

**CENTRAL ELECTRICITY REGULATORY COMMISSION  
NEW DELHI**

**Petition No. 393/MP/2019**

**Coram:**

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

**Date of order: 07.05.2022**

**In the matter of:**

Petition under Section 79 of the Electricity Act, 2003 read with Regulation 29 of the Central Electricity Regulatory Commission (Terms and Condition of Tariff) Regulations, 2019 for approval of additional expenditure on account of installation of various Emission Control Systems at Indira Gandhi Super Thermal Power Station (3x500 MW) in compliance with the Ministry of Environment and Forests and Climate Change, Government of India notification dated 7.12.2015.

**And in the matter of:**

Aravali Power Company Private Limited,  
NTPC Bhawan, Core-7, SCOPE Complex,  
7, Institutional Area, Lodi Road,  
New Delhi-110 003.

**.....Petitioner**

**Versus**

1. Haryana Power Purchase Center (HPPC),  
Shakti Bhawan, Sector-VI, Panchkula,  
Haryana-134109.
2. Tata Power Delhi Distribution Limited (TPDDL),  
33 kV Grid Substation, Hudson Road, Kingsway Camp,  
Delhi-110009.
3. BSES Rajdhani Power Limited (BRPL),  
BSES Bhawan, Nehru Place,  
New Delhi-110019.
4. BSES Yamuna Power Ltd. (BYPL),  
Shakti Kiran Building, Karkardooma,  
Delhi-110092.

**....Respondents**



- For Petitioner** : Ms. Poorva Saigal, Advocate, APCPL  
Ms. Tanya Sareen, Advocate, APCPL  
Mr. Anjum Zargar, Advocate, APCPL
- For Respondents** : Ms. Swapna Seshdari, Advocate, HPPC  
Mr. Anand Gansean, Advocate, HPPC  
Ms. Ritu Apurva, Advocate, HPPC,  
Mr. R. B Sharma, Advocate, BRPL  
Ms. Megha Bajpeyi, Advocate, BRPL  
Mr. Manoor Shoket, Advocate, TPDDL,  
Mr. Kunal Singh, Advocate, TPDDL  
Ms. Shefali Sobti, TPDDL

### **ORDER**

Aravali Power Company Private Limited (APCL) (hereinafter referred to as ‘the Petitioner’) has filed the present petition under Section 79 of the Electricity Act, 2003 (hereinafter referred to as “the 2003 Act”) read with Regulation 29 of the Central Electricity Regulatory Commission (Terms and Condition of Tariff) Regulations, 2019 (hereinafter referred to as “the 2019 Tariff Regulations”) for approval of Additional Capital Expenditure (ACE) on account of installation of various Emission Control Systems (ECS) at Indira Gandhi Super Thermal Power Station (IGSTPS) (3x500 MW) in compliance with the Ministry of Environment and Forests and Climate Change, Government of India Notification dated 7.12.2015 (“the MoEFCC Notification”).

2. The Petitioner has made the following prayers:

- a) *“Grant approval for under taking implementation of various schemes mentioned above in order to meet Revised Emission Standards.*
- b) *Grant liberty to approach Hon’ble Commission for approval of implementation of Revised Emission Schemes on account of mercury, specific water consumption, Particulate Matter, if required.*
- c) *Allow additional APC, Gross station heat Rate, additional water consumption, additional O&M Expenses, Cost of Reagents etc as per Regulation-76 i.e. “Power to relax” of the Tariff Regulations 2019 and*



*d) Allow deemed availability of the station/unit on account of shutdown for the implementation of ECS as per Regulation-76 i.e. "Power to relax" of the Tariff Regulations 2019."*

### **Background**

3. The background of the instant petition is as follows:
- a) The Petitioner is a generating company within the meaning of Section 2(28) of the 2003 Act. It is promoted as a Joint Venture by NTPC Limited, a Government of India Undertaking holding 50% of the equity share capital along with Indraprastha Power Generation Company Limited (IPGCL), a Government of Delhi Enterprise (25%) and Haryana Power Generation Corporation Limited (HPGCL), a Government of Haryana Enterprise (25%). Being a Central Government controlled generating company, its tariff is regulated by the Commission in terms of Section 79 (1)(a) of the 2003 Act. The Petitioner has set up IGSTPS with an installed capacity of 3X500 MW in the Jhajjar district of Haryana.
- b) In exercise of the powers conferred under Sections 6 and 25 of the Environment (Protection) Act, 1986, (hereinafter referred to as "the 1986 Act"), MoEFCC vide its Notification No. S.O. 3305(E) dated 7.12.2015 has amended the Environment (Protection) Rules, 1986, introducing revised standards for emission of environmental pollutants to be followed by all existing and new thermal plants. As per the MoEFCC Notification, all thermal power plants TPPs were mandatorily required to comply with the revised Emission Control Norms (ECNs) within a period of two years from the date of the MoEFCC Notification. The deadline for compliance of the revised ECNs has been subsequently revised to 2022 vide notification dated 1.4.2021 of MoEFCC. The amended norms prescribed by the MoEFCC Notification are as follows:



<b>Sr. No</b>	<b>Industry</b>	<b>Parameter</b>	<b>Standard</b>
1	2	3	4
<b>"5A.</b>	<b>Thermal Power Plant (Water consumption limit)</b>	<b>Water consumption</b>	<p><b>I.</b> All Plants with Once Through Cooling (OTC) shall install Cooling Tower (CT) and achieve specific water consumption up to maximum of 3.5m<sup>3</sup>/MW/hr within a period of two years from the date of publication of this notification.</p> <p><b>II.</b> All existing CT-based plants reduce specific water consumption up to maximum of 3.5m<sup>3</sup>/MW/hr within a period of two years from the date of publication of this notification.</p> <p><b>III.</b> New Plants to be installed after 1<sup>st</sup> January 2017 shall have to meet specific water consumption upto maximum of 3.0 m<sup>3</sup>/MW/hr and achieve zero waste water discharge.</p>
<b>"25.</b>	<b>Thermal Power Plant</b>	<b>TPPs (Units) installed before 31<sup>st</sup> December, 2003*</b>	
		Particulate matter	100 mg/ Nm <sup>3</sup>
		Sulphur Dioxide (SO <sub>2</sub> )	600 mg/Nm <sup>3</sup> (Units Smaller than 500 MW capacity units) 200 mg/Nm <sup>3</sup> (for units having capacity of 500 MW and above)
		Oxides of Nitrogen	600 mg/ Nm <sup>3</sup>
		Mercury (Hg)	0.03 mg/Nm <sup>3</sup> (for units having capacity of 500 MW and above)
		<b>TPPs (units) installed after [1<sup>st</sup> January, 2004]<sup>#</sup>, upto 31<sup>st</sup> December, 2016</b>	
		Particular Matter	50 mg/Nm <sup>3</sup>
		Sulphur Dioxide (SO <sub>2</sub> )	600 mg/Nm <sup>3</sup> (Units smaller than 500 MW capacity units) 200 mg/Nm <sup>3</sup> (for units having capacity of 500 MW and above)
		Oxides of Nitrogen (NOx)	300 mg/Nm <sup>3</sup>
		Mercury (Hg)	0.03 mg/Nm <sup>3</sup>
		<b>TPPs (units) to be installed from 1<sup>st</sup> January, 2017**</b>	
		Particular Matter	30 mg/Nm <sup>3</sup>
		Sulphur Dioxide (SO <sub>2</sub> )	100 mg/Nm <sup>3</sup>
		Oxides of Nitrogen (NOx)	100 mg/Nm <sup>3</sup>
		Mercury (Hg)	0.03 mg/Nm <sup>3</sup>



*\*TPPs (units) shall meet the limits within two years from date of publication of this notification.*

*\*\*Includes all the TPPs (units) which have been accorded environmental clearance and are under construction”.*

*# amended vide Gazette Notification No.590 dated 7.3.2016*

c) Central Electricity Authority (CEA) was entrusted with planning and coordination for implementation of ECS notified by MoEFCC. CEA along with Regional Power Committees formulated a phasing plan up to 2024 which was subsequently reduced to 2022 as per revised action plan of Ministry of Power (MoP). Further, Hon'ble Supreme Court of India issued direction to complete the installation of ECS in highly polluted and densely populated area by December, 2021 and other stations latest by December, 2022.

d) MoP in exercise of the power under Section 107 of the 2003 Act issued directions to the Commission vide letter dated 30.5.2018 to consider the additional cost implication due to the installation of ECS as a pass through in tariff.

e) The Commission in order dated 20.7.2018 in Petition No. 98/MP/2017 observed that on basis of the guidelines/recommendation and operational parameters determined by CEA, the Commission will approve expenditure after prudence check as per Regulation 14(3) of the 2014 Tariff Regulations. The relevant portions of the order dated 20.7.2018 is extracted hereunder:

*“46. ....In all these situations, “additional capital expenditure on change in law or compliance with any existing law” is allowed. Therefore, additional capital expenditure on implementation of the ECS in terms of the Notification dated 7.12.2015 shall be admissible after due prudence check, under Regulation 14 of the 2014 Tariff Regulations.*

*47. The compliance of the revised norms specified under the MOEFCC Notification by these generating stations would require identification of suitable technology depending upon location of plant and existing level of emission from such plant. Moreover, the scope of work would also*



*differ from plant to plant, depending upon the type of technology to be adopted.....”*

*“48. Therefore, a mechanism needs to be devised for addressing the issues like identification of suitable technology for each plant for implementation of ECS, its impact on operational parameters and on tariff, and the recovery of additional capital and operational cost. The Commission in this regard directs the CEA to prepare guidelines specifying; (a) Suitable technology with model specification for each plant, with regard to implementation of new norms; (b) Operational parameters of the thermal power plants such as auxiliary consumption, O&M expenses, Station Heat Rate etc., consequent to the implementation of ECS. (c) Norms of consumption of water, limestone, ammonia etc., required for operation of the plants after implementation of ECS. (d) Any other detailed technical inputs.”*

f) On the basis of the directions of the Commission in order dated 20.7.2018 in Petition No. 98/MP/2017, CEA vide letter dated 21.2.2019 on ‘Operation Norms for Thermal Generating Stations for the Tariff Period 2019-2024’ recommended various technologies to comply with revised ECNs as specified by the MoEFCC Notification.

g) Regulation 29(3) of the 2019 Tariff Regulations provides that, *“where the generating company makes an application for approval of additional capital expenditure on account of implementation of revised emission standards, the Commission may grant approval after due consideration of the reasonableness of the cost estimates, financing plan, schedule of completion, interest during construction, use of efficient technology, cost-benefit analysis, and such other factors as may be considered relevant by the Commission.”*

h) The Commission amended the 2019 Tariff Regulations vide Central Electricity Regulatory Commission (Terms and Conditions of Tariff) (First Amendment) Regulations, 2020 (hereinafter referred to as “the 2020 Amendment Regulations”), wherein separate tariff stream for ECS including determination of capital cost, financial parameters and operational parameters were specified.



i) CEA on 7.2.2020 issued 'Advice on Flue Gas Desulphurisation (FGD) Technology selection for different unit size'. As per the Advisory, TPPs are required to select the appropriate FGD technology based on parameters like SO<sub>2</sub> removal efficiency, units' size, balance plant life and the geographical location of TPPs.

j) MoEFCC has extended the time limit, vide Notification No. 243(E) dated 1.4.2021, for implementation of the ECS to comply with the revised ECNs through the Environment (Protection) Amendment Rules, 2021. The said Notification dated 1.4.2021 also provides for constitution of task force and environment compensation for operating the TPPs beyond the specified timelines. The relevant portion of the Notification dated 1.4.2021 is as follows:

*“(i) A task force shall be constituted by Central Pollution Control Board (CPCB) comprising of representative from Ministry of Environment and Forest and Climate Change, Ministry of Power, Central Electricity Authority (CEA) and CPCB to categorise thermal power plants in three categories as specified in the Table-I on the basis of their location to comply with the emission norms within the time limit as specified in column (4) of the Table-I, namely: -*

**Table-I**

Sl. No.	Category	Location/area	Timelines for compliance	
			Non retiring units	Retiring units
(1)	(2)	(3)	(4)	(5)
1	Category A	Within 10 km radius of National Capital Region or cities having million plus population <sup>1</sup> .	Up to 31 <sup>st</sup> December 2022	Up to 31 <sup>st</sup> December 2022
2	Category B	Within 10 km radius of Critically Polluted Areas <sup>2</sup> or Non-attainment cities <sup>2</sup>	Up to 31 <sup>st</sup> December 2023	Up to 31 <sup>st</sup> December 2025
3	Category C	Other than those included in category A and B	Up to 31 <sup>st</sup> December 2024	Up to 31 <sup>st</sup> December 2025

<sup>1</sup> As per **2011** census of India.

