ORDER

OF THE

WEST BENGAL ELECTRICITY REGULATORY COMMISSION

IN CASE NO. OA-372/20-21

IN REGARD TO THE APPLICATION SUBMITTED FOR IN-PRINCIPLE CLEARANCE FOR INSTALLATION OF FLUE GAS DESULPHURIZATION (FGD) IN THE 3 x 150 MW THERMAL POWER STATION OF HIRANMAYE ENERGY LIMITED

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

DATE: 02.02.2022

In regard to the application submitted by for In-principle clearance for installation of Flue Gas Desulphurization (FGD) in the 3 x 150 MW Power Station of Hiranmaye Energy Limited

FACTS IN BRIEF

1.0 This is in regard to the Petition submitted by Hiranmaye Energy Limited (HMEL) before the West Bengal Electricity Regulatory Commission (Commission) on 13.07.2021 for 'in-principle clearance' for installation of Flue Gas Desulphurization (FGD) in its 3 x150 MW thermal power station at Haldia, West Bengal in terms of regulations 2.8.4.1 (iii), 5.2.2 (iii), (iv), (vi) and (vii) of the West Bengal Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2011, as amended. The application has been admitted by the Commission in Case No. OA – 372/21 – 22 on 23.08.2021.

2.0 The petition is for compliance with the Environment (Protection) Amendment Rules, 2015 dated 07.12.2015 and 28.06.2018 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. The MoEFCC Notification mandates all thermal power plants (TPPs) to comply with the revised Emission Control Norms (ECNs) as specified in the MoEFCC Notification.

3.0 The petition was admitted by the Commission on 23.08.2021. On admission of the FGD application, Hiranmaye Energy Limited was directed to publish the gist of the FGD application, as submitted by HMEL and approved by the Commission. Accordingly, the gist was published simultaneously on 21.09.2021 in the 'The Telegraph', the 'Ananda Bazar Patrika', 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 04.10.2021. The approved gist along with the FGD application was also published in the website of HMEL. 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, Hiranmaye Energy Limited has inter-alia stated the following:

4.1 The date of commercial operation (COD) of different units of the Power Station as declared are Unit #1: 13.08.2017, Unit #2: 31.12.2017 and Unit# 3: yet to be commissioned. The Petitioner had entered into a Long Term PPA for 300 MW capacity with West Bengal State Electricity Distribution Company Limited ("WBSEDCL") on 28.12.2010.

4.2 Ministry of Environment, Forest and Climate Change, Government of India (MoEF&CC) issued Gazette notification on 7th December 2015 amending Environment (Protection) Rules, 1986. Amended rules are called Environment (Protection) Amendment Rule, 2015. Gazette notification of Amendment on the water consumption limits and stack height was issued on dated 28th June 2018.

The revised standards are mandatory in nature and are to be complied with within a stipulated time frame.

4.3 Ministry of Power (GoI), vide its letter dated 30.05.2018 addressed to Central Electricity Regulatory Commission (CERC) has issued directions for smooth implementation of the revised emission standards and mechanism.

4.3 The Petitioner appointed M/s Fichtner Consulting Engineers (India) Private Limited (FCEIPL) to prepare Feasibility Report after carrying out the evaluation and assessment for implementation of the revised emission norms for existing/and under construction units of 3x150 MW power plant of the Petitioner at Haldia. As per the Detailed Project Report (DPR) prepared and attached with the petition, the existing infrastructure of HMEL is not adequate to meet the norms as per Amendment Rules, 2015 pertaining to SOx, NOx, Particulate Matter (PM) and Specific water Consumption (SWC). The feasibility report provided a technical and techno-economic analysis of various technologies for control of SOx, NOx, particulate matter and specific water consumption based on coal analysis, site plan, flue gas analysis, existing equipment rating & drawings and soil investigation report. The emission abetment technologies proposed are summarized as under:

SOx emission is to be reduced by 94.5% from the present levels to meet the December, 2015 norms of MoEFCC at 100 mg/Nm^3. After analyzing various technologies, it was concluded that Wet Limestone based technology emerged as the most suitable one in order to economically achieve the prescribed reduction of SOx.

NOx emission needed to be curtailed by 77% from the present levels in order to achieve the norms prescribed by MoEFCC at 100 mg/Nm^3. As per the feasibility report, Selective Catalytic Reduction (SCR) emerged as the most suitable technology in which ammonia would be used as a Reagent.

In order to meet the desired norms of 30 mg/Nm^3 for Particulate Matter (PM), Ammonia dosing at ESP along with upgrading of ESP with latest technology may be considered in absence of space in the existing power plant for an additional ESP, which could have been the best choice. Further, the existing Ash handling system also needs to be augmented to cater to the disposal of additional ash generated.

