CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI

Petition No. 377/MP/2019

Coram:
Shri P.K. Pujari, Chairperson
Shri I.S Jha, Member
Shri Arun Goyal, Member

Date of Order: 07.09.2021

In the matter of:

Petition under Section 79(1) (b) read with Section 79(1) (f) of the Electricity Act, 2003 and Article 10 of the Power Purchase Agreement dated 19.8.2013 entered into between the Petitioner and the Respondents, seeking approval of the cost to be incurred by the Petitioner on account of change in law, for installation/retrofit of 'Electrostatic Precipitators' (ESP), installation of Flue Gas Desulphurisation (FGD), installation of low NOx burners, providing Over Fire Air (OFA) and any other measures for compliance of the notification dated 07.12.2015 issued by the Ministry of Environment, Forests and Climate Change, Government of India in respect of Thermal Power Plants installed/commissioned after 01.01.2003 and before 31.12.2016.

And in the matter of:

D.B. Power Limited,
Office Block 1A, 5th Floor,
Corporate Block, DB City Park,
DB City, Arera Hills, Opposite MP Nagar, Zone-I,
Bhopal-462016 **…….Petitioner**

Vs

TANGEDCO,
144, Anna Salai,
Chennai - 600002 **…….Respondent**

Parties Present: Shri Deepak Khurana, Advocate, DBPL
Shri Tejasv Anand, Advocate, DBPL
Shri B. Vinodh Kanna, Advocate, TANGEDCO
Shri Vikash Adhia, DBPL
Shri R. Krishnamoorthy, TANGEDCO
Shri R. Thambiraj, TANGEDCO

ORDER

The Petitioner has set up 1200 MW (2 x 600 MW) Thermal Power Plant at Village Badadarha in District Janjgir Champa, Chhattisgarh (in short, 'the

Generating Station') and both of its units are presently in operation. The Petitioner is supplying power to more than one State and has a composite scheme for the generation and sale of electricity as envisaged in Section 79(1)(b) of the Electricity Act 2003. Presently, the Petitioner is supplying 311 MW of power to the State of Rajasthan under the long term PPA dated 1.11.2013 with Power Trading Corporation (PTC). The Petitioner also has a Power Purchase Agreement dated 19.8.2013 with TANGEDCO under which it is currently supplying 208 MW power.

2. Brief facts of the case are as follows:

a) On 16.9.2010, the Ministry of Environment, Forest and Climate Change (in short, "MoEF&CC") issued the Environmental Clearance for setting up of the Generating Station. The Generating Station achieved Commercial Operation Date (COD) on 3.11.2014 and 26.3.2016 for Unit-1 and Unit-2, respectively.

b) MoEF&CC notified the Environmental (Protection) Amendment Rules, 2015 (hereinafter referred to as 'the 2015 Amendment Rules') on 7.12.2015 mandating all thermal power plants to comply with the revised emission control norms stipulated in the 2015 Amendment Rules.

c) The Central Pollution Control Board (CPCB) in exercise of powers under Section 5 of the Environment (Protection) Act, 1986 issued a direction to the Petitioner vide letter dated 11.12.2017 for installation/ retrofit of Electrostatic Precipitators (ESP), installation of Flue Gas Desulphurisation (FGD), installation of low NOx burners, providing Over Fire Air (OFA) and complying with other revised emission norms as per the 2015 Amendment Rules. As per CPCB's directive and based on CEA's phasing plan, the Petitioner had to install the FGD system by 30.9.2020 for Unit-2 and by June 2021 for Unit-1. Further, the timeline for meeting NOx emission norms is by 2022.

d) The Petitioner had filed Petition No. 229/MP/2016 before this Commission seeking compensation on account of occurrence of Change in Law and/or force majeure events relating to Power Purchase Agreement dated 19.8.2013 entered into between the Petitioner and the Respondent. The

Commission vide order dated 19.12.2017, allowed certain claims of the Petitioner while in respect of certain other claims, the Commission granted liberty to the Petitioner to re-approach this Commission with necessary documents.

e) Pursuant to the above, the Petitioner approached the Commission vide Petition No. 208/MP/2018 seeking approval of the cost to be incurred by the Petitioner on account of change in law, for installation/ retrofit of Electrostatic Precipitators (ESP), installation of Flue Gas Desulphurisation (FGD), installation of low NOx burners, providing Over Fire Air (OFA) and for other measures for compliance of the 2015 Amendment Rules in respect of Thermal Power Plants installed/ commissioned after 1.11.2003; and for other claims on account of Change in Law under the Power Purchase Agreement. However, during the hearing dated 20.3.2019, the Petitioner sought permission of this Commission to withdraw the prayer made in the Petition with regard to the approval of expenditure to be incurred on account of amendment in Environmental Norms and installation of FGD system with liberty to approach the Commission at the appropriate stage. The said request was allowed by this Commission vide its Order dated 20.03.2019.

f) The Petitioner had submitted a revised and final feasibility report on 7.1.2019 to the Central Electricity Authority (CEA), wherein the best suited technology and estimated cost was proposed for installation of systems to control emission from the Generating Station.

g) CEA vide its letter dated 21.2.2019 submitted its report on recommendation of suitable technology and indicative cost of installation of FGD system to meet revised emission control norms as stipulated under the 2015 Amendment Rules.

3. The Petitioner has made the following prayers:

"(a) Declare that the events specified in the present Petition are Change in Law events under the PPAs;

(b) Pass an Order granting approval to:

i. *Total Capital Expenditure of Rs. 547 crore required to be incurred by the Petitioner towards installation of 'Wet Limestone based Flue Gas Desulfurization (FGD) system' and other incidental expenditure thereto;*

ii. *Recurring incremental Operation and Maintenance expenditure of Rs. 91 crore per annum (eligible for appropriate annual escalation from the date of petition) upon installation of 'Wet Limestone based Flue Gas Desulfurization (FGD) system', LNB (with OFA) and other associated facilities at the Petitioner's Project;*

iii. *Increase in Auxiliary Power consumption by 1.10% impacting both the operational cost & reduction of availability and increase in water consumption due to FGD / DeNox and aforementioned systems and likely changes in other operational parameters of the Petitioner's Project as a consequence thereof and allow the same to be recovered from the Beneficiaries;*

iv. *Approve the revised tariff (a) arising out of installation of FGD as brought out in the present petition and/or, (b) change in existing tariff arising out of incremental auxiliary consumption due to FGD installation and/or, (c) arising out of compliance of any of measures for compliance of the notification dated 07.12.2015 issued by the Ministry of Environment, Forests and Climate Change, Government of India in respect of Thermal Power Plants;*

v. *Any other expenses or increase in cost on account of the above may also be considered and granted by this Hon'ble Commission.*

vi. *In the alternative to above, devise a suitable mechanism to resituate Petitioner to the same economic position as if Change in Law event has not occurred.*

(c) Declare the Project of the Petitioner as deemed available for the actual time period for Shut down of the Project required for installation of the 'Wet Limestone based Flue Gas Desulfurization (FGD) system' and for installation of LNB (with OFA) and other associated facilities as mentioned in the present Petition; and

(d) Pass any such other and further reliefs as this Hon'ble Commission deems just and proper in the nature and circumstances of the present case."

Submissions of the Petitioner

4. The Petitioner has submitted as under:

a) MoEF&CC had notified the Environment Protection Rules, 1986 on 19.11.1986. Serial No. 5 of Schedule I of the said Rules stipulated the standards/ norms for emission or discharge of environmental pollutants from thermal power plants. By a subsequent notification dated 3.1.1989 issued by MoEF&CC, Serial Number 25 was inserted in Schedule-I which stipulated the norms for emission of

particulate matter in respect of thermal power projects. By the 2015 Amendment Rules, the emission control norms have been further revised by MoEF&CC and the Generating Station is required to comply with the revised emission norms.

b) A comparison of the norms under the Environment (Protection) Rules, 1986 and that as per the 2015 Amendment Rules is as under:

Parameters	Norms under the Environment (Protection) Act and Rules, 1986	Norms as per Environment (Protection) Amendment Rules, 2015
Water consumption	None	3.5 m^3/MWh
Sulphur Dioxide ($SO_{2)}$	None	200 mg/Nm^3
Oxides of Nitrogen (NO_X)	None	300 mg/Nm^3
Suspended Particulate Matter	50-150	50 mg/Nm^3
Mercury	None	0.03 mg/Nm^3

c) CEA vide its letter dated 21.2.2019 submitted its report on recommendation of suitable technology and indicative cost of installation of FGD system to meet revised emission control norms as stipulated under the 2015 Amendment Rules. The indicative cost is as under :

Particulars	Amount (Rs. in crores)
Off shore Basic Value	133
On shore Basic Value	157
Import Duty + GST Offshore	39
GST Onshore	28
Total FGD Hard Cost	357
NOx Hard Cost (Over-Air Fire Damper and Burner modifications) including Taxes)	30
Other Asset	13
Pre-Operative Expenses	61
Trial Run Costs	20
Margin money for working capital	6
Contingency	19
IDC @11.10% Interest rate for 24 months	40
Total Capex	547

d) Prior to the 2015 Amendment Rules, no norms were specified with regards to SO_2 emission from thermal power plants. Further, no such requirement was specified in the environmental clearances obtained for the Generating Station and accordingly the Petitioner did not consider any cost towards the same. However, the 2015 Amendment Rules stipulate that SO_2 emissions from the Generating Station is to be kept below 200 mg/Nm^3 for the

units having capacity of 500 MW installed/ commissioned after 1.1.2003. Considering the quality of coal being used at the Generating Station, the SO_2 emission is expected to be in the range of 2017.542 to 2299.418 mg/Nm^3 for Unit 1 and 2015.883 to 2296.673 mg/Nm^3 (as from the selected coal parameters for design range) for Unit-2.

e) After the 2015 Amendment Rules, the pollutants reduction required for Unit I is 90.09% and for Unit II is 90.08%. In order to comply with the revised norms, the Petitioner is required to install a Wet Limestone based Flue Gas Desulfurization (WFGD) system in the Generating Station. This will consist of reagent preparation system, absorber module with recirculation pump and by product dewatering system. FGD reagent storage and reclaim system along with product storage and transfer system will be included in the FGD system as well. The booster fans will be located upstream of the FGD system and will provide the required flow rate and static pressure to convey combustion flue gas from the outlet of the wet scrubber to the stack. The system will include the capability of controlling the flue gas flow rate over the entire load range from start-up to design flow rate.

f) The WFGD life-cycle capital cost is significantly below all the other SO_2 reduction system options that were considered for the Generating Station. The total indicative capital cost is the sum of the purchased equipment costs, direct installation costs and indirect costs. The indicative capital cost for the WFGD system includes the following features:

(i) Flue Gas Desulfurization Vessels and Associated Equipment.
(ii) Reagent preparation system and by-product dewatering system
(iii) Wastewater treatment system
(iv) Existing stack with glass flake lining for acid corrosion protection Flue Gas Ductwork.
(v) Draft System Stiffening.
(vi) Tanks, Pumps, and Interconnecting Piping.
(vii) Bulk Material Handling Equipment for limestone and by-product.
(viii) Raw Water Treatment System.
(ix) New centrifugal ID fans, VFDs and supporting equipment.
(x) Auxiliary Transformers and Electrical equipment

g) In addition, the indicative annual O&M costs for the WFGD system would consist of the following main categories:

