

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Petition No. 259/GT/2019

Coram:

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

Date of Order: 24th August, 2020

In the matter of

Petition for determination of tariff of SUGEN Power Plant (1147.5 MW) for the period from 1.4.2019 to 31.3.2024

And

In the matter of

Torrent Power Limited
'Samanvay', 600, Tapovan, Ambavadi,
Ahmedabad, Gujarat-380 015

....Petitioner

Vs

1. Torrent Power Limited
Ahmedabad Distribution,
Sola Road, Naranpura,
Ahmedabad- 380 001
2. Torrent Power Limited
Surat Distribution
Torrent house, Station Road
Surat- 395 003
3. PTC India Ltd
2nd floor, NBCC Tower, Bhikhaji Cama Place
New Delhi – 110 066
4. Madhya Pradesh Power Management Co. Ltd
Shakti Bhavan, Vidyut Nagar,
Jabalpur – 482008

.....Respondents

Parties Present:

Ms. Swapna Seshadri, Advocate, TPL
Ms. Deepa Chawan, Advocate, TPL
Shri Damodar Solanki, Advocate, TPL
Shri Lalit Vashisth, TPL
Shri Vihar Patel, TPL
Shri N.K. Joshi, TPL
Shri Ravi Kishore, Advocate, PTC
Shri Ravindra Khare, MPPMCL



ORDER

The petition has been filed by the Petitioner, Torrent Power Limited for approval of tariff of SUGEN Power Plant (1147.5 MW) (hereinafter referred to as ‘the generating station’) for the tariff period 2019-24 in accordance with the provisions of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2019 (hereinafter referred to as ‘the 2019 Tariff Regulations’).

2. The generating station consists of 3 units/blocks of 382.5 MW each, the modules having advance class gas turbine (Siemens make) along with associated Waste Heat Recovery Boilers (WHRB) generator with single shaft configuration. The date of commercial operation (COD) of the different units/blocks of the generating station is as under:

Units	COD
Block- 10	19.7.2009
Block- 20	28.7.2009
Block- 30	15.8.2009

3. The Petitioner had filed Petition No.186/GT/2014 for approval of tariff of the generating station for the period from 1.4.2014 to 31.3.2019 and the Commission by its order dated 6.10.2015 had approved the tariff of the generating station for the said period. Thereafter, the Petitioner had filed Petition No. 270/GT/2019 for revision of tariff for the period 2014-19 after truing-up exercise and the Commission vide its order dated 13.7.2020 revised the annual fixed charges of the generating station as under:

	<i>(₹ in lakh)</i>				
	2014-15	2015-16	2016-17	2017-18	2018-19
Depreciation	15372.66	15379.29	15381.98	15293.49	15207.39
Interest on Loan	15074.95	12981.74	10647.95	7246.69	6000.42
Return on Equity	17568.37	17659.34	17660.49	17660.30	17708.88
Interest on Working Capital	21490.89	21653.42	21760.62	21900.96	22073.43
O&M Expenses	31066.98	33376.00	35928.74	38833.91	41493.42
Total	100573.84	101049.79	101379.77	100935.35	102483.54



Tariff for 2019-24 period

4. The Petitioner vide its affidavit dated 3.8.2019 has filed this petition for determination of tariff of the generating station for the 2019-24 tariff period in terms of the provisions of the 2019 Tariff Regulations. Accordingly, the capital cost and annual fixed cost claimed by the Petitioner are as under:

Capital Cost

	(₹ in lakh)				
	2019-20	2020-21	2021-22	2022-23	2023-24
Opening Capital Cost	299166.24	299214.68	303028.91	303028.91	303028.91
Additional Capital Expenditure	48.44	3814.23	0.00	0.00	2421.20
Closing Capital Cost	299214.68	303028.91	303028.91	303028.91	305450.10
Average Capital Cost	299190.46	301121.79	303028.91	303028.91	304239.51

Annual Fixed Cost

	(₹ in lakh)				
	2019-20	2020-21	2021-22	2022-23	2023-24
Depreciation	15208.64	15307.57	15405.25	6498.01	6711.71
Interest on Loan	5035.17	3853.88	2662.09	1665.49	1187.10
Return on Equity	17734.22	17848.69	17961.74	17961.74	18033.49
Interest on Working Capital	17291.11	17362.13	17433.52	17374.27	17462.81
O&M Expenses (including Water charges & Security expenses)	32860.10	34183.17	35574.03	37027.89	38558.17
Total	88129.24	88555.44	89036.62	80527.40	81953.28

5. The Commission vide Record of Proceedings (ROP) of the hearing dated 31.10.2019 had directed the Petitioner to submit certain additional information. Subsequently, based on letter dated 4.11.2019 of the Objector, User Welfare Association (UWA), the aforesaid ROP was modified by granting time to UWA to file its submissions in the matter. Thereafter, the Petition was heard on 27.2.2020 and the Commission after directing the Petitioner to file certain additional information, reserved its order in the Petition. In response, the Petitioner has filed the additional information sought vide ROP and has served copies on the respondents, including the Objector. Reply has been filed by the Respondent MPPMCL vide its affidavit dated 14.11.2019 and the Petitioner vide affidavit dated 27.11.2019 has filed its



Rejoinder to the same. The Objector has, however, not submitted any response to this petition. Taking into consideration the submissions of the parties and the documents available on record, we proceed to determine the tariff of the generating station, on prudence check, as stated in the subsequent paragraphs.

Capital Cost

6. Clause 3 of Regulation 19 of the 2019 Tariff Regulations provides as under:

“The Capital cost of an existing project shall include the following:

- (a) Capital cost admitted by the Commission prior to 1.4.2019 duly trued up by excluding liability, if any, as on 1.4.2019;*
- (b) Additional capitalization and de-capitalization for the respective year of tariff as determined in accordance with these regulations;*
- (c) Capital expenditure on account of renovation and modernisation as admitted by this Commission in accordance with these regulations;*
- (d) Capital expenditure on account of ash disposal and utilization including handling and transportation facility;*
- (e) Capital expenditure incurred towards railway infrastructure and its augmentation for transportation of coal upto the receiving end of generating station but does not include the transportation cost and any other appurtenant cost paid to the railway; and*
- (f) Capital cost incurred or projected to be incurred by a thermal generating station, on account of implementation of the norms under Perform, Achieve and Trade (PAT) scheme of Government of India shall be considered by the Commission subject to sharing of benefits accrued under the PAT scheme with the beneficiaries.”*

7. The annual fixed charges claimed in the petition is based on the opening capital cost of ₹299166.24 lakh as on 1.4.2019, as against the closing capital cost of ₹298756.39 lakh, as on 31.3.2019, approved by Commission’s order dated 13.7.2020 in Petition No. 270/GT/2019. The Petitioner has also furnished the value of capital cost and the liabilities as on 1.4.2019 as per books in Form-L. The details of liabilities and capital cost have been reconciled with the information available with the Commission as under:

	<i>(₹ in lakh)</i>		
	As per Form-L	As per records of Commission	Difference
Capital cost as on 1.4.2019 as per books	299012.79	299012.82	(-) 0.03
Liabilities included in the above	48.91	48.44	0.47



8. It is observed from the above that there is a variation of (-) Rs.0.03 lakh in the capital cost and Rs.0.47 lakh pertaining to liabilities as on 1.4.2019 as per books and the records available with Commission. The said variation is on account of rounding-off errors and accordingly, for the present, the same has been ignored for the purpose of tariff. The Petitioner is, however, directed to furnish the detailed reasons for the said variation, along with supporting documents, if any, at the time of truing-up of tariff of the generating station. The total liability of Rs. 48.44 lakh corresponds to the approved capital cost of Rs.298756.39 lakh (on cash basis) as on 31.3.2019. Accordingly, the capital cost as on 1.4.2019, after removal of un-discharged liabilities works out to Rs.298756.39 lakh, on cash basis.

