CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI

Petition No. 129/GT/2015

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

Date of Order: 30.3.2017

In the matter of

Petition for determination of tariff of Palatana Combined Cycle Gas Based Power Project (726.6 MW) for the period from 1.4.2014 to 31.3.2019

AND

ONGC Tripura Power Company Limited
6th Floor, A Wing, IFCI Towers,
New Delhi-110019 ……**Petitioner**

Vs

1. Assam Power Distribution Company Ltd.
"Bijulee Bhawan", Paltan bazar
Guwahati-781 001

2. Department of Power,
Govt. of Arunachal Pradesh
Vidyut Bhawan
Itanagar – 791 111

3. Department of Power,
Government of Nagaland
Kohima – 797 001

4. Manipur State Power Distribution Company Ltd.,
Government of Manipur
Keishampat, Imphal – 795001

5. Power and Electricity Department,
Government of Mizoram
Aizawal, Mizoram – 796001

6. Meghalaya Energy Corporation Limited,
Short Round road, "LUMJINGSHAI"
Shillong – 793001, Meghalya

7. Tripura State Electricity Corporation Limited,
VidyutBhawan, North Banamalipur,
Agartala, Tripura – 799001

…Respondents

Parties Present:

Shri A.C. Sarmah, OTPCL
Shri Amit Dabas, OTPCL
Shri Arvinder Gupta, OTPCL
Ms. Rashmi Wattal, OTPCL
Shri Mayank Shekhar, OTPCL
Shri S. Ganguly, OTPCL
Shri Samarjeet Thakur, OTPCL
Shri Shree Narayan, OTPCL

ORDER

The petitioner, ONGC-Tripura Power Company Ltd (OTPCL) has filed this petition for approval of tariff of Palatana Combined Cycle Gas Turbine Power Project (726.60 MW)("the project/the generating station") for the period from 1.4.2014 to 31.3.2019 in accordance with the provisions of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2014 ("the 2014 Tariff Regulations").

2. The generating station with an installed capacity of 726.6 MW comprises of two Gas Turbine (GT) units of 232.39 MW each and two Steam Turbine (ST) units of 130.91 MW. The petitioner is a joint venture of ONGC, IL&FS (through its affiliate IEDCL) and the Govt. of Tripura with the major shareholding by ONGC (50%), IEDCL (26%), Govt. of Tripura (0.5%) and Residual Equity (23.5%) for setting up the project. The beneficiaries of the North Eastern States have been allocated a capacity of 628 MW from the generating station and the balance capacity of 98 MW is towards merchant sale.

3. Petition No.199/GT/2013 was filed by the petitioner for determination of tariff of the generating station for the period from anticipated COD of Block-I (31.7.2012) and from COD of Block-II (31.10.2012) to 31.3.2014. Since the units of the generating station could not be declared under commercial operation, the petitioner filed Interlocutory Application (I.A No.15/2013) and submitted

that Block-I of the generating station was expected to be declared under commercial operation on 20.6.2013 and Block-II on 31.10.2013. It had prayed that tariff for the proposed sale of power to respondents from Block-I may be granted with liberty to approach the Commission for determination of tariff of Block-II as and when the same is declared under commercial operation. Subsequently, the petitioner revised the petition considering the actual COD of Block-I from 4.1.2014 to 31.3.2014 and accordingly, the Commission vide order dated 31.8.2015 determined the tariff of Block-I of the generating station on *pro rata* basis for the period from 4.1.2014 to 31.3.2014 as under:

(₹ in lakh)

	2013-14
	(4.1.2014 to 31.3.2014)
Return on Equity	1428.09
Interest on Loan	3681.09
Depreciation	1732.25
Interest on Working Capital	538.06
O&M Expenses	1657.05
Total	**9036.54**

4. While so, Block-II of the generating station was declared under commercial operation on 24.3.2015 and accordingly the petitioner has filed this petition (Petition No.129/GT/2015) for determination of tariff for Blocks I & II of the generating station for the period 2014-19 in accordance with the provisions of the 2014 Tariff Regulations. Thereafter, based on the prayer of the petitioner, the Commission by order dated 17.6.2015 granted interim tariff for the years 2014-15 and 2015-16, subject to final determination of tariff for this generating station as under:

(₹ in lakh)

	2014-15		**2015-16**
	1.4.2014 to 23.3.2015	**24.3.2015 to 31.3.2015**	
Return on Equity	7029.50	293.94	13411.12
Interest on Loan	11951.64	510.05	22481.46
Depreciation	7804.76	326.36	14930.99
Interest on Working Capital	2378.37	107.07	4967.77
O & M Expenses	9434.20	422.82	20606.38
Total	**38598.48**	**1660.25**	**76397.71**

5. The petitioner vide affidavit dated 15.12.2015 has sought approval of tariff in accordance with the provisions of the 2014 Tariff Regulations. Accordingly, the annual fixed charges claimed by the petitioner for the period 2014-19 are as under:

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Depreciation	10525	18876	19414	19664	19737
Interest on Loan	14151	29615	28338	27003	25118
Return on Equity	9643	19081	19962	19962	19962
Interest on Working Capital	2805	5745	5934	6130	6322
O & M Expenses	9862	20616	22019	23517	25123
Total	**46986**	**93932**	**95667**	**96275**	**96262**

6. In compliance with the directions of the Commission, the petitioner has filed additional information with copies to the respondents. The respondent APDCL has filed its reply vide affidavit dated 12.2.2016 and the petitioner has filed its rejoinder vide affidavit dated 25.4.2016 to the same. The petition was heard on 16.2.2016 and the Commission after directing the petitioner to submit certain additional information, reserved its orders in the petition. Based on the submissions of the parties and the documents available on record, we proceed to determine the tariff of the generating station for the period 2014-19 as stated in the subsequent paragraphs.

Commissioning Schedule

7. The Board of Directors of the Petitioner Company in its 21st meeting on 23.6.2008 had considered the evaluation report of M/s FITCHNER Consulting Engineers (India) Private Ltd (Technical Consultants) on the price bid submitted by M/s BHEL on 12.6.2008 and accordingly, Notice of Award (NOA) was issued to M/s BHEL on 23.6.2008 to ensure the completion of the project within 42 to 45 months from the date of NOA (zero date). Thus, the scheduled date of commissioning of the project from the zero date and the actual COD of the two blocks of the generating station are as under:

Description	Scheduled COD	Actual COD	Time overrun
Block-I / Unit-I	22.12.2011	4.1.2014	744 days
Block-II / Unit-II	22.3.2012	24.3.2015	1097 days

Admissibility of Additional Return on Equity (ROE)

8. The date of original investment approval is 18.12.2008. As specified by the Commission, the time line for completion of a green field gas based combined cycle project above 100 MW (ISO

rating) from the date of investment approval is 30 months for the first block with subsequent Blocks at an interval of 4 months each. The actual COD of Block-I/ Unit-I is 4.1.2014 i.e. about 60 months from the date of investment approval and the actual COD of Block-II /Unit- II (generating station) is 24.3.2015 i.e. about 75 months from the date of investment approval. Since the generating station was declared under commercial operation on 24.3.2015 and is beyond the time line specified by the Commission, the generating station is not entitled of additional 0.5% ROE allowed for timely completion of the project.

Time Overrun

9. There is significant time overrun in the declaration of commercial operation of Units I & II/Blocks-I &II of this generating station. The Commission in order dated 31.8.2015 in Petition No.199/GT/2013 had approved the tariff of Block-I (Unit-I) from COD (4.1.2014) to 31.3.2014 and had examined in detail the time overrun of 744 days and had condoned the time overrun of 675 days in the COD of Block-I/Unit-I, on the ground that the same was beyond the control of the petitioner and had accordingly disallowed the time overrun of 69 days for the said unit/block. The question of time overrun for Unit-I/Block-I having been settled in the said order dated 31.8.2015, we proceed to examine the time overrun of 1097 days in the declaration of COD of Unit-II/Block-II in this order.

Reasons for Time Overrun

10. The petitioner vide affidavit dated 14.12.2015 has submitted the reasons for time overrun as under:

(A) <u>Non-availability of Fuel Gas (4.1.2014 to 24.3.2015)</u>

(a) After the COD of Block-I/Unit-I till October, 2014, the petitioner faced non-availability of fuel gas to commission the Block-II/Unit-II of the project. The fuel supplier had informed the petitioner that it was not able to supply fuel gas for Block-II/Unit-II of the project till October 2014 due to the reasons beyond their control. Considering the fact that the location of the generating station was in the remote North-East location of the country, far from any gas grid connectivity, the petitioner had no other option for sourcing of fuel gas.

(b) The fuel gas supplier confirmed the availability of fuel gas supply for Block-II/Unit-II of the project in October 2014 and thereafter, the preparation activities for Block-II/Unit-II were commenced immediately by the petitioner and the same were synchronized in the combined cycle mode on 8.11.2014, and successfully declared the commercial operation on 24.3.2015 i.e within 136 days. It is pertinent to mention that GT and ST cannot be operated separately and function as a unit while in operation.

(c) After the Combined Cycle (CC) mode was synchronized on 8.11.2014, all the machines and equipment's related with Block-II/Unit-II undertook the requisite pre-commissioning tests, during which various teething problems were witnessed and was attended to with appropriate actions. Following are the major tests, which were undertaken as a part of the pre-commissioning activities of Block-II/Unit-II.

- DLN Tuning of GT-2 and base load operation
- HRSG Floating valves Safety check
- HRSG Hydro test, Inspection by Boiler inspector
- Commissioning of Safety system of Boiler
- Water, Gas and Steam line checks
- STG-2 Auto synchronization checks
- GT-2 over Speed testing
- UAT-2 Commissioning, Fast Bus Transfer system checks
- Commissioning of protection system of Turbine/Generator/ Transformer
- Block-II shutdown for IDLN Tuning, Blackout co-ordination checks
- Block-II trial operation (7^{th} to 23^{rd} March, 2015)

(d) It is emphasised that the technical teething problems encountered by the petitioner during the commissioning of Block-II/Unit-II could not have been detected prior to the initiation of start-up activities of Block-II/Unit-II. This was initiated only after CC mode synchronisation as on 8.11.2014.

(e) Various equipments including HRSG were kept under cold preservation till the supply of gas commenced for Block-II/Unit-II. The GT required special inspection to minimise the chance of damage due to operation. The commissioning activities were also affected by dense fog in the state during the winter season. The delay of 136 days from the first CC mode of operation of Block-II/Unit-II to its COD is quite normal with the given conditions. Moreover, the plant is located in a remote site operated in a weak grid and often encountered vibrant weather conditions.

11. Accordingly, the petitioner has prayed that the Commission may condone the delay in COD of Block-II/Unit-II (i) due to non-availability of fuel gas till October, 2014 and (ii) from CC mode synchronisation till COD, i.e. from 8.11.2014 to 23.3.2015 and allow the time overrun involved in the COD of Block-II/Unit-II, in accordance with the principles laid down by the Appellate Tribunal of Electricity (the Tribunal) in its judgment dated 27.4.2011 in Appeal No. 72/2010 (MERC v MPGCL) while approving the capital cost of Block-II/Unit-II of the project.

12. The Commission vide ROP of the hearing dated 16.2.2016 had directed the petitioner to furnish proper justification for time overrun from the schedule COD to actual COD of Block-II/Unit-II and the agency responsible for the delay (in specific terms) for each activity, along with PERT and Bar charts of the project commissioning activities. As regards the reasons for time overrun due to non-availability of fuel gas from 4.1.2014 (COD of Unit-I) to 24.3.2015 (COD of Unit-II) and teething problem in the machines, the petitioner was directed to submit the following information:

(a) Date on which Unit-II was ready in all respects for trial run for declaration of COD and the subsequent dates on which Unit-II was held up for the want of gas;

(b) Quantum of gas received by the generating station as on COD of Unit-I (4.1.2014) and the period from 4.1.2014 to 24.3.2015 in tabular form (date-wise) along with explanation as to why the required gas for trial run of Unit-II could not be arranged from ONGC;

(c) Justification as to non-availability of gas along with necessary correspondence/ documents with the gas supplier during the period from 4.1.2014 to October, 2014;

(d) Justification as to the nature of teething problem, rectification required and the time taken for such rectification work, duly supporting with documents/ correspondence with OEM.

13. In response, the petitioner vide affidavit dated 18.3.2016 has furnished the reasons in respect of time overrun from scheduled COD to actual COD of Block-II/Unit-II as under:

Block/Unit	Scheduled COD	Actual COD	Delay from ScheduledCOD
Block-II/Unit-II (363.3 MW)	22.3.2012	24.3.2015	1097 days

14. The petitioner has submitted that the reasons for time overrun of Block-II/Unit-II which were beyond its control and therefore not attributable to the petitioner are as under:

a) Logistic constraint: From 22.3.2012 to 22.10.2012

b) Unavailability of full load for testing : From 22.10.2012 to 1.3.2013

c) Defects in HRSG : 14.2.2013 to 9.5.2013

d) Gas contamination : 9.5.2013 to 4.1.2014

e) Non-availability of Fuel Gas : 4.1.2014 to 24.3.2015

15. In addition to the above, the reasons for further delay in the commissioning of Block-II/Unit-II as submitted by the petitioner is extracted as under:

> "***Over Dimensional Cargo (ODC)***
>
> *To set up this power project, 90 Over Dimensional Cargo (ODC) were needed to be transported to the site. Maximum weight of these ODC was around 300 MT, maximum width was around 5 mtr, maximum height around 5.1 mtr and maximum length around 24 mtr.*
>
> ***ODC Logistics Constraints***
>
> *To transport the Over Dimensional Cargo (ODC) from mainland India to the plant site, all possible transport routes (Air/Waterway/Rail/Road) were explored. It was only the combined waterways and road route that was found feasible for transportation of ODC as other modes of transport faced challenges of tunnels & bridge capacities (Rail route), runway length & aircraft capacity (Air route) and limited bridge capacity and railway overbridge spans (Road route). The road route also posed other constraints like many weak bridges could not be bypassed, high bypass construction cost on some of the bridges, low clearance span for bowstring girder bridges and electrified railway crossings having low height clearance for ODC.*
>
> ***Long Winding Roadways and Waterways Route***
>
> *The waterways and road route earlier envisaged was Kolkata-Karimganj(Assam)-Palatana route which had a total distance of 1650 Km. On this route, the water draft was available from May to September. Between Karimganj and Palatana, the bridges were not strong enough and bypasses needed to be constructed. Road transportation too involved hilly terrain (125 Km ghat section) where bypass construction was extremely difficult. Bypass construction and road transportation on this route was possible during dry season from November to April.*
>
> ***Transportation through Foreign Country Territory***
>
> *Limited transportation window and risk involved in transportation of ODCs through ghat section led us to explore transportation through Bangladesh territory i.e. Kolkata-Ashuganj(Bangladesh)-Palatana route which had a total distance of 966 Km. This route brought distinct advantages over Karimganj route e.g. waterways navigable throughout the year, very small ghat section to be traversed and comparatively smaller distance to be travelled. However it required permission from Bangladesh government for declaring*

Ashuganj as port-of-call in Indo-Bangla Water Transport Protocol and allowing movement of ODC through Bangladesh after construction of jetties and bypasses.

