ORDER

OF THE

WEST BENGAL ELECTRICITY REGULATORY COMMISSION

IN CASE NO. OA-339/20-21

IN REGARD TO THE APPLICATION SUBMITTED BY CESC LIMITED FOR IN-PRINCIPLE APPROVAL OF CAPITAL EXPENDITURE FOR INSTALLATION OF LIMESTONE BASED WET FLUE GAS DESULPHURIZATION PLANT AT BUDGE BUDGE GENERATING STATION

PRESENT:
SRI SUTIRTHA BHATTACHARYA, CHAIRPERSON
SRI DURGADAS GOSWAMI, MEMBER
SRI PULAK KUMAR TEWARI, MEMBER

DATE: 20.01.2022

In regard to the application submitted by CESC Limited for In-principle approval of capital expenditure for installation of Limestone based Wet Flue Gas Desulphurization Plant at Budge Budge Generating Station

FACTS IN BRIEF

1.0 This is in regard to the Petition submitted by CESC Limited, on 15th July, 2020 for In-principle approval of capital expenditure in the 1st stage for the installation of Limestone based Wet Flue Gas Desulphurization Plant (FGD application) for an amount of Rs. 641.44 crore in respect of 3 x 250 MW Budge Budge Generating Station (BBGS) near Budge Budge, South 24 Parghanas, West Bengal, in terms of regulation 2.8.4.1 (iii) and 2.8.4.2 of the West Bengal Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2011 (in short "Tariff Regulations").

2.0 The petition is for compliance with the Environment (Protection) Amendment Rules, 2015 dated 7 December 2015 (hereinafter referred to as "Amendment Rules, 2015") notified by the Ministry of Environment, Forest and Climate Change (MoEFCC), specifying new standards of compliance for the thermal power plants with respect to emission of pollutants into the atmosphere.

3.0 The petition was admitted by the Commission on 03.05.2021. On admission of the FGD application, CESC Limited was directed to publish the gist of the FGD application, as submitted by CESC Limited and approved by the Commission. Accordingly, the gist was published simultaneously on 04.06.2021 in the 'Times of India', the 'Bartaman', the 'Aajkaal' and the 'Sanmarg'. The publication requested for submission of suggestions and objections from the members, if any, on the application to the Commission by 19.06.2021. The approved gist along with the FGD application was also published in the website of CESC Limited. Opportunities were also afforded to all to inspect the application and take copies thereof but no suggestion and objection is received within due date.

4.0 In the said application, CESC Limited has inter-alia stated the following:

4.1 The date of commercial operation of different units of the Power Station as declared are Unit #1: 7 October 1997, Unit #2: 1 July 1999 and Unit# 3: 28 February 2010. The Ministry of Power (MoP) in consultation with the Central Electricity Authority (**CEA**) decided that in order to meet the new SO_2 emission norms FGD Systems shall be required to be installed in all the plants for complying with the new standards. As per direction of MoEFCC, the Central Pollution Control Board (hereinafter referred to as the "**CPCB**"), vide its communication dated 11 December 2017 issued the directions to Budge Budge Generating Station of CESC Limited to install FGD by December 2022 in unit 1 , 2 and 3 respectively so as to comply SO_2 emission limit, to install ESP to meet emission limit of PM, to take immediate measure like installation of low NOx burners, providing Over Fire Air (OFA) etc. and achieve progressive reduction so as to comply NOx emission limit by the year 2022.

4.2 In its communication to the CERC dated 30.05.2018, containing the said directions, the MoP clarified that the Amendment Rules, 2015 qualifies as an event under 'Change in Law' in respect of the PPAs between generating companies and distribution licensees as well as it advised that affected thermal power plants may approach the Appropriate Commission for approval of additional capital expenditure on account of such Change in Law.

4.3 The existing infrastructure of Budge Budge Generating Station of CESC Limited not being adequate to meet the norms pertaining to SO_2 as per Amendment Rules, 2015 it is now obligatory for the Petitioner to modify the existing emission control system with installation of requisite technology of FGD System in the Power Station within the deadline for adhering to the desired level of SO_2 in flue gas emission. Therefore, the Petitioner will be required to incur substantial capital expenditure for installation of such FGD System and associated equipment for which the Petitioner is approaching the Commission seeking approval of the expected capital expenditure and other associated costs.

