

CENTRAL ELECTRICITY REGULATORY COMMISSION

NEW DELHI

Petition No. 152/MP/2019

Coram:

Shri P.K. Pujari, Chairperson

Dr. M.K. Iyer, Member

Shri I.S. Jha, Member

Date of Order: 11th November, 2019

In the matter of

Petition under Regulations 11 and 29 of the CERC (Terms and Conditions of Tariff) Regulations, 2019 read with other relevant provisions and this Hon'ble Commission's directions in the Order dated 20.03.2017 in Petition no. 72/MP/2016.

And

In the matter of

Maithon Power Limited (MPL),
34, Sant Tukaram Road,
Carnac Bunder,
Mumbai-400009

...Petitioner

Versus

1. Tata Power Delhi Distribution Limited,
NDPL House, Hudson Lane,
Kingsway Camp, New Delhi-110009
2. Damodar Valley Corporation,
DVC Headquarters, DVC Towers,
VIP Road, Kolkata- 700054
3. West Bengal State Electricity Distribution Company Limited
Vidhyut Bhavan (8th Floor), Bidhannagar,
Block-DJ, Sector-II, Salt Lake,
Kolkata – 700091
4. Kerala State Electricity Board Limited (KSEBL)
Vydyuthi Bhavanam, Pattom,
Thiruvananthapuram- 695004.
5. Tata Power Trading Company Limited
Corporate Centre, A-Block,
34, Sant Tukaram Road, Carnac Bunder,
Mumbai-400006

...Respondent



Parties present:

Shri M. G. Ramachandran, Sr. Advocate, MPL
Ms. Pooja Priyadarshini, Advocate, MPL
Shri Nived V., Advocate, MPL
Shri Pankaj Prakash, MPL
Shri Nitin Kala, Advocate, TPDDL
Ms. Shefali Sobti, TPDDL

ORDER

The petitioner is a generating company operating Maithon Right Bank Thermal Power Project, having installed capacity of 1050 MW (2x525MW) at Dhanbad, Jharkhand. The Respondents are distribution licensee and trading licensee buying electricity generated from above said thermal power station who have entered into Power Purchase Agreements (“PPA”) or Power Sale Agreements (“PSA”) with the petitioner.

2. On account of the Ministry of Environment, Forest and Climate Change (“the MoEFCC”) notification dated 7th December, 2015 *inter-alia* specified revised standards of emission applicable to thermal generating station (“revised emission standards”), the petitioner filed Petition no. 72/MP/2016 under CERC (Terms & Condition for Determination of Tariff) Regulations, 2014 (“the 2014 Tariff Regulations”) which was disposed by the Commission on 20.3.2017 with the direction to approach Central Electricity Authority (“the CEA”) with regard to optimum technology, phasing and deciding cost factors accordingly and liberty to approach the Commission thereafter. The petitioner approached the MoEFCC and CEA along with pre-feasibility study for FGD system. On 11.12.2017, the petitioner has received response of the Central Pollution Control Board (CPCB), MoEFCC with regard to timeline and on 8.1.2019, report of CEA detailing the suggestive technology and indicative cost. On the strength of these response, the petitioner filed this petition.

Background

3. The short facts are as follows:



- (a) The revised emission standards prescribed the limit of Water Consumption, Particulate Matter, Mercury, Sulphur dioxide and oxide of Nitrogen.
- (b) In order to achieve the above limit, the petitioner envisaged the requirement of (i) installation of Flue Gas De-Sulphurization (FGD) Plant to meet the SO₂ norms, and (ii) installation of NO_x abatement system along with associated Electrical System Modification and Civil Foundations to meet the norms. The petitioner has decided to install FGD Systems in Unit 1 & 2 of Maithon Thermal Power Plant for SO₂ limit.
- (c) Vide order dated 20.3.2017, the Commission issued the directions to the petitioner to approach Central Electricity Authority (CEA) with regard to the specific optimum technology, associated cost and major issues to be faced in installation of revised environmental norms and MoEFCC for phasing the implementation of different environmental measures. The Commission has granted liberty to approach once the cost factors including technology, implementation schedule is finalized.
- (d) On 6.4.2017, the petitioner approached MoEFCC and CEA for the necessary guidance along with Pre-feasibility study for FGD system. On 11.12.2017, in exercise of powers conferred under Section 5 of the Environment (Protection) Act, 1986, the Central Pollution Control Board, MoEFCC issued the following directions to MPL on time limit for complying with the revised SO₂ and NO_x limits-
- (i) That plant shall install/retrofit Electrostatic Precipitators (ESP) so as to comply PM emission limit immediately.
 - (ii) That plant shall install FGD by September 30, 2021 & June 30, 2022 in Unit 1 & 2 respectively so as to comply SO₂ emission limit.
 - (iii) That plant shall take immediate measure like installation of low NO_x burners, providing Over Fire Air (OFA) etc. and achieve progressive reduction so as to comply NO_x emission limit by the



year 2022.

- (e) On 8.1.2019, CEA furnished its report detailing the “suggestive technology” and “indicative cost” for installation of FGD system at MPL’s Project to comply with Amendment Rules. In this report, CEA has analysed the technologies, its advantages/disadvantages and recommendations.
- (f) Considering the ensuing deadline prescribed by the MoEFCC for FGD installation as 30.9.2021 for Unit-1 and 30.6.2022 for Unit-2 vide its letter dated 11.12.2017 and longer gestation period for implementation of FGD, this Petition for FGD System is being preferred by the petitioner in first phase. The Petitioner craves leave to file separate petition for remaining requirement.

6. The main prayers of the Petitioner are as under:

- (a) Admit the present petition;
- (b) Declare the MoEFCC notification dated 7.12.2015 read with its letter dated 11.12.2017 as Change in Law for MPL;
- (c) Grant in-principle approval to MPL to incur the expenditures (including Capex and Opex) as detailed under this Petition for meeting the revised emission norms in respect of SO₂;
- (d) Approve the estimated total capital cost of Rs. 777.14 crores as proposed in the present petition, subject to truing up;
- (e) Approve the parameters proposed in the present petition in relation to estimated increase in O&M Expenses, Operating Norms like Auxiliary Power Consumption and SHR, spares, water charges, landed cost of reagents, gypsum disposal cost etc. with corresponding increase in Capacity Charges and ECR as detailed above;
- (f) Exclude the period of shutdown (required for installation of FGD) for the purposes of calculating the Availability of the Project and ensure full recovery of shortfall in AFC due to such shutdown;
- (g) Allow the prayer of the Petitioner not to consider the increased ECR for MPL Project on account of FGD installation for preparation of stack of



merit order dispatch till all participating generators comply with the revised emission norms;

- (h) Allow the Petitioner to (i) seek requisite modifications in the granted LTA on account of reduction in the Net Capacity of Maithon Project in phases by 1.15% (ii) Modification in formulae for Availability, ECR and PLF due to increased Auxiliary Power Consumption as detailed in the Petition;
- (i) Grant liberty to the Petitioner to approach this Hon'ble Commission by way of separate petition(s) for remaining ECS which is not being proposed presently, but may be required to be installed in order to comply with the revised emission norms;
- (j) Grant leave to the Petitioner to approach this Hon'ble Commission for determination of Supplementary tariff;
- (k) Condone any inadvertent omissions/errors/rounding-off differences/shortcomings and permit the Petitioner to add/alter this filing and make further submissions as may be required in future;

7. The Respondent No.4 has filed its reply vide affidavit dated 14.8.2019, the Respondent No.1 has filed its reply vide affidavit dated 9.8.2019. The Commission vide Record of Proceedings dated 20.8.2019 directed the petitioner to place on record tendering process. The petitioner has filed rejoinder and information sought by the Commission vide affidavit dated 19.8.2019 and 5.9.2019.