With full support from Government of India (GoI) and Govt.Of Tripura, Bangladesh government included Ashuganj as port-of-call in Protocol in August 2010 and gave permission for movement of ODCs through their territory on 30th November 2010 and gave permission for movement of ODCs through their territory on 29th November 2010.

Onset of Early Monsoons/Jetties and Bypasses

Bypass/jetty construction takes nearly three months and it was only in mid March 2011 that bypasses were ready. 24 bypasses were constructed, 15 in Bangladesh and 9 in India. Also 4 jetties were constructed, 1 in India and 3 in Bangladesh. Early onset of monsoon in Bangladesh gave OTPC time to transport only 35 ODC (of total 90 ODCs) till mid April 2011. The bypasses/jetties were washed out in monsoon and the remaining ODC could be transported only after the monsoon.

The jetties and bypasses were washed out several times and had to be repaired and reconstructed time and again. Barges were used to cross perennial river in Bangladesh at places where bypass construction was not possible. This delayed the transportation of materials and the project as a whole. It required a great effort on the part of OTPC to develop roads, bypasses and jetties in a foreign country for the transportation of ODC's and other critical items. The 90 ODCs were transported to Palatana site from Trichy / Hyderabad/Bhopal/Haridwar covering an average distance of nearly 3000 Km each. For commissioning the project as per scheduled COD, BHEL had to provide the material/equipment for both units at the site by December 2010. However the last ODC for both units reached site in January 2012. Due to this late arrival of equipments at site, which primarily happened due to delay in receipt of permission from Government of Bangladesh (MOU signed in November 2010) and early onset of monsoon, as explained earlier, project got delayed. OTPC was earnestly exploring all the routes for safe transit of ODC cargo from the very start of the project. The details of these efforts are captured in the Board Minutes annexed with this petition.

Project in Remote Area/Difficult Terrain/Manpower-Material Problem

Being situated in a difficult terrain the region faces a scarcity of construction materials, construction equipment's and skilled manpower. Due to its remote location the connectivity of the project location with mainland India was a challenge and posed great difficulty in transportation of materials, equipment and manpower to the site. Most of the construction material is brought to the project site from different states. The manpower for the project activities is not available locally and is sourced from other places. These factors delayed the civil works at the site.

After synchronization of Unit-I in October, 2012, sufficient load for testing purposes of both units was not available due to evacuation system constraints. After the completion of Palatana-Bongaigaon transmission line till Byrnihat on 1.3.2013, the gas available was sufficient to operate only one Unit at a time. This delay in availability of transmission system delayed the commissioning activities of Unit-II.

While both units of the project were nearing commissioning, HRSG associated with Unit-I developed defects due to problem in material used in the HRSG. Upon inspection, similar material problem was also observed in HRSG of Unit-II and the HRSG defects in both units were rectified simultaneously by 9th May 2013. The defect was the insulation failure of cladding sheets in the inlet duct of HRSG. The whole cladding sheets including insulation had to be replaced and the material had to be brought from BHEL, Trichy. The total area of the inlet duct is 595 sqmetre. Approximately 43 tons of material (SS cladding sheet, Insulation material. SS binding wire, cladding pin etc) had to be brought from Trichy. The details were submitted to the Commission and the documents submitted are also annexed with this submission.

Since May 2013, the problems with the quality of the fuelgas supplied by Oil & Natural Gas Corporation (ONGC), supplier of Fuel to the PalatanaProject hampered the commissioning activities. Contamination of foreign particles was observed with the fuel gas thereby restricting drawl of gas. This contamination damaged two of the gas booster compressors (GBC) which were sent to BHEL Hyderabad works for repair. ONGC carried out the pigging of the pipeline twice on 14th June 2013 and 28fh June 2013, did gasket blasting, hard board blasting and even flared some quantity of the fuel gas to expel the dust particles, still the fuel gas remained contaminated. On 08.07.13 ONGC decided to undertake a pipeline cleaning programme of cross country pipeline from Agartala to Palatana so as to provide clean fuel gas to Palatana project by 26th July 2013. ONGC carried out pigging of the entire 53 Km pipeline for 48 times to remove the contamination in fuel gas. Even with this repeated pigging of the pipeline a limited supply of relatively clean gas was supplied with which OTPC was able to operate Unit-1 of the project upto a load of 180 MW for over three weeks (from 17 October 2013 to 7' November 2013). However the contamination, in form of black dust, persisted at higher loads in spite of pigging of the entire 53 Km pipeline by ONGC for 48 times, making it difficult to complete the balance trial run/commissioning tests. Meanwhile ONGC made further efforts to provide clean gas to OTPC by changing some of the filters and scrubbers and also by installing a cyclone separator. Since parts of the cyclone separator were imported, it delayed availability of clean gas. Also, as the contamination in the gas was still there, ONGC undertook the pigging of the pipeline once again using PIGs imported from USA under the supervision of US experts. The details were submitted to the Commission and are annexed to this submission for ready reference.

Due to contaminated gas, trial run of Unit-I and pre-commissioning checks followed by trial run of Unit-II got delayed. After cleaning the entire pipeline and commissioning of cyclone separator, the fuel supplier started supply of relatively contamination free gas in December 2013, which was just sufficient for operation of Unit-I. Utilizing this gas Unit-I got commissioned on 4th January 2014. However due to unavailability of gas for operation of Unit-II, commissioning of Unit-II could not be completed.

In the meanwhile the fuel supplier was also working to expedite fuel supply required for Unit-II. However, due to blockade and law &order issues, the laying of pipeline got delayed resulting in delay in availability of gas for Unit-II. The fuel supplier faced blockade by locals/villagers and law & order problem problems while trying to lay the pipeline for providing fuel gas to OTPC for Unit-II of the Project. With the support of state

administration, the fuel supplier was able to lay the pipelineand start fuel supply required for Unit-II of Palatana Project only from October 2014.

All along Unit-II was being cold preserved to avoid damage to sensitive equipments like GT, HRSG and ST. Once gas became available, Unit-II was normalized and commissioning activities were started. Thereafter, Unit-II was synchronized in combined cycle mode on 08.11.2014. After synchronization and during dedication of Unit-II to the nation by Hon'ble Prime Minister of India, Unit-II was operated at various loads. After successful completion of commissioning activities commercial operation of Unit-II was commissioned on 24.3.2015, within 136 days of CC mode synchronization.

16. The reasons for time overrun from the scheduled COD to actual COD of Unit-II as tabulated by the petitioner is as under:

Time Period affected	Days	Justification	Agency responsible
22.3.2012 to 22.10.2012	399	Logistic	Logistic
		Constraint	Challenges in foreign country under change in law
22.10.2012 to 1.3.2013	70	Unavailability of fall load for testing	Evacuation constraint in system
14.2.2013 to 9.5.2013	69	Defects in HRSG	EPC contractor
9.5.2013 to 4.1.2014	238	Gas contamination	Force Majeure of fuel supplier
4.1.2014 to 24.3.2015	444	Non-availability of Fuel Gas	Force Majeure of fuel supplier

17. Accordingly, the petitioner has submitted that the time overrun of 1097 days from scheduled COD to actual COD of Block-II/Unit-II i.e. from 22.3.2012 to 24.3.2015 was completely beyond the control and factors not attributable to the petitioner and has prayed that the Commission may allow the time overrun without any deduction, in accordance with the principles laid down in the judgment dated 27.4.2011 of the Tribunal and in line with the Commission's order dated 31.8.2015 determining the tariff of Block-I/Unit-I for the period from 4.1.2014 to 31.3.2014.

18. The period from 23.6.2008 (zero date) upto the actual COD of Block-II/Unit-II is detailed as under:

	Block-II / Unit-II (363.3 MW)
Scheduled COD from 23.6.2008 (zero date)	22.3.2012
Actual COD	24.3.2015
Time Overrun considering Scheduled COD	1097 days

Time Overrun allowed from 22.3.2012 (upto scheduled COD of Block-II) to 4.1.2014 (COD of Block-I/Unit-I) in Commission's order dated 31.8.2015 in Petition No. 199/GT/2013.	653 days
Balance days (4.1.2014 to 24.3.2015)	**444 days**
Break-up of 444 days Time overrun:	
(i) Non-availability of Gas from 4.1.14 till 10.10.2014	279 days
(ii) Combined Cycle mode synchronization of Block-II/Unit-II on 8.11.2014 (10.10.2014 to 8.11.2014)	29 days
(iii) Combined Cycle mode synchronization till declaration of COD of Block-II/Unit-II (8.11.2014 to 24.3.2015)	136 days

19. As regards time overrun of 444 days from 4.1.2014 (COD of Unit-I) till 24.3.2015 (i.e COD of Block-II/Unit-II) and the teething problems in the machines due to non-availability of fuel gas, the petitioner has submitted that all efforts were made to make both the units of the generating station ready at the earliest for trial operation. It has also submitted that the difficulties faced in trial operation of Block-I/Unit-I, which included the inability of NERLDC to provide sufficient load for testing purposes due to evacuation system constraints and which resulted in delay in completion of various pre-commissioning tests during this time period, were also applicable for Block-II/Unit-II. The petitioner has reiterated the factors which affected the trial operation of Block-I/Unit-I and consequently for Block-II/Unit-II as stated in para 14 above and has submitted that the factors responsible for the delay in the COD of Block-II/Unit-II are beyond the control of the petitioner and hence the same may be condoned.

20. In response to the directions of the Commission vide ROP of the hearing dated 16.2.2016, the petitioner has submitted the date-wise quantum of gas received at the generating station as on COD of Block-I/Unit-I (as on 4.1.2014) and for the period from 4.1.2014 to 24.3.2015. The petitioner has further submitted that sufficient gas could not be supplied by the fuel supplier even after taking all necessary steps and the fuel supplier had attributed the delay due to Force Majeure as the reason beyond its the control for supply of fuel.

21. As regards the non-availability of fuel gas, the petitioner has submitted that the fuel supplier was regularly requested for supply of full quantum of fuel gas for full load generation from the project

and that the fuel supplier had communicated the gas supply problem affecting the project to the Ministry of Power, GOI vide letter dated 11.8.2014, wherein it had mentioned that the commissioning of Block-II/Unit-II of the project was held up for want of gas supply on account of the delay in up-gradation of infrastructure system comprising of Gas Gathering Station (GGS) of M/s ONGC and the delivery line connecting GGS with the project, due to external factors.

22. The petitioner has further submitted that the fuel supplier had communicated to the petitioner that it had been carrying out the gas exploration activities in Tripura earnestly to supply the designated quantity of gas to the petitioner to operate its project smoothly and therefore, the petitioner was successful in operating its Block-I/Unit-I of the project with the required fuel gas being supplied and from October, 2014 the fuel supplier had started supplying some gas for Block-II/Unit-II of the project. It has also submitted that suitable action such as the creation of additional processing facilities and gas pipeline network for interconnection of various GCS and further connection to the petitioner's gas supply line were also undertaken by the fuel supplier in advance. The petitioner has stated that the above action could not be materialized within the planned schedule due to problems beyond the control of the fuel supplier. It has further stated that the fuel supplier had also added new gas wells on production to supply the required gas to the project in newly commissioned gas manifold of Konanban-GCS, but the desired gas supply could not be supplied to the project.

23. The petitioner has further submitted that the teething problems mentioned were common problems associated with the commissioning activities of a power plant and these were rectified within a reasonable time, which can be observed from the fact that the said Unit-II was commissioned within 136 days of the Combined Cycle mode synchronization. The petitioner has stated that these problems could not have been detected prior to the Combined Cycle mode synchronization. The major teething problems faced during the commissioning activities of Unit-II of the project as submitted by the petitioner is as under:

(i) GT-2, Flame scanner -3 was sensing less intensity of flame.

(ii) DP across HP turbine one transmitter was faulty.

(iii) GTG-2 stator slot No: 19 core temperature was showing bad value.

(iv) GT-2 (Mark-VI) to DCS Mod bus communication was not working, by which archiving &monitoring of GT parameters was not possible.

(v) GT-2 (Mark-VI) time sync with GPS clock was not happening

(vi) ST-2, HPT exhaust steam temperature transmitter NO: 3 (20MAA50CT17AXQ07) was faulty.

(vii) GT-2, Journal bearing -2 temperatures was showing negative value (BT-J2-2A).

(viii) GT-2, BB-9, bearing vibration levels were maintaining at very low value compared to other bearings.

(ix) GT-2, ESD valve installed at performance heater outlet was malfunctioning.

