CENTRAL ELECTRICITY REGULATORY COMMISSION

NEW DELHI

Petition No. 366/MP/2019

Coram:

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

Date of Order: 11th June, 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 Agreements both dated 01.11.2013 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 (DBPL),
Office Block 1A, 5th Floor,
Corporate Block, DB City Park,
DB City, Arera Hills,
Opposite MP Nagar, Zone-I,
Bhopal-462016 **...Petitioner**

Versus

1. PTC India Ltd,
   NBCC Tower, 15 Bhikaji Cama Place,
   New Delhi - 110066,

2. Rajasthan Urja Vikas Nigam Ltd. (RUVNL),
   Vidyut Bhawan, Janpath,
   Jyoti Nagar,
   Jaipur – 302005.

3. Jaipur Vidyut Vitaran Nigam Ltd.
   Vidyut Bhawan, Jyoti Nagar,
   Near New Vidhan Sabha Bhawan
   Jaipur– 302005

4. Ajmer Vidyut Vitaran Nigam Ltd.
   Vidyut Bhawan, Makarwali Road,
   Panchsheel Nagar, Ajmer
   Rajasthan – 305004

5. Jodhpur Vidyut Vitaran Nigam Ltd.
   New Power House, Industrial Area,
   Jodhpur -342003, Rajasthan.**...Respondent**

Parties present:

Shri Amit Kapur. Advocate, CGPL
ShriKunal Kaul, Advocate, CGPL
ShriSamikrith Rao, Advocate, CGPL
Ms.Ranjitha Ramachandran, Advocate,GUVNL, Haryana& Rajasthan,PSPCL
Ms. PoorvaSaigal, Advocate, GUVNL, Haryana& Rajasthan Utilities, PSPCL
Ms. Tanya Sareen, Advocate, GUVNL, Haryana& Rajasthan Utilities, PSPCL
Shri Pulkit Tare, Advocate, MSEDCL
Shri Anup Jain, Advocate, MSEDCL

ORDER

The Petitioner, DB Power Limited (DBPL), is a company incorporated under the Companies Act, 1956 and is a generating company within the provisions of the Electricity Act, 2003. The Petitioner has set up a 1200 MW (2×600 MW) coal based thermal power plant (hereinafter referred to as "the Generating Station") at village Badadarha, in District Janjgir Champa in the State of Chhattisgarh. The Petitioner and the Respondent No.1 (PTC India Ltd.) entered into a Power Purchase Agreement (PPA) on 1.11.2013 for supply of 311 MW power by the Petitioner to the Respondent No.1 for onward supply to Respondent No. 3 to 5, under which the Petitioner is presently supplying 250 MW power. The Petitioner is also supplying 208 MW power from the Generating Station to TANGEDCO through long term PPA dated 19.8.2013.

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.

c) The Chairman of 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 any other measures for compliance of the 2015 Amendment Rules. As per CPCB's directive and based on CEA's phasing plan, the Petitioner has to install the FGD system by September 2020 for Unit-2 and by June 2020 for Unit-1. Further, the timeline for NOx emission is by 2020.

d) The Petitioner filed Petition no. 213/MP/2018 under Article 10 of the PPA dated 1.11.2013, seeking approval of the cost to be incurred 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 other measures for compliance of the 2015 Amendment Rules and for other claims on account of Change in Law events under the PPA. The Petitioner, during 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 compliance with emission control norms with liberty to approach the Commission at the appropriate stage. The said request was allowed by this Commission vide its Order dated 20.3.2019.

e) On 7.1.2019, the Petitioner had submitted feasibility report with regard to SO_2 abatement to the CEA (Central Electricity Authority).

f) The Central Electricity Authority 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 prayers of the Petitioner are as under:

(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', Low NOx Burner (LNB) with Over Fire Air (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 / De-NOx 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 Low NOx Burner (LNB) with Over Fire Air (OFA) and other associated facilities as mentioned in the present Petition;

(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."

4. The Respondents 2 to 5, Rajasthan Discoms have filed their replies vide affidavits dated 15.1.2020 and 20.2.2020. The Respondent, PTC India Ltd., has not filed its reply. The Petitioner has filed its rejoinder vide affidavit dated 4.3.2020 to the replies filed by the Rajasthan Discoms. The Petitioner has submitted information sought by the Commission vide affidavit dated 13.3.2020 and made additional submissions vide affidavit dated 10.8.2020, 19.2.2021 and 5.3.2021.

Submissions of the Petitioner

5. The Petitioner has made following submissions in this petition:

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 control 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 Environment (Protection) Act and Rules, 1986	Norms as per Environment (Protection) Amendment Rules, 2015
Water consumption (m^3/MWh)	None	3.5
Sulphur Dioxide (SO_2) (mg/Nm^3)	None	200
Oxides of Nitrogen (NO_X) (mg/Nm^3)	None	300
Suspended Particulate Matter (mg/Nm^3)	50-150	50
Mercury (mg/Nm^3)	None	0.03

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

Rules. The indicative cost based on current commercial status, which is to be recovered from the Respondents, through appropriate modification of the current tariff (both capacity & Energy charge) works out as below:

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 MoEF&CC Notification dated 7.12.2015, no norms were specified with regards to SO_2 emission from the thermal power plants. Neither any such requirement was specified in the environmental clearances obtained for the Generating Station. 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, 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 for Unit-2 which is more than the revised norms specified.

e) That in order to comply with the revised norms, the Petitioner is required to install a Wet Limestone-based Flue Gas Desulfurization system, which is considered to be the most cost-effective solution to meet SO_2 emission norms.

f) Wet Limestone-based FGD life-cycle capital cost is significantly below other options for FGD system that were considered for the Generating Station. The cost estimate includes major equipment costs, such as the auxiliary power system modifications, mechanical balance-of-plant equipment, ID or booster

fans, draft system component and ductwork stiffening and civil/ structural modifications. The total indicative capital cost is the sum of the purchased equipment cost, direct installation costs and indirect costs. The indicative capital cost for the Wet Limestone-based FGD 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) The indicative annual O&M costs for the Wet Limestone-based FGD system would consist of the following main categories of cost:

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) In addition to foregoing, for installing Wet Limestone FGD 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 Respondents.