Submissions of the Petitioner

8. Vide affidavit dated 7.5.2019, the petitioner has made following submissions:

- a) The petitioner has proposed expenditures to be incurred to comply with the SO₂ norms prescribed under the Environment (Protection) Amendment Rules, 2015 dated 7.12.2015 issued by the Ministry of Environment, Forest and Climatic Change (MoEF&CC). The petitioner is presently operating its Generating Station at Maithon within the new limits prescribed by the Amendment Rules in relation to Water Consumption, Particulate Matter and Mercury. However, in order to fully comply with the Amendment Rules, the petitioner shall have to comply with the following norms prescribed for SO₂ and NO_x:



Installation of TPP	Sulphur Dioxide (SO₂)	Oxides of Nitrogen (NO_x)
TPPs (Units) installed between 01.01.2003 & 31.12.2016	200 mg/Nm ³ for ≥500 MW	300 mg/Nm ³

- b) This can be achieved by way of- (i) installation of Flue Gas De-Sulphurization (FGD) Plant to meet the SO₂ norms, and (ii) installation of NO_x abatement system along with associated Electrical System Modification and Civil Foundations to meet the norms. The compliance of the Amendment Rules entails not only a capital cost but also has an impact on O&M expenses and, further, some of the operational parameters would impact the available capacity or energy and resultant costs of generation from the Project.
- c) The present Petition is confined to the installation of FGD Systems in Unit 1 & 2 of Maithon Thermal Power Plant for SO₂ abatement only. The ensuing deadline prescribed by the MoEFCC for FGD installation as 30.9.2021 for Unit-1 and 30.6.2022 for Unit-2 vide its letter dated 11.12.2017 and longer gestation period for implementation of FGD, this Petition for FGD System is being submitted in first phase..
- (d) CEA in its report dated 8.1.2019 has analysed the technologies as under:

Dry/semi dry process (Spray dry & CFB Process):

- I. Dry FGD having lower SO₂ reduction efficiency compared to Wet Limestone based FGD, may not be effective against high sulphur coal requiring a SO₂ reduction. In dry FGD, the high cost & high purity reagent (slacked/quick lime) and installation/replacement of additional fabric filter bags significantly increases the OPEX. Moreover, fabric filter needs to be installed post scrubber to achieve the specified SPM level and to re-utilize the un-reacted reagent, which in-turn increase the capital costs. Further, installation of Dry FGD with bag filters downstream of the scrubber may not be feasible considering the space constraints. Acid resistant Lining for chimney is required in dry FGD also, as some percentage of SO₂ would be converted to SO₃ which would condense locally on stack walls at temperatures below



acid dew point. Moreover, space constraints in the layout might restrict installation of new scrubber with fabric filters having considerable size and footprints.

Ammonia Process:

- I. Large quantity of anhydrous ammonia would be required by the Ammonia based FGD for SO₂ abatement. Precautions should be taken as Anhydrous ammonia forms a flammable explosive vapour at normal atmospheric temperature and must be transported and stored under high pressure (280 PSIG) in anti-corrosive storage spheres of stainless steel. Further, precautions need to be taken for transportation, handling and storage of huge volume of reagent. Although, this specific technology is using hazardous reagent yet it is a proven technology and successfully operational. However, at present, there are not many vendors available for this technology.

Wet lime Stone& Sorbent Polymer Catalyst based:

Considering the amount of sulphur dioxide level to be removed to meet the new standards, and the large volume of flue gas to be treated, wet limestone based FGD and "Sorbent Catalytic convertor "are more reliable and preferable.

Wet lime stone based FGD being Low cost reagent, marketable by-product, cost effectiveness, reliability, proven nature of the technology and fuel flexibility make it a preferable technology choice for this plant.

Similarly, SPC being a new technology with no reagent requirement and salable byproduct (i.e. Sulphuric Acid) additionally having very less space requirement and low APC is also a promising option in terms of OPEX and CAPEX cost optimization."

"TECHNOLOGY "

The Wet FGD with either "Lime Stone" or "Ammonia based" is suitable for this plant. Both type of FGD have about 60% of common equipment. The nearest source of reagent is about 110 km (The actual source of reagent mat be selected during the detail engineering based on availability, cost, quality and logistics by MPL.) Additionally source of limestone stone should be chosen with life cycle cost analysis comparing "Costs related to Limestone supply to the site V/s Optimum Salability of By-product i.e. Gypsum. In case of Ammonia based FGD, utmost care of handling ammonia is required.



Additionally, Sorbent Polymer Catalyst (SPC) based technology may also be explored for FGD at Maithon Power Plant. This technology has advantage of no reagent cost (not consumable), saleable by-product (Diluted sulphuric acid), small space foot print, moderate operating expenditure and low Auxiliary Power Consumption compared to Wet FGD-Lime stone and Ammonia based technologies.”

- (e) CEA has detailed the pros and cons for the “suggestive technologies” and has finally recommended that Wet FGD with either “Lime Stone” or “Ammonia based” is suitable for this plant, vesting the discretion with MPL to select the appropriate technology for the Project. Notably, CEA has given indicative cost for Capital Expenditure (CAPEX) and Operational Expenditure (OPEX) only for the Limestone Based Wet FGD technology.
- (f) As regards cost estimation, CEA in the Report has indicated the CAPEX as Rs. 0.42 Crore/MW excluding Taxes, Duties, IDC, IEDC, insurance and financing charges. While providing the ‘indicative’ cost, the CEA has clarified that the cost indicated by it should be used as guiding factor, however, the actual cost of retrofitting the FGD system will be discovered through competitive bidding. It has further advised MPL to complete the procurement process for FGD expeditiously in order to meet the target for installation of FGD system.
- (g) The plant and machinery erected by MPL at the Project was well equipped with systems to control emission parameters under prudent utility practices and the conditions under Environmental Clearance (EC), Consent to Establish (CTE) and Consents to Operate (CTOs). However, through the notification of Amendment Rules, MoEF&CC has introduced/amended the norms for emission of SO₂ in flue gases and limited the same to 200 mg/Nm³ for generating Units having capacity of 500 MW and above and commissioned between 01.01.2003 to 31.12.2016. As evident, the introduction of new



parameters for emission of SO₂ amounts to 'Change in Law' in terms of the CERC (Terms and Conditions of Tariff) Regulations, 2019 ("the 2019 Tariff Regulations").