(x) Unit-II performance calculations software was not yet installed & demonstrated.

(xi) ST-2 LPRJB housing vibration value was above alarm limit of 8.0 mm/s.

(xii) ST-2, LP casing differential expansion value was showing abnormal.

(xiii) ST-2 vacuum was maintaining as high as 0.108 Kg/Cm2 (abs), even with running of two vacuum pumps.

(xiv) BFP-2B, NDE side oil leak was predominant.

(xv) GBC-1, suction valve spindle side gas leak was observed in closed position of the valve.

(xvi) GBC-1, motor NDE side, bearing oil leak is observed.

(xvii) Reliability in drum level measurement was still not improved; Control room hydra-step indicators were erratic.

(xviii) SWAS (steam water analysis system) was not operational.

(xix) CEMS- Versus Local Portable Multigas analyzer, CO - showing larger deviations in values during DLN tuning.

(xx) ST-2 control Oil pump servicing was still not completed; hence there was no standby pump.

(xxi) STGT2, GTGT-2 VT failure alarm was frequently appearing in control room-LVS alarms.

(xxii) GBC-1 thrust Bearing MTL temperature TE-7328 was malfunctioning.

(xxiii) GT-2, liquid C02 tank level LO alarm was persisting.

Submissions of Respondent, APDCL

24. The respondent APDCL in its reply affidavit dated 12.2.2016 has submitted as under:

Non-availability of Fuel Gas (4.1.2014 to 24.3.2015)

25. The respondent APDCL has submitted that ONGC who owns the entire gas and petroleum fields in entire south zone of NER as well as major areas of rest of part of NER is the major share holder of the Petitioner Company and is also the fuel gas supplier to the generating station. The respondent has also submitted that only after detailed feasibility analysis, ONGC had ventured into power generation and

signed agreement as fuel supplier to the project with 50% shareholding and as such, the inability to supply gas to the project for reasons beyond its control is not tenable. Referring to Clause 15 read with Clause 17 of the Gas Sale and Purchase agreement between ONGC and OTPC, the respondent has submitted that ONGC is liable to supply the quantum for any contract year as (A) minus (B) minus (C),

> *Where,*
> *A is the 90% of the aggregated Nominated DCQ's*
> *B is the quantum excused from delivering under Clause 17*
> *C is the Seller's Carry forward under Clause 8.5 of the agreement.*

26. The respondent has pointed out that as per terms of the agreement, the quantum under (B) above is permissible only in case of the following event(s):

> *(a) Fire, flood, atmospheric disturbance, cyclone, lightning, storm, tidal wave, hurricane, tornado, earthquake, landslide, epidemic or other acts of God; or*
>
> *(b) War (whether declared or not), riot, civil war, blockade, insurrection, acts of public enemies or civil disturbance; or*
>
> *(c) Unanticipated adverse behaviour of Seller's gas reservoir*
>
> *(d) Acts of Government Agency or of an authority drawing power under any applicable law, or compliance with such acts that directly affect either party's performance*

27. The respondent has further submitted that:

> *"as per Clause 15.1 (c) of the Gas Sale and Purchase agreement between ONGC and OTPC, the buyer (OTPCL) shall raise invoice and seller (ONGC) will pay for any Supply Deficiency Quantity below 80% of aggregated nominated quantity, for the month if actual quantity tendered by seller is lesser . The formula for compensation is set forth in Clause 15.1(b) of the said agreement. However, no such amount is accounted for by OTPC neither in FY 13-14 nor in FY 14-15 (emphasis added). As such, only beneficiary on such count is ONGC, directly being the Fuel Supplier and indirectly being major shareholder of OTPC. As such, Commission is prayed to disallow the time overrun citing non-availability of gas."*

28. The respondent has submitted that despite the submission of the petitioner, the hard fact is that there is delay in commissioning the Unit-II and the generating station as a whole from its scheduled date of commissioning of 22.3.2012 to 24.3.2015 resulting in the time overrun of 1097 days is totally attributable to the petitioner and its fuel supplier, both of whom are ONGC dependent. Accordingly, the respondent has stated that as ONGC is the party responsible for supply of fuel gas and also the largest shareholder of the project, it cannot overrule its responsibility for timely commissioning of the

generating station as a whole.

Rejoinder of petitioner

29. In response to the submission of the respondent, APDCL, the petitioner in its rejoinder dated 25.4.2016 has submitted as under:

a) With effect from January, 2014 till September, 2014, ONGC has supplied more than 80% of the contracted quantity of gas required for operation of Unit- I, which can also be ascertained from the fact that the Plant Availability Factor (PAF) for 2014-15 was more than 78%.

b) ONGC had informed that it was unable to supply required gas for Unit-II of the project till September, 2014 due to Force Majeure. As per clause 15.1.a and 17.1.A of GSPA, ONGC is entitled to withhold, reduce or suspend delivery of gas without incurring liability for liquidated damage. Since gas supply had been reduced due to Force Majeure, ONGC was not liable to pay any liquidated damage as par the said clause in GSPA.

c) Though ONGC is one of the promoters of OTPC, still as per GSPA it is entitled to pro-rata reduce the quantum of gas supply in the event of force majeure. OTPC has constantly pursued with ONGC for restoration of supply of contracted quantity of gas by taking up the matter to the highest level in ONGC and by getting beneficiaries and statutory bodies like NERPC to write to ONGC and Govt. of India.

30. Accordingly, the petitioner has submitted that the Commission may allow the time overrun on account of non- availability of fuel. It has also submitted that since the availability of fuel gas in October, 2014, the petitioner immediately took all necessary steps to commission the Unit- II and was able to synchronize the same in combined cycle mode on 8.11.2014. It has further submitted that on completion of the commissioning activities, the petitioner was able to declare COD of UNIT- II on 24.3.2015 i.e. within 136 days of synchronization. Thus the petitioner has prayed that the net time overrun from 4.1.2014 to 23.3.2015 may be allowed in totality as the same is neither attributable to nor in control of the petitioner.

Analysis and Decision

31. We have examined the submissions of the parties and the documents available on record. The petitioner has stated that the time overrun of 1097 days from scheduled COD (22.3.2012) to actual COD (24.3.2015) was beyond its control and prayed that time overrun may be allowed in accordance with the principles laid down in the judgment of Tribunal by judgment dated 27.4.2011 and consider by the Commission in order dated 31.8.2015 in Petition No. 199/GT/2013. The time overrun of 1097 days from scheduled COD of Block-II / Unit-II (22.3.2012 to 24.3.2015 (actual COD of Block-II / Unit-

II is categorized and discussed as under:

(A) Time overrun from scheduled COD of Block-II / Unit-II i.e. 22.3.2012 to 4.1.2014 (COD of Block- I / Unit-I) – 653 days.

32. From the above submissions, it is observed that there is delay of 653 days from scheduled COD of Block-II / Unit-II i.e. 22.3.2012 to 4.1.2014 (COD of Block-I / Unit-I). The Commission in its order dated 31.8.2015 in Petition No. 199/GT/2013, while examining with the time overrun of Block-I / Unit-I had not condoned the time overrun of 69 days out of total delay of 744 days on account of HRSG problem which was entirely attributable to the petitioner as it was covered under category (i) of the principles laid down in the judgment of the Tribunal dated 27.4.2011.

33. Out of the total time overrun of 653 days in the commissioning of Block-II / Unit-II, the time overrun of 69 days has not been condoned (as disallowed in case of Block-I/Unit-I by order dated 31.8.2015) since the petitioner has submitted that defects in HRSG in Unit-II was also observed in Unit- II and were rectified in both the units simultaneously. However, the LD /Insurance proceeds recovered for the period of time overrun disallowed shall be retained by the petitioner. As the reasons for time overrun are common upto the COD of Block-I/ Unit-I (4.1.2014), the time overrun of 584 days has been allowed. However, the LD recovered from the contractor and the insurance claim proceeds, if any, shall be considered for reduction in the capital cost of the generating station.

(B) Time overrun from 4.1.2014 (COD of Unit-I) to 24.3.2015 (COD of Unit-II/station)- 444 days

34. As regards the time overrun of 444 days from 4.1.2014 to (COD of Unit-I) to 24.3.2015 (COD of Unit-II/station) the petitioner has mainly furnished mainly the reasons as under:

i) Non-Availability of Gas from 04.01.14 to 10.10.2014 for 279 days.

ii) Teething problems from 11.10.2014 to 24.3.2015 for 165 days.

35. The reasons furnished above have already been elaborated in the previous paragraphs of this order. Accordingly, the petitioner has prayed to consider time overrun of Block-II / Unit-II in terms of judgment of the Tribunal dated 27.4.2011 in Appeal No. 72 of 2010. The Tribunal in its judgment

dated 27.4.2011 in Appeal No. 72 of 2010 (MSPGCL v/s CERC &ors) has laid down the following principle for prudence check of time over run and cost overrun of a project as under:

> *"7.4. The delay in execution of a generating project could occur due to following reasons:*
>
> *i. Due to factors entirely attributable to the generating company, e.g., imprudence in selecting the contractors/suppliers and in executing contractual agreements including terms and conditions of the contracts, delay in award of contracts, delay in providing inputs like making land available to the contractors, delay in payments to contractors/suppliers as per the terms of contract, mismanagement of finances, slackness in project management like improper co-ordination between the various contractors, etc.*
>
> *ii. Due to factors beyond the control of the generating company e.g. delay caused due to force majeure like natural calamity or any other reasons which clearly establish, beyond any doubt, that there has been no imprudence on the part of the generating company in executing the project.*
>
> *iii. Situation not covered by (i) & (ii) above.*
>
> *In our opinion in the first case the entire cost due to time over run has to be borne by the generating company. However, the Liquidated damages (LDs) and insurance proceeds on account of delay, if any, received by the generating company could be retained by the generating company. In the second case the generating company could be given benefit of the additional cost incurred due to time over-run. However, the consumers should get full benefit of the LDs recovered from the contractors/supplied of the generating company and the insurance proceeds, if any, to reduce the capital cost. In the third case the additional cost due to time overrun including the LDs and insurance proceeds could be shared between the generating company and the consumer. It would also be prudent to consider the delay with respect to some benchmarks rather than depending on the provisions of the contract between the generating company and its contractors/suppliers. If the time schedule is taken as per the terms of the contract, this may result in imprudent time schedule not in accordance with good industry practices.*
>
> *7.5 In our opinion, the above principle will be in consonance with the provisions of Section 61(d) of the Act, safeguarding the consumers ' interest and at the same time, ensuring recovery of cost of electricity in a reasonable manner."*

36. As regards the non- availability of gas from 4.1.2014 to 10.10.2014, the petitioner has submitted that the same was due to external factors beyond the control of the gas supplier for which the gas supplier has attributed the delay due to Force Majeure. The petitioner has also submitted reasons for delay due to local disturbances but has not furnished the exact period of local disturbance (date- wise) to establish the fact that there was force majeure along with documentary evidence/ correspondences made with the local administration to justify the steps taken by the petitioner to mitigate the delay in support of the claim. It is further noticed that Block-I/Unit-I of the generating station has been continuously receiving gas from January, 2014 to February 2016 and once Unit- I had received gas

regularly between the period from 4.1.2014 (COD of Unit-I) to 24.3.2015 (COD of Unit-II), there is no justification in the submission of the petitioner that Force Majeure on account of local disturbance/ hindrances prevailed for Unit-II only. Despite the direction of the Commission vide ROP of the hearing dated 16.2.2016, the petitioner has not furnished the date by which Block- 2/ Unit-II was ready in all respects for trial run for declaration of COD and the subsequent dates on which Unit-II was held up for the want of gas. However, in response to the direction of the Commission, the petitioner has furnished the gas supply data vide affidavit dated 18.3.2016 and it is noticed that the generating station has received gas for the period from 1.1.2014 to 31.3.2015 regularly. The dates on which the total supply of gas was received continuously more than 1.59 MMSCM on daily basis which is sufficient to run one unit on full load is as under:

Sl.No.	Month	Dates on which total supply of gas received continuously more than 1.59 MMSCM on daily basis (which is sufficient to run one unit on full load)	No of days for which continuously received gas more than 1.59 MMSCM
1	January-2014	6.1.2014-13.1.2014	8 days
2	February-2014	11.2.2014-15.2.2014 and 20.2.2014-26.2.2014	5 days and 7 days
3	March-2014	6.3.2014 -13.3.2014	8 days
4	April-2014	-	-
5	May-2014	-	-
6	June-2014	4.6.2014-9.6.2014 and 11.6.2014 – 17.6.2014	6 days and 7 days
7	July-2014	1.7.2014-3.7.2014 and 15.7.2014-20.7.2014	3 days and 6 days
8	August-2014	9.8.2014-12.8.2014	4 days
9	September-2014	7.9.2014-21.9.2014 and 23.9.2016 - 27.9.2016	15 days and 5 days
10	October-2014	1.10.2014-16.10.2014 and 22.10.2014-31.10.2014	16 days and 10 days
11	November-2014	1.11.2014-30.11.2014	30 days
12	December-2014	1.12.2014-3.12.2014, 8.12.2014-17.12.2014, 20.12.2014-25.12.2014	3 days, 10 days and 6 days
13	January-2015	3.1.2015-7.1.2015, 16.1.2015-19.1.2015 and 23.1.2015-31.1.2015	5 days, 4 days and 9 days
14	February-2015	1.2.2015-3.2.2015	3 days
15	March-2015	6.3.2015-24.3.2015	19 days

37. It is evident from above that except during the period April, 2014 and May, 2014, the generating station, during the period from January, 2014 to March, 2015 had received gas more than 1.59 MMSCM (sufficient to run one unit on full load.) on many days continuously during this period. In this background, it can be concluded that the petitioner had not made sufficient attempts to declare the COD of Block- 2/ Unit-II despite gas being available regularly for one unit. Accordingly, in our view, no Force Majeure conditions prevented the petitioner to conduct the trial run of the Block-2/ Unit-II. Therefore time overrun of 279 days for the period from 4.01.14 to 10.10.2014 on account of Non-Availability of Gas has not been condoned. In these circumstances, we hold that the delay of 279 days is not beyond the control of the petitioner and the same is attributable to the petitioner. Accordingly, in terms of the principles laid down by the Tribunal in the judgment dated 27.4.2011 [(situation (i)], the delay of 279 days cannot be said to be beyond the control of petitioner and hence not condoned. Therefore, the increase in cost on account of the said delay has to be borne by the petitioner. However, the Liquidated Damages (LD) and Insurance proceeds if any, received by the generating company, on account of the said delay, could be retained by the generating company.

