

**CENTRAL ELECTRICITY REGULATORY COMMISSION  
NEW DELHI**

**Petition No. 197/GT/2017**

**Coram:**

**Shri P.K.Pujari, Chairperson  
Dr. M.K. Iyer, Member  
Shri I.S.Jha, Member**

**Date of Order: 6<sup>th</sup> December, 2019**

**In the matter of**

Approval of tariff of Feroze Gandhi Unchahar Thermal Power Station, Stage- IV (500 MW) for the period from the actual date of commercial operation of Unit-I (30.9.2017) to 31.3.2019

**And**

**In the matter of**

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

**.....Petitioner**

**Vs**

1. Uttar Pradesh Power Corporation Ltd.  
Shakti Bhawan, 14, Ashok Marg  
Lucknow- 226001

2. Jaipur Vidyut Vitran Nigam Limited,  
Vidyut Bhawan, Janpath,  
Jaipur- 302005

3. Ajmer Vidyut Vitran Nigam Limited,  
Old Power House, Hathi Bhata,  
Jaipur Road, Ajmer

4. Jodhpur Vidyut Vitran Nigam Limited,  
New Power House, Industrial Area,  
Jodhpur

5. Haryana Power Purchase Centre,  
Shakti Bhawan, Sector -VI,  
Panchkula, Haryana-134109



6. Power Development Department,  
Govt. of J K, Civil Secretariat,  
Srinagar

7. Electricity Department, Chandigarh,  
Union Territory of Chandigarh,  
Addl. Office Building, Sector 9 D,  
Chandigarh

8. Uttarakhand Power Corporation Limited,  
Urja Bhavan, Kanwali Road,  
Dehradun-248001

.....**Respondents**

**Parties present:**

Shri Nishant Gupta, NTPC  
Shri Ajay Mehta, NTPC  
Shri R.K.Singh, NTPC  
Shri E.P.Rao, NTPC  
Shri T. Vinod, NTPC  
Shri Anjum Zargar, NTPC  
Shri Varun Shankar, Advocate, TPDDL  
Shri Manish Garg, UPPCL

**ORDER**

The Petitioner, NTPC has filed this petition on 26.7.2017 for approval of tariff of Feroze Gandhi Unchahar Thermal Power Station, Stage- IV (1 x 500 MW) (hereinafter referred to as 'the generating station') for the period from the anticipated date of commercial operation of Unit-I (31.7.2017) to 31.3.2019 based on the projected additional capital expenditure upto 31.3.2019. Thereafter, the Petitioner vide affidavit dated 24.1.2019 amended the petition and has sought approval of tariff from the actual date of commercial operation of the generating station i.e. 30.9.2017 till 31.3.2019 in accordance with the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2014 (hereinafter referred to as "the 2014 Tariff Regulations").

2. The generating station is located at Unchahar in Raebareli district in the State of Uttar Pradesh and comprises of one unit of 500 MW capacity. The project has been



implemented as an expansion to Feroze Gandhi Unchahar TPS-I (2 x 210 MW), Feroze Gandhi Unchahar TPS-II (2 x 210 MW) and Feroze Gandhi Unchahar TPS-III (1 x 210 MW). The Petitioner has entered into Power Purchase Agreement (PPA) with the Respondents and the power generated from the generating station is supplied to the Respondents in terms of the allocation made by the MOP, GOI vide letter dated 6.7.2017. Thereafter, at the request of Respondents, TPDDL & HPSEB and based on the willingness expressed by Respondent UPPCL, the MOP, GOI vide its letter dated 4/10.4.2018, had reallocated the total share of TPDDL & HPSEB from the generating station to UPPCL. The Petitioner has amended the petition, considering the actual expenditure incurred as on 30.9.2017, duly certified by Auditor. Accordingly, the capital cost and annual fixed charges claimed by the Petitioner for the period from 30.9.2017 till 31.3.2019 is as under:

**(a) Capital cost**

	(₹ in lakh)	
	<b>2017-18 (30.9.2017 to 31.3.2018)</b>	<b>2018-19</b>
Capital cost as on COD of Unit-I/ station	232427.71	-
Unamortized finance cost (FC) due to IND AS	169.26	-
Loan ERV treated as borrowing cost drawn after 1.4.2016 transfer to P&L (due to IND AS)	432.60	-
Loan FERV after 1.4.2016 transfer to P&L	805.56	-
Short term FERV	681.95	-
Notional IDC	171.26	-
Opening capital cost	234688.34	242505.64
Add: Addition during the year/ period	7817.30	37452.77
Closing capital cost	242505.64	279958.40
Average capital cost	238596.99	261232.02

**(b) Annual Fixed Charges**

	(₹ in lakh)	
	<b>2017-18 (30.9.2017 to 31.3.2018)</b>	<b>2018-19</b>
Depreciation	12854.41	14073.88
Interest on loan	10953.17	11326.65
Return on equity	14104.99	15483.88
Interest on working capital	5176.85	5275.64
O&M expenses	9794.51	10399.51
<b>Total</b>	<b>52883.94</b>	<b>56559.56</b>



3. In compliance with the directions of the Commission, the Petitioner has filed the additional information with copies to the Respondents. Reply to the petition has been filed by the Respondent, UPPCL and the Petitioner has filed its rejoinder to the said reply. Based on the submissions of the parties and documents available on record, we proceed to examine the claim of the Petitioner, on prudence check, as stated in subsequent paragraphs.

### **Commissioning Schedule and Time Overrun**

4. The Investment Approval (IA) of the generating station was accorded by the Petitioner's Board at its 397<sup>th</sup> meeting held on 30.7.2013 at an estimated completion cost of ₹3471.83 crore (including IDC & FC of ₹450.58 crore and working capital margin of ₹89.51 crore). The scheduled COD of the generating station was 41 months from 30.7.2013 as per the IA, which works out to 31.12.2016. However, the Petitioner has achieved actual COD on 30.9.2017 as against the scheduled COD, thereby causing a delay of 9 months (from 31.12.2016 till 30.9.2017). Accordingly, the detail of actual COD of Unit-I as against SCOD, as submitted by the Petitioner is as under:

<b>Scheduled COD</b>	<b>Actual COD</b>	<b>Time overrun (days)</b>
31.12.2016	30.9.2017	273

5. Thus, as against the SCOD, there is a time overrun of 273 days for Unit-I in the declaration of commercial operation of the generating station. The Petitioner vide its affidavit dated 24.1.2019 has furnished the reasons for time overrun with the help of PERT chart, in justification of the period of delay. According to the Petitioner, the following events, which were beyond the control of the Petitioner, have led to the delay in the declaration of commercial operation of the generating station:



- (a) Non Availability of 'Sand and Moorum' due to ban in mining;
- (b) Excess rainfall during the period from June 2016 to October 2016; and
- (c) Other constraint - High water table

6. The Commission vide ROP of the hearing dated 13.3.2019 had directed the Petitioner to furnish information on the following:

*“CPM/PERT chart indicating the critical activities/milestones which were affected due to each reason of delay with relevant supporting document. Reconciliation of the total delay period corresponding to each activity/milestones with individual delays corresponding to each reason of delay as per the format attached at Annexure-1. Any other relevant information for proving that time overrun and consequent cost overrun, if any, was not attributable to the Petitioner.”*

7. In response to the directions of the Commission vide ROP of the hearing dated 13.3.2019, the Petitioner has furnished the table indicating the schedule and the actual completion of activities as under:

Sl. No	Description of Activities/ Works /Service	Original Schedule (as per planning)	Actual Schedule (as per actual)	Time Over-Run	Reasons for Delay	Supporting Documents	Other Activity affected (mention sr. no.)
1	Hydro Test	5.10.2015	24.6.2016	263	1. Non-availability of sand for prolonged durations due to imposition of blanket ban on mining and sale of sand in and around River basin under direction of NGT and Allahabad High Court results in delay in all the civil fronts.  2. Excess rain fall from June 2016 to October 2016 (5months), Civil & Structural works of all areas were affected severely due to-  a. Water logging; and  b. Difficulty in Shifting of heavy materials due to blockage in movement of heavy vehicles. Total Rain fall recorded 1229 mm against normal 951 mm from June to October	1. Rain fall records.  2. Banning order of sand mining  3. Geotech Survey report	2
2	Boiler Light-up	5.4.2016	26.1.2017	296			3
3	Steam Blowing Completion	5.8.2016	10.3.2017	217			6,7
4	TG Box up completion	5.6.2016	20.10.2017	137			6,7
5	TG Oil Flushing	5.8.2016	26.3.2017	233			7
6	Commissioning	5.12.2016	31.3.2017	116			



