CENTRAL ELECTRICITY REGULATORY COMMISSION

NEW DELHI

Petition No. 94/GT/2016

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

Date of Order : 14-07-2017

In the matter of:

Approval of tariff of Agartala Gas Turbine Combined Cycle Power Project (135 MW) of North Eastern Electric Power Corporation Limited for the period from 1.4.2014 to 31.3.2019.

And in the matter of:

North Eastern Electric Power Corporation Limited
Corporate Office: Brookland Compound
Lower New Colony, Shillong 793003,
Meghalaya ………**Petitioner**

Versus

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

2. Meghalaya Power Distribution Corporation Ltd.
Meter Factory Area, Short Round Road
Integrated Office Complex
Shillong-793 001

3. Tripura State Electricity Corporation Ltd.
Bidyut Bhavan, North Banamalipur
Agartala-799 001

4. Power and Electricity Department
Govt. of Mizoram
P&E Office Complex, Electric Veng, Aizwal-796 001

5. Manipur State Power Distribution Company Ltd
Electrical Complex, Khawal Bazar
Keishampat, Imphal-795 001

6. Department of Power
Govt. of Arunachal Pradesh
Vidyut Bhawan
Itanagar-791 111

7. Department of Power
Govt. of Nagaland
Kohima-797 001

8. North Eastern Regional Power Committee
Meghalaya State Housing Finance Co-operative
NERPC complex, Dong Parmaw
Lapalang, Shillong-793006

9. North Eastern Regional Load Dispatch Centre
Dongtieh, Lower Nongrah
Lapalang
Shillong-793 006 **……….Respondents**

Parties present:-

For Petitioner: Shri P.C Barman, NEEPCO
Shri D. Choudhary, NEEPCO
Smt E. Pyrbot, NEEPCO

ORDER

This petition has been filed by the petitioner, North Eastern Electric Power Corporation Limited (hereinafter referred to as "NEEPCO"), for determination of tariff of Agartala Gas Turbine Combined Cycle Power Project (135 MW), AGTCCPP (hereinafter referred to as "the Project/ generating station") for the period from 1.4.2014 to 31.3.2019, based on the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2014 (hereinafter referred to as "the 2014 Tariff Regulations").

2. Petition No. 44/GT/2015 was filed by the petitioner for determination of tariff of Agartala Gas Turbine Power Project operating in open cycle and comprising of four Gas Turbines of 21MW each for the period 2014-19 and the Commission by order dated 23.2.2016 had determined the Capital cost and Annual Fixed Charges as under:

Capital Cost

(₹ in lakh)

	2014-15	**2015-16**	**2016-17**	**2017-18**	**2018-19**
Opening Capital cost	34172.61	34243.04	35845.27	35889.67	35889.67
Additional capital expenditure	70.43	1602.23	44.40	0.00	0.00
Closing capital cost	34243.04	35845.27	35889.67	35889.67	35889.67
Average Capital cost	34207.82	35044.15	35867.47	35889.67	35889.67

Annual Fixed Charges

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Depreciation	544.35	639.86	761.42	768.84	768.84
Interest on Loan	0.00	21.25	21.25	0.00	0.00
Return on Equity	3273.64	3322.84	3371.27	3372.58	3372.58
O&M Expenses	3470.88	3707.76	3959.76	4229.40	4517.52
Interest on Working Capital	903.57	926.96	948.43	968.63	990.51
Total	**8192.43**	**8618.66**	**9062.14**	**9339.45**	**9649.46**

3. The petitioner in this petition has submitted that the Agartala Gas Turbine Power Project (AGTPP) with an installed capacity of 84 MW and operating in open cycle mode was declared under Commercial Operation with effect from 1.8.1998. It has further submitted that the Agartala Gas Turbine Power Project was converted to a Combined Cycle Power Plant with the addition of two Steam Turbine Generating units (STG) comprising of a capacity of 25.5 MW each with effect from 29.7.2015 and 1.9.2015 respectively. Accordingly, the date of commercial operation of the units of the generating station are as under:

	Capacity (MW)	Date of Commercial Operation (COD)
Unit – I (GT)	21	1.4.1998
Unit – II (GT)	21	1.4.1998
Unit – III (GT)	21	1.4.1998
Unit – IV (GT)	21	1.8.1998
Unit – V (ST)	25.5	29.7.2015
Unit – VI (ST) / Generating Station	25.5	1.9.2015

4. The petitioner has further submitted that on commissioning of the aforesaid STG, the power plant has been renamed as “Agartala Gas Turbine Combined Cycle Power Plant” (AGTCCPP), with a total installed capacity of 135 MW. The petitioner has also submitted that the total plant capacity of 135 MW is based on the certification that STG units are of 25.5 MW capacities each by the Original Equipment Manufacturer (OEM). The petitioner has further submitted that though the plant capacity of 25.5 MW has been considered for the purpose of tariff, the Central Electricity Authority (CEA) has considered the capacity as 23

MW for each STG units and had accordingly issued the allocation order for the installed capacity of 130 MW in respect of this generating station. The petitioner has however submitted that after the completion of PG test of the STG units and based on the results of the said test, the plant capacity shall be revised, if needed, in terms of Regulation 5 of the 2014 Tariff Regulations at the time of truing up of tariff of the generating station in terms of Regulation 8 of the 2014 Tariff Regulations.

5. The respondent, APDCL has pointed out that the AGTPP with a capacity of 84 MW had completed approximately two-third of its life span. Accordingly, it has been submitted that the Commission may consider this aspect while approving the capital cost of the generating station. Referring to Regulation 5 of the 2014 Tariff Regulations, the respondent has prayed that the Commission may finalize the installed capacity of the generating station either as per Manufacturer's certification or as per CEA recommendations or based on trial run.

6. We have considered the matter. In terms of Regulation 5 of the 2014 Tariff Regulations, the installed capacity of the plant is determined after the submission of the MCR test report or the PG Test report. Accordingly, the petitioner was directed vide RoP of hearing dated 24.10.2016 to submit the PG test report. In compliance with this direction, the petitioner vide affidavit dated 15.11.2016 has submitted the PG test report which is abstracted here under:

S. No.	**Description**	**Unit**	**Guaranteed Values**	**Corrected values with respect to design exhaust condition**
1.	STG gross output at TMCR condition for Unit I	KW	25500	26100
2.	STG gross output at TMCR condition for Unit II	KW	25500	26100

7. It is noticed from the PG test report above that the guaranteed values in respect of the said units (Units STG-I and STG-II) are 25.5 MW capacity each. Hence, the total capacity of 135 MW is considered for the purpose of tariff of the generating station.

8. The petitioner vide affidavit dated on 3.6.2014 has sought approval of tariff of the generating station in accordance with the provisions of the 2014 Tariff Regulations. Thereafter, the petitioner vide affidavit dated 3.10.2016 has revised the claim for annual fixed charges of the generating station as under:

Capital Cost

(₹ in lakh)

	2014-15	2015-16			2016-17	2017-18	2018-19
		1.4.2015 to 28.7.2015	29.7.2015 to 31.8.2015	1.9.2015 to 31.3.2016			
Opening Capital Cost	34172.61	34243.04	50193.67	65772.19	67678.93	69489.76	70267.02
Additional capital expenditure	70.43	520.94	148.84	1906.75	1810.83	777.26	0.00
Closing capital cost	**34243.04**	**34763.98**	**50342.51**	**67678.93**	**69489.76**	**70267.02**	**70267.02**
Average Capital cost	34207.83	34503.51	50268.09	66725.56	68584.35	69878.39	70267.02

Annual Fixed Charges

(₹ in lakh)

	2014-15	2015-16			2016-17	2017-18	2018-19
		1.4.2015 to 28.7.2015	29.7.2015 to 31.8.2015	1.9.2015 to 31.3.2016			
Depreciation	544.35	189.18	241.78	2029.74	3582.16	3650.45	3674.64
Interest on Loan	-	1.08	40.67	498.02	797.54	695.08	569.24
Return on Equity	3273.64	1097.48	407.32	3163.47	5544.94	5623.00	5651.73
Interest on Working Capital	970.14	257.43	59.90	664.89	1374.04	1407.97	1441.46
O&M Expenses	3470.88	1205.53	449.00	3467.88	6363.90	6797.25	7260.30
Total	**8259.00**	**2750.70**	**1198.67**	**9824.00**	**17662.58**	**18173.75**	**18597.37**

9. The petitioner had filed the additional information in compliance with the directions of the Commission and has served copies on the respondents. Reply has been filed by the respondent, APDCL. We now proceed to examine the claim of the petitioner, on prudence check, based on the submissions and the documents available on records as stated in the subsequent paragraphs.

Project Approval

10. The Investment Approval dated 2.7.2012 for cost of execution of the Project envisaged the conversion of the existing Open Cycle Plant to Combined Cycle Power Plant by installation of two Steam Turbine generating units as the same was conveyed by the Ministry of Power, GoI vide letter No. F.No.7/18/2010-H-I (Pt) dated 2.7.2012 at an estimated cost of ₹29687 lakh (including Interest During Construction of ₹2506 lakh) at June, 2011 Price Level with a debt equity ratio of 70:30.The petitioner has submitted that in terms of the Investment Approval, the expenditure for the project is to be borne by the petitioner with a debt equity ratio of 70:30. It has further submitted that the Revised Cost Estimate (RCE) for the Project was accorded by the Board of Directors of the Petitioner's Company in March, 2016 based on the September, 2015 Price Level (COD of STG I) at ₹36525 lakh (including Interest During Construction of ₹ 1920 lakh).

11. The respondent, APDCL has pointed out that the Original Cost estimate for the project was approved by Ministry of Power, Gol, and the RCE furnished by the petitioner for ₹36525 lakh has been approved by the Board of Director's of the Petitioner's Company. The respondent has further submitted that as per guidelines of the GoI, RCE shall also be approved by the Competent authority which had approved the Original Cost Estimate. It has stated that in case of Cost overrun due to time overrun the same is required to be examined by a Special Committee constituted by MoP, GoI. Referring to the tariff orders dated 7.6.2005 in respect of Ranganadi HEP and Doyang HEP of the petitioner, the respondent has stated that the RCE in this case is required to be approved by MoP, GoI. Accordingly,

the respondent has submitted that the approval of RCE is not as per guidelines of Govt. of India and therefore the same is liable to be rejected and the capital cost of ₹29687 lakh (Including IDC) approved by MoP, GoI on 2.7.2012 may be considered for this project. The respondent has further submitted that the DPR of the project was prepared by M/s Tata Consulting Engineers Limited in November, 2010, and the same was duly concurred by CEA on 3.8.2011. It has further submitted that the EPC contracts were awarded during July, 2012, after 21 months from the date of preparation of DPR and hence there is a substantial time delay in the initial stages of the project. Accordingly, the respondent has prayed that the Commission may examine the question of delay in the project and fix the responsibility.