(C) Teething problems from 11.10.2014 to 24.3.2015 (165 days)

38. The petitioner, in response to the directions of the Commission vide ROP of the hearing dated 16.2.2016, has furnished the major teething problems faced by the petitioner during the commissioning of the activities of Block-II/ Unit-II of the project (as stated in para 21 above). It is noticed that these problems are common in nature for any gas based power project and the OEM contractor is under an obligation to rectify such problems within a shorter duration. In case the OEM has taken an unduly long time for rectifying such teething problems, the petitioner is entitled to be compensated by recovery of L.D amount as per terms of the contract. Further, as gas was available for Unit-I, the petitioner should have undertaken trial run at an early stage in order that the teething problems, if any, associated with the project would have surfaced earlier and rectification could have been done accordingly in time. Based on the above discussions, we are not inclined to condone the time overrun of 165 days for the period from 11.10.2014 (Date of availability of gas) to 24.3.2015

(COD of Unit-II/station) on account of major teething problems. In these circumstances, we hold that the delay of 165 days is not beyond the control of the petitioner and the same is attributable to the petitioner. Accordingly, in terms of the principles laid down by the Tribunal in the judgment dated 27.4.2011 [(situation (i)], the delay of 165 days cannot be said to be beyond the control of petitioner and hence not condoned. Therefore, the increase in cost on account of the said delay has to be borne by the petitioner. However, the Liquidated Damages (LD) and Insurance proceeds if any, received by the generating company, on account of the said delay, could be retained by the generating company.

39. Based on the above discussions, it is noticed that there is time overrun of 653 days (1097 – 444) upto 4.1.2014 (COD of Block- I/ Unit-I). The petitioner has submitted that both the units were nearing commissioning, when HRSG of Unit-I developed defects due to problem in material used in HRSG. On inspection, similar problem was observed in HRSG of Unit-II and defects in HRSG in respect of both the Units were rectified on 9.5.2013. As stated, the Commission in its order dated 31.8.2015 in Petition No. 199/GT/2013 had examined the time overrun of Block-I/ Unit-I and had not condoned the delay of 69 days due to defects in HRSG in terms of the judgment of the Tribunal on the ground that the same was attributable to the petitioner and thus not beyond the control of the petitioner. Since the reasons for time overrun in COD for both the units were common upto 4.1.2014 as submitted by the petitioner, the time overrun of 69 days due to defects in HRSG in commissioning of Block-II/ Unit-II has not been condoned by this order. Accordingly, time overrun of 584 days (653 – 69) has been condoned as the same was beyond the control of the petitioner and not attributable to it. In these circumstances, we hold that the delay of 69 days is not beyond the control of the petitioner and the same is attributable to the petitioner. Accordingly, in terms of the principles laid down by the Tribunal in the judgment dated 27.4.2011 [(situation (i)], the delay of 69 days cannot be said to be beyond the control of petitioner and hence not condoned. Therefore, the increase in cost on account of the said delay has to be borne by the petitioner. However, the Liquidated Damages

(LD) and Insurance proceeds if any, received by the generating company, on account of the said delay, could be retained by the generating company.

40. Based on the above, the total time overrun and time overrun allowed in commissioning of Block-II/ Unit-II is as under:

Unit No.	SCOD from 23.6.2008 (Zero date)	Actual COD	Time overrun considering SCOD (months)	Time over run allowed (months)
Block-II/Unit-II (generating station)	22.3.2012	24.3.2015	1097 days	584 days

41. Based on the above discussions, the time overrun for 584 days (out of the total time overrun of 1097 days) for Block-II/ Unit-II has been allowed and the schedule COD (reset) for the purpose of computation of IDC is as under:

Unit	SCOD from 23.6.2008 (Zero Date)	SCOD shifted to	Actual COD	Time overrun disallowed (days)
Block-II/Unit-II	22.03.2012	27.10.2013	24.3.2015	513 (69+444) days

Impact of time overrun on contract price, IDC and IEDC etc

42. The Commission vide ROP of hearing dated 16.2.2016 directed the petitioner to the furnish details of implication of time overrun on cost of plant & machinery under different packages, if any, separately indicating the details of increase in IDC & IEDC from the scheduled COD to the actual COD of Unit-II. In response, the petitioner vide affidavit dated 18.3.2016 has submitted that there was no cost overrun in Plant and Machinery packages due to time overrun. However, it has submitted that there is increase in the IDC/IEDC from the scheduled COD to actual COD of Block-II/ Unit-II.

43. We have considered the matter. The petitioner has submitted that there is no cost overrun in the contractual price due to time overrun and this has been verified from the revised project cost furnished by the petitioner in Form-5C of the petition. There is also no increase in the land, civil work, EPC and Non-EPC cost except for increase in the pre-operating cost and IDC. It is further noticed that the petitioner has not submitted the head-wise details as per Form 13D and in absence of the

same, it has been inferred from appropriate schedule of the balance sheet that an amount of ₹208.90 lakh as on station COD of the generating station needs to be deducted in full irrespective of the question of time overrun. In addition to this, certain expenses amounting to ₹1.13 lakh which are independent of time overrun needs to be deducted. Thus, the total amount of ₹210.03 lakh (208.90 + 1.13) is not subjected to adjustment owing to the time overrun and the amount of ₹6040.97 lakh (6251.00-210.03) shall be considered for pro rata disallowance due to time overrun. Accordingly, the deduction of overhead expenses on account of the delay of 513 days in the COD of Block-II/ Unit-II is worked out, subject to truing up, as under:

(₹in lakh)

A	Total IEDC claimed for the total period of completion (2464 days) Up to COD of Unit-II/Station.	6251.00
B	Less: IEDC not subject to adjustment due to time overrun	210.03
C	Total IEDC for pro-rata (A-B)	**6040.97**
D	**Pro-rata IEDC disallowed (513 days) (C*513/2464)**	**1257.72**
E	Add: IEDC disallowed irrespective of time overrun	208.90
F	**Total IEDC disallowed (D+E)**	**1466.62**

Capital Cost

Approved Capital Cost

44. As stated, the Board of Directors of the Petitioner Company in its 21st meeting held on 18.12.2008 had approved project cost of ₹3429.30 crore including IDC, FC, FERV and hedging cost of ₹284.91 crore. The Board of Directors of the Petitioner Company in its 50th meeting on 11.2.2014 had revised the project cost from ₹3429.30 crore to ₹4047.00 crore including IDC, FC, FERV and hedging cost of ₹868.93 crore. The comparison of Original cost estimate as per original investment approval as against the Revised project cost as on 11.2.2014 submitted by the petitioner is as under:

(₹ in crore)

Break-up of Cost	**Original estimates as per investment approval (dated 18.12.2008)**	**Revised project cost as on 11.2.2014**	**Remarks**
Land	19.80	17.40	Decrease
EPC & Non-EPC	2906.69	2888.08	Decrease
Preliminary and pre-operative cost	110.96	149.33	Increase
IDC, FC, FERV & Hedging Cost	284.91	868.93	Increase

It is evident from the above that there is decrease in the cost of land, EPC & Non-EPC cost and increase in the Pre-operating cost and the IDC and FC mainly due to the time overrun in the project.

Actual Capital Cost as on COD

45. The petitioner vide affidavit dated 15.12.2015 has furnished the audited capital cost up to COD of Block-II/Unit-II of the generating station (24.3.2015) and capital cost as on 31.3.2015 as under:

(₹ in lakh)

	As on COD of Block-I/Unit-I	As per Audited accounts for 2013-14	As on COD of Block-II/Unit-II	As per Audited accounts for 2014-15
	4.1.2014	**31.3.2014**	**24.3.2015**	**31.3.2015**
Capital Cost including IDC and FC	207102	207102	371240	371240
Less: IDC, FC, FERV and Hedging Cost	36268	36268	81157	81157
Less: Capital Liabilities	27512	22028	34970	34970
Capital Cost excluding IDC, FC and Liabilities	**143322**	**148806**	**255114**	**255114**

46. The Commission vide order dated 31.8.2015 in Petition No 199/GT/2013 had allowed the capital cost as on COD of Block-I/Unit-I (4.1.2014) as under:

(₹in lakh)

Capital Cost including IDC & FC, FERV & hedging cost of ₹.41243.00 lakh	207101.88
Less: Interest During Construction disallowed due to Time overrun	3153.48
Less: Incidental Expenditure During Construction (disallow due to time overrun partly disallow)	89.00
Less: Un-discharged liabilities as on COD	27512.00
Less : Foreign Exchange Rate Variation	1919.98
Less: Difference in cost of Initial spares	7457.38
Capital Cost on cash basis as on COD of Unit-I (4.1.2014)	**166970.03**
Additional capital expenditure due to discharge of liabilities after COD till 31.3.2014	5500.00
Capital Cost as on 31.3.2014	**172470.03**

47. The petitioner has claimed capital cost of ₹185074.00 lakh (excluding liabilities of ₹22028.00 lakh) as on 31.3.2014. However, it is noticed that the Commission in order dated 31.8.2015 in Petition No 199/GT/2013 had admitted the closing capital cost of ₹172470.03 lakh as on 31.3.2014 which is less than the closing capital cost claimed by the petitioner. Therefore, the closing capital

cost of ₹172470.03 lakh as on 31.3.2014 has been considered as the opening capital cost as on 1.4.2014 for the purpose of the tariff of Block-I/Unit-I from 1.4.2014 to 23.3.2015. Accordingly, the capital cost considered for the purpose of tariff as on COD of Block-II/ Unit-II is as under:

(₹in lakh)

	As on 24.3.2015 (COD of Block-II/Unit-II
Capital cost claimed	371240.00
Less: IDC claimed	74905.45
Hard Cost claimed	296334.55
Less: Un-discharged Liabilities	34970.00
Capital cost excluding Liabilities and IDC	261364.55
IDC allowed	56187.04
Capital cost excluding Liabilities and including IDC, FC, Hedging cost and IEDC	**317551.59**

Initial Spares

48. Regulation 13 of the 2014 Tariff Regulations provides as under:

"13. Initial Spares: Initial spares shall be capitalised as a percentage of the Plant and Machinery cost upto 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."

49. The Commission vide ROP of hearing dated 16.2.2016 had directed the petitioner to furnish details of initial spares capitalized as on COD of generating station (24.3.2015) and initial spares claimed up to the cut-off date of the generating station along with list of spares procured, with copy of contract with OEM for supply of spares, with mandatory and insurance spares. In response, the petitioner vide affidavit dated 18.3.2016 has submitted the details as under:

Initial Spares capitalized as on COD of generating station (24.3.2015)	Initial Spares claimed from COD to cut-off date (31.3.2018)
₹16314 lakh	**₹4908 lakh**

50. The petitioner has further submitted that the actual amount of initial spares capitalized till COD of Block-II/ Unit-II of the generating station is ₹16314 lakh and the same has been reflected in Form-C of the petition. The petitioner has further proposed the capitalization of ₹4908 lakh towards initial spares upto the cut-off date i.e. 31.3.2018. This amount includes ₹1914 lakh towards Custom duty on Initial Spares demanded by Central Board of Excise and Customs (CBEC) which has been contested by the petitioner. However, the said amount has been claimed as additional capital expenditure on projected basis in case of the petitioner being directed to pay the amount by the Authorities. Accordingly, the petitioner has claimed total initial spares of ₹21222 lakh for the project till the cut-off date which exceeds the limit specified under the 2009 and the 2014 Tariff Regulations. The petitioner has claimed initial spares and actuals considering the advance transmission, the remote location of the project with more geographical constraint in terms of time period and the logistic requirements to supply the spares, keeping of higher initial spares in lines with recommendations of the OEM for ensuring high availability of machines. The petitioner has further stated that on account of the above reasons, it was not possible for it to exercise any control on the quantum and the value of initial spares in order to restrict the same within the limits specified under the said Tariff Regulations. Accordingly, the petitioner has prayed that the Commission in exercise of its 'Power to Relax' under Regulation 54 of the 2014 Tariff Regulations, may allow the initial spares claimed on the actual basis.