<sup>2</sup> As defined by CPCB.

*(ii) the thermal power plant declared to retire before the date as specified in column (5) of Table-I shall not be required to meet the specified norms in case such plants submit an undertaking to CPCB and CEA for exemption on ground of retirement of such plant:*





Provided that such plants shall be levied environment compensation at the rate of rupees **0.20** per unit electricity generated in case their operation is continued beyond the date as specified in the Undertaking;

(iii) there shall be levied environment compensation on the non-retiring thermal power plant, after the date as specified in column (4) of Table-I, as per the rates specified in the Table-II, namely:-

**Table-II**

Non-Compliant operation beyond the Timeline	Environmental Compensation (Rs. per unit electricity generated)		
	Category A	Category B	Category C
0-180 days	0.10	0.07	0.05
181-365 days	0.15	0.10	0.075
366 days and beyond	0.20	0.15	0.10. ”

4. The Petitioner has filed the instant petition for approval of additional expenditure on account of installation of ECS at its generating station. The Petitioner initially in the petition sought approval of additional APC (Auxiliary Power Consumption), Gross Station Heat Rate (GSHR), additional water consumption, additional O&M Expenses, cost of reagents and availability of the station/ unit on account of shutdown for implementation of ECS under Regulation 76, i.e. “Power to Relax” of the 2019 Tariff Regulations as there were no specific provisions under the 2019 Tariff Regulations. During the pendency of the proceedings, the 2020 Amendment Regulations were notified by the Commission which deal with some of the prayers made by the Petitioner. Accordingly, some of the prayers made by the Petitioner are dealt as per the provisions of the 2020 Amendment Regulations in this order.

### **Submissions of the Petitioner**

5. The gist of the submissions made by the Petitioner in support of its claim is as follows:

- a) In compliance of revised ECNs specified in the MoEFCC Notification dated 7.12.2015, the Petitioner is required to install ECS in its generating station.





b) The Commission vide order dated 20.7.2018 in Petition No. 98/MP/2017 filed by NTPC, seeking in-principle approval with regard to servicing of the expenditure related to installation of the ECS, has observed that additional capital expenditure on implementation of the ECS in terms of the MoEFCC Notification dated 7.12.2015 shall be admissible after due prudence check, under Regulation 14 of the 2014 Tariff Regulations.

c) The Petitioner has considered operating parameters recommended by CEA in its letter dated 20.2.2019. Normative parameters as per the 2019 Tariff Regulations have been considered for working out indicative tariff based on the capital cost.

d) The MoEFCC Notification mandates reduction in water consumption, particulate matter, SO<sub>2</sub>, NO<sub>x</sub>, and Mercury emission. To comply with the revised ECNs, the Petitioner has proposed to implement (a) FGD for SO<sub>2</sub> and (b) Combustion Modification (CM) and Selective Non-Catalytic Reduction (SNCR)/ Selective Catalytic Reduction System (SCR) for NO<sub>x</sub> control.

e) CEA in its recommendations vide letter dated 20.2.2019 for TPPs for the 2019-24 tariff period has specified norms for four technologies in case of SO<sub>2</sub> reduction, namely Wet Limestone-based Flue Gas Desulphurisation (WFGD), lime spray drier/ semi-dry FGD, dry sorbent injection based FGD and furnace injection in CFBC boilers. WFGD based technology is the most appropriate technology as it meets the norms specified in the MoEFCC Notification and it adheres to the CEA's recommendations.



f) WFGD technology is a wet scrubbing process and it uses limestone or lime as a reagent. It is the most frequently selected technology for SO<sub>2</sub> reduction from coal-fired utility boilers. It removes SO<sub>2</sub> by scrubbing the flue gas with limestone slurry. Flue gas is treated in an absorber by passing the flue gas stream through limestone or lime slurry spray where the gas flows upwards through the absorber counter current to the spray liquor flowing downward through the absorber. The shut-down period required for installation of the WFGD system is approximately 30 to 45 days and it is envisaged that it would reduce SO<sub>2</sub> to less than 200 mg/Nm<sup>3</sup> from current levels of 1000 mg/Nm<sup>3</sup> and thereby comply with revised ECNs mandated by the MoEFCC Notification.

g) For meeting revised ECNs w.r.t. NO<sub>x</sub>, CEA has specified the norms based on De-NO<sub>x</sub> combustion system as well as SCR/SNCR technology. There are two kinds of technologies for NO<sub>x</sub> control (a) primary control technologies wherein the amount of NO<sub>x</sub> produced in the combustion/furnace zone is reduced by modifying fuel burners and (b) secondary control technologies reduces NO<sub>x</sub> present in the flue gas by injection of reagent (ammonia [NH<sub>3</sub>] or urea) in flue gas path where it reacts with NO<sub>x</sub> to reduce it to N<sub>2</sub> and water.

h) In De-NO<sub>x</sub> CM System using Low NO<sub>x</sub> Burners, the normal burners installed in the unit boilers are to be replaced by Low-NO<sub>x</sub> Burners (LNB). A LNB limits NO<sub>x</sub> formation by regulating the temperature profiles of the fuel combustion by controlling the aerodynamic distribution and mixing of the fuel and air, thereby yielding reduced oxygen in the primary flame zone, which limits the flame temperature, which in turn limits thermal NO<sub>x</sub> formation. Due to the change in temperature profile of the furnace and



heat transfer pattern, LNB retrofits lead to higher economizer inlet temperatures and increase in unburnt carbon. This increases heat loss of boiler. Accordingly, unit heat rate may increase by around 0.8% on account of De-NO<sub>x</sub> LNB retrofit.

i) De-NO<sub>x</sub> SNCR process involves injecting nitrogen-containing chemicals into the upper furnace or convective pass of a boiler within a specific temperature window without the use of a catalyst. There are different chemicals, that can be used that selectively react with NO<sub>x</sub> in the presence of oxygen to form molecular nitrogen and water, but the two most common chemicals are ammonia/ urea. The SNCR to be installed in the station is proposed to be based on Urea. This system requires low capital cost, having moderate NO<sub>x</sub> removal; involves nontoxic chemical and it requires typically low energy injection. Further, due to formation of water particles during NO<sub>x</sub> reduction, it increases the wet loss of Boilers leading to deterioration of Unit Heat Rate by about 0.4%. The deterioration of Station Heat Rate due to installation of above-mentioned De-NO<sub>x</sub> systems will be claimed by the Petitioner based on the actual performance of these systems.

j) Shutdown period required for installation of CM System and SNCR is approximately 45 to 60 days. Further, the SNCR scheme (yet to be awarded) is likely to be implemented in all units in 15 months from date of award. The shutdown period required will be around 15 days for each unit. However, the decision on implementation of SNCR shall be taken based on outcome of pilot tests.



k) After implementation of CM System, NO<sub>x</sub> emission level is anticipated to come down to below 400 mg/Nm<sup>3</sup> and it is envisaged that the level of NO<sub>x</sub> shall come to below 300 mg/Nm<sup>3</sup> after commissioning of SNCR.

l) With the installation of revised ECS, there would be requirement of additional manpower for operation and maintenance of these systems, spares pertaining to these systems etc. on sustained basis. Accordingly, additional O&M Expenses would be required on account of implementation of ECS. In case of thermal generating stations, the norms of O&M Expenses in the 2019 Tariff Regulations have been fixed (in lakh/MW) based on actual O&M Expenses of different stations in the last five years. As FGD and other ECS were not installed at various stations while finalizing the norms for the 2019 Tariff Regulations, the expenditure on account of them was not considered while framing the norms. Further, the actual O&M Expenses data on account of FGD system and other ECS system is not available. Therefore, as has been provided in case of new hydro generating stations, a norm in relation to percentage (%) of capital cost may be considered. In case of large hydro generating stations, norms for O&M Expenses @ 3.5% of capital cost have been provided in the 2019 Tariff Regulations. Since, proportion of plant and machinery is more in FGD/ other ECS, norms for additional O&M Expenses @4% of capital cost may be considered.

m) The following capital cost and operating parameters for computing the indicative supplementary tariff has been considered.



		<b>FGD</b>	<b>SNCR</b>	<b>CM System</b>	<b>Remarks</b>
1	Capital Cost	₹1100 crore	₹75 crore (without tax/IDC etc)	₹24.98 crore	SCNR implementati on will be decided based on pilot test report.
2	Normative Specific Limestone/ Reagent Consumption (kg/kWh)	0.014 (Limestone)	0.0015 (Urea)	Nil	
3	Additional APC	1%	0.2%	Nil	
4	Additional O&M	4% of capital cost			
5	Shutdown Period	30 to 45 days for each unit	15 days for each unit	45 to 60 days for each unit	
6	Increase in GSHR		9.44 kcal/kWh	18.87 kcal/kWh	0.8% increase: due to CM, 0.4-0.6% increase: due to SNCR

n) The indicative supplementary tariff impact (without considering the impact on GSHR) due to installation of ECS in order to meet Revised ECN is Fixed Cost (FC): 24.20 paisa/kWh, Variable Cost (VC): 8.81 Paisa/kWh (1<sup>st</sup> year) and FC: 23.22 paisa/kWh, (levelised). A further increase in Energy Charge Rate and per unit Fixed Charge (@85% scheduled generation) of the station by about 11 paisa/kWh due to increased APC and Station Heat Rate.

o) The MoEFCC Notification also provides for reduction in Particulate Matter, water consumption and Mercury emission. The Petitioner has sought liberty to approach the Commission as and when the work(s) pertaining to the same is taken up in future.

p) The Petitioner has prayed that it may be allowed additional operating norms of APC and GSHR over and above the normative APC and GSHR for the station, due to implementation of ECS. Further, ACE, additional



O&M Expenses, and associated costs such as increased water charges, cost of chemicals/ reagents (lime stone, urea etc.) on account of implementation of ECS has also been sought.

q) The Petitioner will file a separate supplementary tariff petition in terms of Regulations 29(4) of the 2019 Tariff Regulations based on actual and projected expenditure.

r) The units have to be taken under shutdown one by one for about 45 - 60 days for each unit for implementation of the ECS in compliance of MoEFCC notification and stabilization of the same would take would take some more time.

s) During the period of shutdown of units, there would be loss of availability of the station and would lead to under recovery of Annual Fixed charges on account of implementation of ECS. Accordingly, the shutdown period of units for implementation of these ECS in compliance of MoEFCC Notification may be treated as deemed availability under Regulation 76 of the 2019 Tariff Regulations.

6. The Commission had directed the Petitioner, vide Record of Proceedings (RoP) dated 1.6.2021 to submit certain information and Petitioner vide affidavit dated 11.6.2021 has submitted the requisite information.