In order to limit the specific water consumption within the norms of 3.0 m^3/MWh, it has been recommended in the study that HMEL must adopt UF-RO based waste water treatment system of capacity 300 m^3/hr for 2 units and extension of the same by additional 150 m^3/hr to be done

when the third unit is in operation.

4.7 The Petitioner had submitted the aforesaid DPR before CEA to accord its approval on submitted DPR for onward transmission to Appropriate Commission. However, CEA vide its reply dated 15.06.2021, advised that the Petitioner to directly approach concerned Regulator for future course of action and any plant specific requirement for FGD installation.

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

a) Wet Limestone based FGD System with dedicated absorber for each unit and new common tri-flue wet chimney of 100m height for Unit 1,2 and 3 without using Gas to Gas Heater is envisaged. The auxiliary system of process water, limestone storage & handling, gypsum storage & handling shall be common.

b) Selective Catalytic Reduction (SCR) with ammonia used as a Reagent is envisaged for NOx control.

c) Ammonia dosing at ESP along with upgrading of ESP without adding Field is considered for PM control.

d) UF-RO based waste water treatment system of capacity 300 m^3/hr for 2 units and extension of additional 150 m^3/hr when the third unit is in operation is considered to comply the specific water consumption norm after implementations of ECN.

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

f) Capacity of existing Ash Handling System will be augmented to cater additional ash generated.

g) The space identified for FGD and its auxiliaries is sufficient.

h) Civil piling foundations have been considered for many major load bearing foundations of buildings/structures of Emission Reduction plant.

i) Power source for FGD plant will be taken from existing station boards located at the main TG building. Emergency power to all critical equipment will be provided from existing DG. Auxiliary Power for each generating unit for FGD, NOx and UF-RO system will be 1500 kW (1.00% of installed capacity at full load), 58 kW and 450 kW respectively. Auxiliary Energy Consumption will increase 1.5%.

j) Common PLC based control system in a common Control Room is envisaged for FGD, NOx and PM Emission reduction system having interface with existing plant DCS through soft and hard link. Uninterrupted Power Supply to PLC will be provided from existing UPS system.

4.9 The completion period for implementation of abatement methods for the Petitioner's plant on EPC basis would be 26-30 months excluding the downtime of 4 weeks/boiler for flue gas duct modification in the existing plant. The said timeline for the Petitioner's project is within the target date specified by the MOEF&CC for Category-B Power Plants.

4.10 The total Capital Cost towards the proposed Emission Reduction Plant including FGD, for 2 x 150 MW TPP, is estimated to be Rs. 61140.40 lakh including Initial Spares, civil costs, Taxes & Duties, Insurance, Erection, testing and commissioning, Overheads including Preoperative expenses, Contingency, Interest During Construction and Financing Charges. The Capital Cost has been envisaged based on the prevailing market price and in house data with break up as follows:

Sl. No	Particulars	Rs. lakh
1	Limestone based FGD System and its auxiliaries	21000.00
2	SCR system and its auxiliaries	9000.00
3	ESP upgradation	4000.00
4	UF-RO Plant	4500.00
5	Total Emission Reduction Plant Cost (1+2+3+4)	38500.00
6	Taxes & Duties @18.0% GST	6930.00
7	Transit Insurance @1%	454.30
8	**Total Plant & Equipment including Tax & Duties (5+6+7)**	**45884.30**
9	Erection, testing and commissioning	5506.10
10	Total EPC cost (8+9)	51390.40
11	Total Overheads	513.90
12	Contingency	1541.70
13	Hard Cost or Capital cost excluding IDC & FC (10+11+12)	53446.00
14	Interest During Construction (IDC)	7480.40
15	Finance Charges (FC)	214.00
16	Capital Cost including IDC &FC (13+14+15)	**61140.40**

4.11 The levelised impact of emission reduction system on Tariff comes out to be Rs.0.68/kWh for the balance design life of 18 years considering increase in Auxiliary Energy Consumption, water consumption, ammonia and Limestone consumption, O&M cost. There will be a separate expense on account of Gypsum disposal as well as there may be some income on account of gypsum sale. The disruption in generation of power during the installation phase of various emission control systems will lead to loss of fixed cost recovery during the shutdown period The aforesaid expected changes in various parameters of the Thermal Power Plant will be required to be considered while APR / tariff determination for ensuing years.