4.4 Statutory Remnant Life Assessment (RLA) study for both the Boilers of Units 1 and 2 as well as on the critical components of Turbine and Generator ascertain that there is no major observations which can affect the Remnant Life of the critical components. Therefore, Unit 1 and Unit 2 will be able to operate for more than 10 years post completion of 25 years from the dates of their commissioning.

4.5 The emission levels of Particulate Matter (PM) and Mercury for the Power Station at present are within the limits of Amendment Rules, 2015 if there is any change in coal characteristics.

4.6 At present, Units 1 and 2 of BBGS are sometimes able to meet the new NO_X emission standard of 600 mg / Nm^3 specified by the Amendment Rules, 2015, when running at high loads, however, at low loads these units are not always compliant with this standard. Unit 3 of BBGS is unable to meet the NO_X emission standard of 300 mg / Nm^3 specified by the Amendment Rules, 2015 with the existing equipment. The Petitioner is awaiting identification of suitable mitigation technology through recommendation of CEA to meet the norm. Depending on the recommendations of the CEA, the Petitioner may be required to incur further capital expenditure at BBGS for installation of NO_X abatement systems.

4.7 After consideration of factors like availability of reagent, adequate references of applicability to coal based power plants, efficiency of SO_2 removal, operational requirement, space, layout feasibility, raw material availability, by-product disposal and estimated life cycle cost analysis in the feasibility

report, limestone based Wet FGD technology (WFGD) is proposed with estimated timeline of 24 months. Copy of Feasibility Report for installation of FGD for 3 x 250 MW Budge Budge Generating Station of CESC Limited prepared by Fichtner Consulting Engineers (India) Pvt Ltd has been submitted with the petition as per Regulation 2.8.4.2.1.

4.8 The salient technical features of the proposal are as follows:

a) Wet Limestone based FGD System with dedicated absorber with new twin flue wet chimney for Unit 1 and Unit 2 and Wet Limestone based FGD System with dedicated absorber with new dedicated wet chimney for Unit 3 of BBGS without using Gas to Gas Heater is envisaged with design SO_2 emission level of 500 mg/ Nm^3 to comply with the MoEFCC norms of 600 mg/ Nm^3.

b) Some major systems / equipment are required to be retrofitted.

c) Process water for the units would be sourced from the existing plant CT blow-down water and clarified water system after necessary modification. Waste Water Treatment System consisting of Ultrafiltration-Reverse Osmosis chains to treat the high Total Dissolved Solids (TDS) of FGD waste water for further usage.

d) FGD plant layout as considered encroaches over a lot of infrastructure related installations which have to be relocated and newly constructed.

e) Civil piling foundations have to be considered for all major load bearing foundations of FGD installation as sub soil is soft and ground water level is high.

f) The design and construction of structures shall be required to be cyclone resistant particularly for taller structures like chimney as the power station is located in a high cyclone risk zone.

g) High Seismic design and construction of earthquake resistant structures for all FGD related structure including chimney with corresponding additional expenses is required as the station is located in high damage risk zone with respect to earthquakes.

h) Power source for FGD plant will be taken from existing station boards located at the main TG building. 2 x 100% DG sets have been conceived to provide reliable power to all emergency equipment. Separate UPS systems and DC system have been considered as existing sources are inadequate to cater to this additional load for FGD. Auxiliary Energy Consumption of Wet FGD System for each generating unit will be about 1.20% of installed

capacity at full load.

i) C&I System is considered including FGD PLC system connected with existing Main Plant DCS through Optical Fibre Cable (OFC) and other communication cables.

4.9 The entire process of installation and commissioning of FGD System at the Power Station would take around 24 months subject to the conditions that additional time is not required as per actual working conditions at site particularly during the monsoons.

4.10 The total Capital Cost towards the proposed Wet FGD System implementation is estimated to be Rs. 641.44 Crore including Initial Spares (estimated as per Tariff Regulations), Taxes & Duties, Insurance, Interest During Construction (hereinafter referred to as "IDC"), Pre-operative Expenses and Financing Charges. As per CESC Limited, the Capital Cost of the FGD System has been envisaged based on the present market rates and such estimates may differ from the actual expenditure made later based on the prices discovered through competitive bidding. The detailed break-up of the Capital Cost of the Wet FGD system proposed for the 3 x 250 MW units of BBGS as estimated by the Petitioner based on the Feasibility Report prepared by FIPL is shown in the following Table.