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. The indicative summary of cost estimates for the Wet Lime-stone based FGD system, as compared with recommendations of Central Electricity Authority is 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 X Rs. 0.44 crore/MW = Rs.528 crore	Rs.357 crores

j) The above capital cost 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), generation loss and availability loss due to shut down required for construction and installation.

k) The period for which the Generating Station would be required to be shut down for installation of the FGD system and for installation of Low NOx Burner (LNB) with Over Fire Air (OFA) and other associated facilities, the same should be considered as deemed availability.

l) The indicative capex anticipated by the Petitioner towards FGD system installation of Rs. 357 crores (excluding other expenses as explained in the Petition) is lesser than that recommended indicative cost by CEA in its report. The Petitioner has maintained the technological standards as provided in the notification, while ensuring the most viable options.

m) The 2015 Amendment Rules stipulate that Oxides of Nitrogen i.e. NO_x emission is kept below 300 mg/Nm^3. 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 new LNB ('Low NOx Burners) with OFA ('Over fire Air'). 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 on continuous basis, INR/ tons of

pollutant removed, new LNB with OFA is considered to be the most viable system for meeting the revised NOx limits.

n) For meeting NOx emission limit, different technologies like Selective Non-catalytic Reduction (SNCR), Selective Catalytic Reduction (SCR) , Induct SCR, a new Low NOx Burner (LNB) with Over Fire Air (OFA), Regenerative Activated Coke Technology (ReACT) and the different technically feasible combinations of aforementioned technologies were considered, but only new LNB with OFA was found to be the most cost effective in meeting the limits i.e. 300 mg/Nm^3. LNB life-cycle capital cost is significantly below in comparison to other NOx reduction system options that were considered for the Generating Station. The indicative capital cost for new LNB (with OFA) systems include the following features:

i) Coal burner

ii) Primary air nozzle

iii) Primary air pipe

iv) Dense/ Sparse Pulverized Coal Separator

v) Secondary air nozzle

vi) The main combustion zone corner bellows

vii) The main combustion zone dampers

viii) The main vertical swing mechanism

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

- Operating labour costs.
- Maintenance materials and labour
- Auxiliary Power
- Service Water Cost
- Insurance Premium

p) The indicative cost estimates for new LNB (with OFA) system, based on quotation received from M/s BHEL, Central Public Sector Undertaking through

transparent competitive bid process adopted for FGD & NO_X under single principle bidding is as under.

Parameters	Costs (Rs. in crores)
Capital Cost (indicative)	30

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

r) The 2015 Amendment Rules stipulate that the suspended particulate matter (SPM) emission is to be limited below 50 mg/Nm^3 and mercury emissions are to be limited below 0.03 mg/Nm^3. In this respect, the Petitioner has conducted a preliminary assessment which indicates that it is already in compliance as regards SPM emissions. As regards mercury emission also it would be compliant once the emission control norms for SOx and NOx are implemented. Without prejudice to the same, in the event that any additional measures need to be implemented involving additional installation costs and/or operation costs, subsequent to installation of FGD and LNB with OFA, the Petitioner reserves its right to approach this Commission.

s) Water consumption, envisaged at present, is 3.303 m^3/MWh as borne out from the preliminary assessment conducted by the Petitioner. Further, upon installation of the Wet Limestone-based FGD 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.

t) Other expenses to be incurred by the Petitioner are as under:

i) Interest During Construction (IDC) - The Petitioner has considered a debt-equity ratio of 75:25. However, considering the 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 crores at debt-equity ratio better than 75:25. To arrive at the total completed project cost, the Petitioner has considered interest rate on debt at @11.10%. Based on these parameters, the Interest During Construction for 2 years of

construction phase works out to Rs. 40 crores, which may be allowed as part of total capex of Rs. 547 crore.

ii) Contingency - In the project cost of Rs. 547 crores, 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 crores, as provision towards various contingencies. This expenditure would cover any un-foreseen and un-anticipated expenditure including but not limited to any impact on account of Exchange Rate Variance, which could not have been envisaged at the time of planning.

iii) Pre-operative Expenses - An amount of Rs. 61.26 crore of pre-operative expenses is envisaged in the overall capex of Rs. 547 crores. These expenses are towards the miscellaneous and incidental expenditure which primarily relate to the consultancy charges to be incurred towards technical support for feasibility study, tender evaluation, engineering consultancy and gypsum disposal study. It 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 the installation of FGD system. 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.

iv) Trial Run Cost - The indicative capex of Rs. 547 crores also include expenses to be incurred towards trial run of the new system to be installed. This would include cost of consumables, cost of water and power to be consumed during trial run and also the manpower cost including that of consultant and experts. The Petitioner has not considered any variation on account of increase in APC. The total cost envisaged is Rs. 20.37 crore.

v) Other Asset - The overall indicative capex of Rs. 547 crores also include expenses of Rs. 13 crores anticipated towards raising of height of temporary stack during installation of the FGD.

vi) CEA has not provided the basis for the computation of expenditure towards O&M. As per the calculation submitted by CEA, an amount of Rs. 10.32 crores is the estimated amount for annual O&M expenses of FGD

and tentative annual expenditure on account of O&M of FGD is annexed with the petition.

vii) In addition to the above, impact of increase in Auxiliary Power Consumption ('APC') would also be there. CEA in its report has recommended an APC of 1.10%. CEA has considered a total additional annual operational expenditure of Rs. 24.57 crore towards APC. However, the impact of APC can't 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).

u) The Petitioner submitted a revised and final feasibility report on 7.1.2019 to CEA, wherein the best suited technology and estimated cost were proposed for installations of emission control systems from the Generating Station. CEA sent the report dated 21.2.2019 wherein it detailed the suggestive technologies and total indicative cost in installation of FGD. The Petitioner had prepared a Detailed Project Report (DPR) through M/s Black & Veatch, on the impact of installing and operating the proposed installations for the Generating Station. The technical specifications provided in the DPR and recommendations of CEA have been incorporated in the tendering process. The Petitioner has also done a detailed study through M/s ERCOM Engineers Pvt. Ltd. on sourcing of limestone and disposal of gypsum (by-product) which will be used for capturing the SO_2 post-installation of the FGD System.