(i) Operating labour costs.
(ii) Maintenance materials and labour.
(iii) Reagent.
(iv) By-product disposal (including fly ash).
(v) Auxiliary power.
(vi) ID or booster fan power costs.
(vii) Service water costs.

h) For installing WFGD system for the Generating Station, modification to the existing stack would be required, as the existing stack will have to be lined with flake glass coating/ borosilicate glass lining. But the outage limit required for lining the stack would be around 5 months, which would result in significant availability loss under the long-term contract with the Respondent.

i) The costs of reagent (limestone), by-product disposal, water consumption and auxiliary power are variable annual costs that differ with the amount of SO_2 removed and quality of reagent.

j) The indicative summary of cost estimates for the WFGD system is tabulated as under:

Capex recommended by CEA in its TS report dated 21.02.2019	Capex as per LOI given to vendor by Petitioner
(1200 MW)*(Rs.0.44 crore/MW) = Rs 528 crore	Rs. 357 crore

k) The capital cost mentioned in the above table is excluding owner's cost, finance cost, borrowing cost, construction insurance, other allied construction cost, Exchange Rate Variation (ERV), increase in Auxiliary Power Consumption (APC) and generation/ availability loss due to shut down required for construction and installation.

l) The period for which the Generating Station would be required to be shut down for installation of the WFGD system and for installation of LNB (with 'Over fire Air') and other associated facilities, should be considered as deemed availability as it is because of the 2015 Amendment Rules.

m) The indicative capex anticipated towards FGD system installation of Rs. 357 crore (excluding other expenses as explained in the Petition) is much lesser than that recommended by CEA in its report.

n) The 2015 Amendment Rules, stipulate that Oxides of Nitrogen emission is kept below 300 mg/Nm^3, which is a new condition. The Generating Station is fitted with low NOx burners and presently NOx range in Unit I is from 361.518 to 365.315 mg/Nm^3 and in Unit II, it is from 507.606 to 512.574 mg/Nm^3. In order to comply with the revised norms, the Petitioner is required to install the new LNB (Low NOx Burners) with OFA. In this regard, after comparing different NOx emission control technologies for the Generating Station, keeping in view the level of NOx emissions, as also the pollutant percentage reduction required and after considering the cost effectiveness and pollutant removal capacity, new LNB (with OFA) is considered to be the most viable system for meeting the new NOx emission norms. Other technologies like SNCR, SCR, Induct SCR, ReACT^{TM} and different technically feasible combinations of aforementioned technologies were considered, but only new LNB (with OFA) was found to be the most cost effective. The indicative capital cost for the LNB with OFA systems include the following features:

a. Coal burner
b. Primary air nozzle
c. Primary air pipe
d. Dense/ Sparse Pulverized Coal Separator
e. Secondary air nozzle
f. The main combustion zone corner bellows
g. The main combustion zone dampers
h. The main vertical swing mechanism

o) The Annual O&M costs for the LNB with OFA system consist of the following cost categories:

a. Operating labour costs.
b. Maintenance materials and labour
c. Auxiliary Power
d. Service Water Cost
e. Insurance Premium

p) In addition, it is expected that there will be disruption in power generation during the course of installation and commissioning of LNB with OFA.

q) The indicative cost estimates for the LNB with OFA system, based on quotation received from M/s BHEL, a Central Public Sector Undertaking through adoption of transparent competitive bid process is as under:

Parameters	Cost (Rs. in crore)
Capital Cost (indicative)	30

r) There is no cost estimate provided, with respect to LNB technological upgrade in the Technical Specification report submitted by CEA.

s) The above costs for LNB (with OFA) are indicative and are excluding of the owner's cost, financing cost, borrowing cost, generation/ availability loss due to shut down required for construction and installation, construction insurance, other allied construction cost and increase in Auxiliary Power Consumption (APC).

t) The 2015 Amendment Rules stipulate that the particulate matter emission is to be limited below 50 mg/Nm^3. The Petitioner has conducted a preliminary assessment which indicates that it is already in compliance with the aforesaid condition. However, in the event any additional measures need to be implemented involving additional installation costs and/or operation costs to comply with the aforesaid condition, subsequent to installation of FGD and LNB (with OFA), the Petitioner reserves its right to approach this Commission.

u) Prior to the 2015 Amendment Rules, there was no restriction on consumption of water. However, under the 2015 Amendment Rules, the maximum water consumption, for all existing Cooling Towers based plants such as that of the Petitioner, is limited to 3.5 m^3/MWh. Water consumption, envisaged at present, is 3.303 m^3/MWh as borne out from the preliminary assessment conducted by the Petitioner. Upon installation of the WFGD system, the water consumption would range from 3.479 m^3/MWh to 3.491 m^3/MWh. Thus, at present, the Generating Station's water consumption is within permissible limits. However, in the event that any additional measures are needed to be implemented involving additional installation costs and/or operation costs to comply with the aforesaid condition, the Petitioner reserves its right to approach this Commission. The Petitioner under the above head has considered only the cost of additional water consumption in O&M cost calculation. Any impact of other compliances/ norms like 'zero discharge' due to installation of FGD system and LNB (with OFA) has not been considered at this stage.

v) The 2015 Amendment Rules stipulate that Mercury emissions are to be limited to 0.03 mg/NM^3. On the basis of assessment, the Petitioner has been given to understand that once the aforesaid systems are installed, the Petitioner would be compliant with this condition. In the event that any additional measures need to be implemented involving additional installation costs and/or operation costs to comply with the aforesaid condition, the Petitioner reserves its right to approach this Commission.

w) Interest During Construction (IDC) - The Petitioner has considered debt-equity ratio of 75:25 as per industry norms with interest rate on debt @11.10% which is the current market interest rate being charged to the company for its long term debt. However, considering the current financial position of the Petitioner, and current stress in the power sector, it would be a challenging task to find a suitable lender for capex of Rs. 547 crore at debt-equity ratio better than 75:25. Based on these parameters, the Interest During Construction (IDC) for 2 years of construction phase works out to Rs. 40 crore, which may be allowed as the part of total capex of Rs. 547 crore.

x) Contingency - In the project cost (capex) of Rs. 547 crore, the Petitioner has considered a nominal amount of Rs. 19 crore @5% of the total hard cost, i.e., the cost of equipment and its installation which is computed at Rs. 387 crore, as provision towards various contingencies. Since implementation of FGD is new to the power industry, there exist certain ambiguities with regards to the norms and other eventualities that may arise. This expenditure would cover any un-foreseen and un-anticipated expenditure including but not limited to any impact on account of Exchange Rate Variation, which could not have been envisaged at the time of planning.

y) Pre-operative Expenses - An amount of Rs. 61.26 crore of pre-operative expenses is envisaged in the overall capex of Rs. 547 crore. This is towards the miscellaneous and incidental expenditure which primarily relates to the consultancy charges to be incurred towards technical support for feasibility study, tender evaluation, engineering consultancy and gypsum disposal study. This is also towards the finance charges (processing fee & documentation charge etc.) to be paid to prospective lenders; manpower & administrative charge;

construction power charges; insurance; and availability loss during installation of the FGD system. As per the Petitioner's estimate, installation of the FGD system would lead to outage of about 22 days for each unit thereby reducing the recovery of capacity charges for that period.

z) Trial Run Cost - The overall indicative capex of Rs. 547 crore also includes expenses of Rs. 20.37 crores to be incurred towards trial run of the new system to be installed. This would include cost of consumables, cost of water & power to be consumed during trial run and also the manpower cost including that of consultants & experts, as per working annexed. The Petitioner has not considered any variation on account of increase in auxiliary power consumption and thereby consequent reduction in availability, while making the present claim and thus, reserves its rights and remedies in this regard.

aa) The overall indicative capex of Rs. 547 crore also includes estimated expenses of Rs. 13 crore anticipated towards raising height of temporary stack during installation of the FGD system.

bb) CEA in its report has considered an indicative annual Operational expenditure (Opex) to the tune of Rs. 24.43 crore. The break-up is as follows:

Sr. No.	Description (2 X 600 MW)	Only for FGD Implementation (2X600 MW) (Rs. in crore)	Cost/MW/year (In Rs.)	Remarks
1	Annual Reagent Cost @14 TPH, 2000 INR/TON	22.33	1,86,150	Limestone purity > 90% PLF-85%
2	Annual Clarified Water Consumption @227 TPH, 10.5 INR/TON	1.77	14,789	PLF-85%
3	Annual Cost of APC @ 1.1% of installed capacity, 2.5 INR/UNIT	24.57	20,47,65	PLF-85%
4	Annual Fixed O&M Cost (O&M Manpower,Services, Maintenance etc.)	10.32	86,000	2% of Total FGD CAPEX
5	Annual By-Product handling cost @ 180 INR/MT	3.41	28,416	PLF-85%
6	Less: Annual By-Product sale @ 2000INR/MT	-(37.97)		
7	Annual Opex for 2X600 MW	Rs. 24.43 Crore		

8	Annual Opex per MW	Rs. 2.03 lakh

cc) CEA has not provided the basis for the computation of expenditure towards O&M. An amount of Rs. 10.32 crore has been estimated for annual fixed O&M cost (O&M manpower, services, maintenance, etc) of FGD. The Petitioner has calculated the tentative annual expenditure on account of O&M of FGD system, which is annexed with detailed computation.

dd) There would also be an impact of increase in Auxiliary Power Consumption (APC). CEA in its report has recommended an APC of 1.10%. CEA has considered total additional annual operational expenditure of Rs. 24.57 crore towards APC. However, the impact of APC cannot be quantified as the same would depend on the cost of fuel (which is dependent on escalation index, as provided in PPA) since the increase in APC would impact the Net Station Heat rate. CEA has not considered the fact that the increase in APC would have twin impact, viz. impact on capacity charge (due to decrease in Declared Capacity) and the impact on energy charges (on account of excess consumption of coal).

ee) Installation of FGD system, LNB (with OFA) etc. would lead to corresponding loss of declared capacity to the extent of 1.10% of the Available Capacity. Due to increase in APC, the Petitioner will be required to use additional coal for generation of additional power for APC thereby increasing the energy charges to be incurred by the Petitioner. Accordingly, the net heat rate should be grossed up by additional Auxiliary Power Consumption.

ff) Since the generating companies are required to incur an additional capital expenditure and recurring operational expenditure, it is imperative that the tariff is revised so as to resituate the Petitioner to the same economic position, as if such change in Law event has not occurred. The installation of FGD system would impact the tariff through (i) increase in capacity charge due to capital expenditure incurred and due to increase in APC; and (ii) increase in existing energy charge due to increase in APC, Operation and maintenance of FGD system and insurance cost.

gg) Tariff has been worked out based on certain additional factors which are explained as below:

Additional Factors	Particulars & Remarks	Reason for assumption
Debt-Equity Ratio	75:25	Norms have been considered based on prevailing banking norms for project financing.
Interest on Long term Loans	11.10%	Based on prevailing long term loan rates charged to the petitioner.
ROE (Return on Equity)	15.5%	Based on ROE available for thermal power projects as per Regulation and further grossed up for effective tax rate.
Working Capital	1.5 months of receivables, 1 month of O&M Expenses and spares at 20% of O&M expense	As per 2019 Tariff Regulations of CERC.
Interest on Working Capital	10.05%	Rate is based on prevailing market condition.
O&M expense and its escalation	5.72%	Based as per CERC 2019 regulations.
Depreciation	5.28% till 12 years from COD and balance spreading over the life of the asset	For computation of depreciation, it is considered that FGD would be ready by July 2021 in case of Unit 1 & November 2021 in case of unit 2

hh) The Petitioner published the notice inviting tenders through competitive bidding for engineering, procurement and construction, supply, erection, testing and commissioning of air quality control systems (AQCS) including Flue Gas Desulphurisation in the Dainik Bhaskar newspapers of Raipur, Bhopal and New Delhi NCR on 5.4.2018.

ii) The Ministry of Power, Government of India vide its letter dated 30.05.2018 issued direction under Section 107 of the Electricity Act, 2003 requiring this Commission to treat the 2015 Amendment Rules as a Change in Law event.

jj) The Petitioner engaged Black & Veatch to perform pre-EPC Award Owners Engineering Services. Based on the responses received by the bidders, four bidders were shortlisted by Black & Veatch. Based on the bid evaluation by Black & Veatch, bids submitted by (a) Sepco III and (b) Zhejiang TUNA

Environmental Science Co. Ltd. (in short, 'Tuna Corporation') were found to be competitive, both on technical and commercial grounds. After several rounds of techno-commercial negotiations with the short-listed bidders, Tuna Corporation emerged as the L1 bidder for installation of WFGD system. The Petitioner issued a Letter of Intent dated 13.6.2019 in favour of Tuna Corporation.

kk) The details of the bidding process etc. and the documents thereto were submitted to the Respondent vide letter dated 2.8.2019. The Respondent was informed about the 2015 Amendment Rules, the steps taken by the Petitioner and the bidding process along with pricing. The Respondent was also informed that the Petitioner will be approaching this Commission for seeking approval of cost and incremental tariff due to the Change in Law event.

ll) Thereafter, the Petitioner vide another letter dated 29.8.2019 informed the Respondent about the steps taken by the Petitioner for compliance with the revised emission norms as stipulated by the 2015 Amendment Rules. The Petitioner highlighted the fact that it has not received any response from the Respondent and thus, the Respondent is deemed to have accepted the revised emission norms as stipulated by the 2015 Amendment Rules as a Change in Law event. The Petitioner also invited the Respondent to depute any of its authorized representatives to participate and support the Petitioner in the ongoing discussions with the short-listed contractors on the date and venue so specified in the said letter. The Petitioner also sent the draft of supply contract, service contract under discussion and also copy of the LOI issued to Tuna Corporation on 13.6.2019 and sought comments of the Respondent on the LOI.

mm) In accordance with Article 10.4 of PPA, the Petitioner vide letter dated 17.12.2015 had notified about the Change in Laws event to the Respondent and provided details of Change in law and its effect on the Petitioner as required under Article 10.3.3 of the PPA. It also requested the Respondent to communicate the acceptance of the impact of Change in Law events so that supplementary bill for compensation due to occurrence of Change in Law can be raised.

nn) In continuation of the said letter dated 17.12.2015, the Petitioner, vide its letters dated 17.03.2016, 06.07.2016 and 13.09.2016 notified about the

additional events of Change in Law. However, the Respondent has neither responded to any of the above said letters of the Petitioner nor accepted the impact of such Change in Law events.

oo) The 2015 Amendment Rules are directly affecting the expenses of the Petitioner and is more than 1% of the value of the Standby Letter of Credit (i.e. Rs 70 lakhs) in aggregate for the relevant Contract Year. Thus, the Petitioner fulfils the condition laid down in Article 10.3.2 of the PPA for claiming the additional cost/ expenses incurred by the Petitioner in supplying power to the Respondent under the PPA.

Submissions of TANGEDCO

5. TANGEDCO vide its affidavit dated 26.8.2020 has submitted the following:

a) The issue of installation of FGD system being considered as Change in Law has already been decided by the Appellate Tribunal for Electricity (APTEL) vide its judgment dated 21.1.2013 in Appeal No. 105 of 2011 in the matter of JSW Energy Limited vs. MSEDCL & Anr. The ruling of APTEL is applicable to the facts of the present case. In fact, the condition in the Petitioner's Environmental Clearance is much wider than the JSW's Environmental Clearance, and requires the Petitioner to maintain separate funds for implementation of environmental protection measures along with item-wise break up and report the same on a yearly basis to MoEF&CC.

b) In terms of the conditions imposed under the Environmental Clearance dated 16.9.2010, the Petitioner was (and is) obligated to comply with the environmental norms stipulated by MoEF&CC, notified from time to time, by installing necessary emission control equipment in order to ensure that the critical emissions, such as SO_2, NOx, PM, Hg, etc., are within the prescribed limits. The Environmental Clearance further stipulated an Specific Condition to install a bi-flue stack of 275 m height with continuous online monitoring equipment to monitor the emission levels of SO_2, NOx and Particulate Matter.

c) The Environmental Clearance (EC) also required the Petitioner to provide for installation of a FGD system, and further mandated the Petitioner to allot a separate fund for its installation, which was to be included in the project

cost. The same was again reiterated under the “Standard Technical Features of BTG System for Super-critical 660/800 MW Thermal units” issued by CEA in the year 2013. CEA stipulated that a FGD system may be installed in the future to meet the requirements of pollution control and thus, the upcoming 660 MW thermal units, like the Generating Station which were commissioned in late 2014 and early 2016, were to make certain provisions.

d) Thus, the Petitioner was already aware that it has to comply with the SO_2 emission norms, prescribed from time to time, and to monitor the same. The Petitioner was also aware that for this purpose, a FGD system may be installed in future to meet the requirements of pollution control and, therefore, it has to make certain provisions for future installation of the FGD system, and for that purpose, the Petitioner was, in fact, mandated to allot separate funds which were not to be utilized elsewhere.

e) As per the conditions of EC, cost of provision of FGD should have been included in the project cost which is reflected in the fixed cost quoted by the Petitioner in the bid. It was mandatory on the part of the Petitioner to make provision for installation of FGD system in its capital cost prior to the bidding and include the same in its bid. The petitioner cannot now claim it as change in law.

f) The Petitioner was aware of the 2015 Amendment Rules and it was mandatory on part of the Petitioner to comply with the directions in a timely manner. However, the petitioner failed to take necessary steps in time and has filed the petition only on 4.10.2019. There is no explanation for not taking any action from December 2015 and for not filing the petition within the stipulated three years of limitation. The claim of the Petitioner is, therefore, time barred. The Hon’ble Supreme Court has held in the case of A.P. Power Coordination Committee Vs Lanco Kondapalli Ltd (2016) 3 SCC 468, that a claim coming before the Commission cannot be entertained or allowed if it is barred by limitation prescribed for an ordinary suit before the Civil Court. The Petitioner having failed to comply with the requirements of the 2015 Amendment Rules in time, cannot pray for the cost to be recovered through the tariff even if they come under Article 10 of the PPA.

g) The prayer for recurring incremental Operation and Maintenance expenditure of Rs. 91 crore per annum (with appropriate annual escalation from the date of petition) upon installation of WFGD system, LNB (with OFA) and other associated facilities at the Generating Station is wrong. There cannot be any O&M in the absence of FGD system. Any cost incurred by the generator due to default in compliance of the terms and conditions of EC cannot be now sought to be granted under 'Change in Law' clause of PPA.

Rejoinder of the Petitioner to the reply by TANGEDCO

6. The Petitioner in its rejoinder dated 3.3.2021 has submitted as under:

a) The provision for space in the Environmental Clearance and other documents is only to provide the requisite space for installation, so that if and when required, the FGD system can be installed. Further, the Orders/ Judgments of this Commission as also other State Electricity Regulatory Commissions have consistently held that a mere provision for space under the Environmental Clearance as also the other documents can by no stretch of imagination, purport to installation of FGD System or other pollution control measures which are otherwise not expressly stipulated under the Environmental Clearance and other documents.

b) The Respondent has referred to the general conditions of the Environmental Clearance of the Petitioner to contend that the Petitioner has to allocate and maintain separate funds for implementation of environmental protection measures as part of the project cost. The said condition for allocation of funds is be read and understood in light of the norms prevailing as on the date of issuance of Environmental Clearance. It is absurd to even suggest that the Petitioner was required to allocate required funds for implementation of environmental protection measures that were not even in existence as on cut-off date and may or may not have been introduced, more so, even without knowing the norms and parameters to be complied with.

c) The conditions of EC nowhere mandates the Petitioner to allocate separate funds for implementation of environmental protection measures that may be stipulated in future. The norms of environment protection as prevalent on

the cut-off date were as contained in the Environmental Protection Rules, 1986 and the Petitioner is in compliance of the same along with the conditions stipulated in the Environmental Clearance dated 16.9.2010.

d) As part of project cost, a sum of Rs. 588 crore was allocated across various heads including ESP, chimney, Ash Handling Unit, Ash Pond Dyke, Cooling Towers, Effluent Treatment Plant (ETP) etc. As against this, the Petitioner has actually incurred a sum of Rs. 1239 crore. The Petitioner has complied with the Environmental Clearance condition by earmarking separate funds for implementation of environmental protection measures as part of the project cost. The funds earmarked for the environment protection measures have been utilized for the said purpose.

e) The amount earmarked could have only been for such environmental measures that are contained in the EC or other documents/ legislations, as may be applicable on the date of grant of EC. In absence of any prevalent conditions/ norms, it was not possible for the Petitioner to anticipate installation of the FGD system or to demarcate funds towards the same.

f) The measures taken by the Petitioner and the amounts incurred by the Petitioner reveals that the same do not contain anything pertaining to FGD system. The fact that FGD system was not provided in the item-wise break up of cost, is only because installation of FGD system was not provided under the EC and it was only the space for FGD which was provided.

g) The Petitioner submitted Compliance Reports for period from April 2017 to September 2017 and for period from April 2019 to September 2019. The Petitioner has duly informed MoEF&CC that it has been duly complying with the terms of the EC, more specifically Clause (xix) of the EC. Further, it is an admitted position that even in the said reports, there is no stipulation of the FGD system, as alleged or otherwise.

h) A situation wherein a party is expected to comply with a measure which could have been a potential measure, in addition to the stipulated measure, is contrary to the principles of business efficacy as laid down by the Hon’ble

Supreme Court in "*Transmission Corporation of Andhra Pradesh Limited v. GMR Vemagiri Power Generation Ltd.*"

i) The Respondent has submitted that the Generating Station squarely falls under the second exception of the Ministry of Power letter dated 30.5.2018. This letter provided for the mechanism for implementation of the New Environmental Norms for Thermal Power Plants supplying power to Distribution Licensees under concluded, Long-Term and Medium-Term Power Purchase Agreements.

j) The Respondent has assumed that the Generating Station falls in exception (b) of paragraph 5.1 of the afore-mentioned letter dated 30.5.2018, which is erroneous and misconceived. The Environmental Clearance does not provide for installation of pollution control system as prescribed in the 2015 Amendment Rules.