Particulars	Annotation	Rs. Crore
Base Capital Cost		
FGD Main System including General Civil Works, Electrical and C&I System	a	400.06
Mechanical BoP (HVAC, FPS system)	b	23.76
Waste Water Treatment Plant	c	3.84
Erection, Testing and Commissioning (including Site Development and Enabling Works)	d	40.71
Contingency	e	5.79
Initial Spares (@2.5% of Total Project Cost as per WBERC Tariff Regulations)	f = n*2.5%	16.04
Total Base Capital Cost of FGD Plants	**g = sum (a:f)**	**490.20**

Particulars	Annotation	Rs. Crore
Soft Capital Cost		
Taxes and Duties (GST @18% of Total Base Capital Cost)	h = g*18%	88.24
Insurance (@1% of Total Base Capital Cost)	i = g*1%	4.90
Pre-operative expenses (@1.5% of Total Base Capital Cost)	j = g*1.5%	7.35
IDC (@Rate of Interest 10%)	k	44.02
Financing Charges (@1.5% of Loan)	l = n*70%*1.5%	6.74
Total Soft Capital Cost of FGD Plants	**m = sum (h:l)**	**151.24**
Total Capital Cost of FGD Plants	**n = g + m**	**641.44**

4.11 CESC Limited, vide letter dated 02.03.2021, has furnished the communication from Central Electricity Authority (CEA) dated 24.02.2021 where the Authority has advised the generator that CEA is in the process of reviewing its guidelines on Project Cost and Technology considering that present bid out prices of such FGD systems are generally higher compared to its guidelines issued three years ago. This is also clarified in the said letter of CEA that the CAPEX was "Base Cost" only with new Chimney and without GGH and does not include Taxes-Duties and Opportunity cost for interconnection.

4.12 CESC has now submitted through a petition dated 17.12.2021 that considering the stringent timeline for installation of WFGD system, they invited the tender for international competitive bidding (ICB) for the investment on 18.01.2021 in three widely circulated daily newspaper viz. India Express (Kolkata, New Delhi, Mumbai), (b) The New India Express (Chennai), (c) Financial Express (Kolkata, New Delhi, Mumbai, Chennai). In response to the said Notice Inviting tender (NIT), eight parties purchased Bid Documents. However, finally only three parties had submitted their price bids for the proposed scope of works. The competitive bidding was conducted only for Engineering, Procurement and Construction (EPC) i.e it consisted of Hard Costs, Taxes and Duties and Insurances only for the FGD system. Other costs like preoperative

expenses, expenses towards enabling works, soft cost like financing charges, interest during construction were not covered under the bidding.

4.13 The discovered cost comprising hard costs, taxes and duties and insurances discovered in the bid are as follows:

Name of the Vendor	Total Cost	Cost per MW
BHEL	Rs 1260.0000 Crore	Rs 1.680 Crore / MW
SEC	Rs 1878.0544 Crore (Rs 1317.3603445 Crore On-shore Plus USD 76292486.00, Conversion rate of Rs 73.4927 for 1 USD is considered as on 17.09.2021)	Rs 2.504 Crore / MW
TECHNO	Rs 1044.3000 Crore	Rs 1.392 Crore / MW

4.14 After negotiation with the lowest bidder to reduce its quoted price CESC received a final quote (inclusive of hard cost, taxes and duties, insurance) from the lowest bidder which is Rs. 991.80 Crore. i.e. Rs. 1.3224 Crore /MW. There will be other soft cost like pre-operative cost, enabling works and contingencies totalling of Rs. 0.0597 Cr./ MW which translate the total capital cost at Rs. 1.3821 Cr./MW (Rs 1.3224 Cr/MW + Rs 0.0597 Cr/Mw) excluding the cost of financing and interest during construction (IDC). Thus, the total capital expenditure that will required to be incurred other than financing cost and interest during construction (IDC) are as follows:

Description	Amount (Rs Crore)	Rs Crore per MW
Total EPC cost in the scope of the lowest bidder. (Includes hard cost, taxes and duties and insurance)	991.80	1.3224
Other estimated cost like pre-operative expenses, enabling works and contingencies	44.74	0.0597
Total capital expenditure requirement other than financing cost and interest during construction (IDC)	1036.54	1.3821

4.15 In their petition dated 17.12.2021 CESC has referred letters from CEA dated 30.06.2021 and 07.09.2021 regarding conformity communication of the power plant of Dhariwal Infrastructure Ltd. (DIL) wherein CEA acknowledged by that capital cost of wet lime stone based FGD has increased recently due to various reason like limited vendor, raise in cost of input materials like steel, cement etc. and also advised DIL to discover the cost of FGD plant required to be

installed through competitive bidding. CESC has also submitted that various items of cost as considered by CEA vis-à-vis the capital cost submitted by CESC in its petition have material differences which also significantly contributed to the difference between the capital cost indicated by CEA and capital cost projected by the petitioner. CESC has also submitted that due to poor soil condition as may be shown from the soil investigation report they need extra piling which results extra civil cost. This is also submitted by CESC that CERC has allowed additional cost on account of piling foundation works for FGD installation for some other thermal power plant.