v) 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 newspaper of Raipur, Bhopal and New Delhi NCR on 5.4.2018.

w) 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, subject to the conditions stated therein.

x) Vide its letter dated 22.5.2019, the Respondent No. 2 nominated one of its officials to monitor the process of tendering and awarding of Contract for retrofitting the FGD system of Petitioner. The Respondent No.2 vide the said letter further requested the Petitioner to forward all approvals of CEA/ CERC for retrofitting of FGD system by the Petitioner including technical data and also the tender documents prepared by the Petitioner with reference to CEA/ CERC guidelines. The Petitioner vide its various correspondences dated 2.8.2019, 27.8.2019, 28.8.2019, 3.9.2019 and 10.9.2019 has furnished the details of FGD installations to Respondent No.2.

y) 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. (Tuna Corporation) were found to be competitive, both on technical and commercial grounds. After several rounds of techno-commercial negotiations with the two short-listed bidders, Tuna Corporation emerged as the L1 bidder for installation of Wet Limestone FGD system. The Petitioner issued a Letter of Intent dated 13.06.2019 in favour of Tuna Corporation.

z) The details of the bidding process etc. and the documents thereto were submitted to the Respondent No.2 vide letter dated 2.8.2019. Respondent No.2 was informed about the change in Regulations, the steps taken by the Petitioner and the bidding process along with the pricing. The Respondent No.2 was informed that it shall be approaching this Commission for seeking approval of cost and incremental tariff due to the Change in Law event.

aa) In accordance with Article 10.4 of the PPA, the Petitioner, vide letter dated 29.3.2017 along with relevant documents, has notified the Respondents about the aforesaid Change in Law events which occurred after 11.9.2012 (i.e. 7 days prior to the Bid Deadline date). Vide the said letter dated 29.3.2017, the

details of Change in Law events and their respective effects on the Petitioner were also provided and requested the Respondents to communicate the acceptance of the said impact so that supplementary bill for compensation due to occurrence of Change in Law can be raised. However, none of the Respondents has responded to the above referred letter of the Petitioner.

bb) 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 (.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 PPAs for claiming the additional cost/ expenses incurred by the Petitioner in supplying power to the Respondents under the PPAs.

Submissions of the Respondents

6. The Respondents 2 to 5, Rajasthan Discoms vide affidavits dated 5.1.2020 and 20.2.2020 have mainly submitted the following:

a) This Commission has already taken the view in several cases, including that of the Petitioner, that the 2015 Amendment Rules is a Change in Law. However, the applicability of the said Notification and the computation of admissible amounts under Change in Law cannot be made until certain basic information is provided by the Petitioner.

b) The Petitioner has to first place on record the standards prescribed by the Central Pollution Control Board (CPCB) and the Chhattisgarh Environment Conservation Board (CESB) as on the cut-off date. Even though the 2015 Amendment Rules were notified on 7.12.2015, both CPCB and CESB may have prescribed certain parameters for SO_2 and NOx in so far as the Generating Station is concerned. This Commission ought to direct the Petitioner to place on record the necessary standards.

c) The Petitioner has further not furnished the actual emission profile of the Generating Station as recorded on the cut-off date as well as on the present date. The primary evidence which is necessary to be produced by the Petitioner to claim any relief in the present matter is the actual emission data from the Generating Station on COD on 3.11.2014 (in case of Unit-I) and 26.3.2016 (in case of Unit-II)

which will indicate the emissions of Sulphur Dioxide (SO_2),Oxides of Nitrogen (NOx), Particulate Matter (PM), etc. actually being achieved by the Generating Station.

d) This Commission has held in several cases that to compute the relief under the provisions of 'Change in Law', the law as prevailing on the cut-off date is to be considered including the conditions imposed on the Generating Station. For example, if a condition was envisaged under the Environmental Clearance without being a part of the Environment (Protection) Rules on the cut-off date and was subsequently incorporated by an amendment to the Rules, the same cannot be considered as a Change in Law if the Petitioner was already subject to the said condition as on the cut-off date. It is, therefore, essential to consider all consents and clearances issued to the Generating Station as well as the laws existing on the cut-off date.

e) Further, 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 MoEF&CC on yearly basis. The Petitioner should also be directed to place on record such reports that it filed with MoEF&CC so that the cost which was included by the Petitioner as part of project cost for upcoming environmental measures can be scrutinized by this Commission.

f) 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 the 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, NO_X, PM, Hg, etc., are within the prescribed limits. The Environmental Clearance further stipulated a '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, NO_X and Particulate Matter.

g) The Environmental Clearance 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.

h) 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.

i) 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 "M/s 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 condition in 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 the MoEF&CC.

j) The Petitioner contends that the 2015 Amendment Rules stipulate that oxides of Nitrogen emission is to be kept below 300 mg/Nm^3 and the same is a new condition. The said contention is totally wrong and misconceived as the CEA in the year 2013, had issued CEA Regulations "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 the Generating Station which was commissioned in late 2014 and early 2016. In fact, the limits on NOx emissions stipulated in CEA

regulations are much more stringent than the ones provided under the 2015 Amendment Rules.

k) One of the generators, Coastal Gujarat Power Limited (CGPL) was achieving NOx emissions in the range of 330 mg/Nm^3 to 459 mg/Nm^3 at 4% O_2 which is 283 mg/Nm^3 to 393 mg/Nm^3 at 6% O_2. To come down to 300 mg/Nm^3, CGPL had proposed to adopt Selective Catalytic Reduction (SCR) technology. This was noted by this Commission in its order dated 17.9.2018 in Petition No. 77/MP/2016. Without prejudice to the argument that the Petitioner ought to have built in the above-mentioned Regulation 6.4.9 of the CEA Regulations while installing its project, there is no reason to claim Rs. 30 crores for installing additional low NOx burners. Instead, the Petitioner should explore the possibility in which the existing low NOx burners would serve the intended purpose.