k) As on the cut-off date, no norms for water consumption, Sulphur Dioxide, Oxides of Nitrogen, Mercury etc. were stipulated under the Environment (Protection) Act and Rules, 1986 and it was only vide the 2015 Amendment Rules that such norms were stipulated.

l) The reliance placed by the Respondent on the letter dated 30.5.2018 of the Ministry of Power, Government of India to contend that the Generating Station, being a super-critical technology plant is covered by the exceptions to the said letter is misconceived inasmuch as the Generating Station is based on sub-critical technology (2 units of 600 MW each) and not super-critical technology.

m) The Respondent has also relied on the Judgment dated 21.1.2013 passed by the Appellate Tribunal in Appeal No. 105 of 2011 titled M/s JSW Energy Limited v/s MSEDCL & Anr. to aver that the Appellate Tribunal while interpreting the conditions of Environmental Clearance in that case, which, according to the Respondent, was identical to the Environmental Clearance of the Generating Station, has held that the subsequent confirmation of installation of FGD was not a change in law. The JSW project was located in eco-sensitive zone and one of the conditions in its Environmental Clearance was that of undertaking detailed study regarding the impact of the project on the Alphonso

mango and marine fisheries. The Environmental Clearance of JSW further provided that the cost towards undertaking the study and implementation of safeguard measures will be borne by the project.

n) The Respondent has contended that the Petitioner filed the present Petition on 4.10.2019 and thus, is barred by Limitation. However, the Petitioner vide letters dated 17.12.2015, 17.3.2016, 6.7.2016 and 13.9.2016 had issued change in law notices to the Respondent.

o) The Petitioner had also preferred Petition No. 208/MP/2018 before this Commission seeking approval of the cost to be incurred by the Petitioner on account of change in law, for installation/ retrofit of 'Electrostatic Precipitators' (ESP), installation of FGD system, installation of low NOx burners, providing OFA and any other measures for compliance of the revised emission norms stipulated in the 2015 Amendment Rules. The Petitioner in hearing dated 20.3.2019 sought permission to withdraw the prayer made in the Petition with regard to the approval of expenditure to be incurred on account of amendment in Environmental Norms and installation of FGD system with liberty to approach the Commission at the appropriate stage and the same was allowed by this Commission and has never objected by the Respondent.

Analysis and Decision

7. In the light of the submissions of the Petitioner, the Respondent and documents placed on record, the following issues arise for our consideration:

Issue No.1: Whether the provisions of the PPA with regard to notice in respect of Change in Law have been complied with?

Issue No.2: Whether the 2015 Amendment Rules dated 17.12.2015 qualifies to be considered as an event of Change in Law in terms of the PPA dated 19.8.2013?

Issue No.3: Whether approval of capital expenditure can be granted to the Petitioner for incurring proposed expenditure towards installation of FGD system?

Issue No.4: Whether the approval of operating expenditure due to installation of FGD system is admissible as claimed by the Petitioner?

Issue No.5: What shall be the norms and mechanism for computing the adjustment in tariff corresponding to the additional investment and increase in

the operating costs due to the 2015 Amendment Rules so as to restore the Petitioner to same economic position as if such Change in Law event has not occurred?

We now proceed to discuss the above issues and examine the claims of the Petitioner in subsequent paragraphs.

Issue No.1: Whether the provisions of the PPA with regard to notice in respect of Change in Law have been complied with?

8. The chronology of events with regard to PPA are as under:

Cut-off date	27.2.2013
Bid Deadline	6.3.2013
PPA execution date	19.8.2013
COD of the Generating Station	26.3.2016

9. The claims of the Petitioner in the present Petition pertain to Change in Law event related to PPA dated 19.8.2013 during operation period. Article 10 of the PPA deals with notification of event of Change in Law and the same is extracted as under:

10.4 Notification of Change in Law

10.4.1 If the Seller is affected by a Change in Law in accordance with Article 10.1 and the Seller wishes to claim relief for such a Change in Law under this Article 10, it shall give notice to the Procurer(s) of such Change in Law as soon as reasonably practicable after becoming aware of the same or should reasonably have known of the Change in Law.

10.4.2 Notwithstanding Article 10.4.1, the Seller shall be obliged to serve a notice to the Procurer(s) under this Article 10.4.2, even if it is beneficially affected by a Change in Law. Without prejudice to the factor of materiality or other provisions contained in this Agreement, the obligation to inform the Procurer(s) contained herein shall be material.

Provided that in case the Seller has not provided such notice, the Procurer(s) shall have the right to issue such notice to the Seller.

10.4.3 Any notice served pursuant to this Article 10.4.2 shall provide, amongst other things, precise details of:

(a) the Change in Law; and

(b) the effects on the Seller.

10. The Petitioner had given notices dated 17.12.2015, 17.3.2016, 6.7.2016 and 13.9.2016 indicating the amendments in environmental norms and claiming them as events under Change in Law. The Petitioner had also furnished the details of its effect to the Respondent in terms of Article 10 of the PPA. However, the Respondent did not

respond to the notice of the Petitioner. Thus, in our view, the Petitioner has complied with the requirement of notice under Article 10.4 of the PPA.

Issue No.2: Whether the 2015 Amendment Rules dated 17.12.2015 qualifies to be considered as an event of Change in Law in terms of the PPA dated 19.8.2013?

11. Article 10 of the PPA which deals with Change in Law is extracted as under:

10 ARTICLE 10: CHANGE IN LAW

10.1 Definitions

In this Article 10, the following terms shall have the following meanings:

10.1.1 "Change in Law" means the occurrence of any of the following events after the date, which is seven (7) days prior to the Bid Deadline resulting into any additional recurring/ non-recurring expenditure by the Seller or any income to the Seller:

- *the enactment, coming into effect, adoption, promulgation, amendment, modification or repeal (without re-enactment or consolidation) in India, of anyLaw, including rules and regulations framed pursuant to such Law;*

- *a change in the interpretation or application of any Law by any Indian Governmental Instrumentality having the legal power to interpret or apply such Law, or any Competent Court of Law;*

- *the imposition of a requirement for obtaining any Consents, Clearances andPermits which was not required earlier;*

- *a change in the terms and conditions prescribed for obtaining any Consents, Clearances and Permits or the inclusion of any new terms or conditions for obtaining such Consents, Clearances and Permits; except dueto any default of the Seller;*

- *any change in tax or introduction of any tax made applicable for supply of power by the Seller as per the terms of this Agreement.*

but shall not include (i) any change in any withholding tax on income or dividendsdistributed to the shareholders of the Seller, or (ii) change in respect of UI Charges or frequency intervals by an Appropriate Commission or (iii) any changeon account of regulatory measures by the Appropriate Commission including calculation of Availability.

12. Article 1.1 of the PPA defines the “Competent Court of Law” as below:

"Competent Court of Law" shall mean any court or tribunal or any similar judicial or quasi-Judicial body in India that has jurisdiction to adjudicate upon issues relating to this Agreement;”

13. The terms “Law” and “Indian Governmental Instrumentality” have been defined under Article 1.1 of the PPA as under:

> *“Law” shall mean in relation to this Agreement, all laws including Electricity Laws in force in India and any statute, ordinance, regulation, notification or code, rule, or any interpretation of any of them by an Indian Governmental Instrumentality and having force of law and shall further include without limitation all applicable rules, regulations, orders, notifications by an Indian Governmental Instrumentality pursuant to or under any of them and shall include without limitation all rules, regulations, decisions and orders of the Appropriate Commission;*
>
> *“Indian Governmental Instrumentality” shall mean the Government of India, Governments of state of Tamil Nadu, Chhattisgarh, Madhya Pradesh, Maharashtra and any ministry, department, board, authority, agency, corporation, commission under the direct or indirect control of Government of India or any of the above state Government(s) or both, any political sub-division of any of them including any court or Appropriate Commission(s) or tribunal or judicial or quasi-judicial body in India excluding the Seller and the Procurer(s);*

14. As per the above definition, Law means (a) all laws including Electricity Laws in force in India; (b) any statute, ordinance, regulation, notification or code, rule or its interpretation by an Indian Government Instrumentality which has force of law; (c) includes any statute, applicable rules, regulations, orders and any notifications by an Indian Government Instrumentality pursuant to or under any of them; and (d) all rules, regulations, decisions and orders of Appropriate Commission. Indian Government Instrumentality has been defined as “the Government of India (“GOI”), Government of States where the Procurers and Project are located and any ministry or department of or board, agency or other regulatory or quasi-judicial authority controlled by GOI or Government of States where the Procurers and Project are located and includes the Appropriate Commission.

15. MoEF&CC is a Ministry under Government of India and, therefore, is an Indian Government Instrumentality in terms of Article 1.1 of the PPA. The Environment (Protection) Rules, 1986 was issued by MoEF&CC in exercise of powers conferred under Sections 6 and 25 of the Environment (Protection) Act, 1986 which

qualify as “law” in terms of the PPA dated 19.8.2013. The norms for emission of environmental pollutants to be complied with by the thermal power plants were prescribed in Schedule I of Environment (Protection) Rules, 1986. The cut-off date was 27.2.2013 and MoEF&CC issued the Environment Clearance for setting up the Generating Station on 16.9.2010. MoEF&CC notified the 2015 Amendment Rules on 7.12.2015 amending Schedule I of the Environment (Protection) Rules, 1986 which provided for revised parameters for water consumption, particulate matters, Sulphur Dioxide, Oxides of Nitrogen and Mercury in respect of thermal power plants. The cut-off date of the PPA being 27.2.2013, the 2015 Amendment Rules which were notified on 7.12.2015 by MoEF&CC, an Indian Government Instrumentality in terms of the PPA, which revised the environmental norms prescribed in the Environment (Protection) Rules, 1986, qualifies as change in law event in terms of Article 10 of the PPA dated 19.8.2013.

16. The Respondent in its reply has contended that notification of the 2015 Amendment Rules is not a Change in Law in terms of the PPA and submitted that the Petitioner was required to install FGD system as part of the Environmental Clearance accorded on 16.9.2010 for setting up the Generating Station. The Respondent has submitted that the Petitioner was required to install FGD system irrespective of notification of the 2015 Amendment Rules and, therefore, the Petitioner cannot claim cost towards installation of FGD system under Change in Law. The Respondent, in support of its claim, has submitted that condition (xix) under “General Conditions” under the Environmental Clearance mandated that the Petitioner has to allocate separate funds for implementation of environmental protection measures as part of the project cost, which the Petitioner could not have diverted. The Petitioner also had to maintain a separate fund with item-wise break up and report the same to the

MoEF&CC on yearly basis. In support of its contention that the Petitioner was required to install FGD system, the Respondent has also submitted that as mandated by the Environmental Clearance, the Petitioner was required to demonstrate the emission profile of the Generating Station on a periodic basis.