Sl. No	Description of Activities/ Works /Service	Original Schedule (as per planning)	Actual Schedule (as per actual)	Time Over-Run	Reasons for Delay	Supporting Documents	Other Activity affected (mention sr. no.)
					2016. As type of soil cohesive mix with silt/sand (Alluvial Deposit) & high water table (1.5 mtr. to 3 mtr. down from ground level), further increase the difficulty in civil & structural work. SG, TG & Auxiliaries erection works affected due to delay in completion of civil works e.g. Foundation of Trestle, TPs & TRs of Coal Handling plant, Electrical Duct bank, Ash Slurry Pumps & pipe pedestal foundation etc.		
7	COD (Targeted)	31.12.2016	30.9.2017	273	All the above		

8. We now proceed to examine the aforesaid reasons for time overrun in the declaration of COD of the unit as stated below.

**Non Availability of ‘Sand and Moorum’ due to ban in mining:**

9. The Petitioner vide affidavit dated 24.1.2019 has submitted that the delay in construction activities due to shortage of sand caused by change in law was beyond the control of the Petitioner and the same may be condoned. It has also submitted that the non-availability of sand for prolonged durations due to imposition of ban on mining and sale of sand by various State Governments, including the State of UP, in terms of the directions of National Green Tribunal (NGT), had resulted in delay in the civil works of major packages. It has further submitted that the Hon’ble Allahabad High Court had banned the excavation activity from February 2016 in respect of minor minerals, in pursuance of leases granted to the private parties. Therefore, in view of the directions of



the Hon'ble Court and NGT, the supply of sand and Moorum, the essential raw materials for civil construction got affected, which had delayed the civil works of major packages like Main Plant Civil package (front for coal Mills, ESP VFD room, Chimney civil works etc.) and in BOP Civil packages (front for trestle & gallery of raw/ clarified/ ash water pipes, Fuel oil pipes, foundation of LDO tank, Ash handling pump house civil works etc). The Petitioner has furnished copy of the orders passed by the NGT and the Hon'ble High Court. The Petitioner has stated that the mining agencies and the Petitioner had followed up the matter for early resolution of the issue, but the delay in resolution of the said issue had affected the civil works, which were in standstill from April 2016 onwards. Thereafter, the Petitioner vide affidavit dated 10.4.2019 had submitted that various uncontrollable factors which include non-availability of sand & moorum and ban in mining had resulted in time overrun as the NGT, in respect of sand mining on river bed, had directed the States vide its order dated 13.1.2015 to stop giving permits for carrying on sand mining. The Petitioner has pointed out that the Hon'ble High Court vide its order dated 29.2.2016 had prohibited the excavation activities of minor minerals. The Petitioner has submitted that the aforesaid orders had affected the supply of sand & moorum and the essential raw materials used in the civil construction. The Petitioner has stated that on account of above, the civil works of many of the major packages in the main plant and balance of plant got affected and the milestone in many of these works as indicated in Annexure-B(i) of the Petition got delayed.

10. The Respondent UPPCL vide its reply affidavit dated 29.4.2019 has submitted that it could be observed from NGT order that there was no blanket ban on sand mining and any person having Environmental Clearance (EC) could have obtained permit for the same. It has also submitted that only person without EC was stopped from carrying out



any mining activity. The Respondent has stated that NGT in its order had directed State Environment Impact Assessment Authority (SEIAA) to consider all applications filed for seeking EC in accordance with law and in terms of the observations made in the said order expeditiously and within a period of three months. The Respondent while pointing out that since the ban was only on illegal mining, the event, namely, non-availability of sand and moorum do not qualify either as a force majeure event or change in law event which was beyond the control of the Petitioner as envisaged under Regulation 12(2) of the 2014 Tariff Regulations. Accordingly, the Respondent has submitted that the delay on this ground may not be condoned and the additional IDC/IEDC claimed by the Petitioner may be disallowed.

11. We have examined the matter. Regulation 12(2) of the 2014 tariff Regulations provide as under:

*“12. Controllable and Uncontrollable factors: The following shall be considered as controllable and uncontrollable factors leading to cost escalation impacting Contract Prices, IDC and IEDC of the project:*

*(1) xxxxx*

*(2) The “uncontrollable factors” shall include but shall not be limited to the following:*

- i. Force Majeure events.; and*
- ii. Change in law.*

*Provided that no additional impact of time overrun or cost over-run shall be allowed on account of non-commissioning of the generating station or associated transmission system by SCOD, as the same should be recovered through Implementation Agreement between the generating company and the transmission licensee”*

12. The Petitioner has submitted that the non-availability of ‘sand and moorum’ due to ban in mining in terms of the order of NGT dated 13.1.2015 and the judgment dated 29.2.2016 of the Hon’ble Allahabad High Court is an uncontrollable factor which had caused delay in declaration of COD of unit of the generating station. Per contra, the Respondent has submitted that the ban on mining in terms of the aforesaid orders





related to illegal mining and not on legal mining and therefore the event cannot be termed as uncontrollable event. NGT vide its order dated 13.1.2015 while directing the States to stop giving permit for carrying sand mining observed as under:

*“In the meanwhile, no state shall permit carrying on of sand mining or minor mineral extraction on riverbed or otherwise without the concerned person obtaining environmental clearance from the competent authority.”*

13. Similarly, the Hon’ble Allahabad High Court in its order dated 29.2.2016 had observed as under:

*“For the aforesaid reasons, we direct that until the next date of listing, no excavation activity in respect of minor minerals shall be carried out in pursuance of the leases which have been granted to the private parties.”*

14. It is evident from the above orders that extraction activity in respect of minor minerals were directed to be stopped which, in our view, had affected the supply of ‘sand and Moorum’ which are the essential raw materials used in the civil construction of the project. Consequent on this, the civil works of major packages in the main plant and balance of plant got affected from April 2016. Though the Petitioner has not furnished date of lifting of ban and resumption of the supply of minerals pursuant to the judgment of Hon’ble High Court, it is noticed from that Letter No. 715/86-2017-57(s)/2017 dated 22.4.2017 from the Additional Chief Secretary, Uttar Pradesh, addressed to District officers, Mining Department that the State Government had directed for resumption of mining through e-auctioning procedure. In this background and in the light of the aforesaid orders of the NGT / High Court, we hold that delay caused by disruption in supply of ‘Sand and Moorum’ from April, 2016 till March, 2017 was beyond the control of the Petitioner.

### **Excess rainfall during the period from June 2016 to October 2016**

15. The Petitioner has submitted that the total rainfall recorded during the period from June, 2016 to October, 2016 was 1229 mm as against the normal rainfall of 951 mm. It



has also submitted that the rainfall as above had led to flooding at site, thereby resulting in restriction of movement of men & machinery and virtual stoppage of Civil & Structural works of major areas for 5 months, including the trial of equipment. The Petitioner has further submitted that after stoppage of rains, efforts were undertaken by the Petitioner to dewater the area for normalization and make the passage healthy & safe for movement of heavy materials and crane. According to the Petitioner, the rainfall not only delayed the civil works but also delayed the period towards subsequent months. In justification of the same, the Petitioner has enclosed the rainfall data for the period from 1.6.2016 to 31.10.2018 and the site photographs demonstrating the conditions in and around site and has stated that the delay on this count was beyond the control of the Petitioner. Similar submissions have been made by the Petitioner vide its affidavit dated 10.4.2019.