Additional Capital Expenditure

9. Regulation 25(2) of the 2019 Tariff Regulations, provides as under:

“25. Additional Capitalisation within the original scope and after the cut-off date:

(1) xxxx

(2) In case of replacement of assets deployed under the original scope of the existing project after cut-off date, the additional capitalization may be admitted by the Commission, after making necessary adjustments in the gross fixed assets and the cumulative depreciation, subject to prudence check on the following grounds:

(a) The useful life of the assets is not commensurate with the useful life of the project and such assets have been fully depreciated in accordance with the provisions of these regulations;

(b) The replacement of the asset or equipment is necessary on account of change in law or Force Majeure conditions;

(c) The replacement of such asset or equipment is necessary on account of obsolescence of technology; and

(d) The replacement of such asset or equipment has otherwise been allowed by the Commission.”

10. The total additional capital expenditure claimed by the Petitioner for the tariff period 2019-24 is as under:

	(₹ in lakh)				
	2019-20	2020-21	2021-22	2022-23	2023-24
Additional Capital Expenditure	0.00	5664.00	0.00	0.00	3422.00
Less: De-capitalization	0.00	1849.77	0.00	0.00	1000.80
Add: Discharges of liabilities <i>(against allowed assets / works)</i>	48.44	0.00	0.00	0.00	0.00
Net Additional Capital Expenditure claimed (on cash basis)	48.44	3814.23	0.00	0.00	2421.20



11. The Petitioner has submitted that the generating station was originally equipped with SPPA-T2000 (TXP) Data Control System (DCS) and THYRIPOL SIMOVERT-S & SIMADYN-D based Start-up Frequency Converter (SFC)/ Static Excitation (SEE) System provided by M/s Siemens AG, the Original Equipment Manufacturer (OEM). It has also submitted that these systems have now become obsolete, as the control system products follow a defined product lifecycle model. It has further stated that due to technological advancement, these control systems are required to be replaced by a newer technology. The Petitioner has further submitted that the OEM vide its letter dated 8.7.2019 had informed the Petitioner regarding the obsolescence of these control systems and has accordingly limited its support for these systems. According to the OEM, the resources capable of supporting the older control systems has become limited as the product life cycle has ended which can result in undesired breakdown, with the effect of further extending the downtime of the plant. The Petitioner has stated that the OEM has strongly urged the Petitioner to upgrade the system to the latest SPPA T3000 DCS and Thyripol 6RV80 (SFC/SEE) system for Units-10, 20 and 30 of the generating station for reliable and efficient operation and maintenance. In this background, the Petitioner has prayed that the projected additional capital expenditure claimed towards replacement of the DCS and SFC/SEE systems may be allowed under Regulations 25(2)(c) of the 2019 Tariff Regulations as tabulated under:

<i>(₹ in lakh)</i>					
	Head of works/ Equipment	Additional capitalization	Year of commissioning	De capitalization	Depreciation recovered
2020-21	Full Migration to SPPA-T3000 & SFC/SEE Controller Upgrade: Unit 20	2832	2009	940.36	484.10
	Unit 30	2832	2009	909.41	464.16
Total		5664		1849.77	948.26
2023-24	Full Migration to SPPA-T3000 & SFC/SEE Controller	3422	2009	1000.80	515.21



	Upgrade: Unit 10 & Common facilities				
Total		3422		1000.80	515.21
Grand Total		9086		2850.58	1463.48

12. In support of its claim, the Petitioner has furnished on record, the problems faced by it in continuing with the existing systems, specially the maintenance part of DCS and SEE/SFC systems, due to non-supply of essential spares and technical support by the OEM. The Petitioner has submitted that in the past, an attempt was made by the Petitioner to replace the server hardware in one of the Units from global market, with service support by a third-party service provider. However, the said third-party service provider could not resolve many of the perennial problems of the control system. Also, the sustainability and reliability of such arrangement through a third party service provider was also found to be highly unsatisfactory. The Petitioner has further submitted that in an attempt to stock sufficient spares for extension of life of the existing control systems, the Petitioner had placed purchase order on the OEM. Though the purchase order was accepted by the OEM, it had failed to supply the spares at a later stage. The Petitioner has also enclosed copy of the OEM letter dated 8.7.2019, wherein the OEM has informed the Petitioner that the existing version of the DCS and SFC/SEE systems installed in the generating station has been discontinued with effect from December, 2017 (DCS system) and December, 2015 (SFC/SEE system) respectively. The relevant portion of the said letter dated 8.7.2019 is extracted below:

“We take reference to the installation of SPPA-T2000 DCS, Static Excitation System & Compact Unit THYRIPOL based on SIMADYN-D at Unit 10, 20 & 30 at your SUGEN Power Station.

All Siemens control system products follow a defined product lifecycle model. Due to technological advancement, our legacy systems are ultimately replaced by newer technology as it become available.

We therefore share the status of the Obsolete Control System / systems installed at Unit 10, 20 & 30 at your plant as below:



System/ Sub System	Lifecycle Status
SPPA-T2000 (TELEPERM XP) OM650 HMI System	Discontinued since December 31 st , 2017
SPPA-T2000 (TELEPERM XP) AS620 Automation System S5 based	Discontinued since October 1 st , 2015
I&C / DCS –SIMADYN D	Discontinued since December 31 st , 2015
SFC/SEE – SIMADYN D	Discontinued since December 31 st 2015
WIN TS System	Discontinued since December 31 st , 2011
TDY system	Discontinued since December 31 st , 2013
ARGUS system 1.0	Discontinued since December 31 st , 2015
FODS	Discontinued since December 31 st , 2015
BFS **	Discontinued since December 31 st , 2014
AAQMS, CEMS, other Computer system with Window XP 7 Operating System	Microsoft ended support for Window XP on April 8, 2014 Support for Window 7 available until January 14 2020

While it is our endeavor to support the systems installed at your plant, the resources capable of supporting the older I&C systems become limited as the products ends its lifecycle. This can have the undesired effect of extending the downtime of the plant further.