17. The Petitioner has refuted the contention of the Respondents on the ground that no emission norms for Sulphur Dioxide were prescribed before the cut-off date and, therefore, the 2015 Amendment Rules prescribing the norms of 300 mg/Nm^3 for Sulphur Dioxide is a Change in Law event. It has further submitted that the Expert Appraisal Committee (EAC) in its meeting held during 9/10.08.2010, while recommending the Petitioner's project for issuance of Environment Clearance has recorded that the provision in respect of FGD system is only in respect to the space to be provided. A mere provision of space in the Environmental Clearance cannot be construed as requirement of setting up of FGD system under the 2015 Amendment Rules, which were not in the existence at that point of time. As regards the clause (xix) of Environment Clearance relied upon by the Respondents, the Petitioner has submitted that the aforesaid clause nowhere mandates the Petitioner to allocate separate funds for implementation of environmental protection measures that may be stipulated in future. The Petitioner has submitted that as part of Project Cost, a sum of Rs. 588.70 crore was allocated across various heads including ESP, chimney, ash handling unit, ash pond dyke, cooling towers, effluent treatment plant (ETP), etc. against which a sum of Rs.1239.07 crore was actually incurred and that there was no requirement to earmark/ identify funds for setting up of FGD system.

18. As regards demonstrating emission profile of the Generating Station on a periodic basis, the Petitioner has submitted that as on the cut-off date, only the ambient air quality standards (grounds level concentration) for SO_2 and NOx gases

were specified by CPCB which is known as the National Ambient Air Quality Standard (NAAQ). The concentration in ambient air for SO_2 as per the NAAQ was 80 µg/m^3 (annual average) and 120 µg/m^3 (24 hours average) on the cut-off date. Similarly, the stipulated concentration for NOx at ground level was 80 µg/m3 (annual average) and 120 µg/m3 (24 hours average) on the cut-off date. On the other hand, the 2015 Amendment Rules introduced new norms for SO_2 and NOx emissions at the outlet of the chimney. The new norms require the compliance measurement of SO2 and NOx emissions respectively at the outlet of chimney/ stack of a power plant in place of NAAQ (ground level concentration) for SO_2 and NOx that were specified by CPCB which is measured in the outdoor/ open air and that too near the ground level.

19. We have considered the submissions of the Respondent and the Petitioner. Relevant provisions contained in the Environmental Clearance (16.9.2010), Permission to Establish (5.2.2011) and Consent to Operate (3.10.2013) are as under:

a) Environmental Clearance dated 16.9.2010

"(x) Provision for installation of FGD shall provided for future use. High Efficiency Electrostatic Precipitators (ESPs) shall be installed to ensure that particulate emission does not exceed 50 mg/Nm^3"

b) Permission to Establish dated 5.2.2011

"13. Space provision for installation of fuel gas de-sulphurisation plant (FGD) shall be made so that the same could be installed, if required from environmental angle"

c) Consent to Operate dated 3.10.2013

"8. Space provision for installation of fuel gas de-sulphurisation plant (FGD) shall be made so that the same could be installed, if required from environmental angle"

20. The relevant extracts of the Environment clearance dated 16.9.2010 with regard to SO_2 emission norms and the FGD system is as under:

"A. Specific Conditions:

……

(ii) Sulphur and ash contents in the coal to be used in the project shall not exceed 0.5% and 34% respectively at any given time. In case of violation of coal quality at any point of time fresh reference shall be made to MoEF for suitable amendments to environmental clearance condition wherever necessary.

(iii) A bi-flue stack of 275 m height shall be provided with continuous online monitoring equipments for SOx, NOx and Particulate Matter. Exit velocity of the flue gases shall not be less than 22 m/sec. Mercury emission from stack may also monitored on periodic basis.

……

(x) Provision for installation of FGD shall be provided for future use / High Efficiency Electrostatic Precipitators (ESP) shall be installed to ensure that particulate emission does not exceed 50 mg/Nm^3. Adequate dust extraction system such as cyclones / bag filters and water spray system in dusty areas such as in coal handling and ash handling points, transfer areas and other vulnerable dusty areas shall be provided.

……

B. General Conditions:

……

(x) Regular monitoring of ground level concentration of SO_2, NOx, $PM_{2.5}$ & PM_{10} and Hg shall be carried out in the impact zone and records maintained. If at any stage these levels are found to exceed the prescribed limits necessary control measures shall be provided immediately. The location of the monitoring stations and frequency of monitoring shall be decided in consultation with SPCB. Periodic reports shall be submitted to the Regional Office of this Ministry. The data shall also be put on the website of the company.

……

(xv) The proponent shall upload the status of compliance of the stipulated EC conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of MoEF, the respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely; SPM, RSPM (PM2.5 & PM10), SO_2. NOx (ambient level as well as stack emissions) shall be displayed at a convenient location near the main gate of the company in the public domain.

……

(xix) Separate funds shall be allocated for implementation of environmental protection measures along with item-wise break-up. These costs shall be included as part of the project cost. The funds earmarked for the environment protection measures shall not be diverted for other purposes and year-wise expenditure should be reported to the ministry."

21. It is clear that the Environment Clearance dated 16.9.2010, Permission to Establish dated 5.2.2011 and Consent to Operate dated 3.10.2013 only required

making provision for space for FGD system, if required at a later stage. It is nowhere mentioned that there was requirement to actually install FGD system in the Generating Station.

22. The Commission vide ROP (record of proceedings) for the hearing held on 27.2.2020 directed the petitioner to submit the details of the funds earmarked and considered as a part of project cost for the environmental protection measures as per clause (xix) of EC. It is clear from the submissions of the Petitioner that environmental protection measures for which the funds of around Rs.588 crore were earmarked, did not include the FGD system.

23. We also do not find any substance in the argument of the Respondent as regards demonstrating emission profile of the Generating Station on periodic basis as was in existence on cut-off date. While as on cut-off date, the requirement was to adhere to NAAQ (that were measured near the ground level), the 2015 Amendment Rules mandated specific norms for SO_2 and NOx to be measured at outlet of chimney/ stack of a generating station. Also, the levels of allowed emission differ widely as on cut-off date and as per the 2015 Amendment Rules.

24. In view of the above, we do not agree with the contention of the Respondent that the Petitioner was required to install FGD system and that funds were required to be earmarked for that purpose and also that the norms of SO_2 and NOx notified by the 2015 Amendment Rules were to be complied with by the Petitioner as on cut-off date.

25. TANGEDCO has also relied on the Appellate Tribunal's judgment dated 21.1.2013 in Appeal No. 105 of 2011 in the case of JSW Energy Limited v. Maharashtra State Electricity Distribution Co. Ltd. & Anr (in short, "the JSW Case"), wherein it was held as under:

"50. Summary of Our Findings

(ii) The Environmental Clearance dated 17.5.2007 provided for installation of the FGD at a later stage. It further mandated that separate funds must be allotted for installation of the said FGD, which are to be included in the project cost. Admittedly, these conditions have not been complied with by the Appellant after getting the Environmental Clearance.

(ii) On a careful perusal of the relevant clause of the PPA, the Environmental Clearance dated 17.5.2007 and the letter issued by the Central Government on 16.4.2010, it is clear that there is no "Change in Law" as contemplated by the PPA. In fact, the letter dated 16.4.2010 issued by the Central Government merely confirms the requirement of installation of the FGD intimated through the letter dated 17.5.2007. It merely informs the Appellant the state of the installation of the FGD. Therefore, there is no "Change in law" as claimed by the Appellant. The reasonings given in the impugned order for rejecting the claim of the Appellant are perfectly valid in law."

26. However, we note that vide judgment dated 28.8.2020 passed by the Appellate Tribunal in Appeal No. 21 of 2019 & batch in the case of Talwandi Sabo Power Ltd. v. Punjab State Electricity Regulatory Commission & Anr., the Appellate Tribunal held as under:

"97. It is also seen that the environmental clearance granted by MoEF & CC for thermal power projects prior to revised norms of 2015 with reference to installation of FGD system broadly categorized into two types. One category covers the projects which were given environmental clearances similar to that of the Appellants envisaging a condition that a space provision is to be kept for the installation of the FGD equipment if required at a later stage in terms of environmental Regulations. The other category of environmental clearance is where MoEF & CC specifically mandated installation of FGD equipment as a statutory requirement.

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99. Therefore, in all those thermal power projects where there was requirement of only space provision, it is difficult to accept the contention of the Respondents that in spite of absence of specification and design for FGD, the Appellants were still required to estimate the cost and earmark funds anticipating revised norms after six years or so from the cut-off date. ....Depending upon the requirement in terms of conditions of EC recommended by relevant authority some thermal plants like JSW, Adani etc., might have installed FGD system. But one has to see what were the existing norms, conditions imposed in EC or other allied documents before notification in question and not the availability of FGD system in the market. As already stated, anticipating such change, substantial cost cannot be included as capital cost of the project at the time of bidding itself. If such requirement of FGD did not occur during the entire term of the Project, the consumer would be burdened with higher tariff. As a matter of fact, such substantial and significant cost as part of capital cost of the project would not have been approved at all.

----

102. The Respondent-Commission opined that requirement for installation of FGD equipment was already envisaged as part of environmental clearance for the project, therefore, it does not amount to Change in Law event. We note from the records and the documents relied upon by the Appellants that a standard clause was introduced in the ECs for many of the thermal power projects i.e., only the provision for space for the installation of FGD. As discussed above, there was no clarity on any of the norms for

SO2 and NOx emission, which required specific FGD system and/or SNCR or any other suitable technology for achieving efficiency level as existed at the time of granting ECs. One cannot find fault with the Appellants or any other project of similar nature with similar facts that they did not estimate and earmark funds for the installation of such mechanism as stated above. Therefore, we are of the opinion that installation of FGD and funds for the same was not contemplated or envisaged in the ECs, which were issued six year prior to the Notification in question.

103. It is pertinent to mention Para 58 of "Energy Watch Dog & Ors vs. CERC" (2017 (14) SCC 80) on this issue. The Hon'ble Supreme Court Categorically rejected the submissions advanced by the Appellants before the Apex Court that the relevant policy (controversy pertaining to Change in Law event in Energy Watch Dog's case) was announced much prior to the effective date, therefore, it has to be presumed that Generators were aware of such policy much prior to the effective date or promulgation of the revised norms.

…..

104. It is clear from the above opinion of the Apex Court that Law does not work on contemplations unless an action factually takes place i.e., cause of action for such action. We also place reliance on the Judgment of the Hon'ble Supreme Court in "Ahmedabad Municipal Corp. vs. Haji Abdulgafur" (1971) 1 SCC 757. Therefore, we have no hesitation to opine that installation of FGD became mandatory only after the issuance of Notification in December 2015 and the strict compliance came to be implemented when directions of CPCB came to be issued in this regard.

105. According to the Respondents, the judgment of this Tribunal in JSW's case is binding on this Tribunal as settled position. Even otherwise, one has to see whether facts and circumstances in the instant appeals and facts and circumstances in JSW's case are one and the same. Based on the judgment of JSW's case, the Respondent-Commission denied the claim of Appellants pertaining to Change in Law event.