- (h) A conjoint reading of the Regulations 11, 26 and 29 of the Tariff Regulations, 2019 reveals that the Petitioner herein is required to obtain prior approval of this Commission before undertaking the expenditures for meeting the revised emission standards. While Regulation 29(1) specifically mandates filing a Petition before Commission for undertaking additional capital expenditure for compliance of the revised emissions standards, Regulation 29(4) requires filing of a Petition for determination of tariff due to the implementation of revised emission standards for such additional capital expenditure actually incurred or projected to be incurred.
- (i) In view of the applicable provisions of Tariff Regulations, 2019, Electricity Act, 2003 and in compliance of this Commission's directions in the Order dated 20.03.2017 in Petition no. 72/MP/2016, the Petitioner has filed the present Petition seeking in-principle approval of the expenditures proposed to be incurred by MPL in order to comply with the SO₂ norms prescribed under the Environment (Protection) Amendment Rules, 2015 dated 07.12.2015 issued by the MoEF&CC, approval for undertaking the additional capital expenditure on account of the revised emission standards and seeking further clarity and adjudication on the incidental/associated issues related to financial/operational costs/parameters. The Petitioner shall be filing a separate and detailed petition for determination of supplementary tariff in near future based on the proposed and/or approved costs/parameters and any other relevant factor/information for such determination.
- (j) It was concluded that Limestone Based Wet Flue Gas Desulphurization is the most suitable technology for MPL due to Low



cost reagent, Easy reagent availability, Marketable byproduct, Large reference list, Fuel flexibility, Ease of retrofit and Proven and most common technology.

- (k) The entire scope of work has been divided into 4 packages, namely, (a) FGD main system package [Package 1]; (b) Electrical power supply arrangement [Package 2]; (c) FGD waste water treatment system [Package 3]; and (d) Fire-fighting system [Package 4]. It is most humbly submitted that MPL has resorted to competitive bidding process to award the two critical packages i.e. Packages 1 & 2. It is further submitted that Packages 3 and 4 i.e. 'FGD waste water treatment system' and 'Fire-fighting system' are ancillary in nature and would be firmed up after detailed engineering of Package 1 and Package 2.
- (l) As discovered in the bidding process and with further estimations regarding the ancillary/associated costs, the total cost towards the proposed Limestone based FGD implementation is estimated to be about Rs 777.14 Crores including Interest During Construction ("IDC") i.e. Rs. 0.74 Crore/MW, which is subject to true-up upon completion based on actually incurred cost.
- (m) The break-up of proposed Capital Expenditure for the Wet Limestone based FGD system for 2x525 Units of MPL estimated on the basis of bidding results of two main packages (FGD Main System and Electrical System) is as follows:

Sr. No.	Description	MPL Capex Estimate	MPL Capex Estimate	CEA Report Indicative Cost
1	Total FGD EPC Base Cost	Rs Cr	RsCr/MW	RsCr/MW
1.1	FGD main package	430.50	0.410	0.244
1.2	Electrical power supply package	29.00	0.028	0.085
1.3	Waste water treatment	5.00	0.005	



Sr. No.	Description	MPL Capex Estimate	MPL Capex Estimate	CEA Report Indicative Cost
1.4	Fire protection and detection	5.00	0.005	
1.5	Spares (@ 2.5% of all above) ^A	-		0.008
2	Total FGD EPC Basic Cost	469.50	0.447	0.337
3	Engg, Project Management and Contingency reserve	34.33	0.033	0.025
4	Total Base Cost of the project	503.83	0.480	0.362
5	GST (@18% of base cost)	90.69	0.086	
6	IEDC (Pre-operative Expenses, Consultancy Services, Financing Charges etc.) and Insurance	12.60	0.012	
7	Total EPC Cost incl Tax & Contingencies	607.12	0.578	0.362
8.1	Opportunity Cost related to U1	49.87	0.047	0.029
8.2	Opportunity Cost related to U2	52.37	0.050	0.029
9	Total EPC Cost incl Tax, Contingencies and Opportunity Cost	709.36	0.676	0.420
10	IDC (@10.5% Interest)	67.78	0.065	
11	Total Capital Expenditure including IDC	777.14	0.740	0.420

(n) It may be seen from the above comparison that the proposed cost of the FGD system is higher than indicative cost given by CEA mainly on account of higher cost discovered through open competitive bidding process. It may also be noted that CEA also has categorically stated that its cost estimate is only indicative and actual cost has to be discovered through open competitive bidding. In fact, in the subsequent notification dated 21.02.2019, while specifying general norms for Wet Limestone based FGD system, CEA itself has given an increased Base Cost norm of Rs. 0.405 Crore/MW against the approval of Rs. 0.362 Crore/MW in the MPL Report dated 08.01.2019. Even in this notification, CEA has stated that the cost may vary on account of various project/site specific factors. Thus, CEA also recognises the fact that retrofitting of FGD system is highly dependent on specifics of each project e.g. type and quality of coal,



original technical design and layout of equipment at project site, availability of space, location of project and reagent chosen, perception/assessment of different constraints by market players while bidding etc. and, hence, it is not possible to give unique or exact estimate for the project. Thus, any comparison of retrofitted Project Costs for different stations is not of much significance when each case has to be dealt with on its own specifics and particularly when the discovery of cost is through market based mechanism of open competitive bidding, which is the accepted mechanism specified in the Tariff Regulations, 2019.

- (o) In view of the above justifications, the Petitioner submits that the Additional Capital Expenditure of Rs. 777.14 Crore (or Rs. 0.74 Crore/MW) proposed by Petitioner is reasonable and Commission may be pleased to grant in-principle approval for incurring this expenditure and allowing its consequential impact in tariff and related issues for supply of power to beneficiaries including scheduling.
- (p) As brought out above, the Petitioner shall be filing a separate Petition for determination of Supplementary Tariff on account of Capital Expenditure for installation of emission control system in line with the requirement of Regulation 29(4) of the Tariff Regulations, 2019. Tariff Regulations, 2019 stipulate that commission shall come out separately with regulations on determination of Supplementary Tariff. However, pending issuance of such regulations, filing of such Petition and determination of tariff thereon would require determination of various parameters and decision on various issues associated with such installation on case to case basis.
- (q) Apart from an impact on capacity charges the petitioner has submitted the detailed reasons for other cost implications mainly pertaining to O&M Expenses and Auxiliary Power Consumption, reduction in SHR etc. The O&M Expenses would increase on account of the running Operation Cost of the consumables like Limestone Cost for the FGD Plant towards operation of the new facilities, costs towards disposal of by-products and



wastes of the FGD Plant such as Gypsum etc. Further, the Maintenance Spares and services of contracted/outsourced manpower would also be required to ensure the availability and reliability of the system. All these will lead to increase in Annual Fixed Cost and, hence, Capacity Charges over rest of the life of the Project. The existing per unit capacity charge at normative PLF of 85% will increase not only because of increase in Annual Fixed Cost but also due to increase in Auxiliary Consumption due to FGD system. The existing energy charge rate will also increase due to additional reagent cost and increase in auxiliary consumption. Accordingly, the Petitioner submits proposals for such parameters and issues, which may also be addressed and decided by Commission.