Analysis

51. We have examined the matter. Regulation 29(1)(c) of the 2014 Tariff Regulations provides for separate O&M expenses for 'Advance F class Machines' after considering the features of the Advance class Machines and the recommendations of the OEM on maintenance. Accordingly, the claim of the petitioner for relaxation of the ceiling limit of 4% towards initial spares in respect of the combined cycle generating station of the petitioner is not justified. Accordingly, initial spares as on COD of Block-II/ Unit-II (24.3.2015) @ 4% of Plant and Machinery has been allowed and computed as under. The petitioner has not furnished the Plant and Machinery cost separately for project. Hence, in accordance with

Regulation 13(b)(iv) of the 2014 Tariff Regulations, the Plant and machinery cost for the project is computed as under:

(₹ in lakh)

A	Audited project cost as on COD of Unit-II (24.3.2015)	371240.00
B	Amount of IDC, FC & Hedging cost included in 'A' above	74906.00
C	Amount of IEDC included in 'A' above	6251.00
D	Land Cost in 'A' above	1740.00
E	Civil work in 'A' above	71804.00
F	Amount of liability in 'A' above	34970.00
G	Plant and machinery cost (A-B-C-D-E-F)	181569.00
H	Plant and Machinery in Add Cap up to cut off date	11497.00
I	Actual Plant & Machinery as on cut-off date including initial spares (G+H)	193066.00
J	Initial Spares included	16314.00
K	Plant & Machinery as on cut-off date excluding initial spares (I-J)	176752.00
L	Plant & Machinery as on cut-off date including initial spares (K/96%)	184116.67
M	Initial Spares allowed (L-K)	7364.67
N	**Initial Spares disallowed (J-M)**	**8949.33**

Sale of infirm power from the date of synchronization to COD of Block-II/ Unit-II

52. The petitioner was directed to furnish the details of the revenue earned (excluding fuel cost) from sale of infirm power as on the COD of Block-II/ Unit-II, excluding fuel cost. In response, the petitioner vide affidavit dated 18.3.2016 has furnished the details regarding revenue from sale of infirm power as under:

Revenue from sale of infirm power from Unit-II of Project (₹)	Expenses on commissioning gas for Unit-II of the Project (₹)
411065818	**260312635**

53. The petitioner has submitted that the revenue from sale of infirm power from Block-II/ Unit-II of the project till COD of Unit-II (4.1.2014) is ₹411065818 and the same has been deducted from the expenses/cost undertaken on the project. It has further submitted that the said amount has been adjusted and accordingly reflected in the audited accounts of the year 2014-15 in the notes forming part of the balance sheet on Capital Work In Progress. In addition, the petitioner has submitted that

an amount of ₹260312635 was spent on commissioning gas for Block-II/Unit-II which has also been incorporated in the balance sheet under Commissioning and Startup Expenses-Fuel & Power. The petitioner has further submitted the UI accounts reflecting the amount receivable. On scrutiny of the above, it is noticed that the revenue generated from sale of infirm power, from the date of synchronization till COD of Block-II/Unit-II of the generating station is in order and no further deduction is required to be made on this count.

Liquidated Damages

54. In response to the directions of the Commission, the petitioner vide affidavit dated 18.3.2016 has submitted that no Liquidated Damages (LD) has been recovered under various packages till date. In view of this no adjustment on account of LD has been considered at this stage. However, upon the settlement of LD, the petitioner should place on record the details of the same at the time of truing-up.

55. Accordingly, after adjustment of the cost of initial spares and pro-rata reduction of establishment cost as on COD of Block-II/ Unit-II of the generating station, the capital cost is worked out as under:

(₹in lakh)

	Actual capital expenditure of Block-I & II as on COD of station (24.3.2015)
Capital cost including IDC & FC, FERV & hedging cost	317551.59
Less**:** Pro-rata establishment cost due to period of time overrun not allowed	1466.62
Less**:** difference in cost of initial spares after restriction.	8949.33
Capital cost including IDC, FC, FERV & Hedging cost	**307135.63**

Reasonableness of Capital Cost

56. There is no benchmark capital cost specified by the Commission in case of gas based power projects like coal based projects. Accordingly, the reasonableness / competitive cost of the project has been derived by comparing the capital cost of some of the contemporary Advance Class Gas Turbines machines installed in Uno-Sugen gas based power plant (382.50 MW) of Torrent Power

Ltd. and Pragati-III Gas Based (726.60 MW) Combined Cycle project of Pragati Power Corporation Ltd. The capital cost comparison furnished by the petitioner is as under:

	Pragati-III	**Uno-Sugen CCPP**	**OTPC (the petitioner)**
Project (crore)	5195.81	1808.65	3371.67
Less IDC, FC, Overheads, un-discharged liabilities etc (₹ crore)	403.58	313	811.57
Hard Cost on cut-off date (₹crore)	4792.23	1495.65	2560.1
Installed Capacity (MW)	1371	382.5	726.6
Hard Cost (Crore/MW)	3.50	3.91	3.52 (up to cut-off date)

57. It is observed from the above that the hard cost of the project up to the cut-off date(31.3.2018) is comparable to hard cost of contemporary combined cycle project of Pragati-III of IPGCL and Uno-Sugen CCPP of Torrent Power Ltd. Accordingly, in our view, the capital cost (hard cost) of the project, is found reasonable and justified.

Projected Additional Capital Expenditure from COD of station (24.3.2015) to 31.3.2019

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

"14.(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

59. The projected additional capital expenditure claimed by the petitioner from COD of Block-II/ Unit-II of the generating station (24.3.2015) to 31.3.2019 is as under:

(₹in lakh)

	2015-16	2016-17	2017-18	2018-19
Land	0.00	0.00	0.00	0.00
Plant and machinery	5441.00	2190.00	0.00	0.00
Civil	2725.00	5923.00	4390.00	0.00
Right to use land	0.00	0.00	0.00	0.00
Computers and software	1457.00	154.00	0.00	0.00
Vehicle	0.00	0.00	0.00	0.00
Office equipments	2013.00	242.00	0.00	0.00
Furniture & fixtures	0.00	0.00	0.00	0.00
Furniture and fitting (Leasehold improvements)	0.00	0.00	0.00	0.00
Total	**11636.00**	**8509.00**	**4390.00**	**0.00**

60. The petitioner has claimed projected additional capital expenditure of ₹11636.00 lakh in 2015-16, ₹8509.00 lakh in 2016-17 and ₹4390.00 lakh in 2017-18 towards Plant & Machinery, Land, Office equipment etc. under Regulation 14 (1) of the 2014 Tariff Regulations. The petitioner was directed to furnish the asset-wise break-up details of actual additional capital expenditure of ₹11636.00 lakh in 2015-16, ₹8509.00 lakh in 2016-17 and ₹4390.00 lakh in 2017-18 in Form-9A complete in all respects, indicating the year-wise, item-wise and asset-wise break-up of the claim along with the relevant provisions of the regulations under which the same is claimed. However, the petitioner has not furnished the asset-wise break-up of the claim under Plant and Machinery.

61. The cut-off date of the generating station is 31.3.2018. It is observed that the additional capital expenditure claimed by the petitioner in respect of the assets is within original scope of work and is within cut-off date of the generating station, we allow the additional capital expenditure of ₹11636.00 lakh in 2015-16, ₹8509 lakh in 2016-17and ₹4390 lakh in 2017-18 is allowed under Regulation 14(1)(iv) of the 2014 Tariff Regulations. However, the petitioner shall furnish the details of additional capital expenditure indicating the year-wise, item-wise and asset-wise break-up of the claim in accordance with the relevant provisions of the 2014 Tariff Regulations at the time of truing-up of tariff.

Discharge of Un-discharged liability

62. The petitioner has claimed discharge of un-discharged liability for the period up to COD amounting to ₹34970.00 lakh in 2015-16. This has been considered while working at the capital cost for tariff.

Capital Cost for 2014-19

63. Based on the above, the capital cost approved in respect of the generating station for the period 2014-19 is as under:

(₹in lakh)

	2014-15		2015-16	2016-17	2017-18	2018-19
	1.4.2014 to 23.3.2015	24.3.2015 to 31.3.2015				
Opening capital cost	172470.03	307135.63	307135.63	353741.63	362250.63	366640.63
Additional Capital Expenditure	0.00	0.00	11636.00	8509.00	4390.00	0.00
Add: Liability Discharged	0.00	0.00	34970.00	0.00	0.00	0.00
Closing capital cost	**172470.03**	**307135.63**	**353741.63**	**362250.63**	**366640.63**	**366640.63**

Debt Equity Ratio

64. 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.

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 of 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 utilization 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 the 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 ratio based on actual information provided by the generating company or the transmission licensee as the case may be.

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

65. The petitioner has claimed debt-equity ratio as on COD as 75:25, based on the funds deployed for the entire project. It is observed from the balance sheet of the Petitioner Company as on 31.3.2015, that the total equity raised for the project includes "Share Application Money Pending Allotment" for ₹49042.64 lakh. The Commission in order dated 31.8.2015 in Petition No. 199/GT/2013 had considered 'Advance against Equity' of ₹29296 lakh reflecting in the balance sheet as on 31.3.2014 as normative loan, instead of equity for the purpose of determination of tariff.

66. The petitioner has submitted that during the year 2014-15, it had initiated active steps to rope in the strategic investor through Right Issue and this Right issue was initiated from 25.3.2015 to 10.4.2015. The petitioner has submitted that since the Right Issue was opened at the end of 2014-15 (31.3.2015), the amount collected under the Right Issue has been mentioned as 'Share application money pending allotment' at the end of the year 2014-15.The petitioner has further submitted that the Rights Issue had closed on 10.4.2015 and Equity Shares were allotted on 10.4.2015. The petitioner has also submitted that the 'Share Application Money pending allotment', as reflected in the Balance Sheet as on 31.3.2015 has been transferred to 'Equity Share Capital' on 10.4.2015, post allotment of equity shares and the same is reflected in the quarterly balance sheet as on 30.6.2015, 30.9.2015 and 31.12.2015 submitted by the petitioner.

67. It appears from the above that the Share Application Money pending allotment as reflected in the balance sheet as on 31.3.2015 was converted into Equity Share Capital subsequently. Thus, the petitioner has considered the said amount of 'Share Application Money Pending Allotment' as Equity for the purpose of determination of tariff for the period 2014-19. It is also observed that in terms of Regulation 19(1) of the 2014 Tariff Regulations, the debt-equity ratio as on COD is considered as debt-equity ratio for the generating station. Considering the fact that in Commission's order dated 31.8.2015 in petition No. 199/GT/2013, the debt equity ratio of 82:18 was arrived at considering such "advance against equity" as normative loan in view of certainty of the conversion of the said sum was not established. However, the series of subsequent events as submitted by the petitioner demonstrate that certainty of such conversion of the said sum into equity has since been achieved and there has been increase in position of equity capital *albeit* after the date of COD to tune of ₹49042.64 lakh which includes the amount shown under Advance against Equity amounting to ₹29296.10 lakh as on 31.3.2014. Thus, the denial of return on such sum as equity capital for the entire project life of 25 years, in our view, is not justified. In view of the above, we, in exercise of power to relax under Regulation 54 of the 2014 Tariff Regulations, allow the revision of debt: equity ratio with effect from the date of such conversion (10.4.2015). Accordingly, the debt-equity has been worked as under:

For the period 24.3.2015 to 9.4.2015 (as per order dated 31.8.2015)

Total Equity (A)	103054.64	
Share Application Money pending Allotment (B)	49042.64	
Net Equity C=A-B	**54012.00**	**13.49%**
Total Loan (D)	297276.50	
Loan including Advance against equity E=D+B	**346319.14**	**86.51%**

From 10.4.2015

Total Equity	103054.64	**25.74%**
Total Loan	297276.50	**74.26%**

68. As mentioned above, the debt-equity ratio for period from 24.3.2015 to 9.4.2015 has been worked out as 86.51:13.49 and the debt-equity ratio for the period from 10.4.2015 onwards has

been worked out as 74.26:25.74 for the purpose of determination of tariff. Accordingly, the debt-equity ratio has been worked out as under:

For the period 24.3.2015 to 9.4.2015

		Percentage
Capital Cost as on COD	307135.63	100%
Debt	265697.41	86.51%
Equity	41438.22	13.49%

From 10.4.2015

		Percentage
Capital Cost as on COD	307135.63	100%
Debt	228071.71	74.26%
Equity	79063.93	25.74%

Return on Equity

69. 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.*

70. 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.

(3) The generating company or the transmission licensee, as the case may be, shall true up the grossed up rate of return on equity at the end of every financial year based on actual tax paid together with any additional tax demand including interest thereon, duly adjusted for any refund of tax including interest received from the income tax authorities pertaining to the tariff period 2014-15 to 2018-19 on actual gross income of any financial year. However, penalty, if any, arising on account of delay in deposit or short deposit of tax amount shall not be claimed by the generating company or the transmission licensee as the case may be. Any under-recovery or over-recovery of grossed up rate on return on equity after truing up, shall be recovered or refunded to beneficiaries or the long term transmission customers/DICs as the case may be on year to year basis.

71. Though the regulation prescribe computation of effective tax rate on the basis of tax paid, we deem it proper to allow grossing up on MAT rate considering the fact that the matter is getting decided during the year 2016-17. Accordingly, for the present, the effective tax rate (MAT) of 20.961% has been considered for the 2014-15 & 21.342% for 2015-16 onwards up to 2018-19 for the purpose of grossing up of the base rate of 15.5%. Based on the above, the rate of ROE works out to 19.610% for FY 2014-15 and 19.705% for FY 2015-16 onwards. This is however, subject to truing up. Accordingly, return on equity has been worked out as under:

(₹in lakh)

	2014-15		**2015-16**		**2016-17**	**2017-18**	**2018-19**
	1.4.2014 to 23.3.2015	**24.3.2015 to 31.3.2015**	**1.4.2015 to 9.4.2015**	**10.4.2015 to 31.3.2016**			
Gross Notional Equity	31047.44	41438.22	79063.93	79063.93	91061.41	93251.82	94381.91
Addition due to Additional Capitalization	0.00	0.00	0.00	11997.48	2190.42	1130.09	0.00
Closing Equity	31047.44	41438.22	79063.93	91061.41	93251.82	94381.91	94381.91

Average Equity	31047.44	41438.22	79063.93	85062.67	92156.62	93816.87	94381.91
Return on Equity (Base Rate)	15.500%	15.500%	15.500%	15.500%	15.500%	15.500%	15.500%
Tax rate for the year	20.961%	20.961%	21.342%	21.342%	21.342%	21.342%	21.342%
Rate of Return on Equity (Pre Tax)	19.610%	19.610%	19.705%	19.705%	19.705%	19.705%	19.705%
Return on Equity (Pre Tax)	**5954.96**	**178.10**	**383.10**	**16349.43**	**18159.46**	**18486.61**	**18597.96**

72. The petitioner is directed to furnish on affidavit, the effective tax rates along with the Tax Audit Report for the period 2015-19 at the time of truing-up exercise in respect of the generating station in terms of the 2014 Tariff Regulations.