7. The instant petition was admitted on 27.2.2020 and order was reserved on 1.6.2021. Haryana Power Purchase Centre (HPPC), Respondent No. 1 has filed its reply vide affidavit dated 5.5.2020 and the rejoinder has been filed by the Petitioner vide affidavit dated 6.1.2021. Tata Power Delhi Distribution Ltd. (TPDDL), Respondent No. 2, has filed its reply vide affidavit dated 14.7.2020 and has filed its Written Submissions on 24.6.2021 and the rejoinder has been filed by the Petitioner vide affidavit dated 6.1.2021. BSES Rajdhani Power



Limited (BRPL), Respondent No. 3 has filed its reply vide affidavit dated 14.10.2020 and Written Submissions vide affidavit dated 25.6.2021 and the rejoinder has been filed by the Petitioner vide affidavit dated 6.1.2021. The Petitioner has filed reply to the queries raised in RoPs /Technical Validation letters vide affidavits dated 30.5.2020, 11.6.2021.

8. The issues raised by TPDDL, HPPC and BRPL and clarifications given by the Petitioner are dealt in the respective paragraphs of this order.

### **Maintainability**

9. BRPL, TPDDL and HPPC has submitted that the instant petition is not maintainable for the reasons that (a) Petitioner has not followed the procedure laid down in the 2019 Tariff Regulations, (b) the Petitioner has not submitted case specific recommendations of CEA, (c) the MoEFCC Notification is not applicable to instant generating station, (d) the Petitioner has not submitted the present emission levels and (e) there is delay in award of contracts. The issues raised by the Respondents and the clarifications given by the Petitioner are dealt in the following paragraphs.

### ***Petitioner has not followed the procedure laid down in the 2019 Tariff Regulations***

10. BRPL has submitted that the Petitioner has not complied with the provisions of Regulation 29 of the 2019 Tariff Regulations. The Petitioner has submitted that due to the stringent timelines they initiated the bidding process prior to the notification of the 2019 Tariff Regulations and the proposal for compliance of Revised Emission Norms was shared with the beneficiaries in terms of the Regulation 29 of the 2019 Tariff Regulations and 2020 Amendment Regulations. The stand taken by the Petitioner is in violation of the mandate and defeats the intent and purpose of Regulation 29 of the 2019 Tariff Regulations.





This issue was also raised by BRPL in October, 2018 during 40<sup>th</sup> Technical Coordination Sub-committee (TCC) hosted by NRPC and asked to share the proposal and cost-benefit analysis. The Petitioner has not provided the information as required under Regulation 29(3) of the 2019 Regulations and without sharing the proposal with the beneficiaries has filed the instant petition.

11. BRPL has further submitted that the delay in implementing the FGD norms is on account of the Petitioner and the additional burden caused on account of the same cannot be fastened upon the consumers in the form of increased tariff. The Petitioner has taken a stand that Regulation 29 of the Tariff 2019 Regulations does not envisage sharing of the proposal prior to tendering/bidding of ECS and again no more res-integra as the order of the Commission dated 28.4.2021 in Petition No. 335/MP/2020 and batch Petitions. The facts and circumstances leading to filing of present petition are not the same as those considered by the Commission in order dated 28.4.2021 where the basis of granting "in-principle" approval to various power plants of NTPC for installation of ECS was under Regulation 11 of the 2019 Tariff Regulations. In the instant case, the Petitioner has started the installation process and same has been underway for more than 2 years since the notification of 2019 Tariff Regulations. The installation of the ECS has been under process since long after the 2019 Tariff Regulations came into force on 7.3.2019. As such, the Petitioner cannot resort to order dated 20.7.2018 passed in Petition No. 98/MP/2017, to aver that the Petitioner proceeded on the basis of the said order. There is no reason as to why the Petitioner chose to ignore the statutory prescription of Regulation 29 of the 2019 Tariff Regulations. The Petitioner did not submit its proposal for installation of ECS or share it with the beneficiaries prior to the filing of the instant Petition on 1.10.2019 as per Regulation 29(1) of the 2019 Tariff



Regulations. However, IFB were issued on 24.11.2018, yet the same was informed to the Respondent for the first time on 1.10.2019 when the Petition was filed by the Petitioner i.e., after lapse of more than 11 months from the date of IFB.

12. TPDDL has submitted that the Petitioner has failed to comply with the mandatory procedural requirements of sharing the proposal under Regulation 29 of the 2019 Tariff Regulations. The Petitioner is required to share its proposal for ACE for compliance of the revised ECNs with the beneficiaries and file a petition before the Commission for undertaking such ACE. The Petitioner is required to fulfil both requirements and one is not a substitute for the other. Subsequent sharing of the proposal cannot be said to fulfil the requirement under Regulation 29 of the 2019 Tariff Regulations. IFBs and the Board approvals for awarding FGD package took place in 2019 i.e. after the 2019 Tariff Regulations came into effect. Accordingly, the Petitioner should have shared its proposal for ACE with the beneficiaries and file a petition before the Commission for undertaking such ACE. Subsequent sharing of the proposal cannot be said to fulfil the requirement under Regulation 29 of the 2019 Tariff Regulations. The facts in the instant petition are materially different from the facts considered by the Commission in order dated 28.4.2021 in Petition No. 335/MP/2020 & Ors. and, hence, order dated 28.4.2021 is not applicable to the instant petition. Just because TPDDL was a party to the Petition No. 98/MP/2017 is not equivalent to the Petitioner having shared the proposal as per Regulation 29(1) of the 2019 Tariff Regulations. The purpose behind sharing of a proposal is not to make the beneficiaries aware but to seek their assent with regard to such proposal.



13. HPPC has submitted that the Petitioner has pre-maturely approached this Commission to seek an in-principle approval, without having incurred any expense and without any documentary proof of any increase in expense/ decrease in revenue for establishing the impact of the alleged “change in law” event.

14. In response, the Petitioner has given a consolidated clarification regarding compliance of Regulation 29 of the 2019 Tariff Regulations and has submitted that the Petitioner has filed the petition as per Regulation 29 of the 2019 Tariff Regulations incorporating the selection of technology in line with CEA guidelines, tentative/awarded capital cost, tentative supplementary tariff etc. and has duly shared the proposals by serving the petitions to the respective beneficiaries/Respondents. The Petitioner has submitted that the progress of work was not only being monitored in all RPCs, wherein all stakeholders were kept aware of it, but also by the Hon'ble Supreme Court which issued direction to complete the installation of ECS in highly polluted and densely populated area by December, 2021 and in other stations latest by December, 2022. The complete installation of ECS in a station from pre-award activities to erection and commissioning of the systems would take at least 3 years. Accordingly, the Petitioner proceeded for tendering and awarding FGD systems as early as possible in a phased manner through a transparent competitive bidding process in order to comply with the norms within the time frame. These developments took place during the 2014-19 tariff period. By the time, the Commission notified the 2019 Tariff Regulations, the bidding process had already been initiated.

15. The NIT for re-tendering of FGD package was called on 24.10.2018, which was much before prior to the notification of the 2019 Tariff Regulations. Based on the bidding process, GEPIL was discovered as the successful bidder.



The Board Approval for the award was accorded on 12.4.2019. Subsequently, the LoA was issued by the Petitioner in favour of GEPIL on 29.4.2019. Hence, the bidding process for IGSTPS was initiated much before the issuance of the 2019 Tariff Regulations. The Petitioner has submitted that the progress of work is being monitored in all Forums including RPCs and Respondents as the participants of RPC forums were aware of the developments and stringent targets in meeting the Revised Emission Norms. Considering the stringent timelines, the implementation of ECS schemes needed parallel action of going ahead for phase-wise tendering/ award process as well as presenting the proposal of the same in the form of the instant petition for approval.

16. The Petitioner has submitted that after the notification of the 2019 Tariff Regulations, the Petitioner filed the instant petition under Regulation 29 of the 2019 Tariff Regulations for approval of ACE towards installation of ECS and shared the details of various ECS, technology selection, indicative cost and tariff etc. in line with CEA guidelines, awarded capital cost, tentative supplementary tariff etc, and sharing the proposals by serving the petitions to the respective beneficiaries/ Respondents. Further, subsequent to the notification of 2020 Amendment Regulations, the Petitioner vide letter dated 14.10.2020 shared the details of ECS with all the beneficiaries.

17. We have heard the submissions of the Petitioner and the Respondents. The instant petition is filed under Section 79 of the 2003 Act read with Regulation 29 of the 2019 Tariff Regulations for “in-principle” approval of ACE towards installation of ECS for reduction of SO<sub>2</sub> and NO<sub>x</sub> emission levels in compliance of the MoEFCC Notification. The Respondents have contended that the Petitioner has not shared the proposal for installation of ECS in the subject



generating station as mandated under Regulations 29(1) of the 2019 Tariff Regulations. In response, the Petitioner has submitted that as the installation of ECS is mandatory and was to be implemented within a strict timeframe, which was being monitored by the Hon'ble Supreme Court, the Petitioner had initiated the pre-award activities and floated NIT during the 2014-19 tariff period. The Commission has already dealt with the contentions of the Respondents in order dated 28.4.2021 in Petition No. 335/MP/2020 and batch matters.

18. The Commission has specified the procedure for claiming ACE on account of implementation of ECS in Regulation 29 of the 2019 Tariff Regulations, which provides as follows:

*“29. Additional Capitalization on account of Revised Emission Standards:*

*(1) A generating company requiring to incur additional capital expenditure in the existing generating station for compliance of the revised emissions standards shall share its proposal with the beneficiaries and file a petition for undertaking such additional capitalization.*

*(2) The proposal under clause (1) above shall contain details of proposed technology as specified by the Central Electricity Authority, scope of the work, phasing of expenditure, schedule of completion, estimated completion cost including foreign exchange component, if any, detailed computation of indicative impact on tariff to the beneficiaries, and any other information considered to be relevant by the generating company.*

*(3) Where the generating company makes an application for approval of additional capital expenditure on account of implementation of revised emission standards, the Commission may grant approval after due consideration of the reasonableness of the cost estimates, financing plan, schedule of completion, interest during construction, use of efficient technology, cost-benefit analysis, and such other factors as may be considered relevant by the Commission.*

*(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.”*

19. As per Regulation 29(1) of the 2019 Tariff Regulations, a generating company intending to incur ACE towards installation of revised ECS shall share its proposal with the Respondents/ beneficiaries and file a petition for



undertaking ACE. The proposal should contain the details of the proposed technology as specified by CEA and other relevant information under Regulation 29(2) of the 2019 Tariff Regulations. On an application by the generating station, the Commission may approve additional capital expenditure towards the implementation of ECS after prudence check as per Regulation 29(3) of the 2019 Tariff Regulations. As per Regulation 29(4) of the 2019 Tariff Regulations, the generating station after implementation of the revised ECS shall file a petition for determination of tariff.

20. The Petitioner had initiated action for implementation of ECS in the subject generating station in compliance of the MoEFCC Notification in the 2014-19 tariff period taking into consideration the stringent timelines and the fact that the installation of ECS is being monitored by the Hon'ble Supreme Court. Moreover, in the instant case, IFB was issued during the 2014-19 tariff period prior to the notification of the 2019 Tariff Regulations. Based on the bidding process, GEPIL was discovered as the successful bidder. The Board Approval for the award was accorded on 12.4.2019 and the LOA of Award was issued by the Petitioner on 29.4.2019. It is observed that the process for installation of ECS was initiated during the 2014-19 tariff period and as there was no provision in the 2014 Tariff Regulations for sharing any proposal that would lead to ACE and the Petitioner did not share the proposal for installation of ECS with the beneficiaries/ Respondents. The requirement of sharing the proposal for implementation of the ECS with the Respondents was introduced in the 2019 Tariff Regulations, which were notified in March 2019 and is effective since 1.4.2019. However, the NoA was issued in the 2019-21 tariff period after the notification of the 2019 Tariff Regulations. Therefore, in our view, the Petitioner should have shared the proposal for installation of ECS with Respondents as



mandated in Regulation 29(1) of the 2019 Tariff Regulations. However, the Petitioner failed to share the proposal for installation of ECS with the Respondents and the Petitioner has not given any satisfactory explanation for not doing so. The Respondents have also contended that they were not consulted by the Petitioner before taking action for installation of ECS. In this regard, we observe that Regulation 29(1) of the 2019 Tariff Regulations neither provides for or specify any timeline between sharing of the proposal and filing of the petition, nor does it provide for furnishing any comments or objections by the Respondents. Therefore, as per the said Regulation, the Petitioner has to share the proposal for installation of ECS with the Respondents for their information prior to or at the time of filing the Petition. The Petitioner has shared the proposal with the Respondents while filing of the petitions and all other details on the directions of the Commission. Moreover, a copy of the petition is automatically served on the beneficiaries immediately after the petition is uploaded in the e-filing portal of the Commission. We are of the view that it would have been better if the Petitioner had shared the details of the proposal with the beneficiaries as envisaged in Regulation 29(1) of the 2019 Tariff Regulations before filing the instant petition for “in-principle” approval of ACE. However, we are unable to agree with the Respondents that the instant Petitions are not maintainable on this ground.