We therefore strongly urge you to upgrade to the latest SPPA T3000 DCS and Thyripol 6RV80 (SFC/SEE) for your Units at SUGEN.

Since 2013 more than 250 Plants with SPPA-T2000 (TELEPERM XP) across the globe have already adapted the shift and migrated from SPPA-T2000 to SPPA-T3000 Systems.

The broad advantages of the new SPPA-T3000 & Thyripol 6RV80 (SFC / SEE) are:

- System upgrade to state-of-the-art technology
- Modern I&C system with simple handling, enables cost efficient operation & maintenance.
- Benefit from SPPA-T3000 with latest technology for your turbine.
- Designed according to international norms and regulations (IEC, VGB, DVG, EC etc).
- Extremely fast conversion planning for the modernization to the new system.

13. The Petitioner has listed out the instances of forced outages faced by it due to faults in these obsolete systems along with the list of components that failed during operation. The Petitioner has submitted that the failure of components like SMPS, VGA cards, HDD, Monitors etc., and complete hardware of HMI Systems like Engineering Server (ES), Technology Server (TDY), OPC Server, has affected the functionality of the respective applications for Plant Operation and Monitoring and that such failures are still continuing. The Petitioner has further submitted that in the old TXP DCS System, historical data is archived in MOD system and currently MOD could not be procured thereby resulting in problems for retaining the past data. Also,



the printer server facility, for monitoring the process parameter is also not available due to obsolescence of compatible printers and drivers. The Petitioner has stated that the TXP DCS system along with SFC/SEE system were supplied and commissioned by M/s Siemens and very few power plants in India have the Siemens TXP DCS system. Since the office of the OEM located in India does not have any experience in the installation, commissioning and service support for TXP DCS system, the Petitioner is highly dependent on the support from their offices located in offshore countries. According to the Petitioner, this has led to a long lead time in getting service support from the OEM and the corresponding cost is very high. The Petitioner has concluded by submitting that in view the difficulties faced by it in maintaining the existing DCS system, it would not be possible for the Petitioner, in future, to restore the control systems or the solution for restoration may be time consuming and very expensive. In view of the issues aforesaid, the Petitioner has proposed to upgrade the present DCS system to T3000 DCS system and SFC/SEE system to Thyriopol 6RV80 system, which according to the Petitioner is latest state-of-the-art technology driven system recommended by the OEM, who is also the OEM for main equipment like Gas Turbines and Steam Turbine.

14. The major advantages of the upgraded data control systems viz., T3000 DCS system and Thyriopol 6RV80 system (SFC/SEE), from the submissions of the Petitioner, leading to significant improvement in the Plant Availability, Reliability and Performance are highlighted as under:

- a) The upgraded control systems, T3000 DCS system and Thyriopol 6RV80 (SFC/SEE) are with the state of the art technology. The control system is developed on latest Operating System platform of Microsoft Windows and will have long service life;
- b) HMI is simplified with fewer components with flat system architecture. Easy Navigation from Governor and Protection to Control Part and all values can be viewed directly on the HMI workbench. Easy access to all information, fully integrated system documentation, enhanced control options.



- c) The upgraded control system is Cyber Security compliant. Cyber Security Packages, Security Lifecycle and Patch Management and Malware Protection are available as embedded feature with new control system. Implementations of updates for new control system are possible with No Shutdown. (Online update with latest Security Patches-‘Serviceability at any time’)
- d) Automation level is having One Lean-High Performance System which includes all automation functions (Non-failsafe, Failsafe and Closed Loop Control). Failsafe and non-failsafe functionality can be mixed in one Automation Server. Gas Turbine Governor Control (in place of SIMADYN), Failsafe Protection (in place of 95F), Process Control (in place of S5 CPU) implementation in one Automation Server S7 400FH. Less hardware means less trouble and less maintenance cost.
- e) Engineering System is unified. All tasks like Engineering, Operation, Diagnostics, Commissioning, Tuning and all applications are available on single HMI workbench. The present control system require different engineering tool and knowhow on ES680 for Open Loop Controls, PG for SIMADYN Governor, PG for Step 5 (Fail Safe), PG for STRUC (Closed Loop Control). No code compilation and no separate download required in new T3000 system.
- f) The new control system is ready with Logic features for Modernization & Upgrade Solutions provided by Mechanical Equipment supplier and solutions are already on-board and easy to implement. e.g. Gas /Steam Turbine various basic solutions, ATT @ zero speed, Advanced fast loading of Steam Turbine, Advanced Stability Margin Controller (Logic) etc.
- g) Better data management will turn operational data into plant improvement. New control system is provided with Digital Lifecycle Services (DLS) with digital data analytics for higher operator efficiency and availability.
- h) Installation base of T3000 DCS system in Indian Power Plants and Other industries is vast. Huge knowledge base & experience on T3000 is available in India and services, if required, can be availed promptly at competitive cost.
- i) Reliability and availability of consistent power supply will be ensured by reducing number of unexpected problem in the old control system.
- j) Upgrade will help to reduce unscheduled outages and hence will improve the availability for uninterrupted power supply to beneficiaries.
- k) Reduced maintenance cost on account of a) stocking rarely available spares of old control system at high cost. b) high cost of rarely available remote OEM/third party service support for old control system.
- l) The upgraded control system will help in improving the plant performance by utilizing data analytics for higher operator efficiency and availability. In-built logic on performance improvements will support easy implementation of plant performance improvements recommended by mechanical equipment supplier and will improve plant heat rate.

15. The Respondent No.4, MPPMCL has opposed the proposal of the Petitioner for projected additional capitalization of the expenditure towards replacement of the DCS system and SFC/SEE system and has submitted that the Petitioner has only



furnished the letter of OEM regarding the obsolescence of the technology. The Respondent has further submitted that as per provisions of Regulations 2.4.2 and 2.4.3 of Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2010 ('the IEGC, 2010'), the Petitioner is required to approach the Regional Power Committee (RPC) of the Western Region for discussions and obtain a decision, prior to the Petitioner declaring obsolescence of the existing system and planning the replacement of SPPA-T2000 DCS system as stated above. Accordingly, the Respondent has prayed that the Commission may not permit the additional capital expenditure claimed by the Petitioner as the same shall have to be first discussed and decided by the WRPC.

16. The submissions have been considered. Regulation 2.4.2 and 2.4.3 of the IEGC, 2010 stipulate the functions of RPC relating to the smooth and safe operation of the grid. Sub-clause 2.4.2(d) of the IEGC, 2010 which pertains to the generating machines reads as follows:

“2.4.2 (d) To coordinate planning of maintenance of generating machines of various generating companies of the region including those of interstate generating companies supplying electricity to the Region on annual basis and also to undertake review of maintenance programmed on monthly basis.”