- (r) Clause (5) of the Regulation 3 of the Tariff Regulations, 2019 stipulates that any increase in auxiliary energy consumption on account of compliance to revised emission standards shall be considered separately. In line with CEA Report dated 8.1.2019, the Petitioner proposes to consider Auxiliary Consumption of 1.15% for FGD system in addition to the Normative Auxiliary Consumption of 6.25% applicable as per Tariff Regulations, 2019 for MPL Project. Further, since the said Auxiliary Consumption of 1.15% is based on projected levels of operation of plant (PLF) and FGD system it is likely that that the same may be higher or lower than this projection based on actual level of operation of plant and FGD system. When the generating units operate at part load, there may be some reduction in absolute value (in kWh) of Auxiliary Consumption, however, its reduction in terms of percentage will not be in the same proportion and hence percentage Auxiliary Consumption at part load may be higher than that at TMCR condition. The CEA recommendation to Commission on Operation norms for thermal generating stations dated 10.12.18, indicates additional% of Auxiliary Consumption vis a vis change in plant loading, e.g. the recommendation report permits upto 1.8% additional Auxiliary Consumption for Plant Loading going down upto 40% over and above the normative Auxiliary Consumption. However, similar



proportions of additional Auxiliary Consumption norms cannot be applied for FGD plants because of the nature of operation of FGD system which requires continuous operation of certain major power consuming equipment and, hence, may lead to higher proportion of additional Auxiliary Consumption.

Submissions of the Respondent No.4 (KSEBL)

9. The Respondent No.4, vide affidavit dated 14.8.2019, has mainly submitted the following:

- a) The proposed capital expenditure is considerably higher than the CEA benchmark cost. A comparison of the individual cost elements show that the FGD main package cost proposed by the petitioner i.e. Rs. 0.41 Cr/MW is very high compared to the CEA benchmark cost i.e. Rs. 0.244 Cr/MW.
- b) CEA at Chapter 10 of its Report has reiterated that the cost of retrofitting FGD should be discovered through a competitive bidding process. The bidding process adopted by the petitioner is through invitation of Expression of Interest published in National Edition of Financial Express. The Petitioner failed to invite International Competitive bids for such a big investment projects, when CEA has specifically stated in its report that open competitive bidding has to be carried out in consultation with representatives of DVC for implementing the project. The Petitioner has not provided any valid justification substantiating the huge increase over the benchmark cost when the report of CEA indicating the benchmark cost was specifically prepared for the Maithon Thermal Power Plant duly taking into consideration the plant specific features. It is humbly requested that the cost of FGD main package may be limited to the benchmark cost fixed by CEA.
- c) The Petitioner has claimed an amount of Rs. 0.047 Cr and Rs. 0.050 Cr as opportunity cost related to Unit-1 and Unit-2 respectively. In this matter it is submitted that as per the report of CEA, Power plants are advised to



minimize the interconnection time by taking suitable measure so that the “Opportunity cost” associated with plant shutdown may have least impact on Tariff. It is requested that as recommended by CEA, interconnection of FGD with Main plant may be planned during annual overhauling of Units so that opportunity cost can be minimized.

- d) Commission may kindly carryout prudence check on the claims of the petitioner to minimize the impact of the capital expenditure on the beneficiaries.
- e) The petitioner has claimed Additional O&M on Manpower/Spare cost at 5% of total capex based on the estimated Manpower and Maintenance spare required to operate and maintain the FGD plant for 2x525 MW thermal power plant. It is submitted that the claim of the petitioner is on high side. As per the report of CEA, O &M expense are fixed as 2% of the capex. It is requested that O&M cost may be allowed only within the upper ceiling limits fixed by CEA.
- f) The Petitioner has claimed as escalation of 5% over the price of 2018-19 for arriving at the cost of limestone and cost of sale of disposal of by-product. The escalation rates are on the higher side and it is requested that the escalation may be allowed only after prudence check.
- g) The Petitioner has further requested that even after installation of FGD for MOD purposes the ECR formula may be used taking both Limestone Consumption and Landed price of Limestone as zero and auxiliary Consumption as per approved norms without installation of FGD and till all FGDs are installed, the merit order may be run without any reference to additional ECR. The request of the petitioner is illegal and may be rejected. MOD without taking the actual variable cost of the plant duly considering the cost of FGD also will jeopardize the power purchase cost of the



beneficiaries and affects the interest of the consumers. The request of the petitioner is against the provisions of the Electricity Act, 2003 and the existing Regulations.

Submissions of the Respondent No.1 (TPDDL)

10. The Respondent No.1, vide affidavit dated 9.8.2019, has mainly submitted the following:

- (a) The Petitioner, in the earlier petition bearing No.72/MP/2016, inter-alia had sought the approval of "*Grant in-principle approval for the proposed Capital Cost*". This prayer was partially allowed by this Commission by order dated 20.03.2017, wherein this Commission held that the Amendment to the Environment (Protection) Rules, 1986 falls under the definition of change in law. In view of the order dated 20.03.2017, passed by this Commission in petition bearing No.72/MP/2016, prayer (b) of the present petition, seeking a declaration that the MoEF notification dated 07.12.2015 is change in law, is rendered infructuous.
- (b) CEA suggested that SPC based technology may also be explored for FGD, however the Petitioner has opted for the Wet lime-stone based FGD as the best suited technology for de-sulphurization of flue gas for MPL plant. While the Respondent No.1 does not oppose the same as being considered by the Petitioner, in light of the CEA recommendations, it is requested that this Commission may consider if Sorbent Polymer Catalyst Technology (SPC) would be more efficient and economical for the Petitioner's plant. In either case, the Respondent No.1 would like to suggest use of more economical and efficient technology, considering the FGD installation in a time bound manner.
- (c) The cost towards capital expenditure, ought not to be disbursed as a one-time payment, it should be released in tranches, depending upon the progress of the installation and commissioning of FGD. The same would help in avoiding tariff shock for the Respondent No.1's end consumers.