***Non-submission of CEA recommendations***

21. The Petitioner has submitted that WFGD system is being installed in the instant generating station for control of SO<sub>2</sub> emission levels as it is the most appropriate technology and is in accordance with the CEA recommendations and also meets SO<sub>2</sub> emission norms stipulated by MoEFCC.





22. TPDDL has submitted that the Commission vide order dated 20.7.2018 in Petition No.98/MP/2017 had granted in-principle approval to NTPC for implementation of ECS. While doing so, the Commission directed NTPC to seek project specific consultation with CEA with regard to adoption of specific ECS technology and cost for the same. The Petitioner had approached the Commission without seeking specific consultation of CEA. The Petitioner has simply stated that it has relied on the recommendations issued by CEA for TPPs. CEA's guidelines are merely indicative and that the Petitioner should have come up with project-specific recommendations.

23. TPDDL has submitted that the Petitioner has failed to mention the project specific consultation/ recommendation of CEA. TPDDL referred to the Petition No. 152/MP/2019 wherein Maithon Power Limited (MPL) consulted CEA specifically for its project and thereafter filed Petition No. 152/MP/2019 for grant of "in-principle" approval for ACE for installing and operating ECS. TPDDL has submitted that the Petitioner has not done so despite being similarly placed to MPL and despite the Commission's specific direction to consult CEA. The Petitioner has also not explained as to why no project specific recommendation were sought from the CEA in compliance with the Commission's order dated 20.7.2018 in Petition No. 98/MP/2017. The Petitioner has simply relied on the general recommendations/ guidelines issued by CEA for TPP's and has not mentioned any recommendations/ details specific to the subject plant. Since, the Petitioner has neither mentioned the basis on which cost of technology has been ascertained nor it has shared critical details of the competitive bidding process with the procurers or mentioned any project specific CEA recommendations, there is a serious risk that the prudent process to determine the most competitive price has not taken place. This is also evident from the fact



that the costs sought by the Petitioner are considerably higher than the indicative costs recommended by CEA even after adjusting the same for efflux of time and price.

24. BRPL has submitted that the Petitioner has failed to provide any certificate from competent authority to show that it has complied with the requirements of CEA. The Petitioner has failed to conduct cost benefit analysis for FGD and life cycle cost benefit considering the life of plant. The Petitioner has failed to provide the intended timeline for completion of the installation of the FGD and operationalization of the same at the instant station. The Petitioner should furnish the implementation timeline along with milestones to be achieved for release of payment from time to time and scheduled date of completion of the installation should also be intimated.

25. In response, the Petitioner has submitted that while selecting FGD technology for De-SO<sub>x</sub> in a particular station/unit, the Petitioner has followed the evaluation criteria of unit size, geographical location, age of units, availability of space, coal quality, etc. and the CEA Advisory dated 7.2.2020. CEA has recommended that for compliance of emission norm of 200 mg/Nm<sup>3</sup>, the required SO<sub>2</sub> removal efficiency of FGD system to be installed has to be in the range 90-95%. WFGD technology with its worldwide footprint, abundance of suppliers, being safer technology, having lower cost for reagent consumption and its suitability for high PLF units is the most suitable technology for the instant generating station. There is only one technology i.e. WFGD for units 500 MW and above size in the CEA advisory dated 7.2.2020. Further, IGSTPS comprising of 3x500 MW units, which were declared commercial operation on 5.3.2011, 21.4.2012 and 26.4.2013, the SO<sub>2</sub> emission is to be limited to below



200 mg/Nm<sup>3</sup> level. Accordingly, the optimum technology for De-SO<sub>x</sub> for the instant station works out to be WFGD as this technology is the most versatile and prominent for any unit size based on CEA advisory. This technology can withstand variation in coal regarding sulphur percentage and calorific value. Further, there are no safety issues as limestone is non-hazardous. This technology is used worldwide. The norms and parameters have been selected in accordance with the CEA recommendations and technical specifications. Therefore, the actions of the Petitioner are in accordance with the orders passed by this Commission. Since the works have been awarded through a process of domestic competitive bidding, TPPDL's reliance on the order passed by this Commission in the case of Sasan is misconceived.

30. We have considered the submission of the BRPL and TPDDL and the clarifications given by the Petitioner. The Respondents have contended that the Petitioner has not submitted project specific recommendations of CEA. It is observed that CEA has been entrusted with the planning and coordination of implementation of the ECS in compliance with the MoEFCC Notification. The Commission in order dated 20.3.2017 in Petition No. 72/MP/2016 directed CEA to decide specific optimum technology and the associated costs of installation of FGD in case of Maithon Power Limited. Later, the Commission in order dated 20.7.2018 in Petition No. 98/MP/2017, filed by NTPC, directed CEA to prepare guidelines regarding suitable technology, operation parameters, norms and other technical inputs. Accordingly, CEA vide its letter dated 21.2.2019 has specified the parameters to be considered for selection of technology, capital expenditure, operational expenditure and APC for ECS for reduction in SO<sub>2</sub> emissions, which are applicable for TPPs in general. Moreover, the Commission



has notified the operating norms in the 2020 Amendment Regulations based on CEA's recommendations. We are of the view that the norms recommended by CEA vide its letter dated 21.2.2019 and Advisory dated 7.2.2020 are applicable to all TPPs including the generating station covered in the instant petition and there is no need for plant specific recommendations. At the same time, we would also like to point out that wherever plant specific recommendations are made by CEA, the same needs to be followed by concerned generating stations/ units.

***MoEFCC Notification is not applicable to instant generating station***

26. HPPC has submitted that the Commission has already held in several cases that the MoEFCC Notification is a "change in law" event. However, the applicability of the MoEFCC Notification on a particular generator has to be seen on a case-to-case basis and the computation of admissible amounts under "change in law" cannot be made until certain basic information is provided by the Petitioner. The Petitioner has to first place on record the Power Purchase Agreement (PPA) entered into with HPCC. The PPA is the primary evidence necessary to be produced by the Petitioner to claim any relief on account of a "change in law" clause.

27. HPPC has submitted that MoP issued a direction under Section 107 of the 2003 Act that MoEFCC Notification is a "change in law" event. However, the said direction does not apply to TPPs which were required to comply with the norms at the time of obtaining Environment Clearance (EC). Therefore, the Petitioner should have given the norms prevailing as on the cut-off date or the date of commissioning of the units to ascertain whether the norms prescribed in the MoEFCC Notification amount to "change in law" event. However, the



Petitioner has not furnished the actual emission profile of instant generating station as on the cut-off date or on the date of commissioning of its units and the present emission levels. Therefore, the Petitioner cannot claim the MoEFCC Notification as “change in law” event without producing the emission levels.

28. HPPC has submitted that in the EC given to other generators, the generators were mandated to allocate separate funds for implementation of environmental protection measures as part of the project cost, which the generators could not have diverted. The generators were also mandated to maintain a separate fund with item-wise break up and report the same to the MoEFCC on a yearly basis. The Petitioner should be directed to place on record the upfront allocation of funds and such reports that it filed with the MoEFCC on yearly basis so that the cost which was included by the Petitioner as part of project cost for upcoming environmental measures can be scrutinized by the Commission.

29. HPCC has further submitted that emission norms were already prescribed before the MoEFCC Notification in the 2008 CEA guidelines and therefore, it was the Petitioner’s responsibility to comply with the norms as it was already aware that it has to install FGD system in future and to allot separate fund which were not to be utilised elsewhere. The EC issued by MoEFCC mandates the Petitioner to maintain a separate fund for implementation of environmental protection measures and the Petitioner should furnish the details of the funds thus created. HPPC has submitted that the Petitioner’s generating station is already complying with the NO<sub>x</sub> emission norms, as in 2008 CEA guidelines, which had stipulated limit on NO<sub>x</sub> emission and was binding on the upcoming TPPs, like the Petitioner’s. The limits on NO<sub>x</sub>



emissions stipulated are much more stringent than the ones provided under the MoEFCC Notification. The question of compensating the Petitioner to the same economic position as if the “change in law” has not occurred would arise only upon the extent of actual erosion in the economic position of the Petitioner on account of expenditure incurred due to the said “change in law” event and therefore, unless the Petitioner demonstrates that it has been actually affected by the “change in law”, it cannot make any claim for compensating it under the PPA.

30. BRPL has submitted that the MoP issued a direction on 30.5.2018 under Section 107 of the 2003 Act that MoEFCC Notification is a “change in law” event. However, the said direction does not apply to TPPs which were required to comply with the norms at the time of obtaining EC. Thus, in view of the above, it is necessary to examine whether the Petitioner’s plant qualifies for claiming “change in law” after verifying EC report and past stack emission and ambient air quality as per MoEFCC notification dated 6.4.2011.

31. In response, the Petitioner has submitted that the PPA entered between the Petitioner and HPPC specifically recognises that the parties shall be governed by the Regulations notified by the Commission. The definition of “change in law” has been defined in the 2019 Tariff Regulations. The MoEFCC Notification is a “change in law” as defined in the 2019 Tariff Regulations and is, therefore, a “change in law” within the meaning of PPA. Neither the CPCB nor the EC dated 8.8.2007 mandated installation of FGD at the generating station. In fact, CPCB had served the Petitioner with a show cause notice for being non-compliant with MoEFCC notification w.e.f. December, 2019. Therefore, the case of the Petitioner does not fall within the purview of the exceptions carved



out in the MoP Directions dated 30.5.2018 under Section 107 of the 2003 Act. Therefore, the Petitioner was not subjected to SO<sub>2</sub> and NO<sub>x</sub> emission norms before issuance of the MoEFCC Notification. The EC provides for a '*space provision for FGD of requisite efficiency of removal of SO<sub>2</sub> if required at later stage*'. The Petitioner has further submitted that the issue of compliance of SO<sub>2</sub> and NO<sub>x</sub> levels before MoEFCC Notification was considered by APTEL in its judgement dated 28.8.2020 in Appeal No. 21 and 73 of 2019 in the case TSPL vs. PSPCL & Ors. ("TPSL Judgment") wherein APTEL has distinguished between the requirement to provide space for FGD installation and the requirement to install FGD equipment. APTEL in its judgment dated 28.8.2020 observed that "*the provision of space for ECS in EC does not infer specific mandatory earmarking of funds for FGD installation for SO<sub>2</sub> or SNCR or any other suitable mechanism for NO<sub>x</sub>*". Similar position was upheld by APTEL in Appeal No. 101 of 2020 in the judgment dated 13.11.2020 in the matter of Lalitpur Power Generation Company Ltd. Vs. UPERC.