12. We have examined the matter. As stated, the original cost of the project amounting to ₹29687 lakh (including IDC) has been approved by the MoP, GoI on 2.7.2012. However, the RCE of the project has been approved by the Board of Director's of the Petitioner's Company for ₹36525 lakh (including IDC) and the same is pending for approval by the MoP, GoI. Hence, in the absence of the approved RCE by MoP, GoI we are inclined to restrict the capital cost as on COD of the project to ₹29687 lakh (including Interest During Construction of ₹2506 lakh). This is however subject to revision based upon the approval of RCE by GoI, and submission of the same by the petitioner in due course. We now examine the issue of time overrun in the completion of STG Units I and II of the generating station.

Time Over-run

13. As per Investment Approval by the MoP, GoI dated 2.7.2012, the project was scheduled to be commissioned within 26 months for STG-I (31.8.2014) and within 30 months for STG-II (31.12.2014). However, the actual commissioning date of STG-I was 1.9.2015 and STG-II on 29.7.2015. Thus, there is a delay of 366 days for STG-I and 210 days for STG-II. The petitioner has furnished the reason for delay of 366 days (for STG-I) and 210 days (for STG II).

14. The respondent, APDCL has submitted that in terms of Regulation 9 of 2014 Tariff Regulations, the benchmark for execution of first block extension of combined cycle power project for existing stations of the project is 24 months and for subsequent units at an interval of 2 (two) months each. The respondent has further submitted that the completion time may be reckoned from the date of Investment Approval by the Board (of the generating company or transmission licensee) or the CCEA clearance as the case may be, up to the date of commercial operation of the Unit or block element of transmission project as applicable. It has pointed out that the scheduled COD as per MOP, GOI is 2.7.2014 for STG-I and 2.9.2014 for STG-II as per 2014 Tariff Regulations and hence the delay in COD of the STG may be computed accordingly.

15. The matter has been examined. As the Investment Approval date by the MOP, GOI is 2.7.2012 the same has been considered as Zero date and accordingly the scheduled COD for STG-I and STG-II has been worked out as under:

- STG-I: 1.9.2015 (26 months from date of Investment Approval)
- STG-II: 1.1.2015 (30 months from the date of Investment Approval)

16. The petitioner has submitted the delay analysis report containing the following reasons for delay in COD of the STG units I and II:

Sl No.	Description of Activity/Works /Service	Original Schedule (As planned)		Actual Schedule (as per actuals)		Time Over-Run	Reasons for delay	Other Activity affected (Sl No. of the activity affected)
		Start Date	Completion Date	Actual Start Date	Actual Completion Date	Days		
1	Review and approval of Drawing Documents for ACC and HRSG		31.12.2013		25.10.2013	(-)67	No delay and completed before the scheduled time	
2	Pile Cap and Foundation of HRSG (100% Completion)		31.7.2013		11.1.2014	93	There has been delay of around three months in	Sl. No 3, 4

Sl No.	Description of Activity/Works /Service	Original Schedule (As planned)		Actual Schedule (as per actuals)		Time Over-Run	Reasons for delay	Other Activity affected (Sl No. of the activity affected)
		Start Date	Completion Date	Actual Start Date	Actual Completion Date	Days		
	including Piling Works of HRSG						completion of Piling works due to Pile Load Test Failure. Delay in Piling works deferred completion of HRSG Foundation readiness.	
3	Pile Cap and Foundation of Chimney (100 % Completion)		30.9.2013		19.3.2014	170	Delay in Piling Works delayed starting of Pile Cap Foundation for Chimneys.	
4	Fabrication and Erection of Chimney – Start		31.7.2013		11.9.2013	101	Erection of Chimney could not be started due to non readiness of Foundation	
5	Piling Works of ACC - I and II (100 % Completion)		31.7.2013		9.8.2013	39	Delay due to non-completion of two numbers of Piles in time	
6	Erection of ACC - II – Start		31.12.2013		30.11.2013	-31	No Delay	
7	STG Building - TG Bay readiness		31.1.2014		28.3.2014	56	Initial Delay in Piling works affected Foundation readiness for STG Building	
8	STG Erection – Start		28.2.2014		28.3.2014	28	Erection activities for one of the STG out of two STGs got delayed due to delay in Foundation Work.	

17. As regards the reasons for time over-run, the submission of the petitioner are as under:

(a) Considering the initial synchronization, the 1st unit (STG-II) got delayed by six months whereas the 2nd unit (STG-I) was delayed by three months. Thus, considering the synchronization of the 2nd unit, project was completed in March, 2015 instead of December, 2014 and thus there has been a delay of three months.

(b) There has been an initial delay to start the Plant Civil works due to failure of piling. During initial pile load test on 8.2.2013, it was observed that the test pile failed to withstand design load and on subsequent vertical load test of working pile also showed lesser load carrying capacity compared to design capacity. To ensure construction quality and pile length, integrity test was done on 23.2.2013, which showed concrete quality and pile length as per specification. The revised geotechnical investigation and several vertical load tests on working pile were carried out to find out actual field capacity of pile and based on the actual field capacity, new pile layout was designed and construction of pile resumed from 27.5.2013. In the revised pile layout, load carrying capacity of piles reduced from 95 ton to 50 ton whereas the number of piles as well as length and diameter was increased with respect to earlier layout and design. The unexpected result of pile capacity had severely affected the construction work for a period with effect from 8.2.2013 to 26.5.2013 (three) months (approx).

(c) Delay due to scarcity of construction materials and unavailability of labour. Due to absence of any big river and stone quarry in the vicinity of the construction site there was always scarcity of construction material and the stone chips available at Agartala normally sourced from Bangladesh. Further, due to absence of any big river in the vicinity of project area it was always cumbersome to stock required quantity of sand. Also, due to scarcity of construction materials, unavailability of labour etc. the project activities were hampered to some extent.

(d) On synchronization of the units, the units were tested on different load conditions to sort out any operational problem for stabilization and Reliability Run Test (RRT) was carried out on the said units as per the contract with M/s Thermax EPC Contractor. On completion of the RRT and the trial operation as per the 2014 Tariff Regulations, the project was declared under Commercial operation.

18. The respondent, APDCL has submitted that since the contract were awarded on EPC basis, the delay in completion of the project is attributable to the contractors. It has further submitted the penalty clause, if any, in the contract is requested to be invoked by the petitioner for delay on the part of the EPC contractor for completion of the work.

19. We have considered the submissions of the parties. It is evident from the submissions of the petitioner that the delay in completion of piling works for HRSG by three months had led to the delay in completion of other activities and consequently the delay in completion of the project. In our view, the petitioner had duly undertaken soil investigation as per relevant standards prior to its construction and despite this there has been collapsing/ piling of soil covariate. In this background, we are of the considered view that the collapsing/piling of soil could be considered as a geological surprise. In this connection, it is pertinent to mention that the Commission in order dated 9.4.2013 in Petition No. 16/RP/2012 (in Petition No. 247/2010 NTPC V CERC pertaining to determination of tariff for Korba STPS, Stage-III for 2009-14) had considered the issue of piling failure as geological surprise and had condoned the delay on this count. The relevant portion of the order is extracted as under:

> *"13. It is observed that the main reason for rejection of the submissions of the petitioner as regards the delay in execution of the project in our order dated 3.5.2012 is that the petitioner was responsible for not undertaking the preliminary work of testing the soil condition prior to the placement of award for main plant civil works. The petitioner has submitted that it had placed on record the problems faced in the main plant civil works namely collapsing, caving of soil during boring of the piles which had resulted in a delay of 6 to 7 months in regard to commencement of various works. It has also submitted that the Commission had not inquired into the aspect whether there was any soil testing prior to the placement of order for construction of*

the project and if any inquiry had been made, the petitioner would have placed on record that all standard procedures in regard to soil testing was undertaken in the project before placement of order. It is noticed from records that no specific details relating to the preliminary works undertaken for soil testing prior to the placement of order for construction had been called for from the petitioner after scrutiny of the additional information submitted by the petitioner through various affidavits. It is also noticed that though the additional information filed by the petitioner vide affidavit dated 27.4.2012 as regards the soil investigation was prima facie considered in our order dated 3.5.2012, the details submitted there under appear to have been overlooked and was not considered on merits. Having overlooked the said details on merits, we are of the considered view that the order dated 3.5.2012 suffers from infirmity and the same is required to be reviewed. We order accordingly. Consequently, the submissions contained in affidavit dated 27.4.2012 as quoted in paragraph 12 above have been considered on merits. From the detailed submissions made by the petitioner it is clear that the petitioner had undertaken soil investigation as per relevant standards prior to its construction and as such the collapsing/piling of soil can be considered as geological surprise. Therefore, we are of the view that the delay in execution of the project is not attributable to the petitioner…..”

20. In line with the above, we consider the collapsing/piling of soil covariate as geological surprise and accordingly, on prudence check the delay of 93 days due to delay in piling work has been condoned.

21. As regards the delay in other activities, the petitioner has submitted that the delay of 273 days for STG-I and 117 days for STG-II in Pile cap foundation of chimney, Fabrication and Erection of chimney, Piling work of ACC-I and II and STG building and erection was on account of delay in failing of piling work. However, it is noticed that the petitioner has not furnished any supporting documents substantiating the period of delay of the said works but has instead submitted that the delay was on account of failure of piling work in both the STG’s. In the absence of any documentary evidence substantiating the period of delay and the reasons thereof, we are inclined to hold that there has been slackness in the project management by the petitioner and the delay on this count cannot be said to be beyond the control of the petitioner. Accordingly, we are of the view that delay of 273 days for STG-I and 117 days for STG-II is attributable to the petitioner. Therefore, the delay of 273 days for STG-I and 117 days for STG-II has not been allowed on prudence check.

22. To summarise, out of total delay of 366 days for STG-I and 210 days for STG-II, the delay of 93 days has been allowed for both the STGs, the delay of 273 days for STG-I and 117 days for STG-II has not been allowed for the reason stated there under.

