regulation, water charges are to be allowed based on water consumption depending upon type of plant, type of cooling water system etc., subject to prudence check of the details furnished by the petitioner. The petitioner has submitted that at present water charges have not been claimed for the generating station. However, it 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 submission, we grant liberty to the petitioner to claim water charges at the time of truing up and the same will be considered in accordance with law.

Capital spares

71. The petitioner has claimed capital spares on projection basis under Regulation 29(2) of the 2014 Tariff Regulations. However, 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, after prudence check in terms of the provisions of the 2014 Tariff Regulations.

Operational Norms

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

Target Availability (%)	75.00
Heat Rate (kCal/kWh)	2700.00
Auxiliary Energy Consumption (%)	10.25
Specific Oil Consumption (ml/kWh)	1.50

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

Normative Annual Plant Availability Factor (NAPAF)

74. 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%*

"

75. We have considered Target Availability of 75% during 2014-19 same as claimed by the petitioner in accordance with above regulation.

Heat Rate (kCal/kWh)

76. Regulation 36(C)(a)(iii) of the 2014 Tariff Regulations provides the Gross Station Heat Rate of 2700 kCal/kWh for this generating station. The petitioner has considered heat rate of 2700 kCal/kWh. Hence, the heat rate considered by the petitioner as per norms is in order and is allowed.

Auxiliary Energy Consumption

77. Regulation 36(E)(b) of the 2014 Tariff Regulations provides the Auxiliary Energy Consumption of 10.25% for this generating station. The petitioner has considered Auxiliary Energy Consumption of 10.25%. Hence, the Auxiliary Energy Consumption considered by the petitioner as per norms is in order andis allowed.

Specific fuel Oil Consumption

78. Regulation 36(D)(c) of the 2014 Tariff Regulations provides secondary fuel oil consumption of 1.50 ml/kWh for coal-based generating stations of the petitioner. Accordingly, the secondary fuel oil consumption considered by the petitioner as per norms is in order and is allowed.

Interest on working capital

79. 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

80. 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	9870.37	9870.37	9870.37	9870.37	9870.37
Cost of Main Secondary Fuel Oil- 2 months	654.42	656.22	654.42	654.42	654.42
Total	**10524.80**	**10526.59**	**10524.80**	**10524.80**	**10524.80**

81. Accordingly, the fuel components in the working capital has been computed based on the price and GCV of coal & secondary fuel oil procured and burnt for the preceding three months of January, 2014, February, 2014 and March, 2014 and has been allowed as under:

(₹ *in lakh)*

	2014-15	2015-16	2016-17	2017-18	2018-19
Cost of Coal for stock	5003.68	5017.39	5003.68	5003.68	5003.68
Cost of Coal for generation	5003.68	5017.39	5003.68	5003.68	5003.68
Cost of secondary fuel oil – two months	654.42	656.22	654.42	654.42	654.42

Maintenance spares

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

(₹ *in lakh)*

2014-15	2015-16	2016-17	2017-18	2018-19
3011.40	3200.40	3402.00	3616.20	3844.26

83. The petitioner has claimed maintenance spares as per the 2014 Tariff Regulations and the same has been considered.

Receivables

84. 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 shown below:

(₹ *in lakh)*

	2014-15	2015-16	2016-17	2017-18	2018-19
Variable Charges -2 months	10661.79	10691.00	10661.79	10661.79	10661.79
Fixed Charges - 2 months	3898.84	4094.47	4471.25	4594.94	4683.54
Total	**14560.63**	**14785.47**	**15133.04**	**15256.73**	**15345.33**