16. The Respondent, UPPCL vide its affidavit dated 29.4.2019 has submitted that out of the period of 30 days in June, 2016, there was nil rainfall on 15 days and on 8 days, the rain was 10 mm or less. It has also submitted that for the balance 7 days, the rainfall was in excess of 10 mm with a maximum being 15 mm on a single day. The Respondent has expressed surprise that for a meagre rainfall of 1 mm on 4<sup>th</sup> June, the plant was not able to operate for the period from 1.6.2016 to 14.6.2016. The Respondent has submitted that it needs to be assessed for how much rainfall, the plant was geared to operate and that for meagre rainfall, the plant came to halt. As regards rainfall in July 2016, the Respondent has submitted that the maximum rainfall was 34 mm on a single day. With regard to rainfall in August 2016, the Respondent has submitted that while the rainfall was 10 mm or less for 17 days, it was more than 30 mm only for two days. Similarly, for the month of September 2016, the rainfall was 10 mm or



less for 21 days and more than 30 mm for a single day. With regard to rainfall in October 2016, the Respondent has stated that the rainfall was 10 mm or less for 31 days. Accordingly, the respondent, while pointing out that plants are designed not on average basis but for maximum contingency, has submitted that the Commission may evaluate the issue on prudence check and disallow the claim for time overrun on this count.

17. The matter has been examined. The claim for excess rainfall along with time period as furnished by the Petitioner is as under:

<b>Rainfall</b>	<b>Rain period</b>	<b>Normalization period</b>	<b>Total work stoppage</b>
June, 2016 to October, 2016	5 month	15 days	5.5 month

18. It is noticed from the above that the time overrun due to excess rainfall as claimed by the Petitioner is for the period from June 2016 to October 2016. This period of delay coincides with the period of delay (April 2016 to March 2017) due to disruption in the supply of sand and minerals as discussed above. Since the period of delay in COD due to excess rainfall and flooding has been subsumed in the delay on account of ban on mining of minerals, the stoppage of work of the project for 5.5 months which had contributed to time overrun is deemed to have been condoned.

#### **Other Constraint- High Water Table**

19. The Petitioner vide its affidavit dated 24.1.2019 has submitted that the water table at site location was very high i.e. only 1.5 meter to 3 meter down from ground level. In justification of the same, the Petitioner has also submitted that due to this high water table, the execution time of underground works increased as the same required frequent dewatering and caused interruption in progress of civil foundation works. All the foundation works of critical areas including CW duct were adversely affected due to



this high water table. Based on this, the Petitioner has submitted that the aforesaid delay is beyond the control of Petitioner and hence the delay may be condoned.

20. It is observed that Petitioner has not quantified the delay caused due to the difficulties faced by it because of high water table. In absence of such details and based on the table at para 5, Commission is of the view that impact of high water table and the reasons for which delay has been already condoned i.e non availability of 'Sand and Moorum' and 'High Rainfall', affected the activities till commissioning of the unit i.e 31.3.2017.

21. From the table under para 7 above as furnished by the Petitioner, it is noticed that the Scheduled commissioning date of the unit was 5.12.2016 and the same was delayed to 31.3.2017. This delay of 116 days has been attributed to cumulative impact of non-availability of sand for prolonged durations, excess rainfall & water logging and high water table. In our view, the total delay of 116 days from 5.12.2016 to 31.3.2017 was beyond the control of the Petitioner and accordingly the time overrun on this count is condoned. For the further delay of 157 days (273-116) beyond 31.3.2017 in achieving the COD after commissioning, Petitioner has submitted that all the reasons which caused the delay till commissioning of the unit were also responsible for this further delay. This in our view is a very general statement and is not acceptable as these reasons i.e non-availability of sand for prolonged durations, excess rainfall & water logging and high water table, cannot be considered as valid reasons of further delay after achieving the commissioning of the unit. As such, in absence of valid reasons for the further delay of 157 days, we are not inclined to condone the same. As the SCOD of unit as submitted by the Petitioner is 31.12.2016, the time period envisaged from the scheduled commissioning of the unit (5.12.2016) to SCOD was 26 days. Accordingly,



after allowing for the scheduled time period of 26 days as envisaged by the Petitioner, unit/station should have achieved COD on 26.4.2017 i.e 26 days after the commissioning date of 31.3.2017.

22. In view of the above discussions, out of the total time overrun of 273 days from the scheduled COD (31.12.2016) to the actual COD of the unit (30.9.2017), the delay of 116 days upto 26.4.2017 has been condoned and the delay of 157 days has not been condoned. Accordingly, the time overrun allowed/ disallowed is summarized as under:

Scheduled COD	Actual COD	Total Time overrun (days)	Time overrun allowed (days)	Time overrun disallowed (days)
31.12.2016	30.9.2017	273	116	157

23. Accordingly, the revised SCOD / actual COD for the generating station is as under:

SCOD	Revised SCOD	Actual COD
31.12.2016	26.4.2017	30.9.2017

### **Capital Cost**

24. The estimated capital cost of the project is ₹3471.83 crore including IDC & FC of ₹450.58 crore and working capital margin of ₹89.51 crore as per IA. The Petitioner has claimed the capital cost as on COD of Unit-I, duly certified by Auditor as under:

	(₹ in lakh)
Gross Block (as per IND AS) for the project as on COD of Unit-I	626959.10
Less: Gross Block (as per IND AS) for FGUTPS-I, II & III as on COD of Unit-I	353881.05
Less: Gross Block (as per IND AS) pertaining to Solar project as on COD of Unit-I	6746.02
<b>Gross Block (as per IND AS) for the generating station as on COD of Unit-I</b>	<b>266332.03</b>
Add: IND AS adjustment to Gross Block, pertaining to the generating station, as on COD of Unit-I	1121.55
<b>Gross Block as per IGAAP (i.e. historical cost basis), pertaining to the generating station, as on COD of Unit-I (on accrual basis)</b>	<b>267453.58</b>
Less: Un-discharged liabilities included above	35025.87
<b>Gross Block as per IGAAP pertaining to the generating station, as on COD of Unit-I (on cash basis)</b>	<b>232427.71</b>
Add: Notional IDC	171.26
Add: Short Term FERV (charged to revenue)	681.95
Add: Loan ERV charge to revenue post 1.4.2016	805.56
Add: Un-amortised Financing Cost	169.26
Add: FERV treated as Borrowing Cost after 1.4.2016 transferred to P&L	432.60
<b>Capital cost claimed as on COD of Unit-I</b>	<b>234688.34</b>



25. The Commission vide ROP of hearing dated 13.3.2019 had directed the Petitioner to furnish the implication of time overrun on cost, separately indicating the details of increase in prices of different packages and increase in IDC & IEDC from the scheduled COD to the actual COD. In compliance with the said direction, the Petitioner vide its affidavit dated 10.4.2019 has submitted that it has awarded some of the packages of the project on firm price and other packages with a provision for price escalation. It has also submitted that the price escalation is based on applicable indices published by various authorities and any revision in the scheduled milestones such as, supply of material, erection of equipment etc. the Petitioner has furnished the details of different packages awarded to various parties such as NBPPL and other parties in Form-5D. The Petitioner has further submitted that as on date, in none of the packages, the scheduled milestones have been revised. The Petitioner has stated that it has only paid the price escalation from award of contract up to scheduled dates of supply and erection of packages and there is no cost overrun due to time over run. In this regard, the certificate of Auditor certifying that there is no cost overrun due to time overrun has been placed on record as Annexure-F1. As regards increase of IDC & IEDC, the Petitioner has furnished the details of IEDC (₹70.2346 crore) and IDC (₹120.6818 crore) as on SCOD to ₹115.7472 crore and ₹201.7688 crore as on actual COD in Form-13D and Form-14 respectively. The Petitioner has also submitted that IDC as on actual COD of Unit (₹201.7688 crore) is much less than that envisaged in the IA (₹434.36 crore) and the benefit of the same will be passed on to the beneficiaries. Accordingly, the Petitioner has prayed for allowing IDC of ₹201.7688 crore as claimed in the petition.



26. It is noticed that due to the delay in COD of the generating station, IEDC expenses have increased. This requires pro-rata disallowance of IEDC expenses for the period of 157 days. The total IEDC expenses as on SCOD is ₹7023.46 lakh and that claimed as on actual COD is ₹11574.72 lakh.