- (d) As in the case of capital expenditure, the operational expenditure should also not be disbursed as a one-time payment, instead should be released in tranches. The same would help in avoiding tariff shock for the Respondent No.1's end consumers.
- (e) In compliance with MoEF, directing installation of FGD, by 30.09.2021 and 30.06.2022 in Unit 1 & 2 respectively at the MPL plant, it is proposed that the installation, testing and commissioning of the FGD system should be done during the period the plant is under shut down on account of annual overhauling, so that the beneficiaries are not burdened with extra costs, in addition to the fixed costs. In fact, CEA in its report stated that opportunity cost can be reduced if commissioning of the FGD is planned during the annual overhauling of the units. It is also proposed that MPL should take the consent of the beneficiaries before shutting down the plant at the time of retrofit, and in a time bound manner so that shutdown during the high demand periods can be avoided.
- (f) Thermal Power plants will schedule power taking into consideration the total cost of production, which would be inclusive of the costs incurred for installation of FGD. As a result, plants which have complied with the SO₂ emission norms, (which would schedule power at a higher rate) would be at a disadvantage in the merit order scheduling in comparison to the plants which have not complied with the SO₂ emission norms. The Petitioner in para 53 of the present petition has proposed that for MPL after installation of FGD, for Merit Order Dispatch purposes, the ECR formula may be used taking both lime stone consumption and landed price of limestone as zero, and auxiliary consumption as per approved norms, without installation of FGD, and till all FGDs are installed the merit order may run without reference to additional ECR. Accordingly, it is prayed that this Commission may provide a clarification as regards merit order scheduling considering enhanced tariff of generating plants which have installed FGD and those which have not installed FGDs. It is



suggested that a common guideline/ policy on merit order scheduling be considered which can be followed by thermal plants across the country without having the possibility of being backed down on account of having higher ECR due to FGD expense. Further, the FGD installation plants would become compliant to environmental norms, however, at the same time would have an inherent risk of being backed down on account of higher ECR after installation of FGD compared to ECR prior to FGD installation.

- (g) The Petitioner in para 6 of the petition has submitted that it will file a separate petition(s) for meeting further compliances, including NOx abatement system. The Respondent No.1 shall file an appropriate response as and when the Petitioner files petition/s for meeting further compliances.

Rejoinder of the Petitioner to the reply of KSEBL

11. The Petitioner has filed its rejoinder vide affidavit dated 19.8.2019 in respect of Reply of the Respondent No.4 as under:

- a) That the CEA has clarified that the costs incorporated in its Report are merely “indicative”. It is clarified that as set out in detail under the Petition, the prices claimed under the petition are discovered in the bidding process carried out by the Petitioner.
- b) That the report of CEA was specifically prepared for the Maithon Thermal Power Plant duly taking into consideration the plant specific features. In this regard, it is pertinent to note that this question is no longer res-integra and, in the Statement of Reasons (SOR) to the CERC (Terms and Conditions of Tariff) Regulations, 2014. As evident from the SOR, International Competitive Bidding (ICB) is not mandatory and it is the discretion of the Petitioner to decide the bidding process to be followed. The Petitioner has taken every possible step to ensure widest participation and has, in fact, received responses from multiple bidders. In respect of the objections



raised by KSEB with respect to strict adherence to the CEA Report and capping of costs, it is reiterated that this prayer of KSEB is against the spirit of the CEA Report itself as the CEA costs are merely indicative and not conclusive.

- c) That the Petitioner would endeavour to minimize the period of installation by synchronizing it with scheduled maintenance for each Unit during the year to the extent possible.
- d) Against the very spirit of the CEA Report itself, KSEB is requesting for capping of costs as per CEA Report. Further, the parameters proposed in the present petition in relation to estimated increase in O&M Expenses, Auxiliary Power Consumption, spares, Water charges, landed cost of reagents, etc. are with detailed justifications on its assumptions.
- e) That full recovery of shortfall in AFC due to such shutdown may kindly be ensured as such shutdown is compulsorily required to comply with change in law of revised environmental norms.
- f) That the proposal of the Petitioner on MOD is in-line with the proposed recommendations regarding incentives to Thermal Power Plants for early installation of Pollution Control Equipment given by the Central Electricity Authority vide letter dated 26.09.2018.

Rejoinder of the Petitioner to the reply of TPDDL

12. The Petitioner has filed its rejoinder vide affidavit dated 05.9.2019 and has mainly submitted the following:

- a) CEA in its report dated 08.01.2019 carried out a comparative analysis of the various technologies. As is discernible from the above, CEA itself in its recommendation report has suggested that the removal efficiency of SPC based technology is lower than that of Wet Limestone based FGD technology. In addition to same it is also noteworthy that, SPC based technology is currently installed in



addition to Wet limestone based FGD, downstream of absorbers as per experience list shared by SPC technology owner. Till now SPC based technology has not been installed on standalone basis for removal of SOx. Following additional requirement envisaged:

- a. Additional chemical (NaOH/ lime) handling is required for dilution of bi-product. Market price of neutralizing agent i.e. NaOH is comparable with lime.
 - b. Additional clarified water required to be generated through desalination process in case of coastal area plants where sea water is used as primary source. This will add to the CAPEX. Generation of Sulphuric Acid in the process which is hazardous. Disposal/ selling of H₂SO₄ generated as bi-product is difficult.
- (b) MPL in its petition has already submitted that it would endeavor to minimize the period of installation by synchronizing the same with the scheduled maintenance of Unit during the year to the extent possible. However, it is humbly reiterated that the actual installation period and the resultant shut down period would depend upon the actual progress with reference to the plan evolved in consultation with the stakeholders. It is humbly submitted that the same maybe considered in a reasonable manner keeping in mind the fact that FGD Technology is still in its nascent stages of implementation and no clear records exist to conclusively deduce the time involved.

Analysis and Decision

13. In the light of the above submission of the petitioner, Respondents and documents placed on records, the following issues arise for consideration in the present petition:

Issue No.1: Whether the MoEFCC notification dated 7.12.2015 read with Central Pollution Control Board (CPCB) letter dated 11.12.2017 be declared as Change in Law and in principle approval of capital expenditure can



be granted to the petitioner for incurring proposed expenditure towards installation of FGD?

Issue No.2: Whether additional O&M expenses and the relaxation in other operating norms due to installation of FGD are admissible as claimed by the petitioner? Also can period of shutdown be excluded for calculation of availability for recovery of fixed charges?

Issue No.3: Whether any direction can be issued with regard to Merit Order Dispatch and modification of LTA due to reduction in Net Capacity due to installation of ECS?

14. We deal with the above issues in subsequent paragraphs.

Issue No. 1: Whether the MoEFCC notification dated 7.12.2015 read with CPCB letter dated 11.12.2017 be declared as Change in Law and in principle approval of capital expenditure can be granted to the petitioner for incurring proposed expenditure towards installation of FGD?

15. The petitioner has prayed that the MoEFCC notification dated 7.12.2015 read with letter dated 11.12.2017 as Change in Law for the petitioner. The Respondent No.1 has submitted that in view of the order dated 20.3.2017, passed by this Commission in petition bearing No.72/MP/2016 *qua* the approval of Grant in-principle approval for the proposed Capital Cost, the prayer of the petitioner seeking a declaration that the MoEF notification dated 7.12.2015 is change in law, is rendered in-fructuous. Relevant operating para of the above said order is extracted below:

“8. We have considered the submissions of the petitioner and perused the documents on record. We now consider as to whether the prayer of the petitioner for in-principle approval for the Abstract Scheme of capital expenditure is maintainable. The petitioner has submitted that the Amendment Rules, 2015 have been issued by MoEFCC in exercise of the powers conferred on it by Sections 6 and 25 of the Environment (Protection) Act, 1986 (29 of 1986). Such amendment of Environment (Protection) Rules, 1986 under an Indian Act squarely falls under the definition of “Change in Law” as stipulated in 2014 Tariff Regulations. Further, such Change in Law is an uncontrollable factor for the petitioner as stipulated in Regulation 12 (2) of the 2014 Tariff Regulations. The petitioner has



contended that from the harmonious reading of the provisions of the Regulations, the present proposal of the petitioner on Abstract Schemes can be classified under Regulation 14 (3) (ii) read with Regulations 3 (9) and 12 (2) of 2014 Tariff Regulations.