32. The Petitioner has further submitted that as regards HPPC's contention that SO<sub>2</sub> and NO<sub>x</sub> norms were already prescribed for the Petitioner and, therefore, funds were required to be earmarked for the purpose of compliance with environmental norms, the Petitioner has submitted that APTEL in judgement dated 28.8.2020 held that in none of the documents, based on which EC were issued, there was mandate for installation of FGD system and no separate fund was directed to be earmarked for FGD system installation and/ or SNCR system. The Petitioner has submitted that similarly, in the present case, there was no stipulation with regard to earmarking of funds for installation of FGD system in the EC. In the absence of specific norms, the Petitioner could not have anticipated the financial impact of FGD system installation.





33. We have considered the submissions of the Respondents and the clarifications given by the Petitioner. HPPC have contended that the CPCB and HSPCB have already prescribed the norms for SO<sub>2</sub> and NO<sub>x</sub> emission levels and, therefore, the MoEFCC Notification cannot be held to be a “change in law” event universally and has to be examined on a case to case basis. The Petitioner has contended that the SO<sub>2</sub> and NO<sub>x</sub> norms were specified in the MoEFCC Notification for the first time and, therefore, it amounts to “change in law” and it is mandatory for all TPPs, including the Petitioner, to comply with the norms. The Commission taking into consideration Regulation 3(9) of the 2014 Tariff Regulations and MoP directions contained in letter dated 30.5.2018 (under Section 107 of the 2003 Act) held, in order dated 20.7.2018 in Petition No. 98/MP/2017, that the MoEFCC Notification is a “change in law” event. The relevant portions of the order dated 20.7.2018 is as follows:

*“38. As per the definition, “adoption, amendment, modification, repeal or reenactment of any existing Indian Law” is covered under Change in Law. The Environment (Protection) Rules, 1986 have been notified by the Central Government in exercise of the power vested under sections 6 and 25 of the Environment Protection Act, 1986. Rule 3 of the Environment (Protection) Rules provides for Standards for emissions or discharge of environmental pollutants. Through the Environment (Protection) Amendment Rules, 2015 notified by the Central Government vide Notification dated 7.12.2015, the standards of emission of environmental pollutants to be followed by the thermal power plants have been revised. Since the Central Government has revised the standards of emissions of environmental pollutants in exercise of its power under the Environment Protection Act, 1986, the said notification is covered under Change in Law in terms of Regulation 3(9)(ii) of the 2014 Tariff Regulations. The revised standards are mandatory in nature and are to be complied with within a stipulated timeframe.”*

*“43. MoP in its directions under section 107 of the 2003 Act has recognised that the MOEFCC Notification requiring compliance of Environment (Protection) Amendment Rules, 2015 dated 7th December, 2015 is of the nature of Change in law event with no exceptions namely, where Power Purchase Agreements of such TPPs whose tariff is determined under section 63 of the Electricity Act 2003 having bid deadline on or after 7th December, 2015; or where such requirement of pollutions control system was mandated under the environment clearance of the plant or envisaged otherwise before the notification of amendment rules.*



*44. In our view, the MOEFCC Notification dated 7.12.2015 requiring the thermal generating stations to implement the revised environmental norms amounts to "Change in Law" in accordance with the 2014 Tariff Regulations as well as the Policy directions issued by the MoP under section 107 of the Act."*

34. As the MoEFCC Notification has already been held as "change in law" event by the Commission, the issue left for our consideration is whether any norms for SO<sub>2</sub> and NO<sub>x</sub> emissions were in existence at the time of commissioning of the generating stations and whether any emission norms were specified while granting EC by the concerned Pollution Control Board. We have perused the EC certificate dated 8.8.2007 issued by MoEFCC for instant generating station. It is observed that as per EC issued, the Petitioner is only required to monitor the ambient air quality standards in and around the generating stations and no norms were prescribed for SO<sub>2</sub> and NO<sub>x</sub> emissions. Therefore, HPPC's and BRPL's contention that norms were prescribed for SO<sub>2</sub> and NO<sub>x</sub> emissions even before the MoEFCC Notifications and that applicability of the MoEFCC Notification has to be verified on case to case, cannot be sustained.

35. HPPC have further contended that the Petitioner is required to earmark separate funds for the purpose of implementation of environmental protection norms. The Petitioner has contended that these issues have already been decided by APTEL in its judgement dated 28.8.2020 in Appeal No. 21 of 2019 and Appeal No. 101 of 2020. The Petitioner has contended that issues raised by HPPC are similar to the issues settled by APTEL in Judgement dated 28.8.2020 and, hence, the said judgement is applicable in the instant case also.

36. We have considered the submissions made by HPPC and the Petitioner. APTEL in judgement dated 28.8.2020 has held that there was no mandate for installation of FGD and earmarking separate funds for installation of FGD



system and SNCR system. The relevant portion of the judgement dated 28.8.2020 is as follows:

*“124. It is seen that based on the Expert Appraisal Committee report, ECs were granted. In both the reports Expert Appraisal Committee while granting recommendation for ECs did not state anything with regard to earmarking of funds towards installation of FGD for SO<sub>2</sub> and any suitable system to control NO<sub>x</sub> emissions. Out of total cost of the project of Rs.8000 Crores, a sum of Rs. 461 Crores was earmarked for the existing environmental protection measures so far as Appellant TSPL’s project is concerned. As far as the Appellant-NPL is concerned, the total cost of the project was about Rs.5500 Crores, which included Rs. 410.10 Crores for environment protection measures. In none of the documents, based on which ECs were provided, there is no mandate for installation of FGD and no separate fund was directed to be earmarked for FGD installation and/or SNCR system.”*

37. Further, the EC certificates issued to the instant generating station regarding earmarking of funds provides as follows:

*“(xxii) Separate funds should be allocated for implementation of environmental protection measures along with item-wise break-up. This cost should be included as part of the project cost. The funds earmarked for the environment protection measures should not be diverted for other purposes and year wise-expenditure should be reported to the Ministry.”*

38. As per the above provision in the EC certificates, the Petitioner is required to earmark funds only for implementation of environmental protection measures. We are of the view that the funds are to be earmarked for the implementation of environmental protection measures existing at the time of issue of ECs and the provision does not envisage earmarking funds for norms that may be prescribed in future. Therefore, we are not able to agree with the contention of HPPC that the Petitioner was required to earmark separate funds for installation of FGD system and De-NO<sub>x</sub> system.

39. On perusal of the EC dated 8.8.2007 issued to the Petitioner, it is observed that the Petitioner is only required to provide space for FGD unit and the ECs do not mandate installation of FGD. The relevant portion of the ECs is as follows:

*“Space provision shall be made for Fuel Gas De-sulphurisation (FGD) unit, if required at a later stage.”*



40. As the EC mandated only provision of space for installation of FGD, if required at a later stage, the Petitioner was obliged to provide space accordingly and thus not become eligible for compensation for land for the purpose of installation of FGD.

***Non-submission of the present emission levels of the generating stations***

41. HPPC has submitted that the Petitioner has not placed on record the present emission levels of SO<sub>2</sub> and NO<sub>x</sub> of past three years. In response, the Petitioner has submitted that as per the MoEFCC Notification, the SO<sub>2</sub> norms for a generating Station with a unit size of 500 MW and above, commissioned before 31.12.2016 is 200 mg/Nm<sup>3</sup>. IGSTPS has an online Emission Monitoring System and, accordingly, real time emission data of the station is automatically transmitted to CPCB. The SO<sub>2</sub> levels of IGSTPS for the past three years have been recorded with average daily values of around 1300-1600 mg/Nm<sup>3</sup>. Similarly, as per the MoEFCC Notification, the NO<sub>x</sub> norms for a generating station with a Unit size of 500 MW and above, commissioned before 31.12.2016 is 300 mg/Nm<sup>3</sup>. This was later relaxed to 450 mg/Nm<sup>3</sup>. The average daily NO<sub>x</sub> levels of IGSTPS for the past three years are in the range of 500 mg/Nm<sup>3</sup> and has gone up to maximum of 650 mg/Nm<sup>3</sup>. The Petitioner has submitted that the CM system was installed at the generating Station in June, 2019, January, 2020 and December, 2020 for Unit-3, Unit-1, and Unit-2 respectively. Therefore, the difference between the NO<sub>x</sub> emissions prior to the installation of the CM System and thereafter is roughly 150 mg/Nm<sup>3</sup>.

42. BRPL has submitted that the Petitioner may be directed to submit a report from an independent authority in order to evaluate the need for investment of NO<sub>x</sub> reduction in the instant station, in view of fact the average



NO<sub>x</sub> emission for the instant station was about 11% higher than the allowable limit as prescribed by MoEFCC Notification. The Petitioner has failed to provide any information/ documents regarding cheaper alternatives available with the Petitioner in order to bring the NO<sub>x</sub> emission for the instant station within the prescribed limit. The Petitioner ought to have provided the cost analysis and technical report with regard to alternative options for NO<sub>x</sub> emission level for the instant station. BRPL has requested the Commission to direct the Petitioner to provide a third-party report in which all the alternative options along with their cost are provided as this would enable the beneficiaries to check whether the Petitioner has adopted the most efficient route or not.

43. We have considered the submissions of the Respondents and clarification of the Petitioner. The Respondents have contended that the Petitioner has not submitted the present emission levels to ascertain the requirement of ECS. As per the submissions of the Petitioner, the present emission levels of SO<sub>2</sub> are higher than the norms prescribed in the MoEFCC Notification. Therefore, there is a requirement for installation of ECS in the instant generating stations/ units of the Petitioner in order to bring down the SO<sub>2</sub> emission levels to the norms prescribed by MoEFCC. The current emission levels are only required to establish whether there is requirement of ECS or not for meeting the stipulated norms. In the instant cases, the need for FGD system is established as the existing SO<sub>2</sub> emission levels as submitted by the Petitioner for these stations are on higher side.

44. In view of the above discussions, we hold that the instant petition filed by the Petitioner is maintainable. We now deal with the prayers of the Petitioner in the following paragraphs.



### **Prayers of the Petitioner**

45. We now take up the prayers of the Petitioner in the instant petition. The Petitioner has prayed to (a) approve undertaking implementation of ECS in order to meet revised ECNs; (b) grant liberty to approach the Commission for approval of implementation of ECS on account of Mercury, water consumption and particulate matter in future, if required; (c) allow additional APC; (d) allow additional GSHR; (e) allow additional water consumption; (f) allow additional O&M Expenses; (g) allow cost of reagents; and (h) allow deemed availability on account of shutdown.

#### ***(a) Approve undertaking implementation of ECS and incurring Additional Capital Expenditure (ACE)***

46. The Petitioner has sought approval for undertaking implementation of ECS in order to meet revised ECNs and the consequent additional expenditure. The Petitioner has proposed WFGD system for the control of SO<sub>2</sub> and CM to control NO<sub>x</sub> its generating station. The Petitioner based on the capital cost of ECS discovered through competitive bidding and on the basis of certain assumptions regarding operating parameters, had arrived at the indicative supplementary tariff submitted in the petition. The beneficiaries/ Respondents raised their concerns on various issues like identification of suitable ECS, effectiveness of the identified ECS, bidding process and the capital cost of ECS identified in the instant petition. Accordingly, the Commission for the purpose of prudence check and on the basis of the concerns raised by the beneficiaries/ Respondents, directed the Petitioner to submit certain information regarding the capital cost claimed towards ECS, the proposed technology for control of NO<sub>x</sub>, the indicative supplementary tariff and other parameters considered by the Petitioner for the subject generating station. However, the Commission has



introduced the operating parameters through the 2020 Amendment Regulations for additional APC, water consumption and O&M Expenses on account of installation of ECS. The capital cost and operating parameters considered by the Petitioner for computing the indicative supplementary tariff are as follows:

		<b>FGD</b>	<b>SNCR</b>	<b>CM System</b>	<b>Remarks</b>
1	Capital Cost	₹1100 crore	₹75 crore (without tax/IDC etc.)	₹24.98 crore	SCNR implementation will be decided based on pilot test report.
2	Normative Specific Limestone/ Reagent Consumption (kg/kWh)	0.014 (Limestone)	0.0015 (Urea)	Nil	
3	Additional APC	1%	0.2%	Nil	
4	Additional O&M	4% of capital cost			
5	Shutdown Period	30 to 45 days for each unit	15 days for each unit	45 to 60 days for each unit	
6	Increase in GSHR		9.44 kcal/kWh	18.87 kcal/kWh	0.8% increase: due to CM, 0.4-0.6% increase: due to SNCR

47. The indicative supplementary tariff impact (without considering the impact on GSHR) due to installation of ECS in order to meet Revised ECN is Fixed Cost (FC): 24.20 paisa/kWh, Variable Cost (VC): 8.81 Paisa/kWh (1<sup>st</sup> year) and FC: 23.22 paisa/kWh, (levelised). A further increase in Energy Charge Rate and per unit Fixed Charge (@85% scheduled generation) of the station by about 11 paisa/kWh due to increased APC and Station Heat Rate.