27. The auditor certified capital cost on accrual, as well as cash basis, amounting to ₹267453.58 lakh and ₹232427.71 lakh, as on COD of Unit-I, includes IDC & FC amounting to ₹20176.88 lakh and FERV amounting to ₹439.40 lakh. Accordingly, the hard cost component of capital cost as on COD of Unit-I works out to ₹246837.30 lakh, on accrual basis and ₹211811.43 lakh, on cash basis. Further, as per Form-13D, as submitted in the Petition, the hard cost includes IEDC amounting to ₹11574.72 lakh as on COD of Unit-I. However, on perusal of Form-5B, as submitted in the Petition, it is observed that the overheads included in the hard cost as on COD of Unit-I is ₹11643.39 lakh. Normally, the IEDC and overheads remains same. Accordingly, for the present, Overheads amounting to ₹11643.39 lakh has been considered as IEDC for the purpose of tariff. This is however subject to truing-up. Considering the details of IEDC as claimed by the Petitioner and the time overrun of 157 days disallowed in this order, the IEDC is worked out and allowed as ₹8354.24 lakh (after disallowance of IEDC for ₹3289.15 lakh) as on COD of Unit-I. Accordingly, the hard cost considered for the purpose of tariff as on COD of Unit-I works out to ₹208522.27 lakh.

28. We now proceed to examine the Petitioner's claim for IDC & FC, FERV, Notional IDC, Short-term FERV charged to revenue, Loan FERV charged to revenue post 1.4.2016, Un-amortized finance cost and FERV treated as borrowing cost drawn after 1.4.2016 and transferred to P&L as shown under:



- a) **IDC & FC** – The Petitioner has claimed IDC & FC amounting to ₹20176.88 lakh as on COD of Unit-I. However, considering the details of draws, repayments and rate of interest applicable to each loan and disallowed time overrun of 157 days, the allowable IDC and FC, as on COD of Unit-I, works out to ₹15645.61 lakh. Accordingly, the IDC & FC to be deducted as on the COD of Unit-I works out to ₹4531.26 lakh.
- b) **FERV** – The Petitioner has claimed FERV on loan amounting to ₹439.40 lakh as on COD of Unit-I. Considering the details of draws, repayments and exchange rates, the claim is found to be in order and accordingly allowed for the purpose of tariff.
- c) **Notional IDC** - The Petitioner has claimed Notional IDC amounting to ₹171.26 lakh as on COD of Unit-I. There is no provision under the 2014 Tariff Regulations for allowing Notional IDC. However, Regulation 9(2)(b) of the 2014 Tariff Regulations provides for allowance of Normative IDC (over and above actual IDC). Accordingly, considering the quarterly debt-equity position corresponding to actual cash expenditure, the allowable Normative IDC (over and above actual IDC) works out to ₹74.53 lakh, as on COD of Unit-I.
- d) **Short-term FERV charged to revenue** – The Petitioner has claimed Short-term FERV amounting to ₹681.95 lakh as on COD of Unit-I. As per consistent methodology adopted by the Commission, FERV charged to revenue upto COD is allowed as part of capital cost for the purpose of tariff.
- e) **Loan FERV charged to revenue after 1.4.2016** – The Petitioner has claimed loan FERV charged to revenue after 1.4.2016 for ₹805.56 lakh over and above the auditor certified capital cost, as per IGAAP, as on COD of Unit-I. On perusal of the statement showing the details of FERV calculation, it is observed that FERV amounting to ₹805.56 lakh was charged to revenue prior to COD. As per consistent methodology adopted by the Commission, FERV charged to revenue upto COD is allowed as part of capital cost for the purpose of tariff.





f) **Un-amortized Finance Cost** – The Petitioner has claimed ₹169.26 lakh as the un-amortized bond issue expenses corresponding to loan drawn after 1.4.2015. The Petitioner has submitted that in the erstwhile IGAAP, loan issue expenses paid upfront were accounted as and when incurred and the same used to be claimed as part of IDC. Since, the auditor certified cash capital cost of ₹232427.71 lakh is as per IGAAP any further adjustment to the same on account of IND AS adjustment is not justifiable, without proper documentation / justification. Hence, the Petitioner’s claim under this head has been ignored for the purpose of tariff and the same will be considered at the time of truing up of tariff, based on the documents to be furnished by the Petitioner.

g) **FERV treated as borrowing cost drawn after 1.4.2016 transferred to P&L** – The Petitioner has claimed ₹432.60 lakh under this head. However, on perusal of the statement showing details of IDC capitalized upto COD of Unit-I along with Form-5B, it is observed that this amount already forms part of the auditor certified cash capital cost of ₹232427.71 lakh as per IGAAP (on cash basis). As such, any further adjustment of the same over and above auditor certified (cash) capital cost (as per IGAAP) is unjustifiable. Hence, the Petitioner’s claim under this head has been ignored for the purpose of tariff and the same will be considered at the time of truing up of tariff, based on the documents to be furnished by the Petitioner.

29. Based on the above discussions, the capital cost allowed as on COD of Unit-I works out to ₹226169.33 lakh.

### **Initial Spares**

30. Regulation 13 of Tariff Regulations 2014 provides as under:

*“13. Initial Spares: Initial spares shall be capitalized as a percentage of the Plant and Machinery cost up to cut-off date, subject to following ceiling norms:*

*(a) Coal-based/lignite-fired thermal generating stations - 4.0%*

*(b) Gas Turbine/Combined Cycle thermal generating stations - 4.0%*

*Provided that:*



i. where the benchmark norms for initial spares have been published as part of the benchmark norms for capital cost by the Commission, such norms shall apply to the exclusion of the norms specified above:

iv. for the purpose of computing of initial the cost spares, plant and machinery cost shall be considered as project cost as on cut-off date excluding IDC, IEDC, Land Cost and cost of civil works. The transmission licensee shall submit the break-up of head wise IDC & IEDC in its tariff application.”

31. The calculation of initial spares as furnished by the Petitioner is a under:

(₹ in lakh)	
	<b>Capital Cost</b>
Cost of Plant & Machinery as on COD	167504.89
Cost of initial spares claimed as on COD	1773.4
% age of Plant & Machinery cost	1.06%
Estimated cost of Plant & Machinery as on cut-off date	229952.34
Cost of initial spares claimed as on cut-off date	3954.54
Percentage of Plant & Machinery cost	1.72%

32. The COD of the generating station is 30.9.2017 and hence the cut-off date of the generating station is 31.3.2020. The Petitioner in Form-5B of the Petition has submitted that the cost of initial spares capitalized as on COD is ₹1773.40 lakh and the estimated cost of initial spares as on cut-off date of the generating station is ₹3954.54 lakh. Also, the Plant & Machinery cost as on the COD of the generating station is ₹167504.89 lakh and the estimated cost of Plant & Machinery as on cut-off date of unit is ₹229952.34 lakh, which constitutes 1.06% as on the COD and 1.72% as on the cut-off date. It is observed that the initial spares capitalized as a percentage of plant and machinery cost up to the COD and the cut-off date of generating station is less than the ceiling limit of 4% as specified under Regulation 13(a) of the 2014 Tariff Regulations. As the claim of the Petitioner for capitalization of initial spares is within the ceiling limit specified under the 2014 Tariff Regulation, the same is allowed to be capitalized. The Petitioner is however directed to furnish the details of initial spares capitalized up to the cut-off date, at the time of truing-up of tariff of the generating station.



### **Sale of infirm power from synchronization upto COD of Unit-I**

33. The Petitioner has submitted that the amount of infirm power sold up to COD is ₹1124.96 lakh and has furnished Auditor's certificate in respect thereof. The Petitioner has however adjusted the revenue earned from sale of infirm power in the pre-commissioning expenses in Form-5B. Accordingly, no separate adjustment of the said amount has been made in the capital cost.

### **Liquidated Damages (LD)**

34. In response to the directions of the Commission vide ROP of the hearing dated 13.3.2019, the Petitioner has submitted that no LD has been recovered from the contractor. The Petitioner has further submitted that closing of some of the contracts is in process and LD deducted, if any, shall be filed before the Commission. In view of this, no adjustment on account of LD has been made in this order. The Petitioner is directed to furnish details of the LD, if any, recovered, at the time of truing-up of tariff in terms of Regulation 8 of the 2014 Tariff regulations.