17. In our view, the above Regulation does not mandate the RPC to discuss and decide the need for replacement of the components/ machines of a generating station. The Petitioner is, therefore, not under an obligation, to approach the RPC of the Western Region for a decision on the replacement of the systems prior to it planning the replacement of SPPA-T2000 DCS system and seeking additional capital expenditure towards obsolescence of the existing system. Hence, the submission of the Respondent MPPMCL is not acceptable. Keeping in view the problems faced by the Petitioner in the operation of the generating station with the existing SPPA-T2000 (TXP) Data Control System (DCS) and THYRIPOL SIMOVERT-S & SIMADYN D based Start-up Frequency Convertor (SFC)/Static



Excitation (SEE) system and considering the fact that the spares for these systems are not available (since the OEM has discontinued the production of these systems), there is justification in the proposal of the Petitioner to replace/ upgrade the subject I&C system of all the units, including the common system, in order to avoid the unscheduled forced outages of the units and for improving the availability of the generating station. In this background, the projected additional capital expenditure claimed by the Petitioner for replacement/up-gradation of the DCS and SFC/SEE systems, including the expenditure on common system, along with the de-capitalized amount, is allowed in terms of Regulation 25(c) of 2019 Tariff Regulations as under:

	<i>(Rs. in lakh)</i>	
	2020-21	2023-24
Projected additional capital expenditure admitted	5664.00	3422.00
Less: De-capitalization amount	(-) 1849.77	(-) 1000.80
Net additional capital expenditure allowed	3814.23	2421.20

Discharge of liabilities

18. Out of the balance un-discharged liabilities of Rs.48.44 lakh as on 1.4.2019, the Petitioner has claimed the entire liability of Rs.48.44 lakh as discharged during the year 2019-20 on projected basis. The same is considered in terms of Regulation 25(1)(f) of the 2019 Tariff Regulations.

19. Based on the above, the projected additional capital expenditure allowed for the purpose of tariff is as under:

	<i>(₹ in lakh)</i>				
	2019-20	2020-21	2021-22	2022-23	2023-24
Admitted additional capital expenditure	0.00	5664.00	0.00	0.00	3422.00
Less: De-capitalization	0.00	1849.77	0.00	0.00	1000.80
Add: Discharge of liabilities (against allowed assets / works)	48.44	0.00	0.00	0.00	0.00
Net additional capital expenditure admitted (on cash basis)	48.44	3814.23	0.00	0.00	2421.20



Capital Cost

20. Based on the above, the capital cost allowed for the purpose of tariff for the period 2019-24 is as under:

	(₹ in lakh)				
	2019-20	2020-21	2021-22	2022-23	2023-24
Opening Capital Cost	298756.39	298804.83	302619.06	302619.06	302619.06
Add: Additional Capital Expenditure	48.44	3814.23	0.00	0.00	2421.20
Closing capital cost	298804.83	302619.06	302619.06	302619.06	305040.26
Average Capital Cost	298780.61	300711.95	302619.06	302619.06	303829.66

Debt Equity Ratio

21. Regulation 19 of the 2019 Tariff Regulations provides as under:

“(1) For new projects, the debt-equity ratio of 70:30 as on date of commercial operation shall be considered. If the equity actually deployed is more than 30% of the capital cost, equity in excess of 30% shall be treated as normative loan:

Provided that:

- (i) where equity actually deployed is less than 30% of the capital cost, actual equity shall be considered for determination of tariff:*
- (ii) the equity invested in foreign currency shall be designated in Indian rupees on the date of each investment:*
- (iii) any grant obtained for the execution of the project shall not be considered as a part of capital structure for the purpose of debt: equity ratio.*

Explanation - *The premium, if any, raised by the generating company or the transmission licensee, as the case may be, while issuing share capital and investment of internal resources created out of its free reserve, for the funding of the project, shall be reckoned as paid up capital for the purpose of computing return on equity, only if such premium amount and internal resources are actually utilised for meeting the capital expenditure of the generating station or the transmission system.*

(2) The generating company or the transmission licensee, as the case may be, shall submit the resolution of the Board of the company or approval of the competent authority in other cases regarding infusion of funds 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 1.4.2019, debt: equity ratio allowed by the Commission for determination of tariff for the period ending 31.3.2019 shall be considered:

Provided that in case of a generating station or a transmission system including communication system which has completed its useful life as on or after 1.4.2019, if the equity actually deployed as on 1.4.2019 is more than 30% of the capital cost, equity in excess of 30% shall not be taken into account for tariff computation;

Provided further that in case of projects owned by Damodar Valley Corporation, the debt: equity ratio shall be governed as per sub-clause (ii) of clause (2) of Regulation 72 of these regulations.



(4) In case of the generating station and the transmission system including communication system declared under commercial operation prior to 1.4.2019, but where debt: equity ratio has not been determined by the Commission for determination of tariff for the period ending 31.3.2019, the Commission shall approve the debt: equity ratio in accordance with clause (1) of this Regulation.

(5) Any expenditure incurred or projected to be incurred on or after 1.4.2019 as may be admitted by the Commission as additional capital expenditure for determination of tariff, and renovation and modernisation expenditure for life extension shall be serviced in the manner specified in clause (1) of this Regulation.”

22. The gross loan and equity amounting to Rs.209129.47 lakh and Rs.89626.92 lakh, respectively as on 31.3.2019 was considered in order dated 13.7.2020 in Petition No. 270/GT/2019. The proportionate equity as a percentage of admitted capital cost as on 31.3.2019 is 30%. Accordingly, the gross loan and equity amounting to Rs.209129.47 lakh and Rs.89626.92 lakh has been considered as gross loan and equity as on 1.4.2019. Further, the additional capital expenditure approved above has been allocated in debt-equity ratio of 70:30.

Return on Equity

23. Regulation 30 of the 2019 Tariff Regulations provides as under:

“(1) Return on equity shall be computed in rupee terms, on the equity base determined in accordance with Regulation 18 of these regulations.

(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 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 return on equity in respect of additional capitalization after cut-off date beyond the original scope excluding additional capitalization due to Change in Law, shall be computed at the weighted average rate of interest on actual loan portfolio of the generating station or the transmission system;

Provided further that:

(i) In case of a new project, the rate of return on equity shall be reduced by 1.00% 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) or Free Governor Mode Operation (FGMO), data telemetry, communication system up to load dispatch centre or protection system based on the report submitted by the respective RLDC;

(ii) in case of existing generating station, as and when any of the requirements under (i) above of this Regulation are found lacking based on the report



submitted by the concerned RLDC, rate of return on equity shall be reduced by 1.00% for the period for which the deficiency continues;

(iii) in case of a thermal generating station, with effect from 1.4.2020:

- a) rate of return on equity shall be reduced by 0.25% in case of failure to achieve the ramp rate of 1% per minute;*
- b) an additional rate of return on equity of 0.25% shall be allowed for every incremental ramp rate of 1% per minute achieved over and above the ramp rate of 1% per minute, subject to ceiling of additional rate of return on equity of 1.00%:*

Provided that the detailed guidelines in this regard shall be issued by National Load Dispatch Centre by 30.6.2019”

24. Regulation 31 of the 2019 Tariff Regulations provides as under:

“31. Tax on Return on Equity:

(1) The base rate of return on equity as allowed by the Commission under Regulation 30 of these regulations 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 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 paid on income from other businesses including deferred tax liability (i.e. income from business other than business of generation or transmission, as the case may be) shall be excluded 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.