48. The details submitted by the Petitioner vide affidavit dated 11.6.2021 are as follows:

- a) The Petitioner's BoD considered the revised ECNs pertaining to NO<sub>x</sub> and SO<sub>2</sub> in its 74<sup>th</sup> and 76<sup>th</sup> and Meeting held on 14.5.2018 and 7.9.2018, respectively and approved the 'Proposal for interim Environmental Action Plan for meeting the New Emission Norms', notified by MoEFCC.





b) Initially bids were invited by issuing IFB in public domain for installation of FGD system at Petitioner's generating station on 29.11.2017 through DCB Reliance infrastructure was discovered as L1 Bidder and LoA was issued to Reliance Infrastructure on 1.2.2018. However, as per the requirement, Reliance Infrastructure failed to furnish requisite bank guarantee. As a result, the Petitioner went for re-tendering the FGD package and fresh IFB for installation of FGD System was issued by the Petitioner on 24.10.2018 through and following vendors participated in the bid:

- (i) Indure Ltd.
- (ii) Mitsubishi Hitachi Power System India Pvt. (MHPSIPL)
- (iii) Bharat Heavy Electricals Ltd.( BHEL)
- (iv) Larsen & Turbo (L&T)
- (v) Isgec Heavy Engineering Ltd. (ISGEC)
- (vi) Tata Projects Ltd.
- (vii) Doosan Power Systems India Private Ltd.
- (viii) GE Power India Ltd.
- (ix) Thermax Ltd. (Thermax).

c) Based on the bidding process, GEPIL was discovered as the successful bidder. The Board approval for the award was accorded on 12.4.2019. Subsequently, the LoA was issued by the Petitioner on 29.4.2019 in favour of GEPIL for ₹872.15 crore (including GST).

d) Subsequent to the award of contract for installation of FGD, GEPIL has started the process for installation of FGD. At present, the erection and installation of equipment by the Vendor is in advance stage and the Petitioner is putting all efforts to commission the FGD before December,



2022 as mandated by CPCB compliance. However, due to Covid-19 the work is progressing at slow pace.

e) The projected capital cost for De-NO<sub>x</sub> system for CM Package is ₹16.94 crore.

Sr. No.	Particulars	Price (in ₹)
1.	Ex-manufacturing work/ Place of dispatch price (both in India) for main Equipment	14,89,75,035
2.	Ex-manufacturing work/ Place of dispatch price (both in India) for main Mandatory Spares	2,05,00,090
Total		16,94,75,125

f) MoEFCC vide Notification dated 19.10.2020 has revised the emission norm of 300 mg/Nm<sup>3</sup> for NO<sub>x</sub> to 450 mg/ Nm<sup>3</sup>. Accordingly, only CM is proposed to be implemented as primary system of De-NO<sub>x</sub> to bring the level of NO<sub>x</sub> emission below 450 mg/Nm<sup>3</sup> and the secondary De-NO<sub>x</sub> system of SNCR proposed initially will not be implemented.

g) The implementation of primary De-NO<sub>x</sub> system of CM has been awarded to BHEL, through DCB Route. The CM system has already been installed at the generating station in June, 2019, January, 2020 and December, 2020 for Unit-3, Unit-1, and Unit-2 respectively.

h) The break-up of the capital cost claimed by the Petitioner for FGD system implementation, is as follows:

Capacity (MW)	CEA's indicative hard cost (₹ lakh per MW)	Hard cost claimed (₹ lakh per MW)	Total IDC claimed (₹ lakh)	Total IEDC claimed (₹ lakh)	Total taxes & duties claimed (₹ lakh)	Total other costs claimed (₹ lakh)	Total costs claimed (₹ lakh)
3x500 MW	40.50	49.28	7600.00	10.00	13290.00	14200.00	110000.00

49. On the basis of the submissions made by the Petitioner, the following three issues arise for our consideration as part of prudence check (i) approvals and the bidding process; (ii) suitability and effectiveness of ECS; and (iii) capital cost of the identified ECS. We deal with them in the following paragraphs.



(i) Approval and Bidding Process

50. TPDDL has submitted that the Petitioner has not shared any details of the competitive bidding process with the procurers. In the absence of these details, there is a serious risk that the prudent process to determine the most competitive price has not taken place. TPDDL has further submitted that the Petitioner has not placed on record the decision of competent authority confirming that the ECS technology selected is the best suited cost-effective technology in terms of CEA's Advisory dated 7.2.2020 or the recommendations of the Bid Evaluation Committee which are critical for the purposes of ascertaining transparency in selection of the bidder and discovery of most competitive price. The Petitioner has failed to acknowledge that certification regarding the applicability of FGD system is not a commercial consideration and the same should have been certified by a competent authority such as CEA.

51. BRPL has made the following submissions:

- a) The Petitioner has failed to provide the certificate from the competent authority that bidding and award of the work has been carried out in a fair and transparent manner as per the applicable Gol guidelines.
- b) The Petitioner should have provided the certificate from a Competent Authority and not merely self-certified that the technology adopted is as per the recommendation of CEA. The Commission had specifically directed the Petitioner to provide the certificate from 'Competent Authority'. However, instead of complying with the directions, the Petitioner has erroneously relied on order dated 28.4.2021 in Petition No. 335/MP/2021 & Ors. and stated that the WFGD system is the appropriate technology for the instant station.



- c) CEA is entrusted with the responsibility of specifying the technical and safety standards for construction of the power plants. Therefore, the Petitioner should obtain a certificate from CEA regarding the selection of the ECS technology after conducting a proper audit of the ECS proposed to be installed.
- d) The Petitioner has attached minutes of the 76<sup>th</sup> board meeting dated 7.9.2018 regarding re-tendering of the IFB, as Reliance Infrastructure failed to perform the activities as per the Bidding Schedule. However, the Petitioner has failed to provide the details of the Board of Director's Meeting which accorded the first approval of FGD installation based on which IFB dated 24.10.2018 was issued.
- e) The Petitioner has failed to justify the cost benefit analysis for the instant station and which would have enabled it making an informed decision regarding the selection of the appropriate FGD technology after consultation with the beneficiaries.
- f) International bidding would have increased the competition and might have invited more bidders. The reliance placed by the Petitioner on order dated 1.11.2019 in Petition No. 152/MP/2019 titled MPL vs. TPDDL wherein DCB was allowed for approval of FGD and order dated 28.4.2021 in Petition No. 335/MP/2020 wherein the Commission observed that the bidding process undertaken with the approval of NTPC's BoD as part of the procedure laid down under its DoP is misplaced. The Petitioner has not given any cogent reasons and has merely concluded that the DCB and ICB are equally effective and domestic buyers should be given opportunity under the "Make in India" programme.



52. The Petitioner in response to the contentions of the Respondents has submitted that the bidding process and award has been carried out in a transparent manner as per the applicable Government of India/ NTPC guidelines. The Petitioner has submitted that instant station is situated in NCR region. Considering the urgency and strict timelines for compliance to MoEFFCC norms and the monitoring of Hon'ble Supreme Court in the matters, IFB for installation of FGD system at the instant station was issued on 29.11.2017 and various vendor participated in the bid and the accordingly, Reliance Infra emerged as successful bidder. However, as per the requirement, Reliance infra failed to furnish requisite bank guarantee. Owing to this, the Petitioner had to undergo re-tendering for FGD package. The Petitioner's Board of Directors in the 76th Meeting dated 7.9.2018 approved the proposal to award the contracts for the FGD package. Accordingly, IFB for installation of FGD in the instant generating station was issued by Petitioner on 24.10.2018. Based on the bidding process, GE Power was discovered as the successful bidder. The Board approval for the award was accorded on 12.4.2019. The Petitioner issued NOA on 29.4.2019 to GE power for FGD system installation at the instant generating station.

53. The Petitioner has submitted that ICB was adopted for installation of FGD system in respect of Lot-1A stations since projects/ generating stations selected under Lot-1A were implemented under Mega Power Project Policy of Government of India. Accordingly, these stations qualified for deemed export benefits. Under this policy, the units and its auxiliaries supplied by the international vendor for execution of projects were exempted from customs duty and excise duty so that the overall project cost could be less. However, the



successful bidders in ICB in case of all the projects under LoT-1A were domestic vendors. Further, most of these domestic bidders also had technology transfer arrangement with established international vendors. Accordingly, for generating stations not covered under the Mega Power Project Policy, DCB was adopted as Customs Duty could be avoided, thus, bringing down the overall cost of the FGD system installation. Based on the experience of ICB, response from domestic players, discovery of competitive cost etc., it was decided to adopt DCB in the subsequent lots. Thus, DCB was adopted in the instant case.

54. We have considered the submissions of the Petitioner and the Respondents. The Respondents have contended that the Petitioner has not submitted the details of the bidding process as directed by the Commission and has not produced the certificate from the “competent authority” regarding suitability and effectiveness of ECS adopted by the Petitioner as directed by the Commission. It is observed that nine vendors participated in the bidding process and the Petitioner has submitted that the whole process from identification of the suitable technology to award of NoA to the selected L1 bidder was with the approval of its Board, which was granted on 12.4.2019. The Petitioner has also certified that bidding and award has been carried out in a fair and transparent manner as per DoP of the Petitioner and it is in line with the Government of India guidelines. The LoA was issued on 29.4.2019 and work is under progress. It is observed that GEPIL has started the process of installation of FGD and at present the erection and installation of equipment by the vendor is at advanced stage and work is expected to complete by December, 2022.

55. As regards the other contention that the Petitioner has not submitted the certificate from the competent authority, the Petitioner has submitted the



Minutes of the Meetings of its BoD approving the installation of ECS in the instant generating station and that the ECS proposed by the Petitioner would comply with the norms prescribed in the MoEFCC Notification. There being no competent authority specifically defined in the 2019 Tariff Regulations or the MoEFCC Notification, approval of the Petitioner's BoD and affidavit submitted by the Petitioner is sufficient.

56. BRPL have further contended that the Petitioner should have adopted ICB which would have attracted more bidders and competitive prices, instead of DCB. It is observed that the Petitioner initially adopted ICB and subsequently adopted DCB. The successful bidders in case of ICB were domestic vendors and most of them had international tie-ups. Further, bids received through DCB were competitive. As the price discovery through DCB is competitive, we do not find any infirmity in Petitioner adopting DCB instead of ICB based on its initial experience.