l) The Petitioner is making claims for several aspects which are not contemplated to be compensated under the framework of competitive bidding under Section 63 of the Electricity Act, 2003. The claim of 'Interest During Construction (IDC)' of Rs. 40 crore is completely misconceived and has no basis at all. Article 13 of the PPA dealing with 'Change in Law' cannot by any stretch of imagination be read to cover IDC of the Petitioner. It is not the responsibility of either the Respondents or this Commission to give comfort to the Petitioner's lenders. The argument of the Petitioner that it has a considered a debt-equity ratio of 75:25 at an interest rate of 11.10% (linked to marginal cost of fund base lending) and that the cost (through tariff) be allowed as a pass-through, is also misconceived.

m) The Petitioner has also claimed an amount of Rs. 19 crores (5% of Hard Cost) as 'Contingency'. 'Contingency' is in the nature of Incidental Expenses During Construction (IEDC), which is relevant for tariff determination under Section 62 of the Electricity Act, 2003.

n) The Petitioner has further claimed 'Pre-operative Expenses' amounting to Rs. 61.26 crores. The Petitioner cannot proceed as if it's a green-field project and the costs including the books of the Petitioner would be scrutinized by this Commission. In cases of capital cost determination, this Commission has framed detailed regulations and also set up the benchmarks for all aspects including IDC

and IEDC. None of these are applicable to the Petitioner , and have, in fact, never been complied with by the Petitioner. The 'Pre-operative Expenses', therefore, cannot be claimed at all under 'Change in Law'.

o) The claim of Rs. 20.37 crores as 'Trial Run Cost' is also without merit. The chart at page 331 of the Petition is based on conjectures and needs to be disregarded. Even generating companies whose tariff is determined under Section 62 of the Electricity Act, 2003, do not get the reimbursement of 'Trial Run Costs' in their tariff.

p) The Petitioner has also claimed Rs. 13 cores as 'Other Asset' which has no basis. The Petitioner can only claim what is provided under the PPA and it cannot be that each and every expenditure which the Petitioner is imagining to be incurred would be reimbursed under 'Change in Law'.

q) The Petitioner has claimed Rs. 24.43 crores as indicative annual expenditure based on the CEA Report to be 'Recurring Operational Expenditure to be incurred after FGD installation'. This is not the time and proceedings to seek an advance declaration on this amount before this Commission. The Petitioner has contended that as against Rs. 528 crores recommended by CEA for capital expenditure, it has been able to award contract at Rs. 357 crores. Therefore, even the figure of Rs. 24.43 crores is only indicative and the Petitioner may be able to bring it down substantially. This would, however, be known only when the Generating Station actually operates after the installation of FGD.

r) The Petitioner is claiming Rs. 10.32 crores as an estimated amount of 'Annual O&M Expenses for FGD'. This is a dubious claim and seems to be overlapping with the claims made by the Petitioner in paragraph 12.6.6 of the petition. Such costs are based on conjectures and surmises and are not allowable under the terms of the PPA.

s) The Petitioner has claimed that the 'Auxiliary Power Consumption' would increase and this would further impact the capacity charges as well as the energy charges. The Petitioner is seeking a fundamental change in the terms of the PPA, which is not permissible at all. As per the back-to-back PPA/PSA, the

capacity contracted by Rajasthan Discoms is 311 MW. The capacity charges and energy charges which were quoted by the Petitioner were examined by the bid evaluation committee and the Petitioner won the bid to supply electricity. Any deviation on the capacity or the energy charges at this stage would render the entire bidding process meaningless and cannot be permitted. The Petitioner has to arrange for the electricity for the FGD operation at its own cost and the capacity contracted with the Respondents cannot be disturbed.

t) There is no basis to claim an impact on energy charges. The energy charges were quoted in the bid and the sanctity of the bid cannot be disturbed by a Change in Law clause interpretation as being sought by the Petitioner. The computation of tariff impact due to installation of FGD and "due to certain additional factors" in paragraph 12.6.9 of the Petition is absolutely perverse as there can be no question of computing the so-called impact on the tariff parameters, such as Interest on Loan, Return on Equity, Working Capital, Depreciation and O&M Expenses. This would set a disastrous precedent and would be against the Judgment of the Hon'ble Supreme Court in Energy Watchdog vs Central Electricity Regulatory Commission &Ors. (2017) 14 SCC 80.

u) With reference to the details of the bidding procedure carried out by the Petitioner, it is stated that the Respondents were neither informed nor kept abreast of these steps and the communication of the Petitioner seems to have been only with PTC. The Commission is requested to conduct the prudence check on the process followed and the Respondents are not in a position to comment on such process.

v) The Hon'ble Supreme Court has noted that MoEF&CC has filed an affidavit stating that a consensus has been reached between the Environment Pollution (Prevention and Control) Authority for National Capital Region, MoP, CPCB, CEA, NTPC Limited and MoEF&CC for revision of NOx norms from 300 mg/Nm^3 to 450 mg/Nm^3 for thermal power plants installed between 1.1.2014 to 31.12.2016 and the same will be presented for final decision to the Secretary, MoEF&CC and the Secretary, MoP. It is submitted that the NOx norms which are sought to be revised, would be applicable on the Generating Station. The Petitioner should be directed to place the latest status with regard to the NOx

norms applicable to it in order for this Commission to decide the matter in a meaningful manner.

w) FGD system to be used by the Petitioner produces gypsum as a by-product. Gypsum has commercial value and is saleable in the market and, therefore, the revenue which the Petitioner would earn from the sale of gypsum should be necessarily subtracted from the operating cost claimed by the Petitioner.