Illustration-

(i) In case of the generating company or the transmission licensee paying Minimum Alternate Tax (MAT) @ 21.55% including surcharge and cess:

Rate of return on equity = 15.50/(1-0.2155) = 19.758%

(ii) In case of a generating company or the transmission licensee paying normal corporate tax including surcharge and cess:

(a) Estimated Gross Income from generation or transmission business for FY 2019-20 is Rs 1,000 crore;

(b) Estimated Advance Tax for the year on above is Rs 240 crore;

(c) Effective Tax Rate for the year 2019-20 = Rs 240 Crore/Rs 1000 Crore = 24%;

(d) Rate of return on equity = 15.50/ (1-0.24) = 20.395%.

(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 2019-24 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, as the case may be, on year to year basis.

25. The Petitioner has claimed tariff considering the rate of Return on Equity (ROE) as 19.758% (i.e. base rate of 15.50% and MAT rate of 21.549%) for the period from 1.4.2019 to 31.3.2024. However, since the MAT rate as applicable for the year 2019-20 is 17.472% (MAT Rate of 15% + Surcharge of 12% + HEC of 4%), the same has been considered for the period 2019-24. Accordingly, considering the base rate of ROE of 15.5% and MAT rate of 17.472%, the rate of ROE considered for the period 2019-24 works out to 18.782%. Accordingly, Return on Equity has been computed as under:

	(₹ in lakh)				
	2019-20	2020-21	2021-22	2022-23	2023-24
Notional Equity- Opening	89626.92	89641.45	90785.72	90785.72	90785.72
Addition of Equity due to additional capital expenditure	14.53	1144.27	0.00	0.00	726.36
Normative Equity - Closing	89641.45	90785.72	90785.72	90785.72	91512.08
Average Normative Equity	89634.18	90213.58	90785.72	90785.72	91148.90
Return on Equity (Base Rate)	15.500%	15.500%	15.500%	15.500%	15.500%
Effective Tax Rate	17.472%	17.472%	17.472%	17.472%	17.472%
Rate of Return on Equity (Pre-Tax)	18.782%	18.782%	18.782%	18.782%	18.782%
Return on Equity (Pre-Tax)- (annualized)	16835.09	16943.92	17051.37	17051.37	17119.59

Interest on loan

26. Regulation 31 of the 2019 Tariff Regulations provides as under:

“32. Interest on loan capital:

(1) The loans arrived at in the manner indicated in Regulation 18 of these regulations shall be considered as gross normative loan for calculation of interest on loan.

(2) The normative loan outstanding as on 1.4.2019 shall be worked out by deducting the cumulative repayment as admitted by the Commission up to 31.3.2019 from the gross normative loan.

(3) The repayment for each of the year of the tariff period 2019-24 shall be deemed to be equal to the depreciation allowed for the corresponding year/period. In case of de-capitalization of assets, the repayment shall be adjusted by taking into account cumulative repayment on a pro rata basis and the adjustment should not exceed cumulative depreciation recovered upto the date of de-capitalisation of such asset.



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

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

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

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

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

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

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

- (i) As stated above gross normative loan amounting to Rs.209129.47 lakh has been considered as on 1.4.2019;
- (ii) Cumulative repayment amounting to Rs.147209.73 lakh as on 31.3.2019 as considered in order dated 13.7.2020 has been considered as on 1.4.2019.
- (iii) Accordingly, the net normative opening loan as on 1.4.2019 works out to Rs.61919.74 lakh;
- (iv) Addition to normative loan on account of additional capital expenditure approved above has been considered;
- (v) Depreciation allowed has been considered as repayment of normative loan during the respective year of the 2019-24 tariff period;
- (vi) The Petitioner has claimed interest on loan by applying the weighted average rate of interest of 9.10% for the 2019-24 tariff period. This has been considered for the purpose of tariff.

28. Accordingly, interest on loan has been worked out as under:

	(₹ in lakh)				
	2019-20	2020-21	2021-22	2022-23	2023-24
Gross opening loan	209129.47	209163.38	211833.34	211833.34	211833.34
Cumulative repayment of loan upto previous year / period	147209.73	162419.46	176672.01	192077.14	198426.77
Net Loan Opening	61919.74	46743.92	35161.33	19756.20	13406.57
Addition due to Additional Capital Expenditure	33.91	2669.96	0.00	0.00	1694.84
Repayment of loan during the year	15209.73	15308.04	15405.13	6349.63	6445.77
Less: Repayment adjustment on account of de-capitalization	0.00	1055.49	0.00	0.00	676.23
Net Repayment of loan during the year	15209.73	14252.55	15405.13	6349.63	5769.55



Net Loan Closing	46743.92	35161.33	19756.20	13406.57	9331.87
Average Loan	54331.83	40952.63	27458.77	16581.39	11369.22
Weighted Average Rate of Interest on Loan	9.1000%	9.1000%	9.1000%	9.1000%	9.1000%
Interest on Loan	4944.20	3726.69	2498.75	1508.91	1034.60

Depreciation

29. Regulation 33 of the 2019 Tariff Regulations provides as under:

“33. Depreciation

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

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 a 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 the salvage value for IT equipment and software shall be considered as NIL and 100% value of the assets shall be considered depreciable;

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

Provided also 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 unit or transmission system as the case may be, shall not be allowed to be recovered at a later stage during the useful life or 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-I to these regulations for the assets of the generating station and transmission system:

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



(6) In case of the existing projects, the balance depreciable value as on 1.4.2019 shall be worked out by deducting the cumulative depreciation as admitted by the Commission upto 31.3.2019 from the gross depreciable value of the assets.

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

(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.