Interest on loan

73. 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 Decapitalization 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 up to the date of de-capitalization 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 loan.

74. The petitioner has submitted that it has refinanced the loan and the same has resulted in substantial benefits to the respondents on account of interest on loan with lower interest rates and the benefits of refinancing will be calculated and shared between the beneficiaries and petitioner in the ratio of 2:1 in terms of Regulation 26 (7), (8) & (9) of the 2014 Tariff Regulations.

75. Interest on loan has been worked out as mentioned below:

(a) The petitioner has claimed weighted average rate of interest as 10.50% for 2014-15 and 10.00% for 2015-19 calculated on the basis of the rate of interest of each individual loan corresponding to the number of days. Accordingly, the weighted average rate of interest is allowed for the calculation of interest of normative loan;

(b) Depreciation allowed for the period has been considered as repayment;

(c) The interest on loan has been calculated on the normative average loan of the year by applying the weighted average rate of interest calculated. However, the petitioner is directed to submit the details regarding refinanced loan portfolio at the time of truing-up of tariff in terms of Regulation 8 of the 2014 Tariff Regulations.

76. Necessary calculations for interest on loan are as under:

(₹in lakh)

	2014-15		**2015-16**		**2016-17**	**2017-18**	**2018-19**
	1.4.2014 to 23.3.2015	**24.3.2015 to 31.3.2015**	**1.4.2015 to 9.4.2015**	**10.4.2015 to 31.3.2016**			
Gross Normative Loan	141422.59	265697.41	228071.71	265697.41	300305.93	306624.52	309884.43
Cumulative Repayment	1732.25	10116.13	10450.70	10829.08	26976.97	44912.57	63134.85
Net Loan-Opening	139690.35	255581.28	217621.01	254868.33	273328.97	261711.95	246749.57
Addition due to Additional Capitalization	0.00	0.00	0.00	34608.52	6318.58	3259.91	0.00
Repayment during the year	8383.89	334.57	378.38	16147.89	17935.61	18222.28	18295.37
Net Loan-Closing	131306.46	255246.71	217242.63	273328.97	261711.95	246749.57	228454.21
Average Loan	135498.40	255414.00	217431.82	264098.65	267520.46	254230.76	237601.89
Weighted Average Rate of Interest	10.50%	10.50%	10.00%	10.00%	10.00%	10.00%	10.00%
Interest on Loan	**13915.50**	**587.80**	**534.67**	**25760.44**	**26752.05**	**25423.08**	**23760.19**

Depreciation

77. Depreciation has been calculated considering the weighted average rate of depreciation of 4.97% for 2014-15 and 5.01% for 2015-16 and 2016-17 and 5.00% for 2017-18 and 4.99% for 2018-19 in terms of the above regulations. Necessary computations in support of depreciation are as under:

(₹ in lakh)

	2014-15		2015-16		2016-17	2017-18	2018-19
	1.4.2014 to 23.3.2015	24.3.2015 to 31.3.2015	1.4.2015 to 9.4.2015	10.4.2015 to 31.3.2016			
Opening Gross Block	172470.03	307135.63	307135.63	307135.63	353741.63	362250.63	366640.63
Additions due to additional capitalization	0.00	0.00	0.00	46606.00	8509.00	4390.00	0.00
Closing Gross Block	172470.03	307135.63	307135.63	353741.63	362250.63	366640.63	366640.63
Average Gross Block	172470.03	307135.63	307135.63	330438.63	357996.13	364445.63	366640.63
Value of Freehold land	716.00	716.00	716.00	716.00	716.00	716.00	716.00
Rate of Depreciation	4.97%	4.97%	5.01%	5.01%	5.01%	5.00%	4.99%
Depreciation value	154578.63	275777.67	275777.67	296750.37	321552.12	327356.67	329332.17
Remaining Depreciable value	152846.38	265661.54	265326.97	286634.24	294953.54	282822.48	266575.70
Depreciation	**8383.89**	**334.57**	**378.38**	**16147.89**	**17935.61**	**18222.28**	**18295.37**

Operation & Maintenance expenses

78. Regulation 29 (1) of the 2014 Tariff Regulations provides the year-wise O & M expense norms for Gas based 726.6 MW (Advance F Class Machines) generating units as under:

(₹ in lakh/MW)

	2014-15	2015-16	2016-17	2017-18	2018-19
O & M expenses Norms*	26.55	28.36	30.29	32.35	34.56
O&M Expenses under Reg. 29(1)	9857.00	20606.00	22009.00	23506.00	25111.00

* *For advance 'F' class machines*

79. In terms of the above regulations, the petitioner has claimed O&M expenses as under:

(₹ in lakh)

2014-15		2015-16	2016-17	2017-18	2018-19
1.4.2014 to 23.3.2015	24.3.2015 to 31.3.2015				
9434.00	423.00	20606.00	22009.00	23506.00	25111.00

80. The normative O&M claimed by the petitioner are in terms of the 2014 Tariff regulations and hence allowed.

Water charges

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

> "*29 (2) The Water Charges and capital spares for thermal generating stations shall be allowed separately:*
> *Provided that water charges shall be allowed based on water consumption depending upon type of plant, type of cooling water system etc., subject to prudence check. The details regarding the same shall be furnished along with the petition:*
>
> *Provided that the generating station shall submit the details of year wise actual capital spares consumed at the time of truing up with appropriate justification for incurring the same and substantiating that the same is not funded through compensatory allowance or special allowance or claimed as a part of additional capitalisation or consumption of stores and spares and renovation and modernization"*

82. 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.

83. The petitioner has claimed water charges for the period 2014-19 as under:

(₹in lakh)

2014-15		2015-16	2016-17	2017-18	2018-19
1.4.2014 to 23.3.2015	24.3.2015 to 31.3.2015				
4.00	0.10	10.00	10.00	11.00	12.00

84. However, the petitioner has not furnished the basis of calculation of water charges projected for the period 2014-19. The Commission vide ROP of the hearing dated 16.2.2016 had directed the petitioner to furnish the details in respect of water charges such as the contracted quantum of water and the allocated quantity, the actual annual water consumption since COD of Block-I/Unit-I till 31.3.2014 and from COD of Block-II/Unit-II till 31.3.2015, the rate of water charges along with the copy of notification(s) for water charges. In addition, the petitioner was directed to submit details of the actual water charges paid to the Water Resource Department/ State Government duly certified by the Auditor, type of cooling water system and justification for any variation in the allocated quantity of water *vis-a-vis* actual consumption. In response, the petitioner vide affidavit dated 18.3.2016 has submitted the details as under:

	Number of Days	Water Consumption (Million litres)	Allocation (Million litres)
4.1.2014 to 31.3.2014	87	836.553	10875
1.4.2014 to 23.3.2015	357	3739.924	44625
24.3.2015 to 31.3.2015	8	125.709	1000

85. The petitioner has further submitted that there has been no deviation from the allocated quantity of water *vis-a-vis* the actual water consumption and that the allocated quantity of water to the plant as per State Support Agreement is 125 Million litres per day. It has further submitted that the rate applicable for water charges is as per State Support Agreement signed between the petitioner and the State Govt.of Tripura and the Water Charges applicable under this agreement is as under:

- For raw water lifted by the company from river Gumti =10 paisa per kilo litre
- Water cess payable = 5 paisa per kilo litre.

86. The petitioner has furnished the copy of the water bill raised by the State Govt. and has submitted that the type of cooling water system used at the plant is 'Induced Draft type. It has also submitted that payments of ₹425465 and ₹27120 were made by the petitioner towards water charges and water cess for the period from 4.1.2014 to 31.3.2015 respectively.

Analysis

87. We have examined the matter. Since the COD of the generating station is 24.3.2015, the actual data for the water consumption furnished is for the limited period of 357 days (4.1.2014 to 24.3.2015) for Block-I/Unit-I and for 8 days (24.3.2015 to 31.3.2015) for Block-II/Unit-I & of the generating station. It is evident from above that the average water consumption per day from 24.3.2015 to 31.3.2015 for the generating station as a whole (both units) is 125709/8=15713.62 KL per day. Therefore, the annual water consumption is 5735473 KL and the water charges as per agreement between the petitioner and the State Govt. of Tripura is 15 paisa / KL (10 paisa/KL for raw water lifting + 5 Paisa/KL as water cess). Accordingly, the total annual water charges computed is ₹8.60 lakh (5735473x0.15/100000). Considering the fact that no annual escalation of water

charges has not been envisaged in the State Government notification, the Water charges considered for the period 2014-19 is as under:

(₹in lakh)

2014-15 (actual) (Unit-I: 1.4.2014 to 31.3.2015) (Unit-II :24.3.2015 to 31.3.2015)	2015-16 (Projected) (Unit-I & II)	2016-17 (Projected) (Unit-I & II)	2017-18 (Projected) (Unit-I & II)	2018-19 (Projected) (Unit-I & II)
4.40	8.60	8.60	8.60	8.60

88. The total O&M expenses including water charges claimed by the petitioner and allowed is as under:

(₹ in lakh)

	2014-15		2015-16	2016-17	2017-18	2018-19
	1.4.2014 to 23.3.2015	24.3.2015 to 31.3.2015				
O&M Expenses as claimed	9434.00	423.00	20606.00	22009.00	23506.00	25111.00
O&M Expenses as allowed	9434.00	423.00	20606.00	22009.00	23506.00	25111.00
Water Charges as claimed	4.00	0.10	10.00	10.00	11.00	12.00
Water Charges as allowed	4.21	0.19	8.60	8.60	8.60	8.60
Total O&M Expenses as claimed (including Water charges)	9439.00	423.00	20616.00	22019.00	23517.00	25123.00
O&M Expenses allowed (including Water charges)	9438.21	424.90	20614.60	22017.60	23514.60	25119.60

Operational Norms

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

Target Availability	85%
Gross Station Heat rate (kcal/kWh)	1823.86
Auxiliary Energy Consumption (%)	3.50

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

Normative Annual Plant Availability Factor

91. The petitioner has considered the Normative Annual Plant Availability (NAPAF) of 85% for the purpose of recovery of annual fixed charge for the period 2014-19 in terms of the 2014 Tariff

Regulations. However, in respect of prevailing Plant Availability Factor of the Project the petitioner has submitted as under:

(i) The Petitioner had conceived and commissioned the project to provide power to otherwise power starved North-Eastern region of the Country, but now the petitioner has been incurring heavy loss due to non- availability of fuel gas. It may kindly be noted that the petitioner is a single project company that operates only the project. With the difficulties in fuel supply being faced and the losses being incurred, it has become difficult for the petitioner to run the plant on sustainable basis unless the Commission, within the powers vested in it under provisions of Regulation 54 of the 2014 Tariff Regulations, relaxes the norms of operation for the petitioner.

(ii) Block-I/Unit-I of the project was operating successfully since COD on 4.1.2014 and it is only after the commissioning of Block-II/Unit-II on 24.3.2015, that the generation at the project is affected due to insufficient fuel gas supply. As project is located in the remote North-Eastern region of the country and it has neither any allocation of APM gas and is not connected to any other pipelines at national level to arrange for spot gas or RLNG or liquid fuel. Thus, unlike gas plants in rest of the regions of the country, the project is solely dependent on one gas supplier, i.e. ONGC.

(iii) Before COD of Block-II/Unit-II, the generating plant was able to achieve higher PAF. This is because only one unit was in operation and available gas quantity was sufficient to run the plant at target PAF. However, after COD of Block-II/Unit-II, i.e. the entire project, both PLF and PAF have dropped drastically on account of lower gas availability. The Petitioner has been making all possible efforts to get full quantum of gas. However, difficulties have been expressed by the fuel supplier regarding its inability to supply full quantum of gas, which is evident from the documentary evidence submitted.

(iv) The petitioner has consistently been submitting daily nomination of gas supply of 3.18 MMSCMD, which is required for operating the plant at its full generation capacity of 726.6 MW. However, the fuel supplier is not able to supply the same. Even with 2.65 MMSCMD of gas, which shall be made available for next 18 to 24 months, as communicated by the fuel supplier, and the existing operating norms of the plant, the petitioner is barely able to achieve a maximum PAF of approx. 80%.

(v) In line with the above, considering the present restricted gas supply, which is equivalent to maximum PAF of 80% approx. on daily basis and taking into account the 15% (100% - 85% normative PAF) forced and planned outages of the plant in a year, the petitioner request the Commission to relax the NAPAF for the project to 68% (80% PAF x 85%) from COD of Unit-II, till the full gas is made available by the fuel supplier.

(vi) Attention is drawn to various instances, wherein, the Projects have been allowed full recovery of the AFC at a reduced NAPAF, due to fuel supply constraints. In the case of Maharashtra State Power Generation Company Limited (MSPGCL), the Maharashtra Electricity Regulatory Commission (MERC) vide their Order in Case No. 28 of 2013 dated 3 September 2013, has also allowed the full recovery of AFC of Uran GTPS at actual availability for FY

2009-10. MERC, considering the gas shortage has approved the actual Availability of Uran GTPS for allowing the fixed cost recovery for FY 2012-13 (Order in Case No. 122 of 2014) and also for 2013-14 (Order in Case No. 15 of 2015).