### **Additional Capital Expenditure**

35. Regulations 14 (1) of the 2014 Tariff Regulations provides as under:

*"14. Additional Capitalization and De-capitalization:*

*(1) The capital expenditure in respect of the new project or an existing project incurred or projected to be incurred, on the following counts within the original scope of work, after the date of commercial operation and up to the cut-off date may be admitted by the Commission, subject to prudence check:*

*(i) Un-discharged liabilities recognized to be payable at a future date;*

*(ii) Works deferred for execution;*

*(iii) Procurement of initial capital spares within the original scope of work, in accordance with the provisions of Regulation 13;*

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

*(v) Change in law or compliance of any existing law:*

*Provided that the details of works asset wise/work wise included in the original scope of work along with estimates of expenditure, liabilities recognized to be payable at a future date and the works deferred for execution shall be submitted along with the application for determination of tariff."*



36. The Petitioner has claimed additional capital expenditure for ₹7817.30 lakh for the period from 30.9.2017 to 31.3.2018 and ₹37452.77 lakh for 2018-19 on projected basis in respect of the following works / equipment as under:

<i>(₹ in lakh)</i>			
<b>SI No.</b>	<b>Description of item</b>	<b>2017-18</b>	<b>2018-19</b>
1	Land and site development	0.00	600.00
2	Plant and Equipment	2569.15	10000.00
3	BOP Mechanical	2879.57	11628.32
4	BOP Electrical	1621.08	3012.45
5	C&I Package	170.32	1911.19
6	MBOA	223.57	0.00
7	Initial spares	0.00	1000.00
8	Civil Works	353.61	9300.81
	<b>Total</b>	<b>7817.30</b>	<b>37452.77</b>

37. The Petitioner has claimed the projected additional capital expenditure towards Land & site development, Plant & Equipment, BOP mechanical & electrical, C&I package, MBOA under Regulation 14 (1)(ii) and capitalization of initial spares under Regulation 14 (1)(iii) of the 2014 Tariff Regulations. In justification of the same, the Petitioner has submitted that all the works claimed form part of original scope of work of the project and is expected to be capitalized within the cut-off date of the generating station. In view of this, the projected additional capital expenditure of ₹7817.30 lakh for the period from 30.9.2017 to 31.3.2018 and ₹37452.77 lakh for 2018-19 in respect of the aforesaid works/ equipment is allowed under Regulations 14(1)(ii) and 14(1)(iii) of the 2014 Tariff Regulations. The Petitioner is however directed to furnish the asset-wise details of the actual capital expenditure incurred along with the liabilities discharged for items within the original scope of work, along with the documentary evidence / justification towards R&R claim, duly certified by Auditor, at the time of truing-up of tariff in terms of Regulation 8 of the 2014 Tariff Regulations.



### **Reasonableness of Capital Cost**

38. The capital cost (excluding IDC, FC & WCM) envisaged at the time of original IA was ₹2931.74 crore, which works out to ₹5.86 crore/MW. The estimated hard cost of the project till the cut-off date as furnished by the Petitioner in Form-5B is ₹3017.61 crore which works out to ₹6.03 crore/MW. As regards the escalation in capital cost, the Petitioner has submitted that it has awarded some of the packages (EPC) of the project with a provision for price escalation, which is based on applicable indices published by various authorities and any revisions in the scheduled milestones such as supply of the material, erection of the equipment etc. The Petitioner has submitted that it has only paid the price escalation from award of contract up to scheduled dates of supply and erection of packages and there is no cost overrun due to time overrun. The Petitioner has furnished the comparative statement of capital cost of the contemporary projects of the Petitioner and its Joint Ventures and has submitted that this generating station is competitively priced at ₹4.65 crore/ MW for 500 MW unit size. Referring to the Commission's order dated 4.6.2012 notifying the benchmark capital cost of coal base thermal power stations, the Petitioner has submitted that the hard cost of the generating station as on COD is ₹4.76 crore/MW (2384.25 / 500) and is well within the benchmark cost of ₹4.92 Cr/MW specified by the Commission.

39. The Commission in its order dated 4.6.2012 has specified the Benchmark capital cost (Hard cost) for thermal power stations with coal as fuel in respect of extension power projects of 500 MW capacity as ₹4.92 crore/MW with December 2011 Indices as base. As stated, the cut-off date of the generating station is 31.3.2020 and the benchmark cost is based on December 2011 indices as base, as such there is a gap of



8 years and 3 months between the said periods. In consideration of the same, the yearly escalation in hard cost works out to be 2.42% (approx.).

40. The comparison of capital cost of the contemporary projects of the 500 MW capacity is as under:

Sl. No.	Station	Capacity MW	COD of the station	Cut-off Date of the Station	Capital Cost (Hard cost) as on COD of the Station (₹ crore/MW)	Capital Cost (Hard cost) as on cut-off date of the station (₹crore/MW)
1	Farakka-III	1 x 500	4.4.2012	31.3.2015	3.61	4.54
2	Vindhyachal-IV	2 x 500	27.3.2014	31.3.2017	4.21	5.12
3	Rihand-III	2 x 500	27.3.2014	31.3.2017	4.28	4.79
4	Unchahar-IV	1 x 500	30.9.2017	31.3.2020	4.23	6.03

41. It is evident from the above that the capital cost as on COD of the generating station is comparable to other contemporary projects. However, the estimated capital cost (hard cost) of the unit of the generating station as on cut-off date is higher than the capital cost as on the cut-off date of the other projects as shown in table above. The Petitioner has claimed the hard cost of ₹211811.43 lakh as on COD and ₹301760.61 lakh as on the cut-off date of the generating station. Accordingly, there is increase of ₹89949.18 lakh. As stated, the Petitioner in Form-9 has claimed projected additional capital expenditure of ₹45270.06 lakh from COD (30.9.2017) to 31.3.2019. Considering this projected additional expenditure, the capital cost of the generating station as on 31.3.2019 works out to ₹5.14 crore/MW which is still less than the approved hard cost of ₹5.86 crore/MW as per IA.

42. The reason of higher hard cost of ₹6.03 crore/MW at cut-off date (31.3.2020) is not ascertainable at this stage as the Petitioner has not furnished the details of deferred works/liabilities against the balance amount of ₹44679.12 lakh (89949.18 - 45270.06) to



be incurred between the COD and the cut-off date (31.3.2020). However, from the other submissions of the Petitioner, it appears that it has planned to incur an expenditure of ₹25000 lakh during 2019-20 for installing the Emission Control Systems (ECSs) to meet the new environmental norms notified by MOEF, GOI. As such, after excluding the amount of ₹25000 lakh, the capital cost of the station at cut-off date would work out to be ₹5.53 crore/MW which is less than the approved hard cost of ₹5.86 crore/MW as per IA. However, the matter of higher hard cost at cut-off date shall be dealt in details while approving the true up tariff of the station. Accordingly, we direct the Petitioner to furnish the reconciliation of originally approved works with the works completed up to COD and the balance works to be completed till cut-off date along with a detailed note providing justification of high capital cost in comparison to other contemporary projects as above, at the time of truing-up exercise, in terms of Regulation 8 of the 2014 Tariff Regulations.

### **Capital Cost for 2017-19**

43. Accordingly, the capital cost considered for the purpose of tariff is as under:

(₹ in lakh)

	<b>2017-18</b> (30.9.2017 to 31.3.2018)	<b>2018-19</b>
Opening Capital Cost	226169.33	233986.63
Add: Projected additional capital expenditure	7817.30	37452.77
<b>Closing Capital Cost</b>	<b>233986.63</b>	<b>271439.40</b>
Average Capital Cost	230077.98	252713.02

### **Debt-Equity Ratio**

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

*“19. Debt-Equity Ratio*

*(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 : equity ratio.”*

45. Considering the details of cash expenditure and net loan position as on COD of the generating station, the debt-equity ratio as on COD of Unit-I works out to 67.01: 32.99, which is within the debt-equity ratio of 70:30 specified under the above regulations. Accordingly, the debt-equity ratio of 70:30 has been considered for the purpose of tariff as on COD of Unit-I and the projected additional capital expenditure for the period from COD of Unit-I to 31.3.2019. This is subject to truing up exercise in terms of Regulation 8 of the 2014 Tariff Regulations.

### **Return on Equity**

46. 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.”