Cost Over-run

23. The petitioner has submitted that the original cost as per Investment Approval of the Project by MoP, GoI on 2.7.2012 was estimated at the cost of ₹29687 lakh at June, 2011 Price Level with the completion schedule of 30 months. It has further submitted that as envisaged in the DPR, EPC contract for execution of the project was awarded in July, 2012 to M/s Thermax Limited for Generator transformers and to M/s Bharat Bijlee for 132 KV Switchyard towards Main Plant equipments comprising of HRSG, Steam Turbine Generating Units, ACC, BOP etc. The petitioner has further submitted that the project was reviewed from time to time and considering the physical and financial progress of the works as and when the expenditure for the project exceeds by more than 50% of the approved cost. Based on this, the project cost was revised as on March, 2015 Price Level as under:

	Total Cost (₹ in lakh)
Hard Cost	34605.00
Interest During Construction	1920.00
Total	36525.00

24. The petitioner vide affidavit dated 3.6.2016 has submitted that the Revised Cost Estimates of ₹36525 lakh at September, 2015 Price Level exceeds the approved project cost of ₹29687 lakh at June, 2011 Price Level by 23%. The detailed breakup of the original investment approval by MoP, GoI, at June, 2011 Price Level and the revised Cost Estimate at September, 2015 Price Level as approved by the Board of Director's of the Petitioner's company, as submitted by the Petitioner is as under:

(₹ in lakh)

<table>
<tr><th>Sl. No</th><th></th><th>Original Cost (₹ in lakh) as approved by the Board of Members (₹ in lakh)</th><th>Actual /Estimated Cost as incurred /to be incurred (₹ in lakh)</th><th>Actual Capital Expenditure as on COD (1.9.2015) (₹ in lakh)</th><th>Difference (₹ in lakh)</th><th>Reasons for Variation</th></tr>
<tr><td>1.0</td><td>Cost of Land & Site Development</td><td>105.00</td><td>0.00</td><td>0.00</td><td>105.00</td><td></td></tr>
<tr><td>2.0</td><td>Plant & Equipment</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>2.1</td><td>Steam Turbine generator Island</td><td rowspan="3">14300.00</td><td rowspan="3">27159.74</td><td rowspan="3">27159.74</td><td rowspan="3"></td><td rowspan="16">• Price against the EPC Contracts is variable with base date as October 2011. Price Escalation for the period June 2011 to October 2011 is based on price indices. Price Escalation from October 2011 to September 2015 is as per the PVC formula provided in the Agreement.
• Modification of Gas Turbine Control System for combined operation was originally proposed to be taken up as R & M of existing GTGs control system, but has been taken additionally through GT OEM.
• Taxes and duties for bought out items are build up with equipment cost.</td></tr>
<tr><td>2.2</td><td>Turbine Generator Island</td></tr>
<tr><td>2.3</td><td>WHRB Island</td></tr>
<tr><td>2.4</td><td>Control & Instrumentation Package</td><td>910.00</td><td></td><td></td><td></td></tr>
<tr><td></td><td>Total Plant & Equipment</td><td>15210.00</td><td>27159.74</td><td>27159.74</td><td>(-)11949.74</td></tr>
<tr><td>3.0</td><td>BOP Mechanical</td><td></td><td></td><td></td><td></td></tr>
<tr><td>3.1</td><td>Make Up Water Treatment Plant</td><td>628.00</td><td>335.84</td><td>335.84</td><td></td></tr>
<tr><td></td><td>Total BOP Mechanical</td><td>628.00</td><td>335.84</td><td>335.84</td><td>292.16</td></tr>
<tr><td>4.0</td><td>BOP Electrical</td><td></td><td></td><td></td><td></td></tr>
<tr><td>4.1</td><td>Switch Yard Package</td><td>122.00</td><td rowspan="6">831.61</td><td rowspan="6">831.61</td><td rowspan="6"></td></tr>
<tr><td>4.2</td><td>Transformers Package</td><td>350.00</td></tr>
<tr><td>4.3</td><td>Switch gear Package</td><td rowspan="4">350.00</td></tr>
<tr><td>4.4</td><td>Cable, Cable Facilities & grounding</td></tr>
<tr><td>4.5</td><td>Lighting</td></tr>
<tr><td>4.6</td><td>Emergency D.G. set</td></tr>
<tr><td></td><td>Total BOP Electrical</td><td>822.00</td><td>831.61</td><td>831.61</td><td>(-)9.61</td></tr>
<tr><td>5.0</td><td>Total Plant & Equipment excluding taxes & Duties</td><td>16660.00</td><td>28327.19</td><td>28327.19</td><td>(-)11667.19</td><td></td></tr>
<tr><td>6.0</td><td>Initial Spares</td><td>666.40</td><td>182.51</td><td>182.51</td><td>483.89</td><td></td></tr>
<tr><td>7.0</td><td>Total Plant & Equipment including Spares excluding taxes & Duties</td><td>17326.40</td><td>28509.70</td><td>28509.70</td><td>(-)11183.30</td><td></td></tr>
<tr><td>8.0</td><td>Taxes and Duties</td><td></td><td></td><td></td><td></td><td>EPC Packages</td></tr>
</table>

Sl. No		Original Cost (₹ in lakh) as approved by the Board of Members (₹ in lakh)	Actual /Estimated Cost as incurred /to be incurred (₹ in lakh)	Actual Capital Expenditure as on COD (1.9.2015) (₹ in lakh)	Difference (₹ in lakh)	Reasons for Variation
8.1	Custom Duty & Excise Duty	1784.62				include many bought out items. Taxes and duties against such items is build-up with equipment cost.
8.2	Other Taxes & Duties	1075.28				
	Total Taxes & Duties	2859.90				
9.0	Total Plant & Equipment including taxes & Duties	20186.30	28509.70	28509.70	(-)8323.40	
10.0	Civil Works					Price against the EPC Contracts is variable with base date as October 2011. Price Escalation for the period June 2011 to October 2011 is based on price indices. Price Escalation from October 2011 to September 2015 is as per the PVC formula provided in the Agreement.
10.1	Main plant	4006.00	4080.45	4080.45		
10.2	Township & Colony	200.00	99.16	99.16		
	Total Civil works	4206.00	4179.61	4179.61	26.39	
11.	Total Construction & Pre-Commissioning Expenses	1684.05				
12.	Total Overheads	999.60				
13.	Interest During Construction (IDC)	2506.00	94.49	94.49	2411.51	IDC has reduced to ₹ 1920 lakh for availing External Commercial Borrowing at low interest rate.
14.	**Total Capital cost**	**29686.94**	**32783.80**	**32783.80**	**(-)3096.86**	

25. The various factors attributable to the variation in cost as submitted by the petitioner is as under:

Sl. No.	Reasons of Variation	Amount (₹ in lakh)	Remarks
1	Price Escalation	2543.00	Due to price variation for the period (June, 2011 to September, 2015)
2	Statutory levies	65.00	According to applicable taxes and duties as per Work Orders against manufacturer's items, civil works and erection and Commissioning.
3	Addition / Deletion	605.00	For hooking up with HRSG etc. for combined cycle operation, modification of Gas Turbine Control System were taken up through OEM, which was originally proposed to be taken up on R&M (upgrading) of existing control systems of GTGs. As per site requirement additional store building as extension to the existing store building, internal road in the township area envisaged.
4	Others	3626.00	Taxes against brought out items are as build up with the main plants equipments' cost which could not be segregated to show against the taxes and duties. Increase in cost against main plant which were based on the awarded cost through tendering. Other cost including establishment based on the awarded cost/actual/projected. IDC has been reduced for availing external commercial borrowing at low interest rate.
5	**Total Variation**	**6839.00**	**23% of the approved cost.**

26. Accordingly, the reasons attributable to the cost variation is as under:

- 9% towards Price Escalation and Change in Statutory levies.
- 2% towards addition / deletion of store building, internal roads etc.
- 12% towards taxes and duties against brought out items (which could not be segregated), increase in cost against Main Plant works and towards Establishment costs.

27. The petitioner has further submitted that the actual status of the cost incurred as on COD and the detailed break-up of the cost will be submitted at the time of truing up.

28. The respondent while pointing out that there has been an overall increase of 23% in the cost of the project within a period of 3 years, has submitted that the petitioner has not furnished the details of break-up of Package in Form 5D and has also submitted contradicting information in Form 5Ei of the petition. The respondent has further submitted

that the additional scope of work with regard to modification of control system with cost of Mark V Control Panel to replace Mark IV Control Panel cannot be considered as the same has been capitalized by order dated 23.2.2016 in Petition No. 453/GT/2014.

29. The matter has been examined. As stated, we have in this order (para 22 above) had not condoned the delay for 273 days for STG-I and 117 days for STG-II of this generating station. It is observed that there has been price escalation on account of time over-run and the increase in cost is on account of the Price Variation clause in the contract. Though the petitioner has submitted that the Price Variation of 23% includes the increase of 9% cost for Price escalation, 2% increase in cost for up-gradation of existing control systems for GTGs & for construction of additional store building (extension of the existing store building) and 12% increase in cost is towards other works mainly taxes and duties against brought out items (which could not be segregated), increase in cost against main plant works through open tendering and also towards establishment cost, it has not furnished any details regarding the Price Variation amount paid to the contractors for the period till SCOD and from SCOD to the actual COD. Moreover, no details in respect of cost over-run of other items have been furnished (i.e. taxes, duties etc). As the petitioner has not furnished any details along with documentary evidence justifying the increase in cost as stated above, we are of the considered view that the increase in the price on account of cost over-run cannot be permitted at this stage. Accordingly, we are inclined to restrict the cost to ₹29686.94 lakh as per the Investment Approval approved by MoP, GoI. The petitioner is however directed to submit the Price variation calculation containing details of the amount paid to the contractors till SCOD and from SCOD to actual COD along with other details/documents as stated above, at the time of truing up of tariff in terms of Regulation 8 of the 2014 Tariff Regulations along with the approved RCE by MoP, GoI.

Infirm Power

The petitioner has submitted that the revenue earned from sale of infirm power from the two STG units from their respective dates of commissioning till their CODs have been adjusted in the capital cost of the project, after accounting for fuel expenses, in terms of Regulation 18 of the 2014 Tariff Regulations. It is observed that the capital cost of the project claimed by the petitioner is higher than the RCE approved cost. Further, the petitioner is yet to obtain RCE approved by the Ministry of Power, GoI. In the absence of RCE, the capital cost has been restricted to the Investment approval cost, as the same is less than the actual capital cost. Since the actual capital expenditure has not been considered for determination of tariff, we find no reason to adjust the revenue earned from infirm power at this stage. However, the revenue earned from infirm power shall be adjusted at the time of truing up of tariff in terms of Regulation 8 of the 2014 Tariff Regulations, after the approved RCE is furnished by the petitioner.

IDC/IEDC

30. The petitioner has submitted that the initial estimate of IDC as per Investment Approval is ₹2506 lakh as on COD of the units. However, IDC has been revised to ₹1920 lakh as on COD in the RCE approved by the Board of the Petitioner's company. The Commission in the ROP of hearing dated 24.10.2016 had directed the petitioner to submit details for calculation of IDC and in response the petitioner vide affidavit dated 15.11.2016 has submitted that the actual IDC incurred as on COD is only ₹94.49 lakh. The petitioner was also directed to submit the loan wise IDC computation specifying the interest rate considered for that quarter as per Form-14 of the 2014 Tariff Regulations and in response, the petitioner has submitted the IDC computation indicating the applicable interest rates. As regards IEDC, the petitioner has submitted that IEDC of ₹2578.00 lakh duly certified by Auditor in support of the same.

31. The matter has been considered. As stated above, the total delay of 273 days for STG I and 117 days for STG II has been disallowed in this order. Since the Capital cost has been restricted to the Investment approval cost as above, we are inclined to consider the adjustment of IDC and IEDC (based on time and cost over-run) at the time of truing-up of tariff, based on the RCE approved by MoP, GoI.

Initial Spares

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

> ***"13. Initial Spares:*** *Initial spares shall be capitalized as a percentage of the Plant and Machinery cost up to cut-off date, subject to following ceiling norms:*
> *(a) Coal-based/lignite-fired thermal generating stations - 4.0%"*

33. The petitioner has claimed initial spares of ₹182.51 lakh as on COD of the generating station. Since the claim of the petitioner is within the ceiling norms of 4% and in terms of the above Regulations, the same is allowed as on COD of the units of the generating station.