(ii) Suitability and selection of the technology

57. The Petitioner has submitted that it initiated the process for implementation of ECS and had issued IFBs in the year 2018 i.e. before the issue of CEA's recommendations dated 21.2.2019. WFGD system proposed by the Petitioner is also in line with recommendation of CEA. The suitability and selection of the technology depends on various parameters like the age, size and location of the plant/ generating station, cost and availability of the technology, cost and availability of the reagents, usage of the by-products etc. CEA has recommended four types of technologies for control of SO<sub>2</sub> emissions and the Petitioner has selected WFGD system for both the generating stations under the instant petitions. The Petitioner has outlined the advantages of WFGD system over other FGD systems as far as its generating stations are



concerned. Further, large number of WFGD technology providers offer an opportunity for obtaining competitive prices. The efficiency level of WFGD system in reducing the SO<sub>2</sub> emissions is around 98% which is better than the other three technologies suggested by CEA. The Petitioner has also submitted that WFGD system is best suited for generating stations/ plants which are of 500 MW and above. As per the Advisory dated 7.2.2020, TPPs should select the appropriate FGD technology based on parameters like SO<sub>2</sub> removal efficiency, units' size, balance plant life and the geographical location of TPPs.

58. The Respondents have raised their concerns on the suitability of the technology selected by the Petitioner for control of the SO<sub>2</sub> emissions in the instant generating station and their submissions in brief are as follows:

- a) TPDDL has submitted that CEA has advised generating units to conduct a "life cycle cost-benefit analysis" while choosing from the available FGD technologies. However, no such analysis was conducted by the Petitioner.
- b) CEA has recommended that factors such as coal quality, unit size and number of units, space availability at plant, availability of reagent, disposal of by-product and balance plant life etc. need to be evaluated on a case to case basis since every plant has specific requirements. As none of the above-mentioned factors have been furnished by the Petitioner, there is no prudent basis to verify the reasonableness of the selected ECS technology. The Petitioner has failed to provide the certificate from competent authority to the effect that the ECS technology selected is as per the recommendations made by CEA and is the best suited cost-effective technology.





a) BRPL has submitted that the Petitioner has failed to provide the certificate from competent authority to the effect that the ECS technology selected is as per the recommendations made by CEA and is the best suited cost-effective technology.

b) BRPL has submitted that the Petitioner has failed to justify the cost benefit analysis for the instant station and which would have enabled it making an informed decision regarding the selection of the appropriate FGD technology after consultation with the beneficiaries.

59. In response, the Petitioner has submitted that while selecting FGD technology for De-NO<sub>x</sub>, the Petitioner has followed the evaluation criteria in terms of unit size, geographical location, age of units, availability of space, coal quality, etc as advised by CEA in its Advisory dated 7.2.2020. The Petitioner has reiterated that WFGD is suitable for units 500 MW and above. WFGD can withstand variation in coal regarding sulphur percentage and calorific value. Further, there are no safety issues as lime stone is non-hazardous. This technology is mostly used worldwide. Therefore, WFGD technology has been selected for SO<sub>2</sub> removal to bring down the current SO<sub>2</sub> emission levels within the norms specified in the MoEFCC Notification. The norms and parameters and suitability has been selected in accordance with the CEA recommendations and technical specifications. Therefore, the actions of the Petitioner are in accordance with the orders passed by this Commission.

60. We have considered the contentions of the Respondents and the clarifications given by the Petitioner. The Respondents have submitted that the Petitioner has not submitted whether the factors recommended by CEA were considered while selecting the De-SO<sub>x</sub> technology, the life cycle cost benefit



analysis of the technology adopted, comparative study of the various technologies and whether the technology adopted would meet the norms fixed by MoEFCC. In response, the Petitioner has submitted that it has considered the unit size, geographical location, age of units, availability of space, coal quality, Sulphur content in coal, balance plant life, availability of reagent and space requirement and accordingly selected the WFGD technology which is in conformity with CEA recommendations dated 21.2.2019 and Advisory dated 7.2.2020.

61. We are of the view that the Petitioner has identified and proposed WFGD systems for reduction in the SO<sub>2</sub> emissions taking into consideration the effectiveness, availability and cost of the WFGD systems, size of the plants, operational expenses and availability of the reagents. Considering the justification submitted by the Petitioner, we are of the view that the Petitioner has done due diligence in identifying WFGD systems as the most suitable technology for reduction of SO<sub>2</sub> emissions as notified by MoEFCC in the instant generating station.

(iii) Capital cost of the identified ECS

62. The Petitioner has claimed the following capital cost towards implementation of WFGD System to control the SO<sub>2</sub> emissions in the instant generating station:

Capacity (MW)	CEA's indicative hard cost (₹ lakh per MW)	Hard cost claimed (₹ lakh per MW)	Total IDC claimed (₹ lakh)	Total IEDC claimed (₹ lakh)	Total taxes & duties claimed (₹ lakh)	Total other costs claimed (₹ lakh)	Total costs claimed (₹ lakh)
3x500 MW	40.50	49.28	7600.00	10.00	13290.00	14200.00	110000.00

63. The Petitioner has submitted that the awarded cost of FGD System is ₹739.25 crore (excluding GST) i.e. ₹49.28 lakh/MW, which is comparable to the



CEA benchmark indicative cost of ₹40.50 lakh per MW. The cost estimation of CEA is merely indicative in nature CEA in its report dated 24.2.2021 has itself acknowledged that the earlier cost estimation is approximately three years old and the cost of FGD installation has increased. The Petitioner has submitted that the Commission in order dated 11.11.2019 in Petition No. 152/MP/2019, order dated 23.4.2020 in Petition No. 446/MP/2019 and order dated 6.5.2020 in Petition No. 209/MP/2019 has already recognised that the cost provided by CEA was indicative in nature and the cost of FGD has increased due to various factors. The Petitioner has further submitted that CEA in its letter dated 24.2.2021 has acknowledged that the earlier cost estimation given in its letter dated 21.2.2019 is approximately three years old and the cost of FGD installation has increased due to increase in demand for FGD equipment, shortage of indigenous manufacturing capacity, import restrictions, etc. and it requires to be revised. The consolidated concerns raised by the Respondents on the aspect of higher hard cost and the clarifications given by the Petitioner are dealt in the following paragraphs.

64. BRPL has contended that the Petitioner has failed to provide the reasons for deviation from CEA recommended cost and has merely made a general submission that the cost of CEA is indicative. Even though the cost break-up has been provided, the basis of arriving ₹1100 lakh is still ambiguous. The contention of the Petitioner that CEA's cost is indicative and the additional expenditure be allowed to the Petitioner at the later stage is denied and disputed. CEA cost is not merely indicative as it factors the overall requirements for implementation of FGD. The Petitioner has failed to provide any details as regards the escalation in the cost of materials due to passage of time. BRPL has further contended that the reliance placed by the Petitioner on the



acknowledgement by the Commission in its various orders that the costs may change is not sufficient. By placing reliance on the order dated 23.4.2020 in Petition No. 446/MP/2019, BRPL has submitted that the Commission may consider approving the cost of FGD system provisionally at the existing CEA rate subject to adjustment after the revision of the CEA cost estimates. The Petitioner has failed to provide the intended timeline for completion of the installation of the FGD and operationalization of the same at the instant station. The Petitioner should furnish the implementation timeline along with milestones to be achieved for release of payment from time to time and scheduled date of completion of the installation should also be intimated

65. TPDDL has submitted that the hard cost estimates provided by the Petitioner is much higher than the indicative cost recommended by the CEA and no explanation has been provided for the same. The Petitioner has failed to provide any adequate explanation for the cost difference between CEA's indicative hard cost and hard cost claimed by the Petitioner. The Petitioner has not followed a consultative process or mentioned the basis on which cost of technology has been ascertained. The issue of difference in the hard cost sought by the Petitioner and the CEA indicative cost has been considered by the Commission in its order dated 28.4.2021 in Petition No. 335/MP/2020 & Ors. The facts in the instant case are different from facts in Petition No. 335/MP/2020 & Ors. where the deviation was only marginal. However, in the instant case, the deviation is substantial. Accordingly, the approach adopted by the Commission in order dated 20.7.2019 in Petition No. 446/MP/2019 may be adopted in the instant case. The costs towards project management and engineering cost are controllable and as such should be restricted to CEA's recommended indicative cost. The Petitioner has not stated whether the cost claimed is only the base



cost of the project or the total capital expenditure inclusive of GST, IEDC, EPC cost inclusive of taxes, opportunity cost and IDC. The Petitioner has not provided the cost breakdown between the main FGD package, electrical power supply package, waste-water treatment, fire protection and detection, spares, engineering, project management and contingency reserve etc. TPDDL has further submitted that the capex estimated by the Petitioner for its 3 units is higher than usual and no explanation has been provided for the same. ACE, if approved, should not be disbursed as a one-time payment but should be released in tranches, depending upon the progress of the installation and commissioning of the FGD system, as the same would help in avoiding tariff shock for the end consumers.

66. In response, the Petitioner has submitted that as per the CEA norms for installation, the cost of FGD is ₹0.45 cr/ MW for 500 MW units. The cost estimation given by CEA is only indicative in nature and is only the base cost. The base cost may further vary depending upon site conditions. CEA in its recommendations has also stated that the hard cost would vary from plant to plant based on various factors. The discovery of price in the instant case is being done through a transparent process of competitive bidding and the same would be subject to prudence check by the Commission at the time of tariff fixation. The expenditure towards installation of ECS has been duly certified by the Auditors and will be submitted at the time of filing the petition for determination of supplementary tariff in terms of Regulation 9(3) read with Regulations 29(4) of the 2019 Tariff Regulations.

67. The Petitioner has further submitted that the Commission has acknowledged that increase in the demand for installation of FGD system may



lead to change in prices of FGD system in the international and domestic market. Therefore, the prices discovered are reasonable for the unit size and have been discovered through transparent process of competitive bidding. The capitalisation cost considered are based on the awarded values which have been discovered through transparent competitive bidding. The payment of the additional capitalization allowed by the Commission will be admissible as per the provisions in the 2019 Tariff Regulations. TPDDL cannot claim that the ACE ought to be granted to the Petitioner in tranches. Moreover, CEA in its letter dated 24.2.2021 has acknowledged that the earlier cost estimation is approximately three years old and the cost of FGD installation has increased possibly due to various reasons specified therein. In this regard, CEA has sought the latest tendering cost for different sizes and technology from TPPs in India.

68. We have considered the submissions of the Respondents and clarifications of the Petitioner on the issue of capital cost of ECS. The Petitioner has claimed hard cost of ₹49.28 lakh MW towards the installation of WFGD system in IGSTPS of 3x500 MW against the CEA recommended hard cost of ₹40.50 lakh/MW for units of 500 MW. The Respondents have contended that the hard cost of WFGD system claimed by the Petitioner is higher than the CEA recommended cost and no satisfactory reason for the deviation has been submitted by the Petitioner. The Petitioner has submitted that the cost provided by CEA was only indicative and that cost of WFGD system in case of subject generating station is discovered through open competitive bidding. The Petitioner has submitted that the Commission in order dated 11.11.2019 in Petition No.152/MP/2019, order dated 23.4.2020 in Petition No. 446/MP/2019



and order dated 6.5.2020 in Petition No. 209/MP/2019 has already recognised that the cost provided by CEA was indicative in nature and the cost of FGD has increased due to various factors. The Petitioner has further submitted that CEA in its letter dated 24.2.2021 has acknowledged that the earlier cost estimation given in its letter dated 21.2.2019 is approximately three years old and the cost of FGD installation has increased due to increase in demand for FGD equipment, shortage of indigenous manufacturing capacity, etc. and it requires to be revised.