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

*“25. 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.”*

48. The Petitioner has claimed return on equity considering the base rate of 15.5% and effective tax rate of 21.3416% (MAT Rate @ 18.5% plus surcharge @ 12% plus Education Cess @ 3%) and 21.5488% (MAT Rate @ 18.5% plus surcharge @ 12% plus Education Cess @ 4%) for the period from COD of Unit-I to 31.3.2018 and 2018-19 respectively. This has been considered for the purpose of tariff and is subject to truing-up exercise. Accordingly, Return on Equity has been computed as under:

(₹ in lakh)

	2017-18 (30.9.2017 to 31.3.2018)	2018-19
Normative Equity - Opening	67850.80	70195.99
Addition due to additional capital expenditure	2345.19	11235.83
Normative Equity – Closing	70195.99	81431.82
Normative Equity – Average	69023.40	75813.91



Base Rate for return on equity	15.500%	15.500%
Applicable Tax Rate	21.3416%	21.5488%
Rate of Return on Equity (Pre-tax)	19.705%	19.758%
<b>Return on Equity</b>	<b>13601.06</b>	<b>14979.31</b>

## Interest on Loan

49. 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-capitalisation of such asset.*

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

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

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

*Provided further that if the generating station or the transmission system, as the case may be, does not have actual loan, then the weighted average rate of interest of the generating company or the transmission licensee as a whole shall be considered.*

*(6) The interest on loan shall be calculated on the normative average loan of the year by applying the weighted average rate of interest.*

*(7) The generating company or the transmission licensee, as the case may be, shall make every effort to re-finance the loan as long as it results in net savings on interest and in that event the costs associated with such re-financing shall be borne by the beneficiaries and the net savings shall be shared between the beneficiaries and the generating company or the transmission licensee, as the case may be, in the ratio of 2:1.*

*(8) The changes to the terms and conditions of the loans shall be reflected from the date of such re-financing.*

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



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

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

- i) Gross normative loan corresponding to admissible capital cost works out to ₹158318.53 lakh as on COD of Unit-I.
- ii) The net opening loan (normative) as on COD of Unit-I is same as gross normative loan, the cumulative repayment of normative loan up to the previous year/period being nil.
- iii) Depreciation allowed has been considered as (normative) repayments for respective periods.
- iv) Average net loan has been calculated as average of opening and closing.
- v) Weighted average rate of interest has been computed considering details of actual loan portfolio as submitted by the Petitioner.

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

	(₹ in lakh)	
	<b>2017-18</b> (30.9.2017 to 31.3.2018)	<b>2018-19</b>
Gross Normative Loan	158318.53	163790.64
Cumulative Repayment	0.00	6214.79
Net Normative Loan – Opening	158318.53	157575.85
Addition due to additional capital expenditure	5472.11	26216.94
Repayment of Normative Loan	6214.79	13615.11
Net Normative Loan – Closing	157575.85	170177.68
Normative Loan – Average	157947.19	163876.76
Weighted Average Rate of Interest	6.6771%	6.6771%
<b>Interest on Loan</b>	<b>10546.21</b>	<b>10942.13</b>

## Depreciation

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

*“(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 on 1.4.2014 shall be worked out by deducting the cumulative depreciation as admitted by the Commission up to 31.3.2014 from the gross depreciable value of the assets.*

*(7) The generating company or the transmission licensee, 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.”*

53. The Petitioner has claimed depreciation considering Weighted Average Rate of Depreciation (WAROD) of 5.3875% for the period from COD of Unit-I to 31.3.2019.



Considering the rates of depreciation as per Appendix-III to the 2014 Tariff Regulations, the admissible WAROD works out to 5.3876% and the same has been considered for the purpose of tariff. Accordingly, depreciation has been calculated as under:

	<i>(₹ in lakh)</i>	
	<b>2017-18</b> (30.9.2017 to 31.3.2018)	<b>2018-19</b>
Average capital cost	230077.98	252713.02
Weighted average rate of depreciation	5.3876%	5.3876%
Depreciable value	207070.19	227441.72
Remaining depreciable value	207070.19	221226.92
Depreciation for the period	6214.79	13615.11
<b>Depreciation for the year (annualised)</b>	<b>12395.63</b>	<b>13615.11</b>
Cumulative depreciation (at the end of the year/period)	6214.79	19829.90

### Operation & Maintenance Expenses

54. Regulation 29(1) (a) of the 2014 Tariff Regulations provides normative O&M expenses for 500 MW units of coal based generating stations as under:

<i>(₹ in lakh /MW)</i>				
<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>
16.00	17.01	18.08	19.22	20.43

55. The Petitioner has claimed the following O&M expenses:

	<i>(₹ in lakh)</i>	
	<b>2017-18</b>	<b>2018-19</b>
O&M Expenses under Reg. 29(1)	9610.00	10215.00
Water Charges under Reg. 29(2)	184.51	184.51
Total O&M Expenses	9794.51	10399.51

56. The normative O&M expenses claimed by Petitioner as above is in order and the same has been considered for purpose of tariff.

### Water Charges

57. The Petitioner has claimed Water charges for the period 2017-19 under Regulation 29(2) of the 2014 Tariff Regulations as under:



<i>(₹ in lakh)</i>	
<b>2017-18</b>	<b>2018-19</b>
184.51	184.51

58. The Petitioner has submitted that water facilities of the generating station are common for all the stages and distribution of consumptive water among stages is being done on the basis of stage capacity i.e. 27.10% for Stage-I, 27.10% for Stage-II, 13.55% for Stage-III and 32.26% for Stage-IV. The Petitioner has also submitted that the payment of water charges is based on actual consumption and not on the basis of allocation. The Petitioner has submitted that the actual water charges in 2016-17 for all the stages of FGUTPS is ₹571.95 lakh and the water charges for this unit @ 32.26% of water charges of whole generating station is ₹184.51 lakh. The Petitioner has claimed the water charges of ₹184.51 lakh for the years 2017-18 & 2018-19, based on the actual water charges for the year 2016-17. Accordingly, the water charges claimed by the Petitioner are allowed for the purpose of tariff. This is however subject to truing-up exercise.

59. Based on the above discussions, the total O&M expenses including water charges allowed is as under:

<i>(₹ in lakh)</i>		
	<b>2017-18</b>	<b>2018-19</b>
O&M Expenses under Regulation 29(1)	9610.00	10215.00
Water Charges under Regulation 29(2)	184.51	184.51
<b>Total O&amp;M Expenses</b>	<b>9794.51</b>	<b>10399.51</b>

### **Capital spares**

60. The Petitioner has not claimed capital spares, on projection basis, for the period 2017-19 and hence, the same has not been considered.

61. Based on the above, the total O&M expenses including water charges as claimed by the Petitioner and allowed is as under:



	(₹ in lakh)	
	2017-18	2018-19
O&M Expenses claimed	9610.00	10215.00
<b>O&amp;M Expenses allowed</b>	<b>9610.00</b>	<b>10215.00</b>
Water Charges claimed	184.51	184.51
<b>Water Charges allowed</b>	<b>184.51</b>	<b>184.51</b>
Total O&M Expenses claimed	9794.51	10399.51
<b>Total O&amp;M Expenses allowed</b>	<b>9794.51</b>	<b>10399.51</b>

## Operational Norms

62. The operational norms considered by the Petitioner in respect of the generating station is as under:

Normative Annual Plant Availability Factor (%)	85
Heat Rate (kcal/kwh)	2372.43
Auxiliary power consumption (%)	5.75
Specific Oil Consumption (ml/kwh)	0.50

## Normative Annual Plant Availability Factor (NAPAF)

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

*“(A) Normative Annual Plant Availability Factor*

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

*Provided that in view of the shortage of coal and uncertainty of assured coal supply on sustained basis experienced by the generating stations, the NAPAF for recovery of fixed charges shall be 83% till the same is reviewed. The above provision shall be reviewed based on actual feedback after 3 years from 1.4.2014.*

*The above provision shall be reviewed based on actual feedback after 3 years from 1.4.2014.”*

In terms of the above regulation, the NAPAF of 85% as claimed by the Petitioner is allowed for the period from COD till 31.3.2019.