9. The Ministry of Environment Forest and Climate Change (MoEFCC) vide notification dated 7.12.2015 notified the Environment (Protection) Amendment Rules, 2015 amending/introducing in schedule I of the Environment (Protection) Rules, 1986, the standards for emission of environmental pollutants to be followed by the thermal power plants. As per the said notification, all existing thermal power plants are required to meet the modified/new norms within a period of two years from the date of the notification. In order to comply with the revised environmental norms as prescribed by the MoEFCC, the petitioner proposes to take up two Abstract Schemes, namely (i) Installation of Flue Gas De-Sulphurization, (ii) Installation of Selective Catalytic Reduction.

10. Since, the 2014 Tariff Regulations do not provide for the grant of in-principle approval for the capital expenditure, the prayer of the petitioner for in-principle approval of the Abstract scheme of capital expenditure by relaxing the provisions of the tariff regulations through invoking Regulation 54 of 2014 Tariff Regulations, is not maintainable. In our view, since, the implementation of new norms in the existing and under construction thermal generating stations would require modification of their existing system and installation of new systems such as Retro-fitting of additional fields in ESP/replacement of ESP, etc. to meet Suspended Particulate Matter norms, installation of FGD system to control SO_x and Selective Catalytic Reduction (SCR) systems for DeNox, the petitioner is directed to approach the Central Electricity Authority to decide specific optimum technology, associated cost and major issues to be faced in installation of different system like SCR, etc. The petitioner is also directed to take up the matter with the Ministry of Environment and Forest for phasing of the implementation of the different environmental measures. Accordingly, the petitioner is granted liberty to file appropriate petition at an appropriate stage based on approval of CEA and direction of MoEF which shall be dealt with in accordance with law.”

It is observed from the above that the Commission vide order dated 20.3.2017 in petition no. 72/MP/2016, allowed the MoEF&CC Amendment Rules, 2015 to be Change in Law under the 2014 Tariff Regulation for the generating station of the Petitioner.

16. In the instant petition also, the petitioner has prayed that expenditure on meeting new environmental norms may be allowed under “Change in Law”. Considering the fact that the expenditure shall be incurred during next tariff period commencing from 1.4.2019, prayer of the petitioner is to be dealt under the provisions of 2019, Tariff Regulations pertaining to additional capital expenditure. As per Regulation 29 of 2019, Tariff Regulations, the additional capital expenditure to be incurred on account of revised emission standards has been



recognized separately. In light of the above explicit Regulation pertaining to the additional capital expenditure on new environment standards, it is not required to invoke the provision of Change in Law as per the 2019, Tariff Regulations. Accordingly, prayer (b) of the petitioner disposed in terms of above.

17. On the issue of in-principle approval of capital expenditure, the petitioner has submitted that conjoint reading of the Regulations 11, 26 and 29 of the Tariff Regulations, 2019 reveals that the Petitioner herein is required to obtain prior approval of this Commission before undertaking the expenditures for meeting the revised emission standards. While clause (1) of the Regulation 29 specifically mandates filing a Petition before Commission for undertaking additional capital expenditure for compliance of the revised emissions standards, clause (4) of Regulation 29 requires filing of a Petition for determination of tariff due to the implementation of revised emission standards for such additional capital expenditure actually incurred or projected to be incurred.

18. The proposed expenditure is to be incurred within the tariff period from 1.4.2019 to 31.3.2024. The admissibility of said expenditure is to be dealt within the 2019 Tariff Regulations. Regulation 11 of the Tariff Regulations, 2019 in regard to in-principle approval is as under:

“11. In-principle approval in specific circumstances: The generating company or the transmission licensee undertaking any additional capitalization on account of Change in law events or force majeure conditions may file petition for in-principle approval for incurring such expenditure after prior notice to the beneficiaries or the long term customers, as the case may be, along with underlying assumptions, estimates and justification for such expenditure if the estimated expenditure exceeds 10% of the admitted capital cost of the projects or Rs. 100 Crore, whichever is lower.”

The petitioner has already informed the beneficiaries about the estimated expenditure which exceeds the limit of Rs.100 crore specified under the Regulation. As such, the proposed expenditure on FGD is squarely covered within the Regulation, 11 of the 2019, Tariff Regulations. Accordingly, it is held that



proposed expenditure qualifies for the In-principle approval, subject to further scrutiny of the proposed expenditure.

19. Now, we proceed to examine the admissibility of proposed expenditure. CEA vide letter dated 8.1.2019 has made recommendations for the generating station (MRBTTP). Relevant Para of the CEA report is extracted below:

“TECHNOLOGY:

The Wet FGD with either "Lime Stone" or "Ammonia based" is suitable for this plant. Both type of FGD have about 60% of common equipment. The nearest source of reagent is about 110km (The actual sources of reagent may be selected during the detail engineering based on availability, cost, quality and logistics by MPL). Additionally Source of limestone should be chosen with life cycle cost analysis comparing "Costs related to Limestone supply to the site Vis Optimum Salability of By-product i.e. Gypsum. In case of Ammonia based FGD, utmost care for handling ammonia is required.

Additionally, Sorbent Polymer Catalyst (SPC) based technology may also be explored for FGD at Maithon Power Plant. This technology has advantage of no reagent cost (not consumable), saleable by-product (Diluted sulphuric acid), small space foot print, moderate operating expenditure and low Auxiliary Power consumption compared to Wet FGD-Lime stone and Ammonia based technologies.”