69. Hard cost approved by commission in other similar petitions is tabulated as under:

Sr. No.	Petition Number & Petitioner's name	Station Name & Capacity (MW)	Date of IFB	Date of NoA	Hard cost claimed (₹ in lakh/MW)
1	517/MP/2020 (NTPC)	KSTPSS-II (3X500)	19.8.2019	30.3.2020	52.76
2	519/MP/2020 (NTPC)	VSTPS-II (2X500)	28.9.2018	22.8.2019	48.24
3	509/MP/2020 (NTPC)	VSTPS-III (2X500)	31.7.2017	18.9.2018	40.27
4	516/MP/2020 (NTPC)	VSTPS-IV (2X500)	31.7.2017	18.9.2018	40.27
5	338/MP/2020 (NTPC)	KSTPS-I&II (3X200 +3X500)	28.9.2018	22.8.2019	45.21
6	521/MP/2020 (NTPC)	KSTPS-III (500)	28.9.2018	10.8.2019	45.21
7	526/MP/2020 (NTPC)	MSTPS-I (2X500)	31.7.2017	18.9.2018	42.32
8	501/MP/2019 (NTPC)	RSTPSS-II (2X500)	31.7.2017	18.9.2018	38.33
9	66/MP/2020 (NTPC)	RSTPSS-III (2X500)	31.7.2017	18.9.2018	38.33
10	510/MP/2020 (NTPC)	SSTPS (5X200+2X500)	19.8.2019	18.2.2020	49.90
11	553/MP/2020 (NTPC)	FGUTPSS-IV (1X500)	31.7.2017	16.10.2018	59.00
12	501/MP/2019 (NTPC)	RSTPSS-II (2X500)	31.7.2017	18.9.2018	38.33
13	333/MP/2020 (NTPC)	TSTPSS-I (2X500)	27.8.2019	30.3.2020	44.54
14	342/MP/2020 (NTPC)	FSTPSS-III (500)	19.8.2019	27.5.2020	53.11
15	508/MP/2020	FSTPSS-I&II	19.8.2019	27.5.2020	53.11



	(NTPC)	(3X200+2X500)			
16	393/MP/2019 (APCPL)	IGSTPS (3x500)	24.10.2018	29.4.2019	49.28

70. The Commission in order dated 23.4.2020 in Petition No. 446/MP/2019 (SPL Vs. MPPMCL) and order dated 6.5.2020 in Petition No. 209/MP/2019 in case of Sembcorp Energy India Limited has already observed that the cost recommended by CEA is indicative in nature and it is not possible to indicate the exact cost that can be discovered through a competitive bidding process. It is observed that the Petitioner has carried out competitive tendering process for installation of WFGD System and same has been duly approved by BoD of the Petitioner.

71. Taking into consideration that the per MW hard cost suggested for FGD system by CEA is indicative in nature, that the cost claimed by the Petitioner is discovered through a competitive bidding process, that the cost recommended by CEA is more than two-three years old and that CEA has already recognised the need for revising the cost recommended by it earlier, we approve the hard cost of ₹49.28 lakh/MW claimed by the Petitioner for installation of WFGD for reduction of SO<sub>2</sub> emissions from the instant generating station.

72. As the instant petition is for in-principle approval of hard cost of ECS, which excludes IDC, IEDC, FERV, taxes and other cost, we are considering only the hard cost of FGD system and other components of cost of FGD system is not considered in this order. The same will be considered after implementation of ECS in IGSTPS in a petition to be filed by the Petitioner under Regulation 29(4) of the 2019 Tariff Regulations.





### ***Reduction in NO<sub>x</sub> Emissions***

73. The Petitioner had initially considered CM as the primary measure and SNCR as the secondary measure to control NO<sub>x</sub> emission. Later, with the revision of emission norms for NO<sub>x</sub> for TPPs installed during the period from 1.1.2004 to 31.12.2016 from 300 mg/Nm<sup>3</sup> to 450 mg/Nm<sup>3</sup> by MoEFCC vide Notification G.S.R. 662(E) dated 19.10.2020, the Petitioner has proposed installation of only CM as primary system of De-NO<sub>x</sub> to bring the level of NO<sub>x</sub> emission below 450 mg/N in the instant station. Secondary, De-NO<sub>x</sub> system of SNCR proposed initially is not being implemented in the instant generating station. The Petitioner has initially claimed the capital cost of ₹24.98 crore towards installation of CM System for reduction in NO<sub>x</sub> emissions in the instant generating station. The primary De-Nox system of CM for the instant station has been awarded to BHEL vide NoA dated 29.10.2018 for ₹16.94 crore. The CM was installed at generating station in June 2019, January 2020 and December 2020 for Unit-III, I and II respectively.

74. BRPL has contended that the Petitioner should have submitted a report from an Independent Authority in order to evaluate the need for investment of NO<sub>x</sub> reduction in the instant station as the average NO<sub>x</sub> emission for the instant station was about 11% higher than the allowable limit as prescribed by MoEFCC Notification. Further, the Petitioner has failed to provide any document/information regarding any cheaper alternatives available to bring the NO<sub>x</sub> emissions for the instant station within the prescribed limit.

75. HPPC has contended that the Petitioner without disclosing the present emission norms being currently achieved by its power plant has sought to install CM and SNCR system to bring down the present NO<sub>x</sub> emissions within the



prescribed norm of 300 mg/Nm<sup>3</sup>. HPPC has further contended that the Petitioner's generating station is already complying with the NO<sub>x</sub> emission norms, as per 2008 CEA guidelines which had stipulated limit on NO<sub>x</sub> emission and was binding on the upcoming TPPs, like the Petitioner's whose units were commissioned in the year 2011, 2012 and 2013. The limits on NO<sub>x</sub> emissions stipulated are much more stringent than the ones provided under the MoEFCC Notification. There is no reason to claim ₹24.98 crore for installing CMS and ₹75 crore (excluding taxes etc.) for installing SNCR. Instead, the Petitioner should explore the possibility in which the existing burners would serve the intending purpose. Moreover, the installation of SNCR is not required, as the NO<sub>x</sub> norm has been relaxed to 450 mg/Nm<sup>3</sup> and can be met by Combustion optimisation already taken by the Petitioner. So, all costs related to SNCR be excluded. The Petitioner has stated that it has already completed installation of CM System. However, HPPC has not been consulted during the process of installation of CM system.

76. In response, the Petitioner has submitted that the capitalization cost considered for CM is based on the awarded values which have been discovered through transparent competitive bidding process. As per MoEFCC Notification, NO<sub>x</sub> norms for a generating station of unit size of 500 MW and above, commissioned before 31.12.2016 is 300 mg/nm<sup>3</sup>. This was relaxed to 450 mg/Nm<sup>3</sup>. The average daily NO<sub>x</sub> levels of the instant generating station for past three years are in the range of 500mg/Nm<sup>3</sup> and has gone up to maximum of 650 mg/Nm<sup>3</sup>. The CM system was installed at the generating station in June, 2019, January, 2020 and December 2020 for Units III, I and II respectively. Therefore, the difference between the NO<sub>x</sub> emission prior to the installation of the CM system and thereafter is roughly 150 mg/Nm<sup>3</sup> and copy of the NO<sub>x</sub> emission of



the instant generating station for last years as submitted to CPCB has also been placed on record in the instant petition.

77. We have considered the submissions of the Petitioner and the Respondents. The Petitioner initially proposed installation of CM and SNCR for reduction in NO<sub>x</sub> emissions from the instant generating station. However, with the revision of norms for NO<sub>x</sub> for TPPs installed during the period from 1.1.2004 to 31.12.2016 from 300 mg/Nm<sup>3</sup> to 450 mg/Nm<sup>3</sup> by MoEFCC vide Notification G.S.R. 662(E) dated 19.10.2020, the Petitioner has dropped the proposal to install SNCR in the instant generating station and has installed only CM. The Petitioner has further submitted that the cost for the CM System has also been discovered through the Domestic Competitive Bidding. It is also observed that the Petitioner has already installed CM in all the three units of the instant generating station. Accordingly, we approve the hard cost of ₹16.94 crore as per the NoA dated 29.10.2018 issued to BHEL, which has been submitted by the Petitioner vide affidavit dated 11.6.2021.

***(b) Liberty to approach the Commission***

78. The Petitioner has submitted that MoEFCC Notification mandates revised ECNs for water consumption, mercury and particulate matter, besides SO<sub>2</sub> and NO<sub>x</sub>. As the generating stations of the Petitioner meet the norms in respect of water consumption, mercury and particulate matter as stipulated by MoEFCC, no claim has been made in respect of them. However, the Petitioner has sought liberty to approach the Commission as and when the generating stations are unable to meet those norms and work(s) pertaining to the same are undertaken in future.



79. We have considered the Petitioner's submission. The Respondents have raised their concern on the Petitioner's prayer for liberty to approach the Commission when the work pertaining to reduction water consumption, mercury and particulate matter are taken up in future. The instant generating stations of the Petitioner already meets the norms specified by MoEFCC in case of water consumption, particulate matter and Mercury as on the date of filing of the petition. Accordingly, the Petitioner has proposed installation of ECS only in case of SO<sub>2</sub> and NO<sub>x</sub>. Without going into the concerns raised by the Respondents, we would like to state that if any application or petition is filed by the Petitioner in this regard in future, it would be dealt as per the applicable laws and Regulations.

***(c) Other prayers***

80. The Petitioner has prayed for the grant of additional APC, Gross station heat Rate, additional water consumption, additional O&M Expenses, Cost of Reagents etc. and allow deemed availability on account of shutdown for installation of ECS under Regulation 76 i.e Power to Relax of the 2019 Tariff Regulations. The Respondents have raised their concerns on the said prayers of the Petitioner. As the instant petition is for "in-principle" approval of ACE towards installation of ECS, we do not deem fit to go into these prayers at this stage and we would consider them in petition to be filed by the Petitioner under Regulation 29(4) of the 2019 Tariff Regulations after installation of ECS. However, we would like to point out that after filing of the instant petitions by the Petitioner, the Commission has introduced a separate tariff stream for ECS by amending the 2019 Tariff Regulations vide the 2020 Amendment Regulations. Accordingly, the Petitioner claim towards grant of additional APC, additional



water consumption and additional O&M Expenses, shall be dealt as per the amended 2019 Tariff Regulations respectively.

81. The Petitioner's prayer for allowing cost of reagents, GSHR and deemed availability on account of shutdown will be dealt in the petition that is required to be filed by the Petitioner under Regulation 29(4) of the 2019 Tariff Regulations

### **Summary**

82. Based on above discussion, the summary of our findings are as follows:

a) The process from the stage of identification of FGD package to LoA was with the approval of the Petitioner's BoDs and as per the procedure laid down under its DoP.

b) The Petitioner has identified and proposed WFGD systems for reduction in the SO<sub>2</sub> emissions taking into consideration the effectiveness, availability and cost of the WFGD systems, size of the plants, operational expenses and availability of the reagents based on the CEA's recommendations. The costs claimed by the Petitioner towards installation of WFGD system and the CM System have been discovered through a competitive bidding process.

b) We have considered only the hard cost, and not considered the Petitioner's claim of total capital cost towards installation of FGD, which apart from hard cost includes IDC, IEDC, FERV, taxes and duties and other costs. These claims would be considered on case to case basis on petitions to be filed by the Petitioner for determination of tariff after implementation of ECS as provided under Regulation 29(4) of the 2019 Tariff Regulations.



83. In view of the above discussions, we accord “in-principle approval” approval of the following additional expenditure on account of installation of ECS at IGSTPS (3x500 MW) in compliance with the MoEFCC notification dated 7.12.2015:

<b>Indira Gandhi Super Thermal Power Station (3x500 MW)</b>	
Hard Cost of FGD (Rs. in lakh/ MW) (excluding GST)	49.28
Capital cost of CM System (Rs. in crore) (excluding GST)	16.94

84. We have not dealt with the Petitioner’s claim of total capital cost towards installation of FGD, which apart from hard cost includes IDC, IEDC, FERV, taxes and duties and other costs. These claims excluding hard cost would be considered on case to case basis on petitions to be filed by the Petitioner for determination of tariff after implementation of ECS as provided under Regulation 29(4) of the 2019 Tariff Regulations.

85. Accordingly, the Petitioner is directed to file separate petition for determination of tariff after implementation of the revised ECS as provided in Regulation 29(4) of the 2019 Tariff Regulations.

86. This order disposes of Petition No. 393/MP/2019 in terms of the above discussions and findings.

sd/-  
**(P. K. Singh)**  
Member

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

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