## Heat Rate

64. Regulation 36 (C) (b) of the 2014 Tariff Regulations provides as follows:

*“New Thermal Generating Station achieving COD on or after 1.4.2014*

*(i) Coal based and lignite-fired Thermal Generating Stations*

*=1.045 × Design Heat Rate (kcal/kWh)*



Where the Design Heat Rate of a generating unit means the unit heat rate guaranteed by the supplier at conditions of 100% MCR, zero percent make up, design coal and design cooling water temperature/back pressure.

Provided that the design heat rate shall not exceed the following maximum design unit heat rates depending upon the pressure and temperature ratings of the units:

Pressure Rating (Kg/cm <sup>2</sup> )	150	170	170	247
SHT/RHT (deg.C)	535/535	537/537	535/565	565/593
Type of BFP	Electrical Driven	Turbine Driven	Turbine Driven	Turbine Driven
Max Turbine Heat Rate (kCal/kWh)	1955	1950	1935	1850
Minimum Boiler Efficiency				
Sub-Bituminous Indian Coal	0.86	0.86	0.86	0.86
Bituminous Imported Coal	0.89	0.89	0.89	0.89
Max Design Unit Heat Rate (kCal/kWh)				
Sub-Bituminous Indian Coal	2273	2267	2250	2151
Bituminous Imported Coal	2197	2191	2174	2078

Provided also that where unit heat rate has not been guaranteed but turbine cycle heat rate and boiler efficiency are guaranteed separately by the same supplier or different suppliers, the unit design heat rate shall be arrived at by using guaranteed turbine cycle heat rate and boiler efficiency:

Provided also that where the boiler efficiency is below 86% for Sub-bituminous Indian coal and 89% for bituminous imported coal, the same shall be considered as 86% and 89% respectively for Sub-bituminous Indian coal and bituminous imported coal for computation of station heat rate:

65. The Petitioner vide its affidavit dated 24.1.2019 has submitted that the ceiling heat rate provided for this generating station in terms of the 2009 Tariff Regulations was 2276 kcal/kWh. Accordingly, it has submitted the Guaranteed Design Gross Turbine Cycle Heat Rate and design Boiler Efficiency of the plant from OEM was approved keeping in mind the ceiling parameters of heat rate provided in the then prevailing Tariff Regulations. The Petitioner has further submitted that the Design Heat Rate as awarded for this generating station was 2270.27 kcal/kWh, which is below the ceiling limit of heat rate of 2276 kcal/kWh provided in the 2009 Tariff Regulations. Since the COD of unit is 30.9.2017, the applicable SHR norm for this generating station under Regulation 36(c) of the 2014 Tariff Regulations works out to 2347.605 kcal/kWh. The Petitioner has pointed out that the design heat rate of the generating station is 2270.27 kcal/kWh. The





operating margin available would be only 3.4%. The Petitioner has stated that as the operating margin of 4.5% is considered reasonable and appropriate by the Commission, the Commission may relax the provision and allow the operating margin of 4.5% over the design heat rate and allow the SHR of 2372.4234 kcal/kWh. In response to the direction of the Commission vide ROP of the hearing dated 13.3.2019, the Petitioner has made similar submissions and has stated that the SHR of 2372.4234 kcal/kWh may be allowed, based on the boiler efficiency of 85.1% and turbine cycle heat rate of 1932 kcal/kWh. The Respondent UPPCL has submitted that the operational norms specified by the Commission under the 2014 Tariff Regulations may be considered and the prayer of the Petitioner for relaxation of norms may be rejected.

66. We have examined the matter. The GSHR norm under the 2014 Tariff Regulations was based on past performance data of thermal plants and was notified after extensive stakeholder consultations. The prayer of the Petitioner for relaxation of SHR norm is therefore rejected. Considering the ceiling limit of 86% and Turbine Cycle Heat Rate of 1932 (kcal/kWh), the Gross Station Heat Rate (GSHR) for the period from COD till 31.3.2019 works out as 2347.60 kcal/kWh ( $1.045 \times 1932/0.86$ ) and the same is considered for the purpose of tariff.

### **Auxiliary Power Consumption (APC)**

67. The Petitioner vide its affidavit dated 24.7.2017 has prayed for relaxed APC of 6.5% in respect of Unit-I on the ground that the 2009 Tariff Regulations provided for APC of 6.5% for 500 MW units (Steam Driven BFPs) with IDCT and that the auxiliaries procured from OEM and plant was erected and commissioned, keeping in view the ceiling parameters of APC provided in the prevailing Tariff Regulations. The Petitioner has however not prayed for relaxation in the revised tariff petition dated 24.1.2019.



Regulation 36(E)(a) of the 2014 Tariff Regulations provides APC of 5.75% for coal based generating stations of 500 MW units with Induced Draft cooling tower and steam driven BFP. Accordingly, the APC of 5.75% in terms of the aforesaid regulation is considered.

### **Specific Fuel Oil Consumption**

68. Regulation 36(D)(a) of the 2014 Tariff Regulations provides for Secondary fuel oil Consumption of 0.50 ml/kWh for coal-based generating stations. The Petitioner has claimed the Specific Fuel Oil Consumption of 0.50 ml/kWh and the same has been allowed in terms of the aforesaid regulation.

69. Accordingly, the operational norms for the generating station are allowed as under:

NAPAF	85%
GSHR	2347.60 kCal/kWh
APC	5.75%
Specific Fuel Oil Consumption	0.50 ml/kWh

### **Interest on Working Capital**

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

*“28. Interest on Working Capital:*

*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.*

71. Regulation 28(2) of the 2014 Tariff Regulations provides as under:

*“(2) The cost of fuel in cases covered under sub-clauses (a) and (b) of clause (1) of this regulation shall be based on the landed cost incurred (taking into account normative transit and handling losses) by the generating company and gross calorific value of the fuel as per actual for the three months preceding the first month for which tariff is to be determined and no fuel price escalation shall be provided during the tariff period.’*

### **Fuel Components and Energy Charges in Working Capital**

72. The Petitioner has claimed cost for fuel component in working capital based on the price and “as received” GCV of coal procured and burnt for the preceding three months i.e. July 2017, August 2017, and September 2017 and secondary fuel oil for preceding three months before COD i.e. July 2017, August 2017, and September 2017 as under:

*(₹ in lakh)*

	<b>2017-18</b>	<b>2018-19</b>
Cost of Coal for stock (30 days)	7266.48	7266.48
Cost of Coal for generation (30 days)	7266.48	7266.48
Cost of Secondary fuel oil 2 months	114.64	114.64

73. The COD of the unit is on 30.9.2017. Therefore, preceding three months are June, July and August 2017 excluding the month of COD i.e. September 2017. However, the Petitioner has furnished the fuel data only for the months of July, August and September 2017. In view of this, the computation of energy charges and fuel component in working capital has been worked out, based on the fuel data as furnished by Petitioner. The Petitioner is however directed to furnish the fuel data for the month of June 2017 for computation of energy charges and fuel component in working capital at the time of truing-up exercise.