30. Accordingly, the cumulative depreciation amounting to Rs.147209.73 lakh as on 31.3.2019 as considered in order dated 13.7.2020 in Petition No. 270/GT/2019 has been considered for the purpose of tariff. Further, the value of freehold land included in the average capital cost has been adjusted while calculating the depreciable value for the purpose of tariff. Accordingly, the balance depreciable value (before providing depreciation) for the year 2019-20 works out to Rs.266928.76 lakh. As on 1.4.2019, the used life of the generating station (i.e. 9.67 years) is less than 12 years from the Effective Station COD of 31.7.2009 and accordingly, depreciation is required to be calculated by applying the weighted average rate of depreciation for the period from 1.4.2019 to 31.3.2022 and depreciation for the period from 1.4.2022 to 31.3.2024 is required to be calculated by applying spreading over of the remaining depreciable value over the remaining useful life. The Petitioner has claimed depreciation considering the Weighted Average Rate of Depreciation (WAROD) of 5.122% for the period 2019-22. However, considering the asset-wise break-up of the gross block as on 1.4.2019, as submitted at Form-11 along with rate of depreciation as specified in Appendix- I to the 2019 Tariff Regulations, the WAROD works out as 5.0906% and the same has been considered for the purpose of tariff for the 2019-22 tariff period. Accordingly, depreciation has been computed as under:



	(₹ in lakh)				
	2019-20	2020-21	2021-22	2022-23	2023-24
Average Capital Cost	298780.61	300711.95	302619.06	302619.06	303829.66
Freehold land included above	2262.64	2262.64	2262.64	2262.64	2262.64
Value of IT equipment & Software included above	625.86	625.86	625.86	625.86	625.86
Depreciable value @ 90%	266928.76	268666.96	270383.37	270383.37	271472.91
Remaining useful life at the beginning of the year	15.33	14.33	13.33	12.33	11.33
Balance depreciable value	119719.03	106247.50	93711.35	78306.23	73046.14
Depreciation (annualized)	15209.73	15308.04	15405.13	6349.63	6445.77
Cumulative depreciation at the end	162419.46	177727.50	192077.14	198426.77	204872.54
Less: Cumulative depreciation adjustment on account of de-capitalization	0.00	1055.49	0.00	0.00	676.23
Net Cumulative depreciation at the end	162419.46	176672.01	192077.14	198426.77	204196.32

Operation & Maintenance Expenses

31. Regulation 35(1)(3) of the 2019 Tariff Regulations provides for the O&M expense norms for Open Cycle Gas Turbine/Combined Cycle generating stations. Accordingly, the O&M expense norms applicable for this generating station of the Petitioner is as under:

(Rs in lakh/MW)				
2019-20	2020-21	2021-22	2022-23	2023-24
26.34	27.27	28.23	29.22	30.24

32. The annual O&M expenses claimed by the Petitioner vide affidavit dated 3.8.2019 is as under:

(Rs in lakh)				
2019-20	2020-21	2021-22	2022-23	2023-24
30225.15	31292.33	32393.93	33529.95	34700.40

33. The annual O&M expenses claimed by the Petitioner is in accordance with the above regulation and hence the same is allowed.

Water Charges

34. Regulation 35(1)(6) of the 2019 Tariff Regulations provides as under:



“The Water Charges, Security Expenses and Capital Spares for thermal generating stations shall be allowed separately after prudence check:

Provided that water charges shall be allowed based on water consumption depending upon type of plant and type of cooling water system, subject to prudence check. The details regarding the same shall be furnished along with the petition;

Provided further that the generating station shall submit the assessment of the security requirement and estimated expenses;

Provided also 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 as per Regulation 17 of Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2014 or Special Allowance or claimed as a part of additional capitalization or consumption of stores and spares and renovation and modernization.”

35. The Petitioner in Form-19 of the petition has claimed water charges as follows:

(₹ in lakh)				
2019-20	2020-21	2021-22	2022-23	2023-24
2444.36	2681.20	2949.49	3244.27	3578.73

36. The break-up furnished by the Petitioner with respect to the claim for water charges is as under:

		(₹ in lakh)				
Sl. No		2019-20	2020-21	2021-22	2022-23	2023-24
(a)	Normative water consumption @ of 85% PLF (M ³) (a)	8567694	8544285	8544285	8544285	8567694
(b)	Rate specified (as per Govt. notification) (Rs/M ³) (b)	28.53	31.38	34.52	37.97	41.77
(c)	Water Charges (Rs in lakh) (c)=(a)x(b)/10 ⁵	2444.36	2681.20	2949.49	3244.27	3578.73

37. The Respondent MPPMCL has submitted that as per proviso to Regulation 35(6) of the 2019 Tariff Regulations, the water charges and security expenses of the generating station may be allowed only after prudence check. The Respondent has also submitted that though it is mandatory for the Petitioner to submit the details of water consumption, assessment of security requirement and the estimated expenses, the Petitioner has failed to provide the said information in the petition. Accordingly, the Respondent has prayed that the Petitioner may be directed to submit the said information and water charges and security expenses may only be allowed after prudence check.



38. It is observed that the normative consumption of water has been calculated by the Petitioner considering water consumption norm of 1 M³ per MWh of the electricity produced. As such, the same translates to 8567694 M³ (1147.5x8784 x 0.85x1) for the leap year and 8544285 M³ (1147.5x8760x0.85x1) for other years for the plant capacity of 1147.5 MW and with 85% normative availability. It is observed from the MoEF&CC notification dated 28.6.2018, that the norm for specific water consumption is specified as 3.5 M³/MWh for thermal power stations. However, the petitioner has considered water consumption of 1 M³/MWh i.e. less than one-third of the aforesaid norm in the MoEF&CC notification. Accordingly, the normative consumption of water as calculated by the Petitioner is allowed.

39. As regards the water charge rate claimed by the Petitioner in terms of the State Govt. notification, it is observed that the actual water charge rate of Rs.25.94/ M³ paid by the Petitioner to the State agency during the year 2018-19 has been escalated @ 10% per annum. The same has been verified from the details of actual water expenses incurred by the Petitioner for the 2014-19 tariff period. The Petitioner, in compliance with the directions of the Commission, had furnished vide affidavit dated 14.11.2019, the audited details of the actual water charges in respect of this generating station for the period 2014-19 in Petition No. 270/GT/2019 as under:

<i>(₹ in lakh)</i>				
2014-15	2015-16	2016-17	2017-18	2018-19
600.85	832.90	1170.96	1712.28	1835.82

40. The actual annual water charges incurred as above is based on the rate in Rs./M³ charged by the State Government agency and the actual water (M³) used for the generating station during the year, which further depends upon the PLF of the generating station. It is observed from the audited details of the Water charges furnished by the Petitioner, that the rate of water charge (Rs./M³) had increased from



Rs.17.72/M³ in 2014-15 to Rs.25.94/M³ in 2018-19, thereby representing an annual increase of 10%. The water consumed during the year 2018-19 was 7077081 M³ which indicates that the PLF of the generating station was low as compared to the normative PLF of 85%.

41. From the above deliberations, it can be concluded that the projected water charges claimed by the Petitioner, based on the water consumption of 1 M³/MWhr, the normative availability of 85% and the escalation of rate of water charges for 2018-19 by 10% per annum is in order. Accordingly, the claim for water charges is provisionally allowed as under:

<i>(₹ in lakh)</i>				
2019-20	2020-21	2021-22	2022-23	2023-24
2444.36	2681.20	2949.49	3244.27	3578.73

42. The Water charges allowed as above is subject to truing-up in terms of Regulation 13 of the 2019 Tariff Regulations, based on the actual water consumption and the actual water charges paid by the Petitioner to the State Government agency.