4.16 CESC has also submitted a copy of the order dated 28.09.2021 passed by CERC on the petition No 597/MP/2020 in matter of NTPC SAIL Power Company Limited vs DNH Power Distribution Corporation Limited & anrs wherein the cost discovered through a competitive bidding process was accepted by CERC though significantly higher than the indicative cost recommended by CEA. Moreover, cost other than hard cost were proposed to be considered on case to case basis at later stage. In the said order CERC has accorded 'in principle approval' to the claimed hard cost of Rs 72.45 lakh/MW towards installation of WFGD system to meet emission control norms for SO2 and claimed cost of Rs 14 crore (without IDC) towards Combustion Modification System to meet emission control norms for NOx.

4.17 CESC has now prayed before the Commission to:

(a) Take the petition dated 17.12.2021 alongwith documents filed alongwith it on record;

(b) Consider the final price of Rs 991.80 Crore i.e Rs 1.3224 Crore per MW discovered through competitive bidding process for the FGD system as the benchmark price for granting in-principle approval towards EPC cost including taxes and duties, and insurances;

(c) Accord in-principle approval to the Capital Cost of the FGD System at the benchmark price of Rs 991.80 Crore i.e Rs 1.3224 Crore per MW towards EPC cost including taxes and duties, and insurances subject to finalization based on actual cost incurred.

d) Accord in-principle approval to the Capital Cost other than the EPC cost comprising pre-operative expenses, enabling works and contingencies as estimated to the tune of Rs 44.74 Crore, i.e Rs 0.0597 Crore per MW, subject to finalization based on actual cost incurred by them

(e) Allow appropriate Financing Charges and Interest during Construction (IDC) at a later stage;

(f) Pass such other or further order(s) as the Commission may deem fit in the facts and circumstances of the case.

OBSERVATION OF THE COMMISSION

5.0 The Commission has observed that the Base Capital cost of the proposal is Rs 1.3224 Crore /MW (Rs 991.80 Crore / 750 MW).

6.0 The indicative CAPEX of CEA is 45.0 lakh /MW for 195/210/250 MW units discovered through open competitive bidding for the projects already awarded. It has been clarified in the communication dated 24.02.2021 on review of guidelines on FGD project cost for different MW size units that CAPEX is "Base Cost" only with new Chimney and without GGH and does not include Taxes-Duties and Opportunity cost for interconnection.

7.0 Central Electricity Authority (CEA) vide its communication dated 24.02.2021 has also advised the generators that CEA is in the process of reviewing its guidelines on Project Cost and Technology considering that present bid out prices of such FGD systems are generally higher compared to its guidelines issued three years ago.

8.0 However, no further guidelines on indicative hard cost has been issued by CEA.

9.0 It is also observed that the quoted hard cost by the lowest bidder is even much more than the hard cost of Rs 72.45 lakh/MW claimed by NTPC-SAIL Power Company Limited for which 'in principle approval' has been accorded by CERC.

10.0 Installation of FGD system is required to be established by CESC in compliance with the Environment (Protection) Amendment Rules, 2015 notified by the Ministry of Environment, Forest and Climate Change (MoEFCC), specifying new standards of compliance for the thermal power plants with respect to emission of pollutants into the atmosphere.

ORDER

11.0 In view of above CESC is directed to review the entire process towards optimization of cost keeping in mind the compliance of the Environment (Protection) Amendment Rules, 2015 notified MoEFCC and the timeline mandated in the notification dated 31.03.2021 issued by MoEFCC.

12.0 Let a copy of this order be served upon CESC Limited.

sd/- **SRI PULAK KUMAR TEWARI** **(MEMBER)**	sd/- **SRI DURGADAS GOSWAMI,** **(MEMBER)**	sd/- **SRI SUTIRTHA BHATTACHARYA** **(CHAIRPERSON)**

Dated : 20.01.2022

sd/-
SECRETARY