O&M expenses for 1 month

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

(₹ *in lakh)*

2014-15	2015-16	2016-17	2017-18	2018-19
1254.75	1333.50	1417.50	1506.75	1601.78

Rate of interest on working capital

86. 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."*

87. 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 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 for stock for 30 days	5003.68	5017.39	5003.68	5003.68	5003.68
Cost of coal for Generation for 30 days	5003.68	5017.39	5003.68	5003.68	5003.68
Oil stock -2 months	654.42	656.22	654.42	654.42	654.42
O & M expenses	1254.75	1333.50	1417.50	1506.75	1601.78
Spares	3011.40	3200.40	3402.00	3616.20	3844.26
Receivables	14560.63	14785.47	15133.04	15256.73	15345.33
Total Working Capital	29488.57	30010.37	30614.33	31041.47	31453.16
Rate of Interest	13.500%	13.500%	13.500%	13.500%	13.500%
Total Interest on Working capital	**3980.96**	**4051.40**	**4132.93**	**4190.60**	**4246.18**

Other Elements of tariff

88. 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

89. 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.

90. 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.

91. In this regard it is observed that the Commission in its order dated 29.7.2016 in Petition No. 469/GT/2014, has disallowed the claim of the petitioner and has observed as under:

> *"96. As stated, the Commission in order dated 29.7.2013 in Petition No. 268/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 petitioners 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.*
>
> *97. In this background, the additional claim of the petitioner towards P&G liability for the period 2009-14 based on Actuarial valuation cannot be allowed. ……"*

92. We have already taken a view in order dated 29.7.2016 in Petition No. 469/GT/2014 that these expenses may be met through 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

93. 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**

94. 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
Bokaro TPS Unit-I to III	131.52	122.62	156.24	229.26	259.77

95. 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.

96. 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. 469/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.

97. 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 469/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**

98. 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	156.51	313.06	1216.92	795.96	147.14
Interest on Loan	19.76	14.14	27.85	21.90	0.00
Return on Equity	4598.82	4606.20	4649.80	4690.17	4696.65
Interest on Working Capital	3980.96	4051.40	4132.93	4190.60	4246.18
O&M Expenses	15057.00	16002.00	17010.00	18081.00	19221.30
Compensation Allowance	420.00	420.00	210.00	210.00	210.00
Sub-Total	**23813.05**	**24986.80**	**27037.51**	**27779.63**	**28311.26**
Share of Common Office Expenses	99.64	91.77	85.72	85.62	84.63
Additional O&M on account of Ash Evacuation, Mega Insurance, CISF Security and Share of subsidiary activities	-	-	-	-	-
Share of Pension & Gratuity Contribution	-	-	-	-	-

	2014-15	2015-16	2016-17	2017-18	2018-19
Sub-Total	**99.64**	**91.77**	**85.72**	**85.62**	**84.63**
Total Annual Fixed Charges	**23912.69**	**25078.57**	**27123.23**	**27865.26**	**28395.89**

Energy Charge Rate (ECR)

99. 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 weightedaverage Gross calorific value of primary fuel shall be arrived inproportion 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 ofblending of fuel from different sources, the weighted average landed price ofprimary 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."

100. The petitioner has claimed an Energy Charge Rate (ECR) of 172.205 paise/kWh. Accordingly, the base energy charge of 172.203 paise/kWh determined based on the price and GCV of fuel for the preceding three months and calculated in accordance with the 2014 Tariff Regulations is allowed as under:

Description	Unit	2014-19
Capacity	MW	3x210 MW
Gross Station Heat Rate	kCal/kWh	2700.00
Auxiliary Energy Consumption	%	10.25%
Specific Fuel Oil Consumption	ml/kWh	1.50
Weighted Average GCV of Oil	Kcal/L	9738.40
Weighted Average GCV of Coal	kCal/kg	3518.32
Weighted Average Price of Coal	₹ /MT	1900.61
Weighted Average Price of Oil	₹ /ml	0.0632
Rate of Energy Charge ex-bus per kWh	Paise/kWh	172.203

Application Fee and Publication Expenses

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

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

103. Petition No. 350/GT/2014 is disposed of in terms of the above.

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

Annexure-I

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

(in lakh)

Particular	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%