Rejoinder of the Petitioner

7. The Petitioner has filed its rejoinder vide affidavit dated 4.3.2020 to the reply of the Respondents 2 to 5 and has mainly submitted the following:

a) Article 10 of the PPA (specifically Articles 10.1.1) recognizes provides for Change in Law after the cut-off date i.e.,11.9.2012 being seven (7) days before the bid deadline of 18.9.2012. In terms of the Environment (Protection) Act, 1986 (EP Act) and the Environment (Protection) Rules, 1986 (EP Rules), there were no norms for SO_2 and NOx emissions and that such norms were introduced for the very first time, approximately three (3) years after the cut-off date by way of the 2015 Amendment Rules, which amounts to Change in Law under the aforesaid provisions of the PPA.

b) The emission norms applicable to thermal power plant (TPPs) under the applicable laws before and after the cut-off date are tabulated as under:

Summary of norms to be complied with by the Petitioner towards Environmental Protection Measures as per the applicable regulations on relevant dates				
Sr. No.	**Parameters**	**As on the date of issuance of the Environmental Clearance dated 16.09.2010 (EC)**	**As on the date of bid submission**	**As per Notification dated 7.12.2015 (for TPPs installed between 1.1.2003 and 31.12.2016)**
1	Particular Matter (mg/Nm^3)	50	50-150	50
2	SO_2 (mg/Nm^3)	None	None	200
3	NO_x (mg/Nm^3)	None	None	300
4	Mercury (mg/Nm^3)	None	None	0.03
5	Specific Water consumption (m^3/MWh)	None	None	3.5

c) The Ministry of Power, Government of India vide its letter dated 30.5.2018 provided the mechanism for implementation of the New Environmental Norms for Thermal Power Plants (TPPs). The said letter duly acknowledges the challenges which would be faced by the TPPs while complying with the aforesaid norms including but not limited to the stringent timelines, availability of suppliers and technology, shutdowns, revenue loss during shutdown and the significant implications on the tariff agreed due to additional infrastructure and operational cost on account of large scale installations, renovations and retro-fitting of existing plant and machinery to meet revised emission norms.

d) The Respondents have wrongly assumed that the Generating Station falls in exception (b) of paragraph 5.1 of the aforesaid letter dated 30.5.2018 of Ministry of Power. The Petitioner's Environmental Clearance does not provide for installation of pollution control system as prescribed in the 2015 Amendment Rules dated 7.12.2015. A mere mention of 'Provision for installation of FGD shall be provided for future use', in the Environmental Clearance cannot mean that the Petitioner is covered under paragraph 5.1(b) of the aforesaid letter. The Environmental Clearance merely provides for keeping provision for space for installation of FGD if the need arises in future, which has been complied with by the Petitioner. The Expert Appraisal Committee (EAC) in its meeting held during August 9-10, 2010, while recommending the Petitioner's project for issuance of Environment Clearance has recorded that the provision in respect of FGD is only in respect to the space to be provided. A mere provision of space in the Environmental Clearance cannot, in any manner, be construed as provision for specific compliance of stricter norms requiring setting up of FGD. In this regard, the Petitioner placed reliance on Order dated 6.2.2019 passed by the Maharashtra Electricity Regulatory Commission in Case No. 300 of 2018.

e) As regards the Respondents' contention relating to display of actual emissions on real-time basis, it is to highlight 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 (NAAQ). The concentration in ambient air for SO_2 as per NAAQ was 80 $\mu g/m^3$ (annual average) and 120 $\mu g/m^3$ (24 hours average) on the cut-off date.

Similarly, the concentration for NOx was 80 µg/m^3 (annual average) and 120 µg/m^3 (24 hours average) on the cut-off date.

f) There is a fundamental difference between emission norms of a particular gas and its ambient air concentration/ ground level concentration i.e. NAAQ. 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 SO_2 and NOx emissions respectively at the outlet of chimney/ stack of a power plant whereas NAAQ (ground level concentration for SO_2 and NOx) were specified by CPCB which is measured in the outdoor/ open air and that too near the ground level.

g) The Clause (xix) of General Conditions of the Environmental Clearance, 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 incorrect to 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. 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. The Petitioner had allocated, as part of the Project Cost, a sum of Rs. 588 crore across various heads including ESP, chimney, ash handling unit, ash pond dyke, cooling towers, effluent treatment plant (ETP), etc. As against allocated amount of Rs. 588 crore, the Petitioner has actually incurred Rs.1239 crore. Thus, 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. Item-wise break up is given below for reference:

Sr. No.	**Description**	**Earmarked in Project cost (Rs. core)**	**Amount incurred (Rs. crore)**
1	ESP	180.00	457.51
2	Chimney	100.00	165.94
3	Ash Handling Unit	80.00	167.18
4	Ash Pond Dyke	85.00	118.34
5	Cooling Towers	70.00	267.75
6	Effluent Treatment Plant (ETP)	35.00	22.94

7	Control of Fire & Explosion Hazards	30.00	37.10
8	Other Misc. items	8.70	2.32
	Total	**588.70**	**1239.07**

h) A bare perusal of the item-wise breakup of the measures taken by the Petitioner and the amounts incurred by the Petitioner, would show that the same do not contain anything pertaining to FGD. The fact that FGD was not provided in the Item wise break up cost, is only because installation of FGD was not provided under the Environmental Clearance (EC) of the Petitioner and it was only the space for FGD which was provided.

i) The Respondents have averred that the Petitioner has not furnished details pertaining to the emission profile of the Generating Station. It is submitted that the Petitioner is in compliance with the terms of the Environmental Clearance and has submitted the compliance reports to MoEF&CC.

j) CEA's "*Standard Technical Features of BTG System for Supercritical 660/800 MW Thermal Units*", applies to the supercritical 660/800 MW Thermal Units. However, the Generating Station has an installed capacity of 1200 MW consisting of two units of 600 MW each using sub-critical technology. Thus, the Generating Station is not governed by the aforesaid conditions. Without prejudice to the above, the aforesaid Standard Technical Features issued by the CEA was issued in July, 2013 while the cut-off date for the purposes of the present Petition is 11.9.2012.

k) The Respondents have further averred that the Petitioner should explore the possibility in which the existing low NOx burners would suffice for meeting the requirements of the 2015 Amendment Rules. In this regard, the Petitioner has submitted a detailed report for the usage of the technology to be deployed for complying with the NOx norms. The Petitioner has further provided the cost estimates based on quotation received from M/s BHEL, a Central Public Sector Undertaking, through adoption of transparent competitive bid process adopted for FGD & NOx under single principal bidding.