74. The computation of energy charges and fuel component (coal cost) in working capital during the period 2016-19 is based on “as received GCV” of coal. The Petitioner



has claimed ECR of 253.914 paise/kWh, based on the weighted average price, GCV of coal on 'as received' basis & oil procured and burnt for the preceding three months before COD of the generating station. The cost for fuel components in working capital has been computed at 85% NAPAF for the year 2017-18 & 2018-19 based on 'as received GCV' of coal and price of coal procured and GCV and cost of secondary fuel oil procured for the months of July 2017, August 2017 and September 2017 as given under:

(₹ in lakh)

	2017-18	2018-19
Cost of Coal for stock- 30 days	7192.09	7192.09
Cost of Coal for generation-30 days	7192.09	7192.09
Cost of Coal for 60 days	14384.18	14384.18
Cost of Secondary fuel oil 2 months	114.64	114.64

### Energy Charge Rate

75. Regulation 30 (6)(a) of the 2014 Tariff Regulations provides for computation and payment of Capacity Charge and Energy Charge for thermal generating stations as under:

*"6. Energy charge rate (ECR) in Rupees per kWh on ex-power plant basis shall be determined to three decimal place in accordance with the following formula:*

*(a) For coal based and lignite fired stations*

$$ECR = \{(GHR - SFC \times CVSF) \times LPPF / CVPF + SFC \times LPSFi + LC \times LPL\} \times 100 / (100 - AUX)$$

*Where,*

*AUX = Normative auxiliary energy consumption in percentage.*

*CVPF = Gross calorific value of primary fuel as received, in kCal per kg, per litre or per standard cubic metre, as applicable.*

*CVSF = Calorific value of secondary fuel, in kCal per ml.*

*ECR = Energy charge rate, in Rupees per kWh sent out.*

*GHR = Gross station heat rate, in kCal per kWh.*

*LC = Normative limestone consumption in kg per kWh.*

*LPL = Weighted average landed price of limestone in Rupees per kg.*



*LPPF = Weighted average landed price of primary fuel, in Rupees per kg, per litre or per standard cubic metre, as applicable during the month.*

*SFC= Normative specific fuel oil consumption, in ml/ kWh*

*LPSFi= Weighted average landed price of secondary fuel in ₹/ ml during the month*

76. The Petitioner has claimed Energy Charge Rate (ECR) of 253.914 Paise/kWh based on the weighted average price, GCV of coal & Oil procured and burnt for the preceding three months. ECR as worked out, based on operational norms specified in 2014 Regulations and on “as received” GCV of coal for the 3 months i.e. July to September 2017, as given below has been considered for allowing 2 months Energy Charge in Working capital:

	Unit	2017-18 (Pro-rata)	2018-19
Capacity	MW	500	500
Gross Station Heat Rate	Kcal/kWh	2347.60	2347.60
Auxiliary Energy Consumption	%	5.75	5.75
Weighted average GCV of oil	Kcal/lit	9819.90	9819.90
Weighted average GCV of Coal	Kcal/kg	3580.77	3580.77
Weighted average price of oil	₹/KL	36949.78	36949.78
Weighted average price of Coal	₹/MT	3592.48	3592.48
Rate of energy charge ex-bus	₹/kWh	2.513	2.513

77. The Energy Charges for two months is worked out as under:

<i>(₹ in lakh)</i>	
2017-18	2018-19
14696.56	14696.56

78. Accordingly, the fuel component and Energy Charges allowed in working capital is as under:

	<i>(₹ in lakh)</i>	
	2017-18 (Pro-rata)	2018-19
Cost of Coal for 60 days	14384.18	14384.18
Cost of Secondary fuel oil 2 months	114.64	114.64
Energy Charges for 2 months	14696.56	14696.56



## Maintenance Spares

79. The Petitioner has claimed maintenance spares in the working capital as under:

<i>(₹ in lakh)</i>	
2017-18	2018-19
1958.90	2079.90

80. Regulation 28(1)(a)(iv) of the 2014 Tariff Regulations provide for maintenance spares @ 20% of the O&M expenses as specified in Regulation 29. Accordingly, the maintenance spares @ 20% of O&M expenses are allowed as under:

<i>(₹ in lakh)</i>	
2017-18	2018-19
1958.90	2079.90

## O & M Expenses (1 month)

81. Regulation 28(a)(vi) of the 2014 Tariff Regulations provides for O&M expenses for one month for coal-based generating station. O&M expenses for 1 month claimed by the Petitioner for the purpose of working capital are found to be in order and accordingly the same is allowed as under:

<i>(₹ in lakh)</i>	
2017-18	2018-19
816.21	866.63

## Receivables

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

<i>(₹ in lakh)</i>		
	2017-18 (30.9.2017 to 31.3.2018)	2018-19
Variable Charges -two months	14696.56	14696.56
Fixed Charges -two months	8574.34	9190.66
<b>Total</b>	<b>23270.90</b>	<b>23887.22</b>

## Rate of interest on working capital

83. 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.”*

84. In terms of the above regulations, Bank Rate of 12.60% (i.e. SBI base rate of 9.10% as on 1.4.2017 plus 350 bps) for the period from COD of Unit-I till 31.3.2019 has been considered for the purpose of calculating interest on working capital. Accordingly, Interest on working capital has been computed as under:

	<i>(₹ in lakh)</i>	
	<b>2017-18 (30.9.2017 to 31.3.2018)</b>	<b>2018-19</b>
Cost of coal for 30 days towards stock	7192.09	7192.09
Cost of coal for 30 days towards generation	7192.09	7192.09
Cost of secondary fuel oil for two months	114.64	114.64
Maintenance spares	1958.90	2079.90
Receivables for two months	23270.90	23887.22
O&M expenses for one month	816.21	866.63
<b>Total Working Capital</b>	<b>40544.83</b>	<b>41332.56</b>
Rate of interest	12.6000%	12.6000%
<b>Interest on working capital</b>	<b>5108.65</b>	<b>5207.90</b>

### Annual Fixed Charges

85. Accordingly, the fixed charges approved for the generating station for the period from 2017-19 is summarized as under:

	<i>(₹ in lakh)</i>	
	<b>2017-18 (30.9.2017 to 31.3.2018)</b>	<b>2018-19</b>
Depreciation	12395.63	13615.11
Interest on Loan	10546.21	10942.13
Return on Equity	13601.06	14979.31
Interest on Working Capital	5108.65	5207.90
O&M Expenses	9794.51	10399.51
<b>Total</b>	<b>51446.06</b>	<b>55143.97</b>

*Note: (1) All figures are on annualized basis. (2) All figures under each head have been rounded. The figure in total column in each year is also rounded. As such, the sum of individual items may not be equal to the arithmetic total of the column.*

86. The pro rata fixed charges shall be calculated using the bases as shown below:



	<b>2017-18</b> <b>(30.9.2017 to</b> <b>31.3.2018)</b>	<b>2018-19</b>
No. of days in year	365	365
No. of days for which tariff is to be calculated	183	365

### **Month to Month Energy Charges**

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

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

### **Application filing fee and Publication Expenses**

89. The Petitioner has sought reimbursement of filing fee and also the expenses incurred towards publication of notices for application of tariff for the period 2017-19. The Petitioner has deposited the filing fees for the period 2017-19 in terms of the provisions of the Central Electricity Regulatory Commission (Payment of Fees) Regulations, 2012. The Petitioner has also incurred charges towards publication of the tariff petition in the newspapers. Accordingly, in terms of Regulation 52 of the 2014 Tariff Regulations, the Petitioner is entitled to recover the filing fees and the expenses incurred on publication of notices for the period 2017-19 directly from the respondents. Accordingly, the expenses incurred by the Petitioner towards tariff application filing fees





and publication of notices in connection with the present petition shall be directly recovered from the Respondent beneficiaries on pro rata basis.

90. The Petitioner has submitted that it is expected to incur expenditure of ₹250 crore during the year 2019-20 towards installation of Emission Control Systems (ECSs) in order to meet the new environmental norms notified by MOEF, GOI on 7.12.2015. The Petitioner has accordingly prayed that it may be permitted to claim the said expenditure under change in law provisions of the 2014 Tariff Regulations. The Petitioner has also prayed that additional APC and O&M expenses on account of ECSs and other installations may be allowed, as and when commissioned, in order to meet the new environmental norms.

91. Considering the fact that the expenditure towards installation of ECSs shall be incurred by the Petitioner during next control period of 2019-24, liberty is granted to the Petitioner to claim the said expenditure in the tariff petition to be filed for the period 2019-24. Accordingly, the Petitioner is at liberty to claim the expenditure towards installation of ECSs and other installations, with relevant documents, including the prayer for allowing relaxed operational norms which shall be considered in accordance with law.

92. The Petitioner has also sought for the revision of O&M charges by including the revised salary of employees with effect from the COD of the generating station as and when the same is finalized. Accordingly, liberty is granted to the Petitioner to approach the Commission with a separate petition and the same shall be dealt with, on case to case basis, in accordance with law.



93. The annual fixed charges approved for the period 2017-19 as above are subject to revision based on the truing-up exercise in terms of Regulation 8 of the 2014 Tariff Regulations.

94. This order disposes of Petition No. 197/GT/2017.

*Sd/-*  
**(I.S.Jha)**  
**Member**

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

*Sd/-*  
**(P.K.Pujari)**  
**Chairperson**