20. The Petitioner has opted for the Wet Limestone based FGD system as the most rational from the list of options in the CEA recommendations. It is observed from the submission that the Petitioner has resorted to a two-part open competitive bidding process for the major packages i.e. “FGD main package” and “Electrical power supply package” which are the major contributors towards hard cost of the project. The break-up of capital expenditure for the Wet Limestone based FGD system for MPL generating station estimated on the basis of bidding results compared to CEA recommended cost is as under:-

Sr. No.	Description	MPL Capex Estimate	MPL Capex Estimate	CEA Report Indicative Cost
1	Total FGD EPC Base Cost	Rs Cr	RsCr/MW	RsCr/MW
1.1	FGD main package	430.50	0.410	0.244
1.2	Electrical power supply package	29.00	0.028	0.085
1.3	Waste water treatment	5.00	0.005	
1.4	Fire protection and detection	5.00	0.005	
1.5	Spares (@ 2.5% of all above) ^A	-		0.008



Sr. No.	Description	MPL Capex Estimate	MPL Capex Estimate	CEA Report Indicative Cost
2	Total FGD EPC Basic Cost	469.50	0.447	0.337
3	Engg, Project Management and Contingency reserve	34.33	0.033	0.025
4	Total Base Cost of the project	503.83	0.480	0.362
5	GST (@18% of base cost)	90.69	0.086	
6	IEDC (Pre-operative Expenses, Consultancy Services, Financing Charges etc.) and Insurance	12.60	0.012	
7	Total EPC Cost incl Tax & Contingencies	607.12	0.578	0.362
8.1	Opportunity Cost related to Unit 1	49.87	0.047	0.029
8.2	Opportunity Cost related to Unit 2	52.37	0.050	0.029
9	Total EPC Cost incl Tax, Contingencies and Opportunity Cost	709.36	0.676	0.420
10	IDC (@10.5% Interest)	67.78	0.065	
11	Total Capital Expenditure including IDC	777.14	0.740	0.420

21. As regards the estimated expenditure, it is observed that there is difference of Rs. 0.32 Cr/MW (Rs. 0.740- Rs.0.420) between the estimate of CEA and the petitioner. CEA has indicated that its estimates are indicative only and the petitioner shall go for open competitive bidding. This difference is due to the fact that CEA has not considered cost towards “Fire protection and detection” package, IDC, IEDC and GST@18% considered by the petitioner and also attributable to difference in cost towards “FGD main package” and “Opportunity cost.”

22. It is observed that for the two packages i.e. “FGD main package” and “Electrical power supply package”, cost discovered through competitive bidding by the petitioner is Rs. 0.438 Crore /MW, which is higher by Rs. 0.101 Crore/MW in comparison to CEA cost of Rs.0.337Crore /MW, including spares. This difference of Rs 0.101 Crore/MW gets reduced to Rs. 0.058 Crore/MW compared to the revised base cost considered by CEA in its report dated 21.02.2019. CEA, in its report dated 21.02.2019, has increased the base cost of FGD system from Rs.



0.362 crore/MW to Rs. 0.405 Crore/ MW based on the prices discovered by various thermal plants.

23. Considering the above facts and recognising that the cost considered by CEA is indicative only and the cost claimed by the petitioner has been discovered based on open competitive bidding, Commission allows the cost claimed by the petitioner for the two packages i.e. “FGD main package” and “Electrical power supply package”.

24. Regarding cost claimed by the petitioner for “Waste Water Treatment” and “Fire Protection and Detection”, CEA in its report has not considered the same. Commission is of the view that these packages shall be in place to meet the statutory requirements and safe operation of the plant. Accordingly, Commission allows the expenditure towards these packages subject to truing up. Regarding cost claimed by the petitioner towards Engineering, Project Management and Contingency reserve, Commission is of the view that expenditure on same is controllable and as such is being restricted to CEA’s recommended indicative cost.

25. CEA has allowed Opportunity cost towards shutdown period of one month. It is, however, observed that while petitioner’s claim is also based on the shutdown period of one month, the opportunity cost claimed by it is on the higher side. Petitioner has clarified in the petition that its claim is based on shut down period of 30 days and AFC allowed by the Commission for the year 2018-19 escalated by 5% per year to arrive at the AFC for the years 2021-22 and 2022-23 i.e. the deadline of installation of FGD.

26. CEA in its report has opined that shutdown period can be reduced if interconnection of FGD with main plant is planned during the annual overhauling of units. Petitioner has also submitted that it would try to minimize the period of shutdown by synchronizing the interconnection of FGD with annual overhaul.



However, the same would depend upon on actual progress of work and consultation with stakeholders on shutdown near the time of installation.

27. The Commission is of the view that beneficiaries and the petitioner shall plan the interconnection of FGD with main plant by synchronizing it with annual overhaul. Therefore, the Commission is not considering the opportunity cost at this stage. However, the same would be considered during truing up based on actual number of days of shutdown and actual AFC for the years 2021-22 and 2022-23 after prudence check to the effect that petitioner has tried to synchronize the interconnection of FGD with Annual overhaul and has consulted the beneficiaries in this respect.

28. The cost other than base cost such as IDC, IEDC, Taxes etc. are consequential and verifiable cost based on relevant records and their admissibility will be dealt accordingly at the time of fixation of tariff.

29. In view of the above, the Commission accords In-principle approval to the petitioner for following cost:

Sr. No.	Description	MPL Capex Estimate	MPL Capex Estimate	Capex allowed
1	Total FGD EPC Base Cost	Rs Cr	RsCr/MW	RsCr/MW
1.1	FGD main package	430.50	0.410	0.410
1.2	Electrical power supply package	29.00	0.028	0.028
1.3	Waste water treatment	5.00	0.005	0.005
1.4	Fire protection and detection	5.00	0.005	0.005
1.5	Spares (@ 2.5% of all above) ^A	-		-
2	Total FGD EPC Basic Cost	469.50	0.447	0.447
3	Engg, Project Management and Contingency reserve	34.33	0.033	0.025
4	Total Base Cost of the project	503.83	0.480	0.472



The Commission allows the petitioner to claim IDC, IEDC, Taxes and opportunity cost at actuals which may be allowed after prudence check in accordance with the 2019, Tariff Regulations.

30. Accordingly, prayer (c) and (d) of the petitioner are disposed in terms of above.

Issue No. 2: Whether additional O&M expenses and the relaxation in other operating norms due to installation of FGD are admissible as claimed by the petitioner? Also can period of shutdown be excluded for calculation of availability for recovery of fixed charges?

31. The petitioner has claimed increase in O&M Expenses, Operating Norms like Auxiliary Power Consumption and Station Heat Rate, spares, water charges, landed cost of reagents, gypsum disposal cost etc. with corresponding increase in Capacity Charges and ECR. The petitioner has also prayed to exclude the period of shutdown (required for installation of FGD) for the purposes of calculating the Availability of the Project and ensure full recovery of shortfall in AFC due to such shutdown.

Additional O&M expenses

32. The petitioner has submitted the report of CEA in support of proposing additional O&M as under:

Description (For 2X525 MW)	Only for FGD implementation (₹ in Crore)	Per MW/Year cost (₹)	Remarks
Annual Reagent Cost @ TPH. 2000INR/Ton	17.87	170190	Lime stone purity>90% PLF-85%
Annual Clarified Water Consumption@ 50 TPH,8 INR/Ton	0.29	2760	PLF-85%
Annual COST OF APC- @ 1.15%of installed capacity, 1.95INR/UNIT	16.77	159714	PLF-85%



Description (For 2X525 MW)	Only for FGD implementation (₹ in Crore)	Per MW/Year cost (₹)	Remarks
Annual Fixed O&M Cost (O&M manpower, Services, Maint. Etc.)	8.82	84000	2% of Total FGD CAPEX
Annual By-Product handling Cost @ 377 INR Per MT	7.6	72380	Considering disposal at 30-60KM
LESS-Annual by product Sale @2000 INR Per MT	(-)28.6	(-)272381	
ANNUAL OPEX FOR 2X525 MW Unit	₹ 20.75 Cr		
ANNUAL OPEX PER MW	₹ 216666		

It may be observed that the additional O&M expenses at 85% PLF works out to about Rs 2.16 Lakh/MW.