Cost of Construction Power

34. The petitioner vide affidavit dated 3.10.2016 has submitted that an amount of ₹100.53 lakh has been incurred towards Purchase of construction power from the respondent Tripura State Electricity Corporation Limited. It has further submitted that the expenditure on account of purchase of construction power shall be capitalized during 2016-17 and hence the expenses incurred on this count has not been considered as on COD of the generating station. Since RCE is pending for approval by the MoP, GoI, the claim under this head shall be considered at the time of truing-up of tariff in terms of Regulation 8 of the 2014 Tariff Regulations, after submissions of the RCE approved by the MoP, GoI, by the petitioner.

Liquidated Damages

35. The Commission vide ROP of hearing dated 11.7.2016 had directed the petitioner to submit the amount of liquidated damages, if any, levied on the contractor on account of the delay in declaration of COD. In response, the petitioner vide affidavit dated 9.8.2016 has

submitted that no Liquidated Damages has been recovered from EPC and Non-EPC contractors. The petitioner has further submitted that the amount of LD to be claimed for the period of time over-run is yet to be finalized by the petitioner. In view of submissions, the amount of LD has not been considered in this order. The petitioner is however directed to finalize the LD amount and submit the same at the time of truing up of tariff in terms of Regulation 8 of the 2014 Tariff Regulations.

Capital cost as on COD

36. Regulation 9(1) of the 2014 Tariff Regulations provides that the capital cost as determined by the Commission after prudence check, in accordance with this regulation shall form the basis of determination of tariff for existing and new projects. Clause (3) of Regulation 9 of the 2014 Tariff Regulations provides as under:

> *"9(3) The Capital cost of an existing project shall include the following: (a)the capital cost admitted by the Commission prior to 1.4.2014 duly trued up by excluding liability, if any, as on 1.4.2014;*
>
> *(b) additional capitalization and de-capitalization for the respective year of tariff as determined in accordance with Regulation 14; and*
>
> *(c) expenditure on account of renovation and modernization as admitted by this Commission in accordance with Regulation 15.*

37. Regulation 9(6) of the 2014 Tariff Regulations provides as under:

> *"9(6) The following shall be excluded or removed from the capital cost of the existing and new project:*
>
> *(a) The assets forming part of the project, but not in use;*
>
> *(b) De-capitalization of Asset;*
>
> *(c) xxxxxx; and*
>
> *(d) The proportionate cost of land which is being used for generating power from generating station based on renewable energy:*
>
> *Provided that any grant received from the Central or State Government or any statutory body or authority for the execution of the project which does not carry any*

liability of repayment shall be excluded from the Capital Cost for the purpose of computation of interest on loan, return on equity and depreciation;"

38. The actual capital cost claimed by the petitioner on cash basis, as on 31.8.2016 and duly certified by Statutory auditor is ₹32783.80 lakh. This includes IDC and IEDC of ₹2672.49 lakh and Initial spares for ₹182.51 lakh. As per the RCE submitted by the petitioner, the actual capital cost claimed as on COD of STG-II (29.7.2015) is ₹16391.91 lakh and as on COD of STG-I (1.9.2015) is ₹32783.82 lakh, as against the capital cost of ₹14843.47 lakh as on COD of STG-II (29.7.2015) was ₹14843.47 lakh and ₹29686.94 lakh as on COD of STG-I (1.9.2015) as per Original Investment Approval. The petitioner has submitted that the RCE approved by Board of Petitioner's Company is yet to be approved by the MoP, GoI. Hence, in the absence of approval of RCE by MoP, GoI, the capital cost has been restricted to Original Investment Approval of ₹14843.47 lakh as on COD of STG-II (29.7.2015) and ₹29686.94 lakh as on COD of STG-I (1.9.2015). Accordingly, the capital cost as on COD is summarized as under**:**

(₹ in lakh)

	STG-I (29.7.2015)	**STG-II (1.9.2015)**
Capital cost excluding IDC/IEDC/FC	14843.47	29686.94
IDC allowed as on COD	0.00	0.00
IEDC allowed as on COD	0.00	0.00
Initial Spares capitalized as on COD	0.00	0.00
Less Income from sale of Infirm Power	0.00	0.00
Capital cost as on COD	**14843.47**	**29686.94**

Projected Additional Capital Expenditure

39. The Commission vide order dated 23.2.2016 in Petition No. 44/GT/2015 had approved the projected additional capital expenditure of ₹1717.06 lakh during the period from 2014-15 to 2016-17 for AGTPP as under:

(₹ in lakh)

Sl. No.	**Head of Work/Equipment**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**Total**
A. Additional Capital Expenditure							
1	Battery Bank with	80.00	0.00	0.00	0.00	0.00	80.00

Sl. No.	Head of Work/Equipment	2014-15	2015-16	2016-17	2017-18	2018-19	Total
	Chargers						
2	6.6 kV Numerical Relay	20.00	28.00	0.00	0.00	0.00	48.00
3	Cooling water pump	6.90	11.50	0.00	0.00	0.00	18.40
4	Gas Flow Meter	20.00	0.00	0.00	0.00	0.00	20.00
5	Up-gradation of controller for two units	0.00	1500.00	0.00	0.00	0.00	1500.00
6	Lightning Arrester	0.00	25.00	0.00	0.00	0.00	25.00
7	Automatic Voltage Regulator	0.00	240.00	80.00	0.00	0.00	320.00
	Total Additional Capital Expenditure (1 to 7)	**126.90**	**1804.50**	**80.00**	**0.00**	**0.00**	**2011.40**
(B) De-capitalization							
8	Battery Bank with Chargers	35.60	0.00	0.00	0.00	0.00	35.60
9	6.6kV Numerical Relay	8.90	12.46	0.00	0.00	0.00	21.36
10	Cooling water pump	3.07	5.12	0.00	0.00	0.00	8.19
11	Gas Flow Meter	8.90	0.00	0.00	0.00	0.00	8.90
12	Up-gradation of controller for two units	0.00	66.75	0.00	0.00	0.00	66.75
13	Lightning Arrester	0.00	11.13	0.00	0.00	0.00	11.13
14	Automatic Voltage Regulator	0.00	106.81	35.60	0.00	0.00	142.41
	Total De-capitalization (B) (8 to 14)	**56.47**	**202.27**	**35.60**	**0.00**	**0.00**	**294.34**
	Net additional capital expenditure allowed (A-B)	**70.43**	**1602.23**	**44.40**	**0.00**	**0.00**	**1717.06**

40. The petitioner in this petition has furnished the break-up details of the additional capital expenditure claimed for STG-I and II of the generating station for the period 2014-19 in terms of provisions of Regulation 14(1) and 14 (3)(vii) of the 2014 Tariff Regulations as under:

(₹ in lakh)

Sl.No	Head of Work/Equipment	Regulation	2015-16	2016-17	2017-18	2018-19
1	BOP Mechanical (DM Water system)	14(1)	192.10	-	-	-
2	BOP Electrical (DM Water system)	14(1)	37.43	-	-	-
3	BOP Lighting system	14(1)	30.00	-	-	-
4	Modification of existing GT control Room	14(1)	28.00	-	-	-

Sl.No	Head of Work/Equipment	Regulation	2015-16	2016-17	2017-18	2018-19
5	Foundation of bulk storage Acid tank for Boiler feed water generation (DM water generation for STGs)	14(1)	5.00	-	-	-
6	RCC Drain surrounding Air Cooled Condenser (ACC) building to raw water reservoir & RCC Culvert	14(1)	42.80	-	-	-
7	Laboratory Instruments (C&I)	14(1)	42.10	-	-	-
8	Chlorination Plant Spares	14(1)	2.56	-	-	-
9	Control System hook up with existing GT control with Central control (Combined ST control)	14(1)	367.00	-	-	-
10	Construction of C--Type Building (double Story) with Electrical wiring &fittings	14(1)	93.04	-	-	-
11	Different process chemicals for for initial charging of HRSG, ACT & DM water lines	14(1)	17.08	-	-	-
12	Acid & alkali (HCL & NaoH flakes) for initial charging of DM plant	14(1)	7.55	-	-	-
13	Procurement of pH meter & Conductivity meter	14(1)	1.01	-	-	-
14	Resin, Carbon filter media, Gravity filter media for initial charging of DM plant	14(1)	7.70	-	-	-
15	Cost of site development & Investigation	14(1)	24.24	-	-	-
16	Cost of Construction Facilities	14(1)	24.05	-	-	-
17	Multimedia Projectors with accessories	14(1)	1.03	-	-	-
18	Construction of HOP Residence including electric wiring/fittings	14(1)	51.61	-	-	-
19	Construction of B-Type Building (Double storied with two units in each floor) including electrical wiring/fittings	14(1)	-	79.28	-	-
20	Emergency DG set interconnection Cabling works	14(1)	-	7.48	-	-
21	Modification of Existing GT control room	14(1)	-	92.92	-	-

Sl.No	Head of Work/Equipment	Regulation	2015-16	2016-17	2017-18	2018-19
22	Security road around the Project	14(1)	-	287.96	-	-
23	Store Building (1120 sqm plinth area) plinth area including electrical wiring & fittings	14(1)	-	256.61	-	-
24	Lighting of BOP Mechanical areas	14(1)	-	30.00	-	-
25	G.I. Piping Bridge from existing GT building to STG Building	14(1)	-	0.29	-	-
26	Construction of Guest House including electrical wiring/fittings	14(1)	-	274.32	-	-
27	ETP (Effluent Treatment Plant) Pond	14(1)	-	60.00	-	-
28	PT (Pre-Treatment) Plant	14(1)	-	121.00	-	-
29	Mod Kit for modification of GT control system (04 nos) for combine cycle operation	14(1)	-	3.81	-	-
30	Site service charges for installation and Commissioning of Combined cycle modification for all GTs(4 nos.) by BHEL-GE	14(1)	-	33.75	-	-
31	Laboratory Equipments for D.M. plant	14(1)	-	4.10	-	-
32	Modification of Drain wall at north side of DM Plant	14(1)	-	0.72	-	-
33	Active & Reactive Power Transducers (ABB make)	14(1)	-	0.86	-	-
34	Landscaping & Horticulture works	14(3)(vii)	-	-	25.00	-
35	Construction of internal road,drains including grading & levelling and toe wall in township	14(1)	-	-	63.75	-
36	Intake Pump House	14(1)	-	-	72.00	-
37	Civil work for Intake water to plant	14(1)	-	-	121.00	-
38	Raw water Pond	14(1)	-	-	285.00	-
39	Overhead Water Tank at plant site	14(1)	-	-	42.00	-
40	Construction of Pavement for Fire tender shed	14(1)	-	-	0.47	-
41	Parapet wall on Effluent Tank	14(1)	-	-	0.64	-
42	Construction of Drain wall near plant gate & Fire	14(1)	-	-	0.38	-

Sl.No	Head of Work/Equipment	Regulation	2015-16	2016-17	2017-18	2018-19
	tender garage					
43	Concrete Flooring for storing of Acid Container	14(1)	-	-	0.30	-
44	Electrical items for Intake pump house		-	-	61.00	-
45	Raising of Boundary wall at colony site	14(3)(vii)	-	-	40.00	-
46	Chain link Fencing in B-type, C-type & HOP's Quarter	14(3)(vii)	-	-	5.03	-
47	Security watch Tower	14(3)(vii)	-	-	15.00	-
48	Development of Green Belt	14(3)(vii)	-	-	15.00	-
49	Spectrophotometer (HACH make model DR2800)		-	-	4.10	-
50	Boiler feed Pump	14(1)	-	-	83.82	-
51	Storm water outfall drain from southern side of ACC to raw water pond	14(1)	-	-	42.80	-
52	Repairing of Quarters at Residential colony	14(3)(vii)	-	-	-	25.00
53	Tennis court	14(3)(vii)	-	-	-	50.00
	Total		**974.30**	**1253.10**	**877.29**	**75.00**

41. The respondent, APDCL vide affidavit dated 3.8.2016 has submitted that the petitioner has not furnished complete documents in support of its claim. It has also submitted that the petitioner may be directed to furnish the details of the scope of work for its claim of additional capital expenditure during the period 2014-19. Accordingly, it has prayed that the claim for additional capital expenditure may be allowed.