l) As regards the objection raised by the Respondents against the Petitioner's claim for other expenses, the Clause 10.2.1 of the PPA

unequivocally 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 revised emission control norms mandated through the 2015 Amendment Rules. The Petitioner has no occasion to incur any such expenses in absence of installation of FGD and other emission control systems which were made compulsory only through the 2015 Amendment Rules.

m) It is incorrect on part of the Respondents 2 to 5 to say that they were neither informed nor kept abreast of the bidding procedure. Immediately on receipt of the Respondents' letter dated 22.5.2019, the Petitioner had not only explained to the Respondents 2 to 5 the procedures and process adopted by the Petitioner for selecting the successful bidder and made available copies of relevant documents such as tendering documents, LOA etc., but had also invited them to take part in the techno-commercial discussions with the short-listed vendors.

n) The Respondents have referred to and placed reliance on the judgment of APTEL in M/s JSW Energy Limited v/s MSEDCL and Anr. The Respondents have failed to even plead much less show the applicability of the said judgment in the facts and circumstance of the present case. The project of JSW Energy Ltd. 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. It may be mentioned that in case of JSW Energy, as part of the recommendations of the Expert Appraisal Committee (Thermal) made in 62nd meeting held during January 2010, MoEF&CC upheld the Environmental Clearance earlier accorded for the project issued vide letter dated 17.5.2007 subject to compliance that (i) the Flue Gas Desulphurisation (FGD) system shall be installed before commissioning the project and (ii) the action in this regard shall be submitted within three months to the Ministry. No such subsequent amendment to Environmental Clearance was issued by MoEF&CC in the

Petitioner's case. The Petitioner has placed reliance on order issued by Maharashtra Electricity Regulatory Commission (MERC) vide its order issued in Case No. 300 of 2018 (Adani Power Maharashtra Ltd.), wherein MERC held that condition for providing space in the Environmental Clearance for installation of FGD system in future, does not mean that FGD system has to be necessarily installed. MERC had further held that till the 2015 Amendment Rules were notified, the Petitioner was not required to install FGD system. It was in light of these conditions that APTEL came to the conclusion that the letter of 16.4.2010 issued by MoEF&CC merely confirms the requirement of installation of FGD system intimated earlier and, therefore, there was no change in law. There is no such condition contained in Petitioner's Environmental Clearance nor was there any subsequent amendment. Therefore, judgment of APTEL in JSW Energy Ltd. matter is not applicable in the present case.

o) With regard to Order dated 5.8.2019 passed by the Hon'ble Supreme Court in Writ Petition (Civil) No. 13029 of 1985 titled "M.C. Mehta vs Union of India & Ors.", the Respondents have contended that the NOx norms which are sought to be revised, would be applicable on the Petitioner (having installed its units between 1.1.2014 to 31.12.2016) and the Generating Station may already be complying with the revised norms. Therefore, the Respondents have averred that it would be improper on the part of this Commission to pre-maturely decide the issue. In this regard, The Petitioner submits that quite to the contrary, the assertions made by the Respondents basis the affidavit filed by the MoEF&CC are pre-mature. As per the information placed on record by the Respondents, it cannot be ascertained as to what would be final decision in the matter as regards the norms of NOx. As on today the Notification dated 7.12.2015 issued by the MoEF&CC amending the Rules stands and subsists and is therefore operative. In terms of the said Notification, the Petitioner is required to install FGD and other systems as detailed in the Petition. Unless and until a fresh Notification is issued amending the Rules, the previous Notification continues to apply. Therefore, on the basis of the affidavit filed by MoEF&CC as asserted by the Respondents, the present Petition ought not to be put on hold, as the Petitioner is required to comply with the extant Rules stipulating the emission norms, for which a decision in the present Petition is required.

p) As regards the Respondents contention that the Petitioner should be directed to place the latest status with regard to the NOx norms applicable to it in order for this Commission to decide the matter in a meaningful manner, the Petitioner submits that it is not aware of any amendment to the Rules after the Notification dated 7.12.2015, which stipulated the emission norms, which the Petitioner is required to comply with. It is further relevant to place on record that the current NOx level for the Petitioner's Unit-1 is 362.528 to 365.315 mg/Nm^3 and for Unit-2 is from 507.606 to 512.574 mg/Nm^3.

q) The Respondents have further contended that the Wet Limestone-based FGD system to be used by the Petitioner produces gypsum as a by-product, which has commercial value and is saleable in the market and, therefore, the revenue which the Petitioner would earn from the sale of gypsum should be subtracted from the operating cost claimed by the Petitioner. In this regard, it is submitted that any profit from the sale of gypsum would be subtracted from the operating cost of the Petitioner. In so far as the cost etc. of such product is concerned, the same can be worked out at the appropriate stage.

Analysis and Decision

8. In the light of the submissions of the Petitioner, the Respondents 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 1.11.2013?

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 are 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?

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

Cut-off date	11.9.2012
Bid Deadline	18.9.2012
PPA execution date	1.11.2013
COD of the Generating Station	26.3.2016

10. The claims of the Petitioner in the present Petition pertain to Change in Law event related to the PPA dated 1.11.2013 during operation period. Article 10 of the PPA deals about notification with the 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."

11. Under Article 10.4 of the PPA, the Petitioner is required to give notice about occurrence of Change in Law events as soon as reasonably practicable after being aware of such events which occurred after the cut-off date i.e., 11.9.2012. The

Petitioner had given notice dated 29.3.2017 indicating the amendments in environmental norms *inter-alia* events under Change in Law and furnished the details of its effect on the Petitioner in terms of Article 10 of the PPA. PTC or the Rajasthan Discoms have not responded 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 1.11.2013?

12. 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 any Law, 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 and Permits 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 due to 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 dividends distributed to the shareholders of the Seller, or (ii) change in respect of UI Charges or frequency intervals by an Appropriate Commission or (iii) any change on account of regulatory measures by the Appropriate Commission including calculation of Availability.*

13. 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;"

14. 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(s) of Rajasthan, Delhi and Chhattisgarh 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);

15. 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."

16. 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 1.11.2013. 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 18.9.2012 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 11.9.2012, 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 the PPA dated 1.11.2013.