(vii) In case of Assam Gas Based Station of NEEPCO, the Commission had relaxed the Normative annual PAF to 72%, with the following observations:

"28.12 It is observed that the Target Availability of 80% could not be achieved by the Assam GPS from 2004-05 to 2007-08. It is because the station is not getting required quantity of gas for availability declaration of 80%. Further, as brought out in our explanatory memorandum with draft regulation that the allocation of 1.0 MCMD of gas on firm basis and 0.4 MCMD on fall back basis is sufficient for sustaining a generation level of the order of 70% only. Arranging of spot gas or any other alternate fuel in the remote north-eastern region is also not a feasible option. In this back drop, Commission is of the view that there is a case for relaxation of target availability norm for the Assam GPS station. However, the average availability of the station is about 73% for the years 2004-05 to 2007-08 despite availability of 70% (Actual PLF) in the year 2007-08. As regards, provision regarding conserving gas during off peak hours and using it during off-peak hours in consultation with beneficiaries due to gas shortage may be a difficult option for Assam GPS due to supply of gas from scattered wells, through short pipelines which do not have any capacity for gas storage (line pack), Considering all these aspect, a target availability norm of 72% is allowed for the tariff period 2009-14 as against 70% provided in the draft regulation."

(viii) The Commission has retained the relaxed norm of 72% in the 2014 Tariff Regulations also. The Petitioner submits that given the similarity of situation for its project, the Commission, in exercise of its power to relax in terms of Regulation 54 of the 2014 Tariff Regulations, may relax the availability norm for the Project, from 85% to 68%. The petitioner request that the Commission may consider the availability in the light of the available quantity of gas for next 18 to 24 months, i.e. 2.65 MMSCM per day, which gives approximately a maximum PAF of 80% only, and providing further allowance of 15% (100% - 85% normative PAF) for outages, etc. Therefore, while determining tariff for 2014-19, the Commission may allow recovery of annual fixed charges at normative availability of 68% instead of the 85% as mentioned in the 2014 Tariff Regulations.

(ix) That the project is located in the North-East Region and facing several difficulties on account of its being established at a remote location, lack of connectivity to gas grid, non-availability of any other source of fuel, etc. The petitioner further submits that the Petitioner has also not been qualified to participate in the recently announced scheme for utilization of gas based power generation capacity, by Ministry of Power, Government of India, for procurement of gas fuel, through reverse e-bid/auction process.

(x) Therefore, the petitioner prays that the Commission may consider extending a similar relaxation to Gas based power plant also, as provided to hydro projects in the North-Eastern Region under Regulation 37(3) of the 2014 Tariff Regulations.

(xi) Accordingly, the petitioner prays that the Commission may approve recovery of annual fixed charges for the period 2014-19 at a lower availability of 68%, considering the gas shortage as an uncontrollable factor. The Petitioner also submits that the Commission may grant liberty to approach the Commission for seeking relaxation in operating norms as per the actual performance in future, on account of gas availability scenario in the region.

Analysis and Decision

92. The petitioner has sought the relaxation in NAPAF for the project to 68% from COD of Block-II/ Unit-II due to shortage of gas till full gas is made available by the fuel supplier. The Commission vide ROP of the hearing dated 16.2.2016 had directed the petitioner to furnish a detailed note on the availability of gas and the timeline for availability of gas for full generation along with supporting documents from supplier. In response, the petitioner vide affidavit dated 18.3.2016 has submitted the following:

(a) The fuel supplier had entered into an agreement with the petitioner in 2008 to supply gas to Palatana Power Project. The fuel supplier had carried out necessary activities well in time to meet gas supply commitments for both units of the Project. At the time of exploration, the gas availability was estimated to be more than sufficient to meet the needs of the Project and other projects in the region. However law & order issues and blockade by locals hampered progress of gas supply network works and gas supply for Unit-II could be resumed in October, 2014.

(b) Besides encountering delays on account of reasons beyond reasonable control of the fuel supplier, there was inherent risk of unexpected reservoir behavior which is typical of the oil & gas industry and is covered under the Gas Sale & Purchase Agreement in Article 17.1(c). Such eventualities are and beyond the control of gas supplier and have been therefore covered under the Force Majeure condition as unanticipated behavior of gas reservoir. The fuel supplier is confident that it will be in a position to supply the gas as per requirement for full load generation of the Plant by September, 2018.

(c) From the gas supply data and the correspondence made with the gas supplier, it is discovered that despite repeated persuasion, the gas supplier agreed to supply the 2.65 MMSCM per day against the requisition of the 3.18 MMSCM per day, which gives approximately PAF of 83 %. Further, the petitioner has claimed for providing additional allowance of 15% for outages, etc. as provided by the Commission in Regulation 36(A)(a).

93. It is observed from the above that the petitioner has sought relaxation in the Target Availability of 85% (as per the 2014 Tariff Regulations) to 68% based on the non-availability of gas. There is no denying the fact that the petitioner is not getting adequate gas to achieve the normative availability of 85%, and hence we find merit in the submission of the petitioner to consider the case for relaxation of Regulation 36(A)(a) in exercise of the Power to relax under Regulation 54 of the 2014 Tariff Regulations. However, we are conscious that the relaxation of target availability, if any, shall be reasonable and based on facts of the case. It is noticed that the issue of non achievement of Target

Availability due to failure of Gas Turbines came up for consideration before the Commission while determining the tariff of Ratnagiri Gas and Power Private Ltd (RGPPL) for the period 2009-14 in Petition No. 283/2009 and the Commission by order dated 18.8.2010 decided as under:

"27…….Considering the fact that NAPAF of gas based generating station has been increased to 85% in 2009 regulations from the target availability of 80% in 2004 regulations, the history of frequent failures of gas turbines of the generating station, and the need for stabilization of performance of the gas turbines after refurbishment, we are of the view that marginal relaxation in the NAPAF of the generating station is required during 2011- 14 for achieving financial viability of the generating station and in the interest of the consumers.

xxx

"29. In view of our observations in para 25 above and in exercise of our power under Regulation 44 of 2009 regulations, we are relaxing the norms of NAPAF for gas based generating stations as specified under Regulation 26(i)(a) of 2009 regulations in respect of the generating station as a special onetime dispensation and allow the following NAPAF for different years of the tariff period 2009-14, for the purpose of recovery of full annual fixed charges:

Financial year	*Net generation (MU)*	*NAPAF (%)*
2009-10	*8227*	*49.90*
2010-11	*11000*	*66.72*
2011-12 to 2013-14	*13188*	*80.00*

Further, relaxation in the NAPAF as allowed above, is subject to the condition that the generating station shall be entitled to incentive corresponding to 50% of the availability in excess of 85% till such time the shortfall in availability from the 80% availability during the years 2009-10 and 2010-11 is made good. We would also like to make it clear that relaxation in NAPAF is a onetime dispensation and no further request for relaxation shall be entertained and consequences of any shortfall in performance shall be borne by the Petitioner."

94. Accordingly, we compute the achievable Target Availability with the quantum of gas available to the petitioner. It is observed these Advance Class Gas Turbine Machines having Long Term Service Agreement (LTSA) with OEM are having guaranteed availability more than 90%. By considering the machine availability of 90% and outage of 10%, the availability of Gas as 83% and considering the fact that during outage of one unit, the second unit shall have 100% availability of Gas, the computation of Availability is as under:

(a) Considering 90% Availability, the no of days available is= 329 days (365 x 0.9=329)

(b) Out of 329 days, one unit shall have gas availability of 83% corresponding to 293 days (329-36) and for remaining 36 days corresponding to the outage of other unit, the availability of the first unit would be 100%

(c) The annual availability is worked out as = (36x1+293x0.83/365)

=76.49%

Accordingly, we find that an annual Target Availability of 76% can be achieved by the petitioner with the available gas.

95. The petitioner has submitted that the fuel supplier will be in a position to supply the gas as per requirement for full load generation of the plant, by September 2018. In the light of the above discussions, the normative availability for recovery of annual fixed charges for the period 2014-19, is allowed as under.

1.4.2014 to 23.3.2015 (Unit-I)	24.3.2015 to 30.9.2018 (Unit-I & II)	1.10.2018 to 31.3.2019 (Unit-I & II)
85%	**76%**	**85%**

96. Further, the relaxation in the availability allowed as above, is subject to the condition that the generating station shall be entitled to incentive corresponding to 50% of the availability in excess of 85% till such time the shortfall in availability from 76% availability during the period 24.3.2015 to 30.9.2018 is made good. We would also like to make it clear that relaxation in availability is a one time dispensation and no further request for relaxation shall be entertained and consequences of any shortfall in performance shall be borne by the petitioner.

Auxiliary Energy Consumption

97. As per the 2014 Tariff Regulations, the norm for Auxiliary Energy Consumption (AEC) for Combined Cycle Gas based Projects is 2.5%. The petitioner vide affidavit dated 15.12.2015 has submitted that the gas delivered by ONGC at plant boundary will be at low pressure (15 +/-1 kg/cm2) and electric motor driven Gas Booster Compressor (GBC), which has a high electricity consumption of approximately 7 MW, will be used to increase the pressure of the gas to approximately 32 kg/cm2. It has also submitted that accordingly, the actual auxiliary consumption of the plant will be higher (approx 3.5%) due to the use of electric motor driven Gas Booster Compressor and the same may be allowed. The petitioner has stated that an electric motor driven GBC has been chosen over gas engine driven GBC as it is proven to be more reliable. Accordingly, the petitioner has prayed that

AEC of 3.5% may be allowed for the generating station in exercise of the Power to relax under Regulation 54 of the 2014 Tariff Regulations.

98. The Commission vide ROP of the hearing dated 16.2.2016 had directed the petitioner to furnish documentary evidence in support of the AEC of 3.41% guaranteed by OEM (M/s BHEL) and clarification as to whether these are computed data or based on meter reading for AEC. It was also directed to furnish the component/ equipment-wise AEC. In response, the petitioner vide affidavit dated 18.3.2016 has submitted the relevant extract of the EPC contract in support of the guaranteed AEC of 3.41% at 100% base load. The petitioner has submitted that this AEC data is guaranteed by the EPC contractor. The petitioner has also submitted the component/ equipment-wise AEC as under:

Month	Total generation (MUs)	Total Auxiliary Consumption			Consumption of GBC	
		MUs (metered)	Aux % (calculated)	Aux % (metered)	MUs	% of total generation
April, 2015	238.72	11.62	4.68	4.65	4.02	1.68
May, 2015	200.98	9.84	4.93	4.90	3.14	1.56
June, 2015	228.98	9.13	4.00	3.99	3.16	1.38
July, 2015	360.22	14.69	4.10	4.08	5.14	1.43
August, 2015	303.32	12.89	4.30	4.25	4.44	1.46
September, 2015	315.31	12.45	3.97	3.95	4.29	1.36
October, 2015	280.94	11.22	3.99	3.99	4.14	1.47
November, 2015	369.50	16.21	4.12	4.10	5.65	1.53
December, 2015	232.03	7.33	3.55	3.55	2.40	1.03
January, 2016	265.39	9.29	3.49	3.50	3.01	1.13
February, 2016	315.25	13.56	4.20	4.01	4.87	1.54
Total (2015-16)	**3110.65**	**128.23**	**4.11**	**4.08**	**44.26**	**1.42**

99. The petitioner has submitted that it could be noticed from the above that the consumption of GBCs vary from 1.03% to 1.68% of the total generation and on an average is 1.42% (approx) of the total generation for 2015-16. It has also submitted that this is when the auxiliary power consumption for the third GBC in standby mode has not been factored in the data. The petitioner has further submitted that the Commission has allowed auxiliary power norms of 2.5% for Gas based power

plants and it is evident from the above data that electric motor driven GBC consume more than 1% of the total power generation. In view of the above, the AEC for any power plant using electric motor driven GBC will be in the range of 3.5%o or more. The petitioner has stated that the consumption of GBC also varies from 31.91% to 36.90% (approx) of the total AEC in 2015-16. Accordingly, the petitioner has prayed to allow a minimum 3.5% of AEC to the petitioner under "Power to Relax" in terms of Regulation 54 of the 2014 Tariff Regulations.

Submission of Respondent, APDCL

100. The respondent, APDCL has submitted that the Commission may decide issues like Auxiliary Consumption, Heat Rate, O&M, and Initial Spares etc. on the basis of the 2014 Tariff Regulations. It has also furnished the auxiliary energy consumption for the entire project as guaranteed by the EPC contractor, BHEL at different base loads as under:

Base Load	Plant Gross Output in KW	Plant Auxiliary energy consumption in KW	Plant Auxiliary Energy Consumption in (%)
100%	726600	24800	3.41
80%	580800	23100	3.98
60%	436200	21700	4.97

Analysis

101. The petitioner has submitted that because of electrical gas engines there is additional energy consumption of 7MW and as per the contract with BHEL (the EPC contractor), the plant auxiliary energy consumption is 24.80 MW for 100% base load. The AEC of 2.5% specified under the 2014 Tariff Regulations for combined cycle gas turbine project was based on the auxiliary consumption pattern of the gas based generating stations of NTPC and NEEPCO. In case of NTPC Gas based stations, there is no Gas Booster Stations (GBS). However, in case of Assam Gas Based Power Station of NEEPCO, there is GBS, but the GBS is using gas engines. In case of this GBS of thie project, electrical driven gas engines are used. The petitioner has furnished the actual auxiliary energy consumption for April, 2015 to February, 2016, the average of which works out to 4.08% and consumption of GBSs as 1.42% separately.

102. We have examined the actual energy consumption during the period from April, 2015 to February, 2016. The reasons for variation in auxiliary energy consumption for this generating station (Block-I & Block-II) from 3.55% to 4.90 % during the period from April, 2015 to February, 2016 is due to different PLF and may be due to difference in the quality of gas. However, the fact appears to be clear that the AEC could be more than 2.5% (which is specified norm) even at 85% or higher PLF, due to operation of electric driven Gas Booster Compressors (GBCs) which is a special feature in this Project and consumes significant energy, averaging 1.42% during the period from April, 2015 to February, 2016. The EPC contractor, M/s BHEL has also furnished guaranteed APC of 3.41% at 100% base load which is close to 3.50% as was claimed by the petitioner. Accordingly, the AEC of 3.50 % has been allowed in exercise of the Power to Relax under Regulation 54 of the 2014 Tariff Regulations.