42. The cut-off date of the generating station is 31.3.2018. It is evident from the above that the petitioner has claimed total additional expenditure of ₹3179.69 lakh for the period 2015-19 in respect of works which are within the original scope of work and within the cut-off date of the generating station under Regulation 14(1) of the 2014 Tariff Regulations. It has also claimed additional capital expenditure in respect of works which are necessary for efficient operation of the generating station after the cut-off date of the generating station under the provisions of Regulation 14(3) of the 2014 Tariff Regulations. As stated earlier, the capital cost as on COD of the project has been restricted to the original Investment Approval

cost of ₹14843.47 lakh as on COD of STG-II (29.7.2015) and ₹29686.94 lakh as on COD of STG-I (1.9.2015) subject to submission of approved RCE by the MoP, GoI, by the petitioner. In this background, we are not inclined to consider the additional capital expenditure claimed by the petitioner, at this stage. The claim of the petitioner under the head shall however be considered at the time of truing up of tariff in terms of Regulation 8 of the 2014 Tariff Regulations after approval of RCE based on the justification/documentary evidence to be furnished by the petitioner.

Capital cost as on 1.4.2014

43. Accordingly, the capital cost considered for the purpose of tariff for 2014-19 is as under:

(₹ in lakh)

	2014-15	**2015-16**			**2016-17**	**2017-18**	**2018-19**
		1.4.2015 to 28.7.2015	**29.7.2015 to 31.8.2015 COD of STG-II**	**1.9.2015 to 31.3.2016 COD of STG-I**			
Opening Capital cost	34172.61	34243.04	49607.45	64599.76	65532.21	65677.14	65677.14
Additional Capitalization approved vide order dated 23.2.2016	126.90	586.71	167.63	1050.16	80.00	0.00	0.00
Additional Capitalization approved in present Petition i.e. as on COD of STG-I and II	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Less: De-capitalization	56.47	65.77	18.79	117.71	35.60	0.00	0.00
Add: Liability discharge during the period (Cost of Construction Power)	0.00	0.00	0.00	0.00	100.53	0.00	0.00
Net Additional capital expenditure	70.43	520.94	148.84	932.45	144.93	0.00	0.00
Closing capital cost	**34243.04**	**34763.98**	**49756.29**	**65532.21**	**65677.14**	**65677.14**	**65677.14**
Average Capital cost	34207.83	34503.51	49681.87	65065.99	65604.68	65677.14	65677.14

Debt: Equity Ratio

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

(1) For a project declared under commercial operation on or after 1.4.2014, the debt-equity ratio would be considered as 70:30 as on COD. If the equity actually deployed is more than 30% of the capital cost, equity in excess of 30% shall be treated as normative loan:

Provided that:

(i) where equity actually deployed is less than 30% of the capital cost, actual equity shall be considered for determination of tariff:

(ii) the equity invested in foreign currency shall be designated in Indian rupees on the date of each investment:

(iii) any grant obtained for the execution of the project shall not be considered as a part of capital structure for the purpose of debt-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 utilized 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 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 ration based on actual information provided by the generating company or the transmission licensee as the case may be.

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

45. Accordingly, gross loan and equity of ₹17489.46 lakh and ₹16683.15 lakh respectively as on 31.3.2014 as allowed in order dated 23.2.2016 in Petition No. 453/GT/2014 has been considered as on 1.4.2014.

46. The Commission in order dated 23.2.2016_had considered the debt of ₹28293.85 lakh and equity of ₹21313.60 lakh as on COD of STG-II (29.7.2015). Accordingly, the Commission in this order has worked out and considered the debt of ₹38788.46 lakh and equity of ₹25811.29 lakh as on COD of STG-I (1.9.2015) as under:

(₹ in lakh)

	As on 1.4.2014 (As allowed in order dated 23.2.2016 in Petition No. 44/GT/2015		**As on 29.7.2015**		**As on 1.9.2015**		**As on 31.3.2019**	
	Amount	**(%)**	**Amount**	**(%)**	**Amount**	**(%)**	**Amount**	**(%)**
Debt	17489.46	51.18	28293.85	57.04	38788.46	60.04	39542.63	60.00
Equity	16683.15	48.82	21313.60	42.96	25811.29	39.96	26134.51	40.00
Total	34172.61	100.00	49607.45	100.00	64599.75	100.00	65677.14	100.00

<u>Return on Equity</u>

47. 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.

48. 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."

49. The petitioner has considered the following Rate of Return on Equity:

	2014-15	**2015-16**			**2016-17**	**2017-18**	**2018-19**
		1.4.2015 to 28.7.2015	**29.7.2015 to 31.8.2015**	**1.9.2015 to 31.3.2016**			
Base Rate	15.500%	15.500%	15.500%	15.500%	15.500%	15.500%	15.500%
Rate of Return on Equity	19.610%	20.113%	20.113%	20.113%	20.113%	20.113%	20.113%

50. The petitioner has further submitted that it has claimed RoE in terms of Regulation 25 of the 2014 Tariff Regulations which provides that ROE shall be grossed up with the effective tax rate of the respective years. The petitioner has further submitted that ROE has been worked out considering the effective tax rate as 22.9355%. It has also submitted that the effective tax rate of 22.9355% is due to special benefit availed under Section 32 AC of the Income tax Act, 1961 for the year 2015-16. The petitioner has submitted that the special benefits may not be available in the future and, for the purpose of calculation of ROE for the period 2018-19, this lower rate of 20.113% has been considered. The petitioner has stated that the pre-tax ROE considered is 20.113% for the year 2015-16 to year 2018-19.

51. We have examined the matter. Though the 2014 Tariff Regulations specify the computation of effective tax rate on the basis of tax paid, we deem it proper to allow the grossing up on MAT rate considering the fact that the matter is decided and disposed of during the year 2017-18. Accordingly, for the present, the effective tax rate (MAT) of 20.961% has been considered for the year 2014-15 and the rate of 21.342% for the year

2015-16 onwards till 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 the year 2014-15 and 19.705% for the year 2015-16 onwards. This is subject to truing-up in terms of the 2014 Tariff Regulations. The petitioner is however directed to furnish the detailed calculation of the effective tax rate, duly certified by Auditor and supported by tax audit report for the respective years, at the time of revision of tariff based on truing up exercise in terms of Regulation 8 the 2014 Tariff Regulations. Accordingly, the return on equity has been worked out as under:-

(₹ in lakh)

	2014-15	2015-16			2016-17	2017-18	2018-19
		1.4.2015 to 28.7.2015	**29.7.2015 to 31.8.2015**	**1.9.2015 to 31.3.2016**			
Notional Equity-Opening	16683.15	16704.28	21313.60	25811.30	26091.03	26134.51	26134.51
Addition of Equity due to additional capital expenditure (addition due to STG+ allowed under Commission's order 44/GT/2015)	21.13	156.28	44.65	279.73	43.48	0.00	0.00
Closing Equity	**16704.28**	**16860.56**	**21358.26**	**26091.03**	**26134.51**	**26134.51**	**26134.51**
Average Equity	16693.71	16782.42	21335.93	25951.16	26112.77	26134.51	26134.51
Return on Equity (Base Rate) (%)	15.500	15.500	15.500	15.500	15.500	15.500	15.500
Tax rate (%)	20.961	21.342	21.342	21.342	21.342	21.342	21.342
Rate of Return on Equity (Pre Tax) (%)	19.610	19.705	19.705	19.705	19.705	19.705	19.705
Return on Equity (Pre Tax)	**3273.64**	**1075.22**	**390.56**	**2975.99**	**5145.52**	**5149.80**	**5149.80**
Return on Equity (Pre Tax) (Annualized)	**3273.64**	**3306.98**	**4204.24**	**5113.68**	**5145.52**	**5149.80**	**5149.80**

Interest on Loan

52. Regulation 26 of the 2014 Tariff Regulations provides as under:-

> ***"26. Interest on loan capital:*** *(1)The loans arrived at in the manner indicated in regulation 19 shall be considered as gross normative loan for calculation of interest on loan.*

(2) The normative loan outstanding as on 1.4.2014 shall be worked out by deducting the cumulative repayment as admitted by the Commission up to 31.3.2014 from the gross normative loan.

(3) The repayment for each of the year of the tariff period 2014-19 shall be deemed to be equal to the depreciation allowed for the corresponding year/period. In case of de-capitalization of assets, the repayment shall be adjusted by taking into account cumulative repayment on a pro rata basis and the adjustment should not exceed cumulative depreciation recovered upto the date of de-capitalization of such asset.

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

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

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

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

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

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

(8) The changes to the terms and conditions of the loans shall be reflected from the date of such refinancing.

(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."*

53. As regards, Interest of loan the petitioner has submitted that It is liable to pay Interest Rate (including interest rates) applicable as per loan agreement. It has further submitted that the company has also deployed its own equity beyond the limit of 30% equity part in place of debt funds and the same has been considered as normative loan for the purpose of tariff. It has therefore prayed that the petitioner may be allowed to adjust ROI suitable as and when base rate / reset of make-up for each Rupee loan is affected by the lenders.

54. Accordingly, Interest on loan has been worked out as under:-

a. The gross normative loan amounting to ₹17489.46 lakh has been considered as on 1.4.2014.

b. Cumulative Repayment amounting to ₹17489.46 lakh as on 31.3.2014 as considered in order dated 23.2.2016 in Petition No. 44/GT/2014 has been considered.

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

d. In line with the provisions of the above regulations, the weighted average rate of interest of has been calculated by applying actual loan portfolio existing as on 1.4.2014 along with subsequent additions during the period 2014-19, if any, for the generating station. In case of loans carrying floating rate of interest, the rate of interest as furnished by the petitioner has been considered for the purpose of tariff.

e. The opening loan as on 1.4.2014 in order dated 23.2.2016 in Petition No. 44/GT/2015 has been considered. Further, the opening loan as on COD of STG-II (29.7.2015) as ₹28293.85 lakh (equal to the closing loan for the period 1.4.2015 to

28.7.2015 plus the gross opening loan as on COD of unit-I) has been considered., The opening equity as on COD of STG – I (1.9.2015) is considered as ₹38788.46 lakh.