106. On perusal of records and documents, we note that there were two ECs in the case of JSW. Appellants stand is that apart from requirement of space provision for installation of FGD, if required at a later stage, it also conditioned installation of FGD and earmarking of funds for environmental protection measures i.e., FGD system. The Appellant-NPL brings on record the distinguishing facts of their appeal with JSW case, which reads as under:

……

109. It is well settled legal principle that a little difference in facts or additional facts may make a lot of difference in the precedential value of a decision. In this regard, reliance is placed on the decisions of the Hon'ble Supreme Court in "Zee Telefilms Ltd. vs. Union of India" (2005 (4) SCC 638 (para 254); "P.S. Sathappan vs. Andhra Bank Ltd." (2004 (11) SCC 672) "Bhavnagar University v. Palitana Sugar Mills Pvt. Ltd." (2003 (2) SCC 111) and "KTMTM Abdul Kayoom & Anr. v. Commissioner of Income Tax, Madras" (AIR 1962 SC 680).

110. Therefore, one significant factual difference can change the determination of a legal principle. It is also a well settled legal principle that each case has to be considered and disposed of in the factual matrix pertaining to the said case.

111. Before issuing ECs pertaining to the Appellants there must have been environment study of the area of the projects and also allied assets of the projects. In JSW case because of existence of marine life i.e., fisheries and Alphanso Orchids, Krishi Vidyapith was requested to make a study of environmental impact on the surroundings situated within 10 kms radius from the project and allied assets of the project. This study led to requirement of installation of FGD system and accordingly second EC incorporating

above condition including earmarking of funds was mandated. JSW itself undertook to comply with the conditions recommended in the report of Krishi Vidyapith if necessary for controlling the impact of the power plant on the surrounding environment. Contrary to this position, in the case of projects in question, there is no such ecologically sensitive area within 10 kms radius of the projects in question. As stated above, such conditions were imposed for the power projects of Assam and Chittinad. Therefore, we agree with the contention of the Appellants that though a standard condition of provision for space demarcation for FGD was mentioned in all the ECs, but depending upon facts and circumstances pertaining to each project, ECs were granted with condition of installation of FGD and the funds required for the same to be earmarked.

112. The ECs of the projects of the Appellants, no doubt, at condition (vi) only refer to provision of space if required at a later stage was made, but there was no specific condition mandating earmarking of funds for FGD installation for SO2 or SNCR or any other suitable mechanism for NOx.

….
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 SO2 and any suitable system to control NOx 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.
…….

127…….Apparently, in ECs pertaining to the instant appeals there is no condition of earmarking of funds for SNCR/any other suitable technology for controlling NOx emissions. It is not in dispute that the existing low NOx burners with over fire assembly installed may not ultimately achieve the prescribed NOx levels. This is clearly mentioned in the feasibility reports prepared by Tata Consulting Engineers Limited. In terms of PPA, change in legal position during "operation period", which has an adverse financial impact on the projects of the Appellants, would definitely quality as a Change In Law event.

27. Appellate Tribunal in the aforesaid judgment observed that a standard clause was introduced in the EC for many of the thermal power projects that required only the provision for space for the installation of FGD system and in such cases, there was no specific mandate for installation of FGD system and/or SNCR or any other technology for reduction of SO_2 or NOx. We note that in the present case also, in the EC granted to the Petitioner, it is only mentioned that the space is to be provided for FGD, if required at a later stage and as in case of EC granted to various other TPPs, there is

no specific stipulation provided towards installation of FGD system and/or SNCR or any other such technology.

28. Further, APTEL in the above judgment has also distinguished its earlier judgment in JSW Case by observing that in JSW Case, there were two ECs. In JSW Case, because of the existence of marine life i.e. fisheries and Alphanso Orchids, Krishi Vidyapith was requested to make a study of environmental impact on the surroundings situated within 10 km radius from the project and allied assets of the project. The initial EC granted in JSW Case itself incorporated a condition that "...*The detailed study regarding the impact on Alphonso mango and marine fisheries as recommended in the report of Dr. B. S. Konkan Krishi Vidyapith Shall be undertaken. Based on same, addition safeguard measures as required will be taken by the proponent.....The cost towards undertaking the study and implementation of safeguard measures, if any, will be borne by the project.*" The said study led to requirement of installation of FGD system and accordingly, second EC was granted to JSW Energy Limited after incorporating above condition including earmarking of funds was mandated. However, Appellate Tribunal observed that in the case of Talwandi Sabo and Nabha Power, EC granted only required to make provisions for space for installation of FGD, if required.

29. We note that in the case of the Petitioner as well, EC mandated provision for space only and there is no specific requirement for installation of FGD system. Therefore, the argument of TANGEDCO comparing the present case with that of JSW Case has no basis and deserves to be rejected.

30. The Petitioner has submitted that the 2015 Amendment Rules stipulate that NOx emission at the stack outlet level shall be kept below 300 mg/Nm^3. Before the

2015 Notification, there was no emission norm to be met at stack outlet level and the norm for NOx as on cut-off date was only in terms of ground level concentration. The Generating Station is fitted with low NOx burners and presently NOx range in Unit-I is from 361.518 to 365.315 mg/Nm^3 and in Unit-II is from 507.606 to 512.574 mg/Nm^3. In order to comply with the revised norms of NOx, the Petitioner is required to install the new LNB (Low NOx Burners) with OFA (Over fire Air). Further, the Petitioner has submitted that after comparing different NOx emission control technologies for the Generating Station, keeping inview the level of NOx emissions, as also the pollutant percentage reduction required and after considering the cost effectiveness on continuous basis, INR/ tons of pollutant removed, the new LNB (with OFA) is considered to be the most viable system for meeting the new NOx standards.

31. The Respondent has submitted that the Petitioner's contention is wrong and misconceived as CEA in the year 2013, had issued CEA Regulations titled "Standard Technical Features of BTG System for Super-critical 660/800 MW Thermal units" which had stipulated limit on NOx emission and was binding on the upcoming 660 MW thermal units, like that of the Petitioner which were commissioned in late 2014 and early 2016. As per the Respondents, the limits on NOx emissions stipulated under CEA Regulations are much more stringent than the ones provided under the 2015 Amendment Rules. The Respondent has also submitted that the Petitioner should explore the possibility in which the existing low NOx burners would serve the intended purpose of achieving the NOx limit stipulated by the 2015 Amendment Rules.

32. The Petitioner has submitted that the Generating Station is based on sub-critical technology while norms of CEA were for power plants based on super-critical technology. It has submitted that, therefore, the contention of the Respondent is not correct.

33. Having considered the submission of the TANGEDCO and the Petitioner, we note that TANGEDCO's argument has no basis.

34. We also note that as per subsequent MOEF&CC notification dated 19.10.2020, NOx emission level has been revised to 450 mg/Nm^3 (for the plants commissioned after 1.1.2003 and up to 31.12.2016) from 300 mg/Nm^3 limit fixed by the 2015 Amendment Rules dated 7.12.2015. The Generating Station is already fitted with low NOx burners and NOx emission level of Unit-I is from 361.518 to 365.315 mg/Nm^3 and in Unit-II is from 507.606 to 512.574 mg/Nm^3. Thus, NOx emission level from Unit-I is within the permissible limit. The two units being similar, we are of the view that there should not be such difference in NOx emission levels between the units. The Petitioner should approach the OEM for operational/ technical solution to bring down the NOx emission levels of Unit II (507.606 to 512.574 mg/Nm^3) in the range of Unit-I NOx emission levels (361.518 to 365.315 mg/Nm^3) or at least within norms specified as per the 2015 Amendment Rules. Accordingly, the Commission is not inclined to allow any expenditure claimed by the Petitioner for implementation of LNB (with OFA) at this stage.

Issue No.3: Whether approval of capital expenditure can be granted to the Petitioner for incurring proposed expenditure towards installation of FGD system?

35. The Petitioner approached CEA for approval of suitable technology with the feasibility report on 7.1.2019. CEA vide letter dated 21.2.2019 has recommended suitable FGD technology and corresponding indicative base cost for the Generating Station. CEA also suggested that the FGD system installation should be done through the process of open competitive bidding in consultation with the Respondent. Relevant extracts from CEA's report as regards technology and cost aspects,are as under:

"TECHNOLOGY:

Wet FGD (Lime stone based) may be considered. The nearest source of reagent is about 214 km to the site. However, actual sources of reagent may be selected based on availability of limestone, limestone purity, cost, quality, detail engineering and logistics to DB power. Additionally, Source of limestone should be chosen with lifecycle cost analysis comparing "Costs related to Limestone supply to the site V/s Optimum Salability of By-product i.e. Gypsum."

ENGINEERING ASPECTS

1. *Individual FGD for each unit.*
2. *Limit SO_2 below environment norms with up to 0.5% Sulphur content in coal.*

……

9.The maximum Additional Auxiliary power Consumption (APC) complete FGD facilities is 1.1%.

CAPEX

The cost of retrofitting FGD for the plant should be discovered through open competitive bidding in consultation Representative of RRUVNL for which RRUVNL has been informed vide Letter ref:44/FGD/UMPP/CEA/2019/124 DTD:23.01.2019. The indicative base cost works out to be Rs. 0.44 Cr./MW.The above indicative cost is "Base Cost" only and does not include Taxes-Duties & other financial miscellaneous costs.

OPPORTUNITY COST:

Since interconnection of newly lined chimneys or New wet stack with absorber may result in loss of generation of the plant, hence DB Power is advised to minimize this interconnection time by taking suitable measure so that the "Opportunity cost" associated with interconnection may have least impact on CAPEX and eventually on tariff revision.

36. Through prayer (b) in the instant Petition, the Petitioner has requested for provisional approval of capital expenditure of Rs. 547 crore and also for approval of recurring annual operating expenditure on account of installation of FGD system, LNB (with OFA) and other associated facilities. As regards LNB (with OFA), we have already held under Issue No. 2 that, at this stage, we are not allowing any expenditure for that purpose and the Petitioner needs to take steps to bring NOx emission levels of Unit-II to the same level as Unit-I of the Generating Station.

37. Through a competitive bidding process, the Petitioner has already selected a vendor (Tuna Corporation) for installation of FGD system. We also take note of the fact that the installation of FGD system in thermal power stations is being monitored by the Hon'ble Supreme Court. Also, the lender needs comfort while granting loan to the Petitioner for undertaking capex for installation of FGD system.

38. Ministry of Power has recognised the problems being faced by generating companies on account of financial institutions seeking assurance of fund flow after installation of FGD system. The Ministry of Power, vide its letter dated 21.1.2020, addressed to Secretary to Forum of Regulators (who is also Secretary to the Commission), stated as under:

> *"2. A copy of the minutes of the meeting held in Ministry of Power on 21.10.2019 with Banks/Financial Institutions regarding issues related to financing of FGDs is enclosed wherein as per Para 4.2 inter alia mentioned as follows:*
>
> *"IPPs requested that provisional tariff on account of FGD may be allowed as Banks arenot willing to finance unless there is clear cut CERC orders on additional tariff, whichcould be possible only when FGD is commissioned. It was requested that based on the estimation of cost by CEA, CERC may fix provisional tariff after allowing some discount (say 10%). Chairperson, CEA informed that they had drafted some norms on provisional tariff and it had been sent to CERC for consideration. Hon'ble Minister advised CEA to follow up with CERC and this issue may be taken up in the Forum of Regulators (FOR) meeting which could be convened at the earliest. The matter regarding fixation of provisional tariff on account of FGD installation may be discussed with CERC."*
>
> *3. In this regard, CEA has informed that:*
>
> *i. Financing of pollution control equipment is mainly an issue for the projects commissioned under section 63 of the Act.*
>
> *ii. During discussion, CERC pointed out that a few generating companies, which have set up generating station under section 63 of the Act have filed petition for compensation due to change in law impacting revenue and cost during the operating period.*
>
> *iii. CERC has already passed some orders in such petitions recommending requirementof installing additional equipment to meet revised environmental norms as change in law and giving liberty to the Petitioner to approach to the commission for determination of revised norms.*

iv. CERC was of the opinion that normally such assurance from regulator should be sufficient for the lenders to fund additional capital expenditure required to meet revised environmental norms.