33. In this regard, we have examined the provision of the Tariff Regulations, 2019. As per Sub-Clause (7) of Clause (1) of Regulation 35-

“the additional operation and maintenance expenses on account of implementation of revised emission standards shall be notified separately provided that till the norms are notified, the Commission shall decide the additional O&M expenses on case to case basis”

Further, the extract of Clause (2) of the Regulation 14 and Clause (4) of the Regulation 29 of Tariff Regulations, 2019 in regard to supplementary charges for meeting the revised MoEF&CC norms is as under:

“14 (2). The supplementary capacity charges for additional capitalization and supplementary energy charges, on account of implementation of revised emission standards in existing generating station or new generating station, as the case may be, shall be determined by the Commission separately.

29(4). After completion of the implementation of revised emission standards, the generating company shall file a petition for determination of tariff. Any expenditure incurred or projected to be incurred and admitted by the Commission after prudence check based on reasonableness of the cost and impact on operational parameters shall form the basis of determination of tariff.”



34. The Commission has dealt similar matter in case of Vindhyachal V project in order dated 31.8.2016 in petition no 234/GT/2015. It was held that the additional O&M expenses will be considered after installation of FGD. Relevant Para is extracted below:

“39. As regards, the submissions of the petitioner for additional O&M of 10% of O&M norms for expenditure towards the installation of FGD system, we are of the considered view that there are no defined norms/ standards relating O&M expenses of FGD system at present. Also, the FGD system has not yet been installed. Accordingly, the additional O&M expenses on account of installation of FGD are not allowed at present. We direct the petitioner to submit the O&M expenses relating to FGD system on actual basis at the time of truing-up. In case the norms for O&M expenses for FGD is notified prior to truing-up, same will be considered in the case of the petitioner.”

35. The norms for additional O&M expenses would be finalized by CERC. Accordingly, the claim of the petitioner for allowing O&M expenditure is not being considered at this stage. We direct the petitioner to submit the O&M expenses relating to FGD system on actual basis at the time of filling the petition for determination of tariff on commissioning of the FGD system.

Operational norms:

36. The petitioner has submitted that Regulation 3(5) of the Tariff Regulations, 2019 stipulates that any increase in auxiliary energy consumption on account of compliance to revised emission standards shall be considered separately. The Petitioner has proposed additional Auxiliary Consumption of 1.15% for FGD system in addition to the Normative Auxiliary Consumption of 6.25% applicable as per Tariff Regulations, 2019 as per CEA Report dated 8.1.2019 at projected higher levels of operation of plant (PLF) and FGD system. When the generating units operate at part load, there may be some reduction in absolute value (in kWh) of Auxiliary Consumption. However, reduction in terms of percentage will not be in the same proportion and hence percentage Auxiliary Consumption at part load may be higher than that at TMCR condition. The petitioner submits that CEA recommendation to Commission on Operation norms for thermal generating stations dated 10.12.18, indicates additional Auxiliary Consumption *vis-a-vis* change in plant loading, e.g. the recommendation report permits upto 1.8%



additional Auxiliary Consumption for Plant Loading going down upto 40% over and above the normative Auxiliary Consumption.

37. The Commission is yet to specify operational norms in respect of systems to be commissioned for meeting environmental norms. In absence of notified operational norms, Commission allows increased auxiliary consumption of 1.15% as recommended by CEA subject to revision based on the norms specified by the Commission, if any. As regards increased power consumption by FGD at part loads, the Commission observes that norms are specified corresponding to units running at NAPAF or above. The increase in operation norms due to part loads is accounted for in the compensation mechanism specified in the grid code.

38. As regards the exclusion of the shutdown period for calculation of availability for recovery of fixed charges, Commission has already taken a view that the generator in consultation with beneficiaries would plan to synchronize the interconnection of FGD with the annual overhaul so as to minimize the additional downtime required for FGD interconnection. Accordingly, Petitioner is directed to schedule the shutdown period prudently to avoid the impact on availability. However, if shutdown period for FGD integration exceeds the period of annual overhauling, the petitioner has liberty to claim the same at the time of tariff determination. Accordingly, prayer (e) and (f) of the petitioner is disposed in terms of above.

Issue No. 3: Whether any direction can be issued with regard to Merit Order Dispatch and modification of LTA due to reduction in Net Capacity due to installation of ECS?

39. The dispatch of the generating station depends on the requisition by the beneficiaries of such generating station. All the beneficiaries may not be purchasing the electricity from same generating stations. The merit order for dispatch is worked out by each beneficiary based on the principle of marginal cost. The marginal cost of each beneficiary is different and therefore, the merit order for



dispatch will also be different. In this context, the Ministry of Power, on 30.7.2019, issued direction u/s 107 of the Act, to address this issue as under:

“3. The Phasing of the implementation of the new environmental norms has been reviewed. Accordingly, it is directed that the impact of operating costs incurred in the implementation of new Environmental Norms shall not be considered for Merit Order Despatch of Coal Based Thermal Power Stations till 31.12.2022. For this purpose, CERC shall advise a methodology of supplementary tariff determination separately from normal tariff so that installation of FGD/other ECS has no bearing on the merit order dispatch till 31.12.2022.”

40. As per Clause (2) of the Regulation 14 of the 2019 Tariff Regulations, the Commission has already specified the regulatory framework for determination of supplementary tariff inter-alia provides supplementary capacity charges and supplementary energy charges. This regulation is effective for 2019-24 tariff period. The Commission will determine this supplementary tariff on submission of application by the petitioner after installation of FGD. As such, state/beneficiaries may decide merit order dispatch while scheduling the plants. Accordingly, prayer (g) of the petitioner is disposed in terms of above.

41. The Petitioner in the instant petition has prayed for requisite modification in the LTA granted on account of reduction in the Net Capacity of the generating station due to increase in Auxiliary Consumption in regard to FGD installation. It is observed that the reduction of LTA capacity is governed as per their provision of LTA Agreement and the CERC (Connectivity, Long term Access and Medium Term Open Access) Regulations, 2009 and subsequent amendment thereof. The Petitioner has to invoke the provision of LTA and connectivity regulations for any reduction of LTA in accordance with Law. Further, in Petition no. 92/MP/2015 dated 08.03.2019, the Commission has clarified as under:

“150....the Commission is of the view that relinquishment on account of auxiliary consumption and overload capacity shall not require payment of compensation payable towards such relinquishment.”



In view of the above, the Petitioner may seek appropriate remedy in case the Petitioner relinquishes LTA due to additional APC. Accordingly, prayer (h) of the petitioner is disposed in terms of above.

42. Petition No. 152/MP/2019 is disposed of in terms of above.

Sd/-
(I.S. Jha)
Member

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

Sd/-
(P. K. Pujari)
Chairperson