55. Necessary calculations for Interest on loan is as under:-

(₹ in lakh)

	2014-15	2015-16			2016-17	2017-18	2018-19
		1.4.2015 to 28.7.2015	**29.7.2015 to 31.8.2015**	**1.9.2015 to 31.3.2016**			
Gross opening loan	17489.46	17538.76	28293.85	38788.47	39441.18	39542.63	39542.63
Cumulative repayment of loan up to previous year	17489.46	17538.76	17903.42	19284.25	21349.94	23594.69	25871.78
Net opening loan	0.00	0.00	10390.43	19504.22	18091.24	15947.94	13670.85
Addition due to Additional Capitalisation	49.30	364.66	104.19	652.71	101.45	0.00	0.00
Repayment of Loan during the period	88.83	410.70	1393.98	2148.09	2269.67	2277.09	2277.09
Less: Repayment adjustment on a/c of de-capitalization	39.53	46.04	13.15	82.40	24.92	0.00	0.00
Add: Repayment adjustment on a/c of discharges / reversals corresponding to un-discharged liabilities deducted as on 01.04.2009	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Closing Loan	**0.00**	**0.00**	**9113.79**	**18091.24**	**15947.94**	**13670.85**	**11393.77**
Average Loan	0.00	0.00	9752.11	18797.73	17019.59	14809.40	12532.31
Weighted Average Rate of Interest on Loan (%)	3.8250%	3.7770%	3.7770%	3.7770%	3.7770%	3.7643%	3.7770%
Interest on Loan (Annualized)	**-**	**-**	**368.34**	**709.99**	**642.82**	**557.46**	**473.35**

Depreciation

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

*“**27. Depreciation:** (1) Depreciation shall be computed from the date of commercial operation of a generating station or unit thereof or a transmission system including communication system or element thereof. In case of the tariff of all the units of a generating station or all elements of a transmission system including communication system for which a single tariff needs to be determined, the depreciation shall be computed from the effective date of commercial operation of the generating station or*

the transmission system taking into consideration the depreciation of individual units or elements thereof.

Provided that effective date of commercial operation shall be worked out by considering the actual date of commercial operation and installed capacity of all the units of the generating station or capital cost of all elements of the transmission system, for which single tariff needs to be determined.

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

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

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

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

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

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

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

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

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

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

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

R&M of the GT Units

Life Extension of GT Units:

57. The petitioner vide affidavit dated 3.6.2016 has submitted that during the conceptual stage of the Project, R & M of existing GTGs was envisaged to match the useful life of GTGs. In this regard, the DPR of the project states as under:

"…..The existing 4 nos. of GTGs have already operated for nearly 13 years. It has residual life of 12 years left as considered by the regulatory bodies viz. CERC. With the integration of the new units having plant life of 25 years, necessary renovation and modernization of existing GTGs would be carried out at appropriate time as per manufacturer's recommendation to match their life with the life f the new units……"

58. The petitioner has further submitted that the Residual Life Assessment (RLA) study of GT has been carried out by OEM M/s BGGTS and the proposal for R&M was accordingly obtained from them. The petitioner has further submitted that in line with the suggestion of OEM, Detail Project Report (DPR) for R&M work was prepared and submitted to CEA on 13.1.2016 for scrutiny and other suggestions. The petitioner has stated that the new technology shall be considered for improvement in power output and heat rate of the generating station. The petitioner further submitted that with the implementation of these R&M schemes, the following benefits will be obtained:

- Life extension of the Gas Turbine to match with life of Steam Turbine.
- Sustained Availability of Gas Turbine
- Technological up-gradation / overcome technological obsolescence.
- Meet statutory environment norms.

59. Accordingly, the petitioner has submitted that the estimated cost of R&M proposal including contingency, IDC and FC at January 2016 price level is ₹18590 lakh.

Schedule of completion for R&M

60. The petitioner has submitted that the specifications, detail scope of work and cost estimates of R&M proposal is under preparation by the petitioner and that the work shall be carried out in phases and the entire scope of work has been proposed to be completed by the year 2020-21, prior to the completion of normal expected useful life of Gas Turbine. The petitioner has further submitted that the depreciation on capitalized cost of assets as on COD and the projected additional capital expenditure has been calculated based on the straight line method over the useful life of the asset (considering the extended life of existing open cycle project matching with the life of new STG, which is for a period of 25 years from COD of the STGs) and at the rates specified under Appendix II of the 2014 Tariff Regulations.The petitioner has submitted that the existing project (open cycle) has completed its 12th year of operation during the year 2010-11 and the useful life of 25 years would expire in the year 2023-24. It has also stated that the useful life of the STG of 25 years will be completed during the year 2040-41 and then the extended useful life of the GTs would require Renovation of the plant from time to time, for maintaining successful and efficient operation. The petitioner has further submitted that R&M works for the GTs of the generating station will be done as and when required. Accordingly, it has submitted that the expenditure incurred for Renovation and Modernization of the Gas Turbines from time to time may be allowed in due course based on submissions made.

61. The respondent, APDCL has submitted that as on date the GTGs have already operated for almost 18 years, out of the total useful life of 25 years. It has further submitted that with the up-gradation of residual life of the GTGs through R&M, the same would result in life extension of the units. The respondent has further submitted that the implementation of new and comparatively advanced technology may improve other parameters like Power

output, Station Heat Rates, Auxiliary Power Consumption etc and has accordingly prayed that the Commission may look into the aspect and reassess the parameters of the generating station in totality at the relevant point of time.

62. The matter has been examined. Regulation 15 of the 2014 Tariff Regulations provides as under:-

> *"**15. Renovation and Modernisation:** (1) The generating company or the transmission licensee, as the case may be, for meeting the expenditure on renovation and modernization (R&M) for the purpose of extension of life beyond the originally recognised useful life for the purpose of tariff of the generating station or a unit thereof or the transmission system or an element thereof, shall make an application before the Commission for approval of the proposal with a Detailed Project Report giving complete scope, justification, cost-benefit analysis, estimated life extension from a reference date, financial package, phasing of expenditure, schedule of completion, reference price level, estimated completion cost including foreign exchange component, if any, and any other information considered to be relevant by the generating company or the transmission licensee.*
>
> *(2) Where the generating company or the transmission licensee, as the case may be, makes an application for approval of its proposal for renovation and modernisation, the approval shall be granted after due consideration of reasonableness of the cost estimates, financing plan, schedule of completion, interest during construction, use of efficient technology, cost-benefit analysis, and such other factors as may be considered relevant by the Commission.*
>
> *(3) In case of gas/ liquid fuel based open/ combined cycle thermal generating station, any expenditure which has become necessary for renovation of gas turbines/steam turbine after 25 years of operation from its COD and an expenditure necessary due to obsolesce or non-availability of spares for efficient operation of the stations shall be allowed :*
> *Provided that any expenditure included in the R&M on consumables and cost of components and spares which is generally covered in the O&M expenses during the major overhaul of gas turbine shall be suitably deducted after due prudence from the R&M expenditure to be allowed.*
>
> *(4) Any expenditure incurred or projected to be incurred and admitted by the Commission after prudence check based on the estimates of renovation and modernization expenditure and life extension, and after deducting the accumulated depreciation already recovered from the original project cost, shall form the basis for determination of tariff."*

63. In terms of the above provision, the petitioner is at liberty to make an application with appropriate justification and the same will be considered by the Commission in accordance with the law.

64. The COD of the Open Cycle (AGTPP) generating station is 1.8.1998. As such, the generating station has completed 12 years of operation as on 1.8.2010. Moreover, the Open Cycle generating station shall complete its useful life on 31.3.2024. The Commission has calculated depreciation in two stages. In the first stage, the remaining depreciation of the generating station (as on 31.3.2014) has been claimed within its useful life as per the provisions of the 2014 Tariff Regulations. In second stage, the depreciation on the additional capitalization has been calculated by claiming maximum depreciation in 12 years as allowed by the Commission in case of normal projects, and the remaining depreciation on the additional capitalization after 12 years to be spread over the balance useful life under R&M.

65. In the case of approval of Singrauli STPS of NTPC referred to by the petitioner, the Commission in order dated 25.8.2011 in Petition No.225/2009 had allowed depreciation of the assets capitalized during the terminal year as per the rate specified in Appendix-III of the 2009 Tariff Regulations for the reasons stated therein. The relevant portion of the said order is extracted as under:

> *"50. The additional capitalization of Dry Ash Evacuation and Transportation Plant (DAETP) for Stage-II and Ash water Recirculation system for S1 Dyke has been allowed for the years 2011-12 and 2012-13 under Regulation 9(2)(ii) of the 2009 Tariff Regulations i.e. Change in law, on the ground that these assets are a statutory requirement in compliance with environmental norms/notification of MOE&F, Govt. of India. As on 1.4.2009, the weighted average life of the generating station is 22.8 years In other words, the generating station has completed its useful life in the year 2011-12. The petitioner had initially claimed depreciation of 90% of average additional capital expenditure. Subsequently vide its affidavit it has requested to consider the life of the asset after commissioning as 8 years commensurate with the loan repayment period currently offered to the petitioner. However, the actual funding details corresponding to the projected additional capital expenditure have not been made available to the Commission. Hence as per calculation, the depreciation rate would work out to 11.25% on straight line method.*
>
> *51. We have given a serious thought on this issue. Since these assets are being capitalized during the terminal year of the generating station, we are of the view that allowing 90% of the depreciation would not be in the interest of the beneficiaries and therefore these assets should be depreciated at the rates specified in Appendix-III of the 2009 Tariff Regulations. The petitioner has not indicated the period for which the life of the generating station would be extended beyond its useful life. In the absence of the said information, the Commission cannot decide as to how the expenditure incurred on DAETP and Ash water recirculation system during the terminal year of the life of the generating station would be serviced in tariff. Therefore, the*

Commission considers it appropriate to allow the depreciation of the assets capitalized during the terminal year as per the rate specified in Appendix-III of the 2009 Tariff Regulations. The petitioner would be required to run the generating station for sufficiently longer period to recover the full depreciation of the said assets. This will be in the interest of the beneficiaries as they will not be overburdened with payment of admissible depreciation during the terminal year of the generating station."

66. It emerges from the above that in the case of Singrauli TPS of NTPC the depreciation of the assets capitalized during the terminal year was allowed as per the rate specified in Appendix-III of the 2009 Tariff Regulations also taking into account the absence of any information on the actual funding details corresponding to the projected additional capital expenditure and the period for which the life of the generating station is to be extended beyond its useful life.