4. In view of the above, it is requested that the issue on 'provisional tariff' on account of installation of FGD, may be included as an Agenda for the next Forum of Regulators (FOR) meeting and the decision taken, therein, may be communicated to Ministry of Power, at the earliest."

39. Further, the Ministry of Power vide its letter dated 20.4.2020 addressed to the Secretary of the Commission, has stated as under:

"I am directed to refer to the meeting taken by Secretary (Power) through Video Conferencing on 09.04.2020 (copy of the meeting are enclosed as Annex-I) and this Ministry's letter of even number dated 21.01.2020 (copy enclosed as Annex-II) with regard to taking up the matter with Forum of Regulators on the above mentioned subject. It was observed that CERC was also contemplating to amend the Tariff Regulations 2019-24 to provide for norms for installation of FGDS for complying with the environmental operating norms as Change in Law.

2. In the above-mentioned meeting held on 09.04.2020, it was recommended that in view of the stipulated timelines decided by the Hon'ble Supreme Court for installation of FGDs, investment approval may be accorded by CERC at the earliest possible on applications of FGD_S submitted by Gencos based on the CEA"s benchmark cost and indicative technologies so as to facilitate funding of banks/ FIs. It was also felt that upon completion of the installation of FGD or a month before the completion of installation, theapplications for fixation/revision of tariff may be filed and CERC would, as far as possible, dispose them in a time frame of 3 months so that the Gencos are not cash strapped and the lenders feel assured. Similar process may also be taken up by CERC with SERCs.

3. Accordingly, CERC is requested to take necessary action and devise a mechanism vide which applications of Gencos for installation of FGD as per norms of CEA, gets decided by the Appropriate Commission within a period of three months for Investment approval. The same is expected to facilitate assurance for lenders on their lending to Gencos for installation of FGD.

4. This issue with the approval of Hon'ble Minister of State (IC) Power and NRE."

40. The Respondent has raised concerns about various elements of the provisional capital cost claimed by the Petitioner. It has submitted that the Petitioner is making claims for several components which are not contemplated to be compensated under the framework of competitive bidding under Section 63 of the Electricity Act, 2003 since tariff has been discovered through bidding process and is not a case of determination of tariff.

41. Per contra, the Petitioner has submitted that the Clause 10.2.1 of the PPA provides that the purpose of compensating the party affected by Change in Law is to restore the affected party to the same economic position as if such Change in Law has not occurred. The cost and expenses expected to be incurred by the Petitioner and claimed in the Petition are only due to implementation of the new environmental norms mandated by the 2015 Amendment Rules and not otherwise.

42. CEA vide its letter dated 21.2.2019 has made recommendations as regards cost for installation and operation of FGD system for the generating station. On 13.6.2019, pursuant to competitive bidding process, the Petitioner selected Tuna Corporation as qualified vendor for installation of the FGD system and issued Letter of Intent. The break-up of capital expenditure for the WFGD system for the Generating Station claimed on the basis of bidding results as compared with CEA recommended cost is as under:

Sr. No.	Description	DBPL Capex Estimate (Rs. Crore)	DBPL Capex Estimate (Rs. Crore/MW)	CEA's Indicative Cost (Rs. Crore/MW)
1	**FGD main package**			
1.1	Off shore Basic Value	133		
1.2	On shore Basic Value	157		0.44
1.3	Import Duty + GST Offshore	39		
1.4	GST Onshore	28		
2	**Total FGD EPC Basic Cost**	**357**	**0.297**	**0.44***
3	**For NOx Control:** Hard Cost (Over-Fire Air Damper and Burnermodifications) including Taxes	30	**0.025**	
4	Other Asset	13		
5	Pre -Operative Expenses	61		
6	Trial Run Costs	20		
7	Margin money for working capital	6		
8	Contingency	19		
9	IDC @11.10% Interest rate for 24months	40		
10	**Total Capex**	**547**	**0.4558**	

** includes hard cost and opportunity cost for FGD only.*

43. We note that CEA in its recommendation has stated that:

"……The indicative base cost works out to be Rs. 0.44 Cr./MW. The above indicative cost is "Base Cost" only and does not include Taxes-Duties & other financial miscellaneous costs."

44. Further, CEA in its recommendation has provided the break-up of the above-mentioned indicative cost and stated as under:

"*Estimated/Indicative CAPEX of FGD with Existing Chimney Lining.*

Sr. No.	***Particulars***	***Basic Value (Rs. Cr/MW)***
1	*Main Equipment Cost*	*0.215*
2	*Cost of Spares*	*0.016*
3	*Freight, Insurance and Transportation*	*0.007*
4	*Civil and Steel Works*	*0.117*
5	*Installation Services*	*0.035*
6	*Opportunity Cost for interconnection*	*0.050*
Total CAPEX		***0.44****

**The above indicative CAPEX cost is "Base Cost" only and does not include the Taxes, Duties & other financial miscellaneous cost."*

45. It is thus clear that the cost recommended by CEA is an indicative cost. CEA has also stated that the costs are "base cost" only. The generating companies such as the Petitioner are required to discover the price through transparent competitive bidding process in consultation with the Procurers. Therefore, while approving the cost for installation of FGD system, the Commission needs to take a view on reasonableness of claimed costs based on (i) whether the cost has been discovered through transparent competitive bidding process in consultation with the Procurers and (ii) how does the discovered cost compare with the indicative cost of CEA.

46. The Petitioner has placed on record the letters dated 2.8.2019, 29.8.2019, 3.9.2019 and 11.9.2019 vide which it explained to the Respondent the procedures and processes adopted for selecting the successful bidder and made available copies of relevant documents such as tendering documents, LOI etc. It also invited the Respondent to take part in the techno-commercial discussions with the short-listed

vendor. The Petitioner has also given the details to the Respondent. However, the Respondent TANGEDCO chose not to respond to the letters. It neither sent its representative to be involved in the process of bidding. Based on the material placed on record, we are convinced that the Petitioner did take steps to consult the Respondent while undertaking the bidding process for installation of FGD.

47. With regard to bidding process, we observe as under from the submission of the Petitioner:

a) The Petitioner had prepared a Detailed Project Report (DPR) through M/s Black & Veatch for installing and operating the various equipment required for the Generating Station to comply with the revised norms as mandated by the 2015 Amendment Rules.

b) The technical specifications provided in the DPR were incorporated in the tendering process. The bidding document also took into account the recommendations made by CEA.

c) The Petitioner published the notice inviting tenders through competitive bidding for engineering, procurement and construction, supply, erection, testing and commissioning of Air Quality Control Systems including flue gas desulphurisation for its project in the Dainik Bhaskar newspaper of Raipur, Bhopal and New Delhi NCR on 5.4.2018.

d) Black & Veatch further carried out a detailed evaluation of the bids. Based on the bid evaluation by Black & Veatch, bids submitted by (a) Sepco III and (b) Tuna Corporation were found to be competitive, both on technical and commercial grounds.

e) The Petitioner had several rounds of techno-commercial negotiations with the two bidders and the bid submitted by Tuna Corporation emerged as L-1 for installation of WFGD system for control of SO_2 emissions.

f) Thereafter, the Petitioner issued Letter of Intent dated 13.6.2019 in favour of Tuna Corporation for Design, Engineering, Supply of all required

materials, equipment and associated accessories, fabrication, erection, testing & commissioning including civil works for FGD system in the Generating Station. Pursuant to the above, Contracts were executed by Petitioner with Tuna Corporation on 26.9.2019 and FGD package has been accordingly awarded.

48. Based on the above submissions of the Petitioner, we are of the view that hard cost as claimed by the Petitioner has been discovered through a transparent competitive bidding process.

49. With regard to reasonableness of the hard cost claimed by the Petitioner based on the outcome of bidding process, it is observed from the Petitioner's Letter of Intent dated 13.6.2019 and letter dated 2.8.2019 to the Respondents that hard cost for "FGD main package" discovered through competitive bidding by the Petitioner is Rs. 284.38 crore, the breakup of which is as under:

(In Rs. crore)

Description	**Cost**
Off shore Basic Value: (as per competitive bid is USD 18174000; @ Rs. 70/ USD)	127.22
On shore Basic Value	157.16
Total Hard cost for FGD	**284.38**

50. Para 3 of the LOI dated 13.6.2019 given by the Petitioner in favour of Tuna Corporation. reads as under :

> *"3.1 Offshore Contract price as indicated in clause no. 2.1.1 above shall be inclusive of all taxes and duties as applicable in china and India except Custom duty and IGST which shall be paid by DBPL extra at actual.*
>
> *3.3 Onshore Contract price as indicated in clause no. 2.1.2 above shall be inclusive of all applicable taxes and duties as applicable in India except GST which shall be paid by DBPL extra at actual.*

As per the above provision the offshore contract price is inclusive of all taxes except Custom duty and IGST. Similarly, the onshore contract price is inclusive of all taxes except GST. The Custom Duty and GST shall be payable by the Petitoiner at actual.

51. Thus, the hard cost discovered from competitive bid works out to be Rs.0.237 crore/MW (Rs. 284.38 crore for 1200 MW). However, hard cost recommended by CEA in its report is Rs. 290 crore (Offshore basic value of Rs. 133 crore and On shore basic value of Rs. 157 crore) excluding import duty and GST (Off shore and on shore). Cost discovered through competitive bidding is less than the CEA recommended hard cost. Considering the fact that the hard cost of Rs. 284.38 crore for installation of WFGD system has been discovered based on open competitive bidding and is less than indicative cost recommended by CEA, the Commission allows the hard cost discovered by the Petitioner for the "FGD main package" on provisional basis.

52. In view of the above, we accord approval to the Petitioner for incurring following hard cost on provisional basis:

Sr. No.	Description	DBPL Capex Estimate (Rs. crore)	DBPL Capex Estimate (Rs. crore/MW)	Provisional Capex Allowed (Rs. crore/MW)
1	FGD main package	357	0.298	0.237
2	NOx control (LNB & OFA)	30	0.025	Nil
3	**Total Basic Cost**	**387**	**0.323**	**0.237**

53. CEA, in its report, has observed that the generating station may be allowed to recover the opportunity cost i.e. the capacity charges lost during shutdown of the generating units for inter-connection of chimney with the absorber. However, CEA has not specified number of days for which units would have to be shut down for interconnection of FGD system with the chimney. CEA has opined that shutdown period can be minimized by taking suitable measures. In this regard, as per the Petitioner's estimate, the installation of FGD package would lead to outage of about 22 days for each unit thereby reducing the recovery of capacity charges for that period. We are of the view that the Respondent and the Petitioner shall plan the interconnection of FGD system with main plant by synchronizing it during annual

overhaul. Therefore, we are not allowing opportunity cost at this stage. However, the same would be considered based on the actual number of days of shutdown after prudence check. The Petitioner is advised that it shall synchronize the interconnection of FGD system with annual overhaul in consultation with the Procurer.