Security Expenses

43. The Petitioner has also claimed security expenses and has submitted that the same is based on the actual expenses incurred for the year 2018-19, with an annual escalation of 10% thereafter. Accordingly, the security expenses claimed by the Petitioner for the 2019-24 tariff period is as under:

<i>(₹ in lakh)</i>				
2019-20	2020-21	2021-22	2022-23	2023-24
190.59	209.65	230.61	253.68	279.04

44. In terms of the second proviso to Regulation 35(1)(6) of the 2019 Tariff Regulations, the Petitioner is required to furnish on record, the assessment of the security requirement along with the estimated expenses. However, the details regarding the number of security personnel required, as assessed by the competent authority, has not been furnished by the Petitioner. Further, the annual escalation of



10% over the Security expenses for the year 2018-19, as considered by the Petitioner, has no basis and the same is also not supported by any justification. Hence, in the absence of any requisite details, we are inclined to only provisionally allow the base security expenses @80% of the actual security expenses incurred for the year 2018-19 (as claimed by the Petitioner) and escalating the same at 3.5% per annum as per escalation rates (for O&M expenses) in terms of the 2019 Tariff Regulations. The Petitioner is directed to furnish the audited statement towards the actual security expenses incurred along with all relevant documents/details, at the time of truing-up of tariff of the generating station. Accordingly, the security expenses provisionally allowed for the 2019-24 period is as under:

<i>(₹ in lakh)</i>				
2019-20	2020-21	2021-22	2022-23	2023-24
143.46	148.48	153.68	159.06	164.63

45. No capital spares have been claimed by the Petitioner in the petition.

46. Based on the above discussions, the total O&M expenses (including water charges and security expenses) claimed by the Petitioner and allowed for the purpose of tariff for the 2019-24 tariff period is as under:

<i>(Rs in lakh)</i>					
	2019-20	2020-21	2021-22	2022-23	2023-24
O&M Expenses	30225.15	31292.33	32393.93	33529.95	34700.40
Water Expenses	2444.36	2681.20	2949.49	3244.27	3578.73
Security Expenses	190.59	209.65	230.61	253.68	279.04
Total O&M expenses claimed	32860.10	34183.17	35574.03	37027.89	38558.17
Total O&M expenses allowed					
O&M Expenses	30225.15	31292.33	32393.93	33529.95	34700.40
Water Expenses	2444.36	2681.20	2949.49	3244.27	3578.73
Security Expenses	143.46	148.48	153.68	159.06	164.63
	32812.97	34122.01	35497.10	36933.28	38443.76

Operational Norms

47. The following norms of operation have been considered by the Petitioner:

Normative Annual Plant Availability Factor (NAPAF) (%)	85
Gross Station Heat Rate for Combined cycle (GSHR) (kCal/kWh)	1853.88
Auxiliary Power Consumption (Combined cycle) %	2.75



The operational norms considered by the Petitioner are in line with Regulation 49 of the 2019 Tariff Regulations and hence allowed.

Interest on Working Capital

48. Regulation 34(1)(b) of 2019 Tariff Regulations provides the following norms for Interest on working capital for 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) 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;

(iii) Maintenance spares @ 30% of operation and maintenance expenses including water charges and security expenses;

(iv) Receivables equivalent to 45 days 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; and

(v) Operation and maintenance expenses, including water charges and security expenses, for one month.

49. Clauses (2), (3) and (4) of Regulation 34 of the 2019 Tariff Regulations provides as under:

“(2) The cost of fuel in cases covered under sub-clauses (a) and (b) of clause (1) of this Regulation shall be based on the landed fuel cost (taking into account normative transit and handling losses in terms of Regulation 39 of these regulations) by the generating station and gross calorific value of the fuel as per actual weighted average for the third quarter of preceding financial year in case of each financial year for which tariff is to be determined:

Provided that in case of new generating station, the cost of fuel for the first financial year shall be considered based on landed fuel cost (taking into account normative transit and handling losses in terms of Regulation 39 of these regulations) and gross calorific value of the fuel as per actual weighted average for three months, as used for infirm power, preceding date of commercial operation for which tariff is to be determined.

(2) Rate of interest on working capital shall be on normative basis and shall be considered as the bank rate as on 1.4.2019 or as on 1st April of the year during the tariff period 2019-24 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.



Provided that in case of truing-up, the rate of interest on working capital shall be considered at bank rate as on 1st April of each of the financial year during the tariff period 2019-24.

(3) Interest on working capital shall be payable on normative basis notwithstanding that the generating company or the transmission licensee has not taken loan for working capital from any outside agency.”

Fuel Components in working capital

(a) Fuel cost

50. The Petitioner has claimed fuel cost for 30 days corresponding to NAPAF of 85% and taking into account the mode of operation of the generating station on Gas Fuel and Liquid Fuel (Imported LNG). The Petitioner has claimed fuel cost for 30 days corresponding to NAPAF of 85% for each year of the tariff period as under:

(₹ in lakh)				
2019-20	2020-21	2021-22	2022-23	2023-24
40020.91	40020.91	40020.91	40020.91	40020.91

51. The Petitioner has submitted the audited statement as regards the quantity and price of the domestic gas, imported gas and liquid fuel (imported LNG) procured and used during the period from October 2018 to December 2018 from different sources as under:

	October 2018 to December 2018		Weighted Average Landed rate (₹/MMBTU)
	Quantity (MMBTU GHV)	Amount (₹)	
Details of consumption of Gas			
Domestic Gas			
GAIL India Limited (GAIL)	386447	180814973	467.89
Imported Gas			
Indian Oil Corporation Limited (IOCL)	2643457	2544892727	962.71
Other Parties*	6453269	4325992635	670.36
	9483173	7051700335	743.60
Transportation Charges			
Gujarat State Petroleum Limited (GSPL)	-	294845942	31.09
Total Quantity and Landed Cost of Gas	9483173	7346546277	774.69
Weighted average landed cost of consumption of Gas for the period from October, 2018 to December, 2018	-	-	774.69

*Other parties Consumption cost includes the Regasification charges



52. It is evident from the above that the price for procuring imported gas from IOCL is Rs.962.71/MMBTU, whereas, the price of gas through direct import of LNG (other parties as referred in the above table) along with regasification cost is Rs. 670.36/MMBTU. However, the direct import of LNG requires regasification before the same can be used in the generating plant. It is observed that for regasification of LNG, the Petitioner has availed the storage and regasification facility of M/s Petronet LNG Limited. The Petitioner, by way of investing in the storage capacity of LNG has ensured the availability of the plant for full recovery of the annual fixed charges. The mode of operation on liquid fuel (imported LNG) is 68.05% ($6453269 \times 100 / 9483173$) (in energy terms) and works out to 61.27% (in monetary terms) as per data furnished by the Petitioner.