67. Considering the above fact that the Open Cycle AGTPP has completed 12 years of operation during the year 2010-11, the remaining depreciable value has been spread over the balance useful life of the generating station till the COD of STGs. With the Commissioning of the STGs, the depreciation for the AGTCCPP has been calculated based on the weighted average rate of depreciation for the period from 2015-16 to 2018-19 which works out as 5.0805%. Necessary calculations in support of depreciation are as under:

(₹ in lakh)

A- Without the impact of additional during 2014-19					
Particulars	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**
Gross Block as on 31.3.2014	34172.61	34243.04	35845.27	35889.67	35889.67
Additional capital expenditure during 2014-19	126.90	1602.23	44.40	0.00	0.00
Closing gross block	34243.04	35845.27	35889.67	35889.67	35889.67
Average gross block	34207.83	35044.16	35867.47	35889.67	35889.67
Depreciable Value	30538.29	31290.99	32031.97	32051.95	32051.95
Balance useful life of the asset (yrs)	9.33	8.33	7.33	6.33	5.33
Remaining depreciable value	5078.76	5329.99	5581.23	4866.78	4097.93
Depreciation (A)	**544.35**	**639.85**	**761.42**	**768.84**	**768.84**

(₹ in Lakh)

B:- Depreciation on additional capitalization during 2014-19							
	2014-15	**2015-16**			**2016-17**	**2017-18**	**2018-19**
		1.4.2015 to 28.7.2015	**29.7.2015 to 31.8.2015**	**1.9.2015 to 31.3.2016**			
Gross Block as on 31.3.2014	0.00	0.00	14843.47	29686.94	29686.94	29686.94	29686.94
Additional capital expenditure during 2014-19	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Closing gross block	0.00	0.00	14843.47	29686.94	29686.94	29686.94	29686.94
Average gross block	0.00	0.00	14843.47	29686.94	29686.94	29686.94	29686.94
Depreciable Value	0.00	0.00	13359.12	26718.25	26718.25	26718.25	26718.25
Balance useful life	0.00	0.00	12.50	24.96	23.96	22.96	21.96
Rate of Interest	0.00%	0.00%	5.0805%	5.0805%	5.0805%	5.0805%	5.0805%
Depreciation (B)	**0.00**	**0.00**	**70.06**	**877.75**	**1508.24**	**1508.24**	**1508.24**
Depreciation Annualized (B)	**0.00**	**0.00**	**754.13**	**1508.24**	**1508.24**	**1508.24**	**1508.24**

(₹ in Lakh)

Total Depreciation Allowed							
	2014-15	**2015-16**			**2016-17**	**2017-18**	**2018-19**
		1.4.2015 to 28.7.2015	**29.7.2015 to 31.8.2015**	**1.9.2015 to 31.3.2016**			
Without the impact of additional capitalization during 2014-19 - A	544.35	208.04	59.44	372.37	761.42	768.84	768.84
Depreciation on additional capitalization during 2014-19 - B	0.00	0.00	70.06	877.75	1508.24	1508.24	1508.24
Total depreciation allowed (A+B)	**544.35**	**208.04**	**129.50**	**1250.12**	**2269.67**	**2277.09**	**2277.09**
Total depreciation allowed (A+B) (Annualized)	**544.35**	**639.85**	**1393.98**	**2148.09**	**2269.67**	**2277.09**	**2277.09**

Operation &Maintenance Expenses

68. Regulation 29 (1)(c) of the 2014 Tariff Regulations provides the year-wise O&M expense norms for Agartala GPS as under***:***

(₹ in lakh/MW)

2014-15	2015-16			2016-17	2017-18	2018-19
	1.4.2015 to 28.7.2015	29.7.2015 to 31.8.2015	1.9.2015 to 31.3.2016			
41.32	44.14	44.14	44.14	47.14	50.35	53.78

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

(₹ in lakh/MW)

2014-15	2015-16			2016-17	2017-18	2018-19
	1.4.2015 to 28.7.2015	29.7.2015 to 31.8.2015	1.9.2015 to 31.3.2016			
3470.88	1205.53*	449.00*	3467.88*	6363.90	6797.25	7260.30

**pro-rata basis*

70. The O&M expenses claimed by the petitioner are in accordance with the 2014 Tariff Regulations in respect of AGTPP. However, after the CODs of STG-I and STG-II, the project has been converted to Combined Cycle generating station. In view of the above, the Commission has considered the O&M expenses specified for Small Gas Turbine Power Project in terms of Regulation 29(1)(c) of the 2014 Tariff Regulations. The petitioner is also directed to furnish the actual O&M expenses incurred for AGTCCPP at the time of truing-up of tariff.

71. Accordingly, the O&M expenses (for Small Gas Turbine Power Station) as per Regulation 29(1)(c) of the 2014 Tariff Regulations provides as under:

(₹ in lakh/MW)

2014-15	2015-16	2016-17	2017-18	2018-19
33.43	35.70	38.13	40.73	43.50

72. Accordingly, the year-wise O&M expense (annualized) considered for the generating station for the period 2014-19 is as under:

(₹ in lakh/MW)

2014-15	2015-16			2016-17	2017-18	2018-19
	1.4.2015 to 28.7.2015	29.7.2015 to 31.8.2015	1.9.2015 to 31.3.2016			
3470.88	3707.76	3909.15	4819.50	5147.55	5498.55	5872.50

Enhancement of O&M expenses

73. The petitioner has submitted that the salary / wage revision of the employees of the petitioner is due with effect from 1.1.2017. The O&M expenses claimed by the petitioner are based on the 2014 Tariff Regulations. The escalation of 6.35% provided in the O&M has not covered the enhanced employee cost w.e.f 1.1.2017. The petitioner, therefore, craves liberty of the Commission to seek enhancement in the O&M expenses with effect from 1.1.2017 towards the increased salary on account of salary revision due from 1.1.2017, based on the actual payments whenever paid by it. The matter has been examined. The Commission in the Statement of Reasons to the 2014 Tariff Regulations has observed as under:

> *"29.26 Some of the generating stations have suggested that the impact of pay revision should be allowed on the basis of actual share of pay revision instead of normative 40% and one generating company suggested that the same should be considered as 60%. In the draft Regulations, the Commission had provided for a normative percentage of employee cost to total O&M expenses for different type of generating stations with an intention to provide a ceiling limit so that it does not lead to any exorbitant increase in the O&M expenses resulting in spike in tariff. The Commission would however, like to review the same considering the macro economics involved as these norms are also applicable for private generating stations. In order to ensure that such increase in employee expenses on account of pay revision in case of central generating stations and private generating stations are considered appropriately, the Commission is of the view that it shall be examined on case to case basis, balancing the interest of generating stations and consumers".*

74. Accordingly, the prayer of the petitioner for enhancement of O&M expenses if any, due to pay revision may be examined by the Commission, on a case to case basis, subject to the implementation of pay revision as per DPE guidelines and the filing of an appropriate application by the petitioner in this regard.

Capital spares

75. 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"

76. The petitioner has claimed capital spares of ₹412.80 lakh consumed under the O&M Expenses upto the cut-off date, under Regulation 29(2) of the 2014 Tariff Regulations. In terms of Regulation 29(2) of the 2014 Tariff Regulations, the capital spares are to be allowed under operation and maintenance expenses on actuals at the time of truing-up. Hence, the claim of the petitioner is not allowed. This is however subject to submission of the details of year wise actual capital spares consumed by the petitioner, at the time of truing up, with appropriate justification for incurring the same along with clarification that the same has not been funded through Compensatory allowance or Special allowance or claimed as a part of additional capitalization or consumption of stores and spares and renovation and modernization. Accordingly, the submissions of the petitioner shall be examined at the time of truing-up, on merits, after prudence check.

Interest on working capital

77. 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 Cost and Energy Charges

78. The petitioner has claimed the cost for fuel component in the working capital based on Price and GCV of natural gas for the preceding 3 months of January, February and March, 2014. The petitioner has submitted the price and GCV of fuel for the period 1.4.2015 to 28.7.2015 as approved by the Commission, for the period 29.7.2015 (COD of STG-II) to 31.8.2015 based on the monthly average of April, 2015 to June 2015 and for the period 1.9.2015 (COD of STG-I) to 31.3.2016 based on the monthly average of June, 2015 to August, 2015. The petitioner has also stated that for the year 2016-17, the fuel cost is considered based on the monthly average of January, 2016 to March, 2016 and the same has been considered for the years 2017-18 and 2018-19. The fuel detail as submitted by the petitioner is as under:

(₹ in lakh)

2014-15	2015-16			2016-17	2017-18	2018-19
	1.4.2015 to 28.7.2015	**29.7.2015 to 31.8.2015**	**1.9.2015 to 31.3.2016**			
1493.07	1648.11	1468.22	1832.04	1598.27	1598.27	1598.27

79. The petitioner has submitted that the fuel cost for one month has been calculated corresponding to the Normative Annual Plant Load Factor (NAPAF) based on normative Gross Station Heat Rate of 3700 kCal/KWh which has already been approved by the

Commission in order dated 23.2.2016 in Petition No. 44/GT/2015 for Open Cycle Gas Station considering the Target energy generation/ month and also considering the installed capacity of 84 MW.

80. The respondent, APDCL has submitted that the calculation furnished by the petitioner is for Heat rate calculation of 135 MW Combined Cycle project is incorrect. The respondent has also submitted that as per OEM's certificate, the total capacity of Heat recovery project is 51 MW and hence the total capacity works out to 135 MW. The respondent has further pointed out that since there is no fuel required for generation of waste Heat recovery project of 51 MW capacity, the total daily generation by Gas Turbine is 2.016 MU per day and with the addition of 51 MW capacity, the total generation would be 3.24 MUs per day. It has submitted that after installation of the waste Heat Recovery Units by the same energy consumption of 3700 KCal, the additional 0.622 KWh unit can be generated, in addition to 1 KWh. The respondent has submitted that the Heat Rate should not be more than 2281 kCal/kWh and Heat Rate of 2534 kCal/kWh claimed by the petitioner is not acceptable. The respondent has therefore submitted that it is important that Performance Guarantee Test must be carried out by the petitioner before finalization of tariff.