Gross Station Heat Rate (GSHR)

103. Regulation 36 (C)(d) of the 2014 Tariff Regulations provides as under:

> *"(d) Gas-based / Liquid-based thermal generating unit(s)/ block(s) having COD on or after 01.04.2009.*
>
> *= 1.05 X Design Heat Rate of the unit/block for Natural Gas and RLNG (kCal/kWh)*
>
> *= 1.071 X Design Heat Rate of the unit/block for Liquid Fuel (kCal/kWh)*
>
> *Where the Design Heat Rate of a unit shall mean the guaranteed heat rate for a unit at 100% MCR and at site ambient conditions; and the Design Heat Rate of a block shall mean the guaranteed heat rate for a block at 100% MCR, site ambient conditions, zero percent make up, design cooling water temperature/back pressure:*
>
> *Provided that the heat rate norms computed as per above shall be limited to the heat rate norms approved during FY 2009-10 to FY 2013-14."*

Submissions of the Petitioner

104. The petitioner has submitted that the guaranteed Gross Station Heat Rate (GSHR) at the Gross Calorific Value (GCV) for Energy Charge Calculations as furnished by the EPC contractor M/s. BHEL is 1823.682 kcal/kWh. The petitioner has also submitted that as per the values of guaranteed Gross Station Heat Rate (GSHR) for different loads as per EPC contract, the weighted average GSHR at GCV would be:

Weighted average GSHR at GCV = 0.4*1670.7+0.4*1735.4+0.2*1872= 1736.84 kcal/kWh

where GSHR 1670.7 kcal/kWh corresponds to the 100% MCR,

GSHR 1735.4 kcal/kWh corresponds to the 80% MCR,

GSHR 1872 kcal/kWh corresponds to the 60% MCR

Therefore, GSHR for the purpose of tariff is considered as 1823.862 kcal/kWh (1.05 x 1736.84)

105. The petitioner in Form-2 has also submitted the Guaranteed Design Gross Turbine Cycle Heat Rate at 100% MCR as 1505.7 kcal/kWh on NCV basis and Design/Boiler efficiency as 90%.

Analysis

106. The petitioner has considered the following for the purpose of tariff;

Weighted average GSHR = 1736.84 kcal/Kwh (0.4*1670.7+0.4*1735.4 +0.2*1872)

where,

GSHR of 1670.7 kcal/kWh corresponds to 100% MCR,

GSHR 1735.4 kcal/kWh corresponds to 80% MCR,

GSHR 1872 kcal/kWh corresponds to 60% MCR.

107. However, Regulation 36 (C)(d) of the 2014 Tariff Regulations provides for GSHR at 100% MCR. Moreover, for computation of GSHR, 1.05 X Design Heat Rate of the unit/block is applied. The petitioner the GSHR as 1823.68 kcal/kWh (1736.84 x 1.05). The said computation of GSHR by the petitioner considering the weighted average GSHR is not in conformity with Regulation 36(C)(d) of the 2014 Tariff Regulations which provide that the Design Heat Rate of a unit shall mean the guaranteed heat rate for a unit at 100% MCR and at site ambient conditions; and the Design Heat Rate of a block shall mean the guaranteed heat rate for a block at 100% MCR, site ambient conditions, zero percent make up, design cooling water temperature/back pressure.

108. Accordingly, considering the GSHR corresponding to 100% MCR as 1670.7 kcal/kWh, the GSHR is worked out as 1754.24 kcal/kWh (1670.7 x1.05). In view of above, GSHR for computation of tariff is considered as 1754.24 kcal/kWh for the period 2014-19.

109. The Commission in its order dated 31.8.2015 in Petition No. 199/GT/2013 while approving the tariff of Block-I/Unit-I of the generating station for the period from 4.1.2014 to 31.3.2014 had

considered the guaranteed weighted average GCV corresponding to 80% MCR as submitted by petitioner instead of considering GSHR corresponding to the 100% MCR. Accordingly, the Commission in the said order had allowed the GSHR of 1823.68 kcal/kWh instead of GSHR of 1754.24 kcal/kWh as worked out in terms of the said regulations, in this order. Hence, we direct that the GSHR of 1754.24 kcal/kWh as worked out in this order shall be applicable in respect of Block-I/Unit-I of the generating station for the period from 4.1.2014 to 31.3.2014.

110. Based on the above discussions, the operational norms considered for the purpose of tariff is as under:

Normative Annual Plant Availability Factor	85 % (1.4.2014 to 23.3.2015)
	76 % (24.3.2015 to 30.9.2018)
	85 % (1.10.2018 to 31.3.2019)
Gross Station Heat rate (kcal/kWh)	1754.24
Auxiliary Energy Consumption (%)	3.50

Interest on Working Capital

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

> *"28. Interest on Working Capital:*
>
> *(1) The working capital shall cover*
>
> *(b) Open-cycle Gas Turbine/Combined Cycle thermal generating stations*
>
> *(i) Fuel cost for 30 days corresponding to the normative annual plant availability factor, duly taking into account mode of operation of the generating station on gas fuel and liquid fuel;*
>
> *(ii) Maintenance spares @ 30% of operation and maintenance expense specified in regulation 29; and*
>
> *(iii) Liquid fuel stock for 15 days corresponding to the normative annual plant availability factor and in case of use of more than one liquid fuel, cost of main liquid fuel duly taking into account mode of operation of the generating stations of gas fuel and liquid fuel';*
>
> *(iv) Receivables equivalent to two months of capacity charge and energy charge for sale of electricity calculated on normative plant availability factor, duly taking into account mode of operation of the generating station on gas fuel and liquid fuel;*
>
> *(v) Operation and maintenance expenses for one month."*

Fuel Component and Energy Charges in working capital

112. The petitioner has claimed the cost for fuel in working capital based on price and GCV of gas procured and burnt for the preceding three months of January, 2014, February, 2014 and March, 2014 for the period from 1.4.2014 to 23.3.2015 and for the preceding three months of December 2014, January, 2015 and February, 2015 as under:

(₹in lakh)

2014-15		2015-16	2016-17	2017-18	2018-19
1.4.2014 to 23.3.2015	24.3.2015 to 31.3.2015				
3055.00	3055.00	6292.00	6524.00	6782.00	7051.00

113. Accordingly, the fuel components, based on the price and GCV of gas procured and burnt for preceding three months from January, 2014 to March, 2014 has been computed and considered as under:

(₹ in lakh)

	2014-15		2015-16	2016-17	2017-18	2018-19	
	1.4.2014 to 23.3.2015	24.3.2015 to31.3.2015				1.4.2018 to 30.9.2018	1.10.2018 to 31.3.2019
Cost of gas for 30 days (annualized)	2480.32	4634.77	4647.47	4634.77	4634.77	4634.77	5183.62

Liquid fuel stock for ½ month

114. Since, the petitioner has not used any liquid fuel in the generation of electricity, the same has not been considered.

Energy Charge Rate

115. Based on the above norms of operation, the GCV & Price of Natural Gas for the preceding three months from COD of Block-I/Unit-I and preceding three months from COD of Block-II/Unit-II, the Energy Charge Rate (ECR) in ₹/kWh on ex-power plant, is calculated and considered as under:

	Unit	1.4.2014 to 23.3.2015	24.3.2015 (COD of Block-II) to 30.9.2018 (except leap year)	1.4.2015 to 31.3.2016	1.10.2018 to 31.3.2019
Capacity	MW	363.3	726.6	726.6	726.6
Normative PLF (76% PLF up to 30.9.2018 and 85 % PLF from 1.10.2018-31.3.2019)	hours/kw/ year	7446	6657.6	6675.84	7446
Gross Station Heat Rate	kCal/kWh	1754.24	1754.24	1754.24	1754.24
Auxiliary Energy Consumption	%	3.50	3.50	3.50	3.50
GCV of Gas (average)	Kcal/SCM	9203.86	9221.00	9221.00	9221.00
Price of Gas (average)	₹/ 1000 SCM	5772.74	6043.46	6043.46	6043.46
Rate of Energy Charge P/kWh (ex-bus)	**Paise/kWh**	**114.018**	**119.143**	**119.143**	**119.43**

The energy charge on month to month basis shall be billed by the petitioner in terms of Regulation 30 (6) (b) of the 2014 Tariff Regulations.

Maintenance spares

116. The petitioner has claimed Maintenance spares in the working capital as under:

(₹ in lakh)

2014-15		2015-16	2016-17	2017-18	2018-19
1.4.2014 to 23.3.2015	24.3.2015 to 31.3.2015				
2958	2958	6185	6606	7055	7537

117. Regulation 28(1)(a)(iv) of the 2014 Tariff Regulations provides for Maintenance spares @ 30% of the Operation & Maintenance expenses. Accordingly, maintenance spares @ 30 % of the O&M expenses, including water charges, is allowed as under:

(₹ in lakh)

2014-15		2015-16	2016-17	2017-18	2018-19
1.4.2014 to 23.3.2015	24.3.2015 to 31.3.2015				
2831.46	127.47	6184.38	6605.28	7054.38	7535.88

O & M Expenses (1 month)

118. The O&M expenses for one month (on pro-rata basis) is considered and allowed as under:

(₹in lakh)

2014-15		2015-16	2016-17	2017-18	2018-19
1.4.2014 to 23.3.2015	24.3.2015 to 31.3.2015				
786.52	35.36	1717.88	1834.8	1959.55	2093.3

Receivables

119. Receivables equivalent to two months of fixed and energy charges has been worked out and allowed as under:

(₹ in lakh)

2014-15		2015-16		2016-17	2017-18	2018-19	
1.4.2014 to 23.3.2015	24.3.2015 to 31.3.2015	1.4.2015 to 9.4.2015	10.4.2015 to 31.3.2016			1.4.2018 to 30.9.2018	1.10.2018 to 31.3.2019
11529.41	474.01	558.46	22908.27	24253.55	24400.07	12260.85	12741.21

120. Accordingly, Interest on working capital is worked out as under:

(₹ in lakh)

	2014-15		2015-16		2016-17	2017-18	2018-19	
	1.4.2014 to 23.3.2015	24.3.2015 to 31.3.2015	1.4.2015 to 9.4.2015	10.4.2015 to 31.3.2016			1.4.2018 to 30.9.2018	1.10.2018 to 31.3.2019
Fuel Cost	2425.96	101.58	114.28	4533.19	4634.77	4634.77	2323.74	2584.71
O & M expenses	786.52	35.41	46.94	1670.95	1834.80	1959.55	1049.52	1043.78
Maintenance Spares	2831.46	127.47	168.97	6015.41	6605.28	7054.38	3778.26	3757.62
Receivables- 2 months	11529.41	474.01	558.46	22908.27	24253.55	24400.07	12260.85	12741.21
Total Working Capital	17573.35	738.48	888.65	35127.82	37328.41	38048.78	19412.37	20127.32
Interest Rate	13.50%	13.50%	13.50%	13.50%	13.50%	13.50%	13.50%	13.50%
Total Interest on Working Capital	**2372.40**	**99.69**	**119.97**	**4742.26**	**5039.34**	**5136.58**	**2620.67**	**2717.19**

Annual Fixed Charges

121. The annual fixed charges approved in respect of the generating station for the period 2014-19 is summarized as under:

(₹in lakh)

	2014-15		2015-16		2016-17	2017-18	2018-19
	1.4.2014 to 23.3.2015	24.3.2015 to 31.3.2015	1.4.2015 to 9.4.2015	10.4.2015 to 31.3.2016			
Return on Equity	5954.96	178.10	383.10	16349.43	18159.46	18486.61	18597.96
Interest on Loan	13915.50	587.80	534.67	25760.44	26752.05	25423.08	23760.19
Depreciation	8383.89	334.57	378.38	16147.89	17935.61	18222.28	18295.37
Interest on Working Capital	2372.40	99.69	119.97	4742.26	5039.34	5136.58	5337.86
O & M Expenses	9438.21	424.90	563.24	20051.36	22017.60	23514.60	25119.60
Total	**40064.96**	**1625.07**	**1979.36**	**83051.37**	**89904.05**	**90783.16**	**91110.97**

122. The annual fixed charges determined as above shall be applicable pro-rata to the capacity contracted with the respondents.

Month to Month Energy Charges

123. Clause 6 sub-clause (b) of Regulation 30 of the 2014 Tariff Regulations provides 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*:
>
> ***(b) For gas based and liquid fuel based stations***
>
> *ECR = GHR x LPPF x 100 / {CVPF x (100 – AUX))}*
>
> *Where,*
> *AUX = Normative auxiliary energy consumption in percentage.*
> *CVPF = Weighted Average Gross calorific value of primary fuel as received, in kCal per kg, per litre or per standard cubic metre, as applicable.*
> *ECR = Energy charge rate, in Rupees per kWh sent out.*
> *GHR = Gross station heat rate, in kCal per kWh.*
> *LPPF = Weighted average landed price of primary fuel, in Rupees per kg, perlitre or per standard cubic metre, as applicable during the month."*

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

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

Application Fee and Publication Expenses

126. The petitioner has sought reimbursement of filing fees and the expenses incurred for publication of notices for application of tariff for the period 2015-19. The petitioner has deposited tariff filing fees of ₹2300900/- for the period 2015-16 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 said tariff petition in the newspapers. Accordingly, in terms of Regulation 52 of the 2014 Tariff Regulations and in line with the decision in Commission's order dated 6.1.2016 in Petition No.232/GT/2014, the petitioner shall be entitled to recover the filing fees (pro-rata to the contracted capacity) and the expenses incurred on publication of notices for the period 2014-19 directly from the respondents. The filing fees for the remaining years of the tariff

period 2016-19 shall be recovered pro rata after deposit of the same and production of documentary proof.

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

128. Petition No. 129/GT/2015 is disposed of in terms of the above.

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