53. Accordingly, based on the normative operating parameters of Station Heat Rate and the weighted average rate of fuel of Rs.774.69 per MMBTU, the fuel cost for 30 days corresponding to the NAPAF of 85% amounting to Rs. 40020.91 lakh for each year of the 2019-24 tariff period is allowed for the purpose of working capital.

(b) Liquid Fuel Stock

54. The Petitioner has claimed liquid fuel stock for 15 days corresponding to NAPAF of 85% as under:

<i>(₹ in lakh)</i>				
2019-20	2020-21	2021-22	2022-23	2023-24
20010.45	20010.45	20010.45	20010.45	20010.45

55. After applying the mode of operation of 61.27 % which represents the ratio of cost of liquid fuel i.e. imported LNG for 30 days to the cost of all types of fuels used during the three months of October, 2018 to December, 2018, the cost of liquid fuel stock for 15 days corresponding to NAPAF of 85% is allowed as under:



(₹ in lakh)				
2019-20	2020-21	2021-22	2022-23	2023-24
12259.71	12259.71	12259.71	12259.71	12259.71

(c) Maintenance spares

56. The cost of maintenance spares as claimed by the Petitioner is as under:

(Rs. in lakh)				
2019-20	2020-21	2021-22	2022-23	2023-24
9858.03	10254.95	10672.21	11108.37	11567.45

57. The cost of maintenance spares considering @ 30% of the O&M expenses (including water charges and security expenses) allowed is as under:

(₹ in lakh)				
2019-20	2020-21	2021-22	2022-23	2023-24
9843.89	10236.60	10649.13	11079.98	11533.13

(d) Receivables

58. The receivable component of the working capital, comprising of capacity charges and energy charges (for 45 days) as claimed by the Petitioner is as under:

(₹ in lakh)					
	2019-20	2020-21	2021-22	2022-23	2023-24
Variable Charges	60031.36	60031.36	60031.36	60031.36	60031.36
Fixed Charges	10835.56	10917.79	10977.12	9928.04	10076.22
Total	70866.92	70949.15	71008.48	69959.40	70107.58

59. Receivables have been worked out on the basis of 45 days of fixed and energy charges (duly taking into account mode of operation of station on gas fuel and liquid fuel) as shown below:

(₹ in lakh)					
	2019-20	2020-21	2021-22	2022-23	2023-24
Variable Charges	60031.97	60031.97	60031.97	60031.97	60031.97
Fixed Charges	10589.43	10527.74	10579.13	9510.54	9641.99
Total	70621.40	70559.71	70611.10	69542.51	69673.96

(e) O&M Expenses (one month)

60. The O&M expenses (for one month) claimed by the Petitioner is as under:

(₹ in lakh)				
2019-20	2020-21	2021-22	2022-23	2023-24
2738.34	2848.60	2964.50	3085.66	3213.18



61. The O&M expenses (for one month) allowed in terms of the Regulation is as under:

(₹ in lakh)				
2019-20	2020-21	2021-22	2022-23	2023-24
2734.41	2843.50	2958.09	3077.77	3203.65

(f) Rate of Interest on working capital

62. In line with the Regulation 34(3) of the 2019 Tariff Regulations, rate of interest on working capital shall be considered as 12.05% (i.e. 1 (one) year SBI MCLR of 8.55% as on 1.4.2019 + 350 bps) for the tariff period 2019-24. Further, the aforesaid rate of interest is subject to truing up based on 1 year SBI MCLR as on 1st April of respective financial years. The tariff of this generating station is determined in the year 2020-21 and one year SBI MCLR as on 1.4.2020 (i.e. 7.75%) is available. Hence, in order to safeguard against additional interest burden due to excess/under recovery or tariff, we deem it prudent to consider the rate of interest on working capital for the period from 1.4.2020 to 31.3.2024 as 11.25% (i.e. 1 year SBI MCLR of 7.75% as on 1.4.2020 + 350 bps). Accordingly, the interest on working capital has been considered as 12.05% for 2019-20 and 11.25% for the period from 2020-21 to 2023-24. Accordingly, interest on working capital is computed as under:

(₹ in lakh)					
	2019-20	2020-21	2021-22	2022-23	2023-24
Cost of fuel – 30 days	40020.91	40020.91	40020.91	40020.91	40020.91
Liquid fuel stock -15 days	12259.71	12259.71	12259.71	12259.71	12259.71
Maintenance Spares @ 30% of O&M expenses	9843.89	10236.60	10649.13	11079.98	11533.13
Receivables -45 days	70621.40	70559.71	70611.10	69542.51	69673.96
O&M expenses (one month)	2734.41	2843.50	2958.09	3077.77	3203.65
Total Working Capital	135480.32	135920.43	136498.93	135980.88	136691.35
Rate of Interest	12.05%	11.25%	11.25%	11.25%	11.25%
Interest on Working Capital	16325.38	15291.05	15356.13	15297.85	15377.78

Annual Fixed Charges

63. Accordingly, the annual fixed charges approved for the generating station for the 2019-24 tariff period is summarized as under:



	(₹ in lakh)				
	2019-20	2020-21	2021-22	2022-23	2023-24
Depreciation	15209.73	15308.04	15405.13	6349.63	6445.77
Interest on Loan	4944.20	3726.69	2498.75	1508.91	1034.60
Return on Equity	16835.09	16943.92	17051.37	17051.37	17119.59
Interest on Working Capital	16325.38	15291.05	15356.13	15297.85	15377.78
O&M Expenses	32812.97	34122.01	35497.10	36933.28	38443.76
Total	86127.36	85391.70	85808.47	77141.04	78421.50

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

64. The annual fixed charges approved as above are subject to truing-up in terms of Regulation 13 of the 2019 Tariff Regulations.

Energy Charge Rate (ECR)

65. The Petitioner has claimed ECR of ₹5.8599/kWh based on the operational norms and weighted average rate and GCV of fuel i.e. ₹774.69/MMBTU used during three months of October, 2018 to December, 2018. ECR has been calculated in three decimal places as ₹5.860/kWh and allowed as follows:

Landed Price of Gas as discovered from para 53 above (Rs/MMBTU)	774.69
Landed Price of gas (Rs/kCal)	0.003074
Normative Gross Station Heat Rate (kCal/kWh)	1853.88
Normative Auxiliary Energy Consumption	2.75%
Energy Charge Rate (Rs.per kWh)	5.860

Filing Fee and Publication Expenses

66. The Petitioner has sought reimbursement of fee paid by it for filing the petition and publication expenses. The Petitioner shall be entitled for reimbursement of the filing fees and publication expenses in connection with the present petition, directly from the beneficiaries on pro-rata basis in accordance with Regulation 70(1) of the 2019 Tariff Regulations.

67. Petition No. 259/GT/2019 is disposed of in terms of the above.

Sd/-
(I.S.Jha)
Member

Sd/-
(P.K.Pujari)
Chairperson