81. The matter has been examined. The petitioner has furnished the PG test report in compliance with the direction of the Commission. On scrutiny of the said PG test report, it is observed that the Turbine Cycle Heat Rate of 3200 KCal/KWh has been considered as Gross Station Heat Rate. Though the petitioner has claimed GHSR of 2534KCal/KWh, it has however not furnished any justification for the same. It is noticed that in case of Assam GPS generating station of the petitioner, the normative Heat Rate of 2500 KCal/KWh on Combined Cycle mode has been specified by the Commission. Since the Heat Rate of 2534 KCal/KWh in case of the generating station appear to be reasonable as compared to the Heat Rate of Assam GPS, and since the Gas Turbine of the generating station is small in size (21 MW) as compared to the Gas Turbines of Assam GPS (30 MW), the Heat Rate as furnished by the petitioner has been considered. Accordingly, the Gross Station Heat Rate of

2534KCal/KWh has been considered in this order. The petitioner shall furnish the reasons and justification for the SHR of 2534kCal/kWh at the time of truing-up of tariff along with the basis of the calculation for the same. The petitioner is also directed to conduct Performance Guarantee test to establish the Station Heat Rate at 100% MCR and same shall be furnished to the Commission at the time of truing-up of tariff. Based on the above, the SHR of 2534kCal/kWh has been considered. The NAPAF of the generating station in terms of the 2014 Tariff Regulation is 85%. Accordingly, the cost of fuel allowed is as under:

(₹ in lakh)

2014-15	**2015-16**			**2016-17**	**2017-18**	**2018-19**
	1.4.2015 to 28.7.2015	**29.7.2015 to 31.8.2015**	**1.9.2015 to 31.3.2016**			
1256.79	1387.28	1254.91	1565.84	1366.04	1366.04	1366.04

Energy/ Variable Charges

82. The petitioner has claimed Energy Charge Rate (ECR) including variations in fuel cost, fuel transportation cost, exchange rate, etc. on a monthly basis based on Gross Station Heat Rate of 3700 KCal/KWh for Open Cycle, as approved by the Commission in order dated 23.2.2016 in Petition No. 44/GT/2015 and on Gross Station Heat Rate of 2534 KCal/KWh, for the period from August, 2015 to March, 2019 for Combined Cycle generating station. The Energy Charge Rate allowed vide order dated 23.2.2016 in Petition No. 44/GT/2015 is as under:

Sl.No.	**Description**	**Unit**		
		Gas	**Natural Gas**	
1	Normative Heat Rate (For CC Operation)	(KCal/KWh)	0000	
2	Normative Heat Rate (For OC Operation)	(KCal/KWh)	3000	
3	Capacity	MW	84.00	
4	Normative Availability Factor	%	85.00	
5	APC for CC operation	%	0.00	
6	APC for OC operation	%	1.00	
7	Weighted Average Rate of Fuel	Rs./1000SCM	6336.640	6336.640
8	Weighted Average GCV of Fuel	KCal/SCM	9170.63	9170.63
9	Rate of Energy- Ex Bus-OC	(Rs/KWh)	**2.582**	**2.582**
10	Weighted Average Cost of Fuel as per above in 2013-14- Ex Bus CC	(Rs./KWh)	**2.582**	

83. Based on the norms of operation, the weighted average price and GCV of Gas used for operation of the plant and the mode of operation, the Energy Charges have been computed and allowed for the period 2014-19, as under.

Sl. No.	Description	Unit	1.4.2014 to 31.3.2015	1.4.2015 to 29.7.2015	29.7.2015 to 31.8.215	1.9.2015 to 31.3.2016
			Natural Gas			
1	Normative Heat Rate (For CC Operation)	(kCal/KWh)	2534			
2	Normative Heat Rate (For OC Operation)	(kCal/KWh)	3700			
3	Capacity	MW	135			
4	Normative Availability Factor	%	85.00			
5	APC for CC operation	%	2.50			
6	APC for OC operation	%	1.00			
7	Weighted Average Rate of Fuel	Rs./1000SCM	7104.00	7817.50	7817.50	7906.67
8	Weighted Average GCV of Fuel	KCal/SCM	9175.85	9172.57	9192.35	9185.48
9	Rate of Energy- Ex Bus-CC	(Rs./kWh)	0.00	0.00	2.237	1.956
10	Rate of Energy- Ex Bus-OC	(Rs./kWh)	2.893	2.210	0.00	0.00
11	Weighted Average Cost of Fuel as per above in 2013-14- Ex Bus CC	(Rs./kWh)	**2.286**			

Energy Charges for two months

84. Energy charges for 2 months on the basis of as billed GCV for the purpose of interest in working capital (annualized) has been worked out as under:

(₹ in lakh)

2014-15	2015-16			2016-17	2017-18	2018-19
	1.4.2015 to 28.7.2015	29.7.2015 to 31.8.2015	1.9.2015 to 31.3.2016			
2513.58	2774.56	2509.83	3131.69	2732.08	2732.08	2732.08

Maintenance Spares

85. The petitioner has claimed the following maintenance spares in the working capital:

(₹ *in lakh*)

2014-15	2015-16			2016-17	2017-18	2018-19
	1.4.2015 to 28.7.2015	**29.7.2015 to 31.8.2015**	**1.9.2015 to 31.3.2016**			
1041.26	361.66	134.7	1040.37	1909.17	2039.18	2178.09

86. Regulation 28(1)(a)(iv) of the 2014 Tariff Regulations provide for maintenance spares @ 30% of the operation & maintenance expenses as specified in Regulation 29. Accordingly, the maintenance spares (annualized) claimed by the petitioner is allowed as under:

(₹ *in lakh*)

2014-15	2015-16			2016-17	2017-18	2018-19
	1.4.2015 to 28.7.2015	**29.7.2015 to 31.8.2015**	**1.9.2015 to 31.3.2016**			
1041.26	1112.33	1172.75	1445.85	1544.27	1649.57	1761.75

Receivables

87. Receivables (annualized) equivalent to two months of capacity charge and energy charges (based on primary fuel only) has been worked out and allowed as under:

(₹ *in lakh*)

	2014-15	2015-16			2016-17	2017-18	2018-19
		1.4.2015 to 28.7.2015	**29.7.2015 to 31.8.2015**	**1.9.2015 to 31.3.2016**			
Variable charges – 2 months	2513.58	2774.56	2509.83	3131.69	2732.08	2732.08	2732.08
Fixed Charges – 2 months	1360.19	1433.64	1804.99	2331.60	2391.34	2441.72	2494.44
Total	**3873.77**	**4208.21**	**4314.82**	**5463.29**	**5123.41**	**5173.80**	**5226.52**

O&M Expenses (1 month)

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

(₹ *in lakh*)

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

	1.4.2015 to 28.7.2015	**29.7.2015 to 31.8.2015**	**1.9.2015 to 31.3.2016**			
289.24	100.46*	37.42*	288.99*	530.33	566.44	605.03

**pro-rata basis*

89. Based on the O&M expense norms specified by the Commission, the O&M expenses for 1 month (annualized) is allowed as under:

(₹ in lakh)

2014-15	**2015-16**			**2016-17**	**2017-18**	**2018-19**
	1.4.2015 to 28.7.2015	**29.7.2015 to 31.8.2015**	**1.9.2015 to 31.3.2016**			
289.24	308.98	325.76	401.63	428.96	458.21	489.38

Rate of interest on working capital

90. Clause (3) of Regulation 28 of the 2014 Tariff Regulations provides as under:

"Interest on working Capital: (3) Rate of interest on working capital shall be on normative basis and shall be considered as the bank rate as on 1.4.2014 or as on 1st April of the year during the tariff period 2014-15 to 2018-19 in which the generating station or a unit thereof or the transmission system including communication system or element thereof, as the case may be, is declared under commercial operation, whichever is later."

91. In terms of the above regulations, the bank rate of 13.50% (Bank rate 10.00 + 350bps) has been considered for the purpose of calculating interest on working capital. Interest on working capital has been computed as under:

(₹ in lakh)

	2014-15	**2015-16**			**2016-17**	**2017-18**	**2018-19**
		1.4.2015 to 28.7.2015	**29.7.2015 to 31.8.2015**	**1.9.2015 to 31.3.2016**			
Fuel cost (APM, Non APM and LNG) - 1 month	1256.79	1387.28	1254.91	1565.84	1366.04	1366.04	1366.04
Liquid fuel stock - 1/2 month	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maintenance spares	1041.26	1112.33	1172.75	1445.85	1544.27	1649.57	1761.75
O&M expense 1 month	289.24	308.98	325.76	401.63	428.96	458.21	489.38

	2014-15	2015-16			2016-17	2017-18	2018-19
		1.4.2015 to 28.7.2015	29.7.2015 to 31.8.2015	1.9.2015 to 31.3.2016			
Receivables 2 months	3873.77	4208.21	4314.82	5463.29	5123.41	5173.80	5226.52
Total working capital	6461.06	7016.80	7068.24	8876.61	8462.68	8647.62	8843.68
Rate of Interest (%)	13.50%	13.50%	13.50%	13.50%	13.50%	13.50%	13.50%
IWC Calculated (Annualized)	**872.24**	**947.27**	**954.21**	**1198.34**	**1142.46**	**1167.43**	**1193.90**

Annual Fixed charges for 2014-19

92. Accordingly, the annual fixed charges approved for the generating station for the period from 1.4.2014 to 31.3.2019 is summarized as under:

(₹ in lakh)

	2014-15	2015-16			2016-17	2017-18	2018-19
		1.4.2015 to 28.7.2015	29.7.2015 to 31.8.2015	1.9.2015 to 31.3.2016			
Depreciation	544.35	639.85	1393.98	2148.09	2269.67	2277.09	2277.09
Interest on Loan	0.00	0.00	368.34	709.99	642.82	557.46	473.35
Return on Equity	3273.64	3306.98	4204.24	5113.68	5145.52	5149.80	5149.80
Interest on Working Capital	872.24	947.27	954.21	1198.34	1142.46	1167.43	1193.90
O&M Expenses	3470.88	3707.76	3909.15	4819.50	5147.55	5498.55	5872.50
Total	**8161.11**	**8601.86**	**10829.92**	**13989.60**	**14348.03**	**14650.34**	**14966.63**

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

Month to Month Energy Charges

93. 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, per litre or per standard cubic metre, as applicable during the month.

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

95. 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

96. The petitioner has sought the reimbursement of filing fee and also the expenses incurred towards publication of notices for application of tariff for the period 2014-19. The petitioner has already paid the requisite filing fees for the period 2014-17 in terms of the provisions of the Central Electricity Regulatory Commission (Payment of Fees) Regulations, 2012. Accordingly, in terms of Regulation 52 of the 2014 Tariff Regulations and in line with the decision in Commission's order dated 5.1.2016 in Petition No. 232/GT/2014, we direct that the petitioner shall be entitled to recover pro rata, the filing fees and the expenses incurred on publication of notices directly from the respondents on submission of documentary proof. The filing fees for the remaining years of the tariff period 2017-19 shall be recovered pro rata after deposit of the same and production of documentary proof.

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

98. Petition No. 94/GT/2016 is disposed of in terms of the above.

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

Annexure-I

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

(₹ in lakh)

Sl No	Loan Details	Interest Rate (%)	Loan deployed as on 1.4.2014	Additions during the tariff period	Total
1	SBI Singapore Loan	3.8989%	17934.84	0.00	17934.84
2	SBI short term loan	10.2575%	1000.00	0.00	1000.00
	Total		**18934.84**	**0.00**	**18934.84**

CALCULATION OF WEIGHTED AVERAGE RATE OF INTEREST ON LOAN FOR TARIFF PERIOD 2014-19

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Net opening loan	18934.84	22735.19	19944.93	17154.67	14364.41
Add: Addition during the period	7413.99	0.00	0.00	0.00	0.00
Less: Repayment during the period	3613.69	2790.26	2790.26	2790.26	2790.26
Net Closing Loan	22735.19	19944.93	17154.67	14364.41	11574.15
Average Loan	20835.04	21340.06	18549.80	15759.54	12969.28
Rate of Interest (%)	3.8250%	3.7770%	3.7770%	3.7643%	3.7770%
Interest	796.93	806.01	700.62	593.23	489.85