17. The Respondents 2 to 5, in their submissions have also accepted that the 2015 Amendment Rules constitute Change in Law. However, they have contended that it is not 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 to the Petitioner on 16.9.2010 for setting up the Generating Station. The Respondents have 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 Respondents, in support of their claim, have 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 a yearly basis. In support of their contention that the Petitioner was required to install FGD system, the Respondents have 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.

18. 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 200 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 August 09-10, 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 revised norms (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.

19. As regards demonstrating emission profile of the Generating Station on a periodic basis, the Petitioner has submitted that 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 the 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 the SO_2 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.

20. We have considered the submissions of the Respondents and the Petitioner. 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"

21. 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."

22. It is clear that the Environment Clearance dated 16.9.2010, Permission to establish dated 05.02.2011 and Consent to Operate dated 03.10.2013 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.

23. 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.

24. We also do not find any substance in the argument of the Respondents 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 level of allowed emission differ widely as on cut-off date and as per the 2015 Amendment Rules.

25. In view of the above, we do not agree with the submission of the Respondents 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.

26. Accordingly, we hold that the case of the Petitioner for installation of FGD system to meet the revised SO_2 norms notified by 2015 MoEFCC Notification is covered under Change in Law in terms of the PPA dated 1.11.2013.

27. 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, 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 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.

28. The Respondents have submitted that the Petitioner's contention is totally 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 Respondents have 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.

29. Per contra, the Petitioner has submitted that the CEA Regulations referred to by the Respondents are applicable to super-critical units whereas the units at the

Generating Station are of sub-critical type. Also, the afore-mentioned CEA Regulations were issued in July, 2013 after the cut-off date i.e. 11.9.2012.

30. Having considered the submissions of the Respondents and the Petitioner, we do not find any substance in the arguments of the Respondents.

31. We note that vide notification dated 19.10.2020, the norms of NOx have been revised to 450 mg/Nm^3 from that of 300 mg/NM^3 that was stipulated through the 2015 Amendment Rules. We note that the existing NOx emission at stack outlet level for Unit-I ranges between 361.518 mg/Nm^3 to 365.315 mg/Nm^3 and is already meeting the new NOx emission level of 450 mg/NM^3 with the existing low NOx burners in place. Therefore, there is no need for any further additional capital expenditure for Unit-I. With regard to Unit-II, the reported NOx emission level is in the range of 507.606 mg/Nm^3 to 512.574 mg/Nm^3. We find no plausible reason as to why the two units of similar configuration commissioned together and equipped with same kind of low NOx burners would have such difference in terms of NOx emission.

32. As regards Specific Water consumption, Particulate Matter and Mercury emission, the Petitioner has submitted that as per the preliminary assessment, it is already in compliance with the revised norms. However, the Petitioner has submitted that it reserves the right to approach the Commission in the event any additional measures need to be implemented involving additional cost to comply with the additional condition.

33. In view of the above, while holding that the 2015 Amendment Rules is Change in Law in terms of the PPA, presently we consider its impact on the Petitioner only as regards SO_2. As regards NOx, the Petitioner needs to explain why Unit-2 of the Generating Station has higher NOx emission. In case of Specific Water consumption,

Particulate Matter and Mercury emission, the Petitioner has sought liberty to approach the Commission, if any such need arises in future. With regard to existing NOx emission levels of Unit-II which are marginally higher than norms, the Petitioner is directed to find some operational solution in consultation with OEM and CEA to bring down the existing NOx emission levels of 507.606 to 512.574 mg/Nm^3 to below 450 mg/NM^3. As such, the Commission at this stage is not considering granting in principle approval for incurring expenditure for NOx control. In case CEA and OEM are not able to suggest any solution to bring down the emission levels of Unit-II to below 450 mg/NM^3 and as a consequence of which, the Petitioner needs to incur expenditure for installation of any NOx control equipment, Commission may consider allowing such expenditure as a part of capital cost of ECSs after prudence check while dealing with the Petition to be filed by the Petitioner for allowing the compensation in form of supplementary tariff after installation of ECSs.

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

Basic Hard Cost

34. 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 RRUVNL (representative of Respondents 2 to 5) and that RRUVNL may be invited to participate in the bidding process. 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.

35. Through prayer (b) in the instant Petition, the Petitioner has requested for provisional approval of capital expenditure of Rs. 547 crores and also for approval of recurring annual operating expenditure on account of FGD system installation, LNB (with OFA) and other associated facilities. As regards LNB (with OFA), we have already held under Issue No. 2 that the Petitioner needs to justify the difference in NOx emission levels between the two units of the Generating Station. And, therefore, LNB (with OFA) is not being considered as of now.

36. Through a competitive bidding process, the Petitioner has already selected a vendor for installation of FGD system. The Commission is conscious of the fact that the installation of FGD system in thermal power stations is being monitored by the

Hon'ble Supreme Court. The Commission also recognizes that delay in securing loan from financial institutions causes delay in installation of FGD system.

37. We also observe that the 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 21.01.2020, 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 are not willing to finance unless there is clear cut CERC orders on additional tariff, which could 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 requirement of 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."*

38. Further, the Ministry of Power vide its letter dated 20.04.2020 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, the applications 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."

39. The Respondents have raised concerns about various elements of the provisional capital cost claimed by the Petitioner. They have submitted that the Petitioner is making claims for several aspects 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.

40. 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.

41. 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 Zhejiang TUNA Environmental Science Co. Ltd. (Tuna Corporation) as qualified vendor for installation of the FGD system and issued Letter of Intent. The break-up of capital expenditure for the Wet Limestone-based FGD 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 Burner modifications) 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 24 months	40		
10	**Total Capex**	**547**	**0.4558**	

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

42. We note that CEA in its recommendation (quoted at paragraph 34 of this order) 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."*

43. Further, CEA in its recommendation has provided the detailed 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."*

44. It is thus clear that the cost recommended by CEA is only 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.

45. The Petitioner vide its submission filed vide affidavit dated 5.3.2021 has placed on record the communications (letters dated 02.08.2019, 27.08.2019, 28.08.2019, 03.09.2019 and 11.09.2019) vide which it explained to the Respondents 2 to 5 the procedures and processes adopted for selecting the successful bidder and made available copies of relevant documents such as tendering documents, LOA etc. It also invited the Respondents to take part in the techno-commercial discussions with the short-listed vendor. The Petitioner has also given the full details to Respondent No. 1 (PTC). Based on the material placed on record, we are convinced that the Petitioner did involve and consult the Respondents while bidding for installation of FGD.