54. Apart from shutdown period of 22 days, the Petitioner has submitted that for installing WFGD system, modification to the existing stack would be required as the existing stack will have to be lined with flake glass coating/ borosilicate glass lining. The Petitioner has submitted that the outage required for lining the stack would be around 5 months, which would result in significant availability loss for the Petitioner under the long term contract with the Respondents. We are of the opinion that such outage, for which the Procurer shall be liable to pay the compensation as capacity charges, will put the Procurer in a position of commercial suffering. In this regard, we take note of CEA's recommendations forwarded vide letter dated 21.2.2019, wherein CEA has weighed the alternatives available to the Petitioner for use of existing chimney vis-à-vis creation of new chimney, as follows:

CHIMNEY
STUDY

In feasibility report DBPL has opted for constructing a new RCC chimney with 02 steel flues instead going for corrosion protecting lining of existing chimney. Hence this chapter further deals with the details for selecting the above proposed option and the methodology being adopted for 2 x 600 MW DBPL.

To comply with new emission norms, assessment of following different options are available for new or existing stack were carried out so that to select the techno-commercially optimum solution for DBPL plant:

Option I

To modify/ change existing chimney flue by applying suitable corrosion resistant lining material which can withstand corrosive environment due to moisture laden post treatment flue gases after FGD installation takes place.

Option II

Construction of new RCC Chimneys with suitable corrosion resistant lining material which can withstand corrosive environment due to moisture laden post treatment flue gases after FGD installation takes place.

1.1 Option 1 – Corrosion Protecting Lining of Existing Chimney:

Currently there are various materials & technologies are available in the industry ----------

--- can resist the sulphur based acids and which can be used for protection of steel flues as below.

I. *Borosilicate Block lining*
II. *Steel Alloy lining*
III. *Glass flake filled epoxy phenol novalac.*
IV. *Glass flake lining.*

METHODOLOGY FOR USING EXISTING WET CHIMNEY:

Step-01

The appropriate corrosion protection lining works of the flues of existing chimneys shall start once the erection works of the FGD absorbers along with auxiliaries will be completed with temporary chimney over absorbers. While the lining works of the existing chimney flues under progress, the scrubbed flue gas from absorber outlet will be passed through the temporary chimney above the absorbers.

The Temporary chimney shall be above absorber in the form of cylindrical bolted shells along with isolating between absorber top and Chimney inlet.

Step-02

Once the lining works of the flute Cans of the existing chimneys is completed, the Isolating damper between the absorber and temporary chimneys above absorber will be closed and scrubbed flue gas from absorber outlet will be routed through the existing newly lined chimney.

Step-03

The Temporary chimney will then be de-bolted and removed. Schematic of the temporary chimney absorber and pictures showing the bolted chimney is shown in the pictures below:

The above scheme would save the longer shutdown time required for Block work of the existing chimney.

1.2 Option II - New Wet Stock

Based on recent MoEF guidelines, instead of modifying by lining of existing chimneys, there is an option to construct new chimneys with suitable lining material. In DB power plant case, the typical height of new chimney will be approx. 130 m. There is an option of going for 2 independent chimneys for 2 units or following existing pattern of two twin flue chimney.

OR

New permanent Chimney above absorber of Steel/FRP.

Conclusion of stack options:
Through citing to economic feasibility DBPL has opted for constructing a new RCC chimney with 02 steel flues but final selection may only be made after conducting a lifecycle cost benefit analysis and seeing technical feasibility of available options before opting any of the above mentioned options."

55. The report indicates that initially the Petitioner had chosen for construction of new chimney. Subsequently, the Petitioner has chosen to use existing stack for which the same needs to be lined with the flake glass coating/ borosilicate glass lining and outage period for such lining has been claimed as five months. To eliminate/ minimize the time required for lining, the Petitioner shall strictly follow the methodology suggested by CEA for using the existing chimney which has three steps and envisages use of temporary chimney while the existing chimney is being lined. CEA report explicitly indicates that this three-step process would help to avoid the longer shutdown period required for block work of existing chimney. Further, with the use of temporary chimney, the FGD system can be declared operational while the lining of the existing chimney is underway as a parallel activity. Once the lining of the existing chimney is complete, the isolating damper between the absorber and temporary chimney/s above absorber will be closed and scrubbed flue gas from absorber outlet will be routed through the existing newly lined chimney. Therefore, we are not inclined to agree to the claimed outage of five months for lining of chimney and accordingly, the consequent lost capacity charges as a part of capital cost through IEDC is not being allowed at this stage.

Issue No. 4: Whether the approval of operating expenditure due to installation of FGD system is admissible as claimed by the Petitioner?

56. The Petitioner has claimed that installation of FGD system will also result in additional operating expenses towards additional auxiliary power consumption (APC),

purchase of raw material, consumables, waste-water treatment, by-product disposal, maintenance, working capital interest and insurance. The impact of higher auxiliary consumption and additional operating expenses will have impact on the tariff.

57. The Petitioner has submitted that it shall be incurring recurring operational expenditure of approximately Rs. 73 crore per annum (first year estimate after installation of FGD system in both units) including cost of maintenance materials, labour, reagent, by-product disposal (including fly ash), additional auxiliary power, ID or booster fan power costs and service water costs upon installation of FGD system.

58. In this respect, CEA in its report forwarded vide letter dated 21.2.2019 has considered the operational cost of FGD as Rs 2.03 lakh/MW [Refer para 4(bb)].

59. The Petitioner, with regard to the above-mentioned recurring operational expenditure considered by CEA has submitted that that CEA has not provided the basis for the computation of expenditure towards O&M. [as per table under para 4 (bb)].

60. The Petitioner has prayed to allow the impact of the increase in APC on quoted capacity charges and energy charges. CEA in the afore-mentioned report, has recommended an auxiliary energy consumption of 1.10%. CEA in its report has considered total additional annual operational expenditure of Rs. 24.57 crore towards auxiliary energy consumption. The Petitioner has submitted that the impact of APC cannot be quantified as the same would depend on the cost of fuel (which is dependent on escalation index, as provided in PPA) since the increase in APC would impact the Net Heat rate (Gross heat rate grossed up for auxiliary consumption). CEA has not considered the fact that the increase in APC would have twin impact, viz,

impact on capacity charge (due to decrease in Declared Capacity) and the impact on energy charges (on account of excess consumption of coal).

61. It is clear that on account of installation of the FGD, there would be impact on O&M expenditure (manpower, services, maintenance water charges etc.), impact of additional auxiliary energy consumed on quoted capacity & energy charges under PPA and reagent charges. The recurring operational charges i.e. O&M expenses and cost of reagent would increase the cost of generation of electricity and additional auxiliary consumption would (i) reduce the recovery of the quoted capacity charges as the ex-bus available energy corresponding to normative availability would reduce; and (ii) increase the cost of generation due to more consumption of fuel per unit of ex-bus energy delivered. Therefore, such recurring operational expenditure are allowable expense during operational period of the generating station in terms of the PPA as an impact of change in law event i.e. installation of FGD system in terms of the 2015 Amendment Rules.

62. The Commission has already issued order dated 13.8.2021 in Petition No. 06/SM/2021 wherein a mechanism has been decided (in consultation with stakeholders) to determine compensation on account of installation of Emission Control System by the generating companies in compliance with the Revised Emission Standards issued by MoEF&CC vide the 2015 Amendment Rules in respect of the Thermal Generating stations whose tariff is determined through competitive bidding under Section 63 of the Electricity Act, 2003. Compensation to the Petitioner for compliance with the 2015 Amendment Rules shall be governed in accordance with that order.

Issue No.5: What shall be the norms and mechanism for computing the adjustment in tariff corresponding to the additional investment and increase in

the operating costs due to the 2015 Amendment Rules so as to restore the Petitioner to same economic position as if such Change in Law event has not occurred?

63. Articles 10.2, 10.3 and 10.5 of the PPA read as follows:

> *10.2 Application and Principles for computing impact of Change in Law 10.2.1 While determining the consequence of Change in Law under this Article 10, the Parties shall have due regard to the principle that the purpose of compensating the Party affected by such Change in Law, is to restore through monthly Tariff Payment, to the extent contemplated in this Article 10, the affected Party to the same economic position as if such Change in Law has not occurred.*
>
> *10.3. Relief for Change in Law*
>
> *10.3.1. -----*
>
> *10.3.2. During Operating Period The compensation for any decrease in revenue or increase in expenses to the Seller shall be payable only if the decrease in revenue or increase in expenses of the Seller is in excess of an amount equivalent to 1% of the value of the Letter of Credit in aggregate for the relevant Contract Year.*
>
> *10.3.3 For any claims made under Articles 10.3.1 and 10.3.2 above, the Seller shall provide to the Procurer(s) and the Appropriate Commission documentary proof of such increase/ decrease in cost of the Power Station or revenue/ expense for establishing the impact of such Change in Law.*
>
> *10.3.4 The decision of the Appropriate Commission, with regards to the determination of the compensation mentioned above in Articles 10.3.1 and 10.3.2, and the date from which such compensation shall become effective, shall be final and binding on both the Parties subject to right of appeal provided under applicable Law.*
>
> *10.5 Tariff Adjustment Payment on account of Change in Law*
>
> *10.5.1 Subject to Article 10.2, the adjustment in monthly Tariff Payment shall be effective from:*
> *(i) the date of adoption, promulgation, amendment, re-enactment or repeal of the Law or Change in Law; or*
> *(ii) the date of order/ judgment of the Competent Court or tribunal or Indian Governmental Instrumentality, if the Change in Law is on account of a change in interpretation of Law.*
>
> *10.5.2 The payment for Change in Law shall be through Supplementary Bill as mentioned in Article 8.8. However, in case of any change in Tariff by reason of Change in Law, as determined in accordance with this Agreement, the Monthly Invoice to be raised by the Seller after such change in Tariff shall appropriately reflect the changed Tariff.*

64. Clause 10.3 of the PPA provides for compensation methodology to be applied if a Change in Law event results in increase in capital cost during the operating period e.g. the instant change in law event requiring installation of FGD system. Clause 10.3.4 of the PPA provides for the Commission to arrive at the compensation for any

increase/ decrease in revenues or cost. Also, as per Clause 10.2 of the PPA, the purpose of compensating the Party affected by such Change in Law, is to restore through Monthly Tariff Payments, to the extent contemplated in this Article 10, the affected Party to the same economic position as if such Change in Law has not occurred.

65. As already stated, the Commission has issued Suo-Motu order in Petition No. 06/SM/2021 dated 13.8.2021, providing detailed compensation mechanism on account of change in law (for installation of ECS) during operation phase of thermal generating station whose tariff is determined under Section 63 of the Electricity Act, 2003. Compensation to the Petitioner shall be determined in accordance with that order.

66. Petition No. 377/MP/2019 is disposed of in terms of above.

Sd/-	**Sd/-**	**Sd/-**
(Arun Goyal)	**(I. S. Jha)**	**(P. K. Pujari)**
Member	**Member**	**Chairperson**