46. With regard to transparent competitive bidding process, we observe as under from the submission of the Petitioner filed vide affidavit dated 5.3.2021:

a) The Petitioner had prepared a Detailed Project Report 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 05.04.2018.

d) The Petitioner received bids from the following 7 bidders:

- L&T Power and Chiyoda – India
- Bharat Heavy Electricals Limited and MHI – India
- Sepco III and Beijing SPC – China
- Zhejiang TUNA Environmental Science & Technology Co. Ltd.– China
- Thermax and Marsulex – India
- China Datang – China
- JET – EPC – China – Ammonia Technology

e) Vendors were shortlisted with recommendation from Black & Veatch.

f) First four bidders from the above list, namely (a) L&T Power and Chiyoda, (b) BHEL and MHI, (c) Sepco III and Beijing SPC and (d) Zhejiang TUNA Environmental Science & Technology Co. Ltd. were shortlisted.

g) 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.

h) 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 Wet Limestone FGD system for control of SO_2 emissions.

i) Thereafter, the Petitioner issued Letter of Intent dated 13.06.2019 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 26.09.2019 and FGD package has been accordingly awarded.

47. 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 international competitive bidding process.

48. 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 Respondent No. 2 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:

Description	Rs. Core
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**

49. Thus, the hard cost discovered from competitive bid works out to be Rs.0.237 crore/MW (Rs. 284.38 crore /1200 MW), which is lower by Rs.0.153 crore/MW in comparison to CEA recommended cost of Rs.0.39 crore/MW (excluding opportunity cost) including spares. Considering the fact that the hard cost of Rs. 284.38 crore for installation of Wet Limestone-based FGD 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”.

50. In view of the above, the Commission accords provisional 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**

Opportunity Cost

51. 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. The Commission is of the view that the Procurer Respondents and the Petitioner shall plan the interconnection of FGD system with main plant by synchronizing it during annual overhaul. Therefore, the Commission is not considering the 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 consultations with the Procurers.

52. Apart from shutdown period of 22 days, the Petitioner has submitted that for installing Wet Limestone-based FGD 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 Procurers in a position of commercial suffering.

53. 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 - use of existing chimney or 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.

54. 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. We are of the view that 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 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.

55. Though Respondents 2 to 5 have raised concerns as regards claim of expenditure towards IDC, finance charges, pre-operative expenses, taxes & duties, trial run expenses and others expenditure towards project management & engineering services, we are of the view that expenditure on these counts have to be allowed since these are on account of installation of emission control system that has arisen on account of mandate through the 2015 Amendment Rules. These expenses can be claimed as per actuals after commissioning of the FGD system and can be allowed after prudence check by the Commission.

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 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, service water costs upon installation of FGD system.

58. In this respect, CEA in its report forwarded vide letter dated 21.2.2019has considered following operational cost for FGD operation:

Sr. No.	DESCRIPTION (FOR 2 X 600 MW)	ONLY FOR FGD IMPLEMENTATION (FOR 2X600 MW) (Rs. in crore)	COST PER MW/YEAR (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 @ 2000 INR/MT	-(37.97)		
	ANNUAL OPEX for 2X600 MW	Rs. 23.43 crore		
	ANNUAL OPEX per MW		Rs. 2.03 lakh	

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 of Rs.10.32 crore.

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 can't 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. The Commission is of the view that on account of installation of the FGD system, there would be impact on O&M expenditure (R&M, 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. However, the extent of compensation and manner in which the compensation is to be recovered by the Petitioner on monthly basis as supplementary capacity charges and supplementary energy charges, in due consideration of additional capital expenditure on installation of environmental control equipment including FGD, cost of reagent consumption, O&M expenses and impact of additional auxiliary consumption, is under finalization by the Commission and are discussed in the following paragraphs.

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. Not Used

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, "t*he 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*". Thus, through compensation for the Change in Law, the Petitioner is required to be restituted to the same economic position as if the Change in Law event had not occurred.

65. We note that few other similar petitions have been filed by other generating companies in respect of their generating stations wherein tariff has been determined through the tariff based competitive bidding route under Section 63 of the Act. PPAs in those cases also contain similar provisions as Clause 10.2 of the instant Petition i.e. there is no explicit provision with regard to methodology for compensation for Change in Law events which occur during the operation period. In those cases too, the PPAs have left it for the Commission to decide at the compensation for any increase/ decrease in revenues or cost on account of change in law during the operation period. Since the FGD system is required to be installed by all thermal generating stations as per the 2015 Notification, more such Petitions are likely to be filed by generating companies for determination of compensation on account of change in law during operation period. In view of above, the Commission has thought it appropriate to adopt a uniform compensation mechanism in respect of all such generating stations.

66. Therefore, the Commission vide order dated 23.4.2020 in Petition No. 446/MP/2019 directed staff of the Commission to float a Staff Paper at the earliest on the issue of compensation mechanism and tariff implications on account of the 2015 Notification in case of those thermal power plants where the PPA does not have explicit provision for compensation mechanism during the operation period and the PPA requires the Commission to devise such mechanism and invite comments/suggest from all the stakeholders. In compliance of the same, on 5.9.2020 the staff have floated the Staff Paper titled *"Mechanism for Compensation on account of change in law for compliance with Revised Emission Standards notified by MoEF&CC in respect of Competitively Bid Thermal generating".*

67. Based on the comments/suggestions obtained on the Staff Paper, the Commission through a Suo-Motu order dated 12.4.2021 in Petition No. 6/SM/2021 has solicited comments/suggestions of stakeholders on the proposed methodology. The Commission is likely to take a final decision soon on the issue. The Petitioner shall be entitled to recover the compensation on account of installation of FGD in terms of the mechanism finalized by the Commission in due course.

68. Petition No. 366/MP/2019 is disposed of in terms of above.

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