4.12 APTEL in the Order dated 28.08.2020 in Appeal Nos. 21 & 73 of 2019 and Appeal no. 153 of 2019 has allowed Capital Cost of the FGD project; wherein it is held that the MoEF&CC notification dated 07.12.2015 is a ***"Change in Law event"*** and directed Punjab State Electricity Regulatory Commission to devise mechanism for its recovery i.e. to formulate tariff determination principles for recovery of FGD project cost. Article 9 of the PPA dated 28.12.2010 between WBSEDCL and the Petitioner, has a provision to deal with Change in Law scenario. The Petitioner has relied upon the MOEF&CC notification, regulations of the Commission and provision under PPA for filing this petition to consider it under the Change in Law scenario and investment approval be granted.

4.12 HMEL has now prayed before the Commission to:

a) Admit the Petition as submitted herewith;
b) Grant 'in-principle clearance' for Rs 61140.4 Lakhs towards capital cost for installation of FGD and other associated system in compliance of MoEFCC notification dated 07.12.2015;
c) Allow the Petitioner to file such additional information, explanation and documents as may be required under the guidelines of the Commission;
d) Consider the revised parameters (such as increase in Auxiliary consumption, O&M expenses, water charges etc.) expected due to installation of FGD system while APR / Tariff determination for ensuing years;
e) Allow procurement cost of limestone and ammonia for operation of FGD System as part of Energy charges;
f) Allow normative availability (85%) for the period of installation and commissioning of FGD as deemed availability for payment of capacity charges during shutdown period;
g) Allow any other relief, order or direction, which the Hon'ble Commission deems fit to be issued;
h) Condone any inadvertent errors / inconsistencies / omissions / rounding off differences, etc. as may be there in the Petition.

OBSERVATION OF THE COMMISSION

5.0 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

6.0 The indicative CAPEX or "Base Cost" of Central Electricity Authority (CEA) for FGD is 45.0 lakh /MW for 195/210/250 MW units discovered through open competitive bidding for the projects already awarded. CEA has clarified that CAPEX is "Base Cost" only with new Chimney and without Gas to Gas Heater (GGH) and does not include Taxes-Duties and Opportunity cost for interconnection. The above Base cost may further vary as per no. of units, chimney layout, range of SO_2 removal, Choice of Corrosion protection lining in chimney, absorber and other sections.

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 guideline on indicative hard cost has been issued by CEA.

9.0 HMEL has submitted petition for 'in-principle clearance' for installation of Flue Gas Desulphurization (FGD) in its 3 x 150 MW thermal power station at Haldia. But from the enclosed Detailed Project Report (DPR), based on which the petitioner has estimated cost, this is noticed that the Emission Reduction Plant is for 2 x 150 MW units at 3 x 150 MW generating station at Haldia of HMEL. However, the envisaged new wet chimney for FGD shall be tri-flue, common to all three units of 3 x 150 MW generating station. Therefore, the Commission considers 2 x 150 MW or 300 MW for per MW cost analysis.

10.0 The proposal includes FGD as well as NOx, PM and SWC reduction plant.

11.0 HMEL has considered hard cost of Rs 53446 lakh excluding Interest During Construction (IDC) & Finance Charge (FC) but including Rs 6930 lakh on Tax & Duties for the total Emission Reduction Plant. Thus, the hard cost excluding Tax & Duties come to Rs 46516 lakh (Rs 53446 lakh – Rs 6930 lakh). In respect of cost of Plant & Equipment, FGD along with associated UF-RO Plant is 66.23% of the total Emission Reduction Plant {(210 Crore + 45 Crore) ÷ 385 Crore}.

Therefore, proportionate hard cost of FGD alone comes to Rs 30809.30 lakh (66.23% of Rs 46516 lakh) i.e Rs 102.70 lakh /MW (Rs 30809.30 lakh ÷ 300 MW).

12.0 It is also observed that the projected hard cost of FGD in lakh/MW is much more than the hard cost of Rs 72.45 lakh/MW for 2 x 250 MW NTPC-SAIL Power Company Limited, Bhilai for which 'in principle approval' have been accorded by CERC Order in Petition No. 597/MP/2020. Further, ₹14 crore (without IDC) towards the Combustion Modification System to meet emission control norms for NOx was approved in the same order whereas the projection HMEL towards De-NOX system works out to be Rs 108.73 Crore (Rs 465.16 Crore x Rs 90 Crore / Rs 385 Crore).

13.0 Installation of Emission Control Systems (ECS) is required to be established by HMEL 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

14.0 In view of above HMEL is directed to review the entire process towards optimization of cost keeping in mind the timeline target set by the Honourable Supreme Court and communicated and monitored by MoEF.

15.0 Let a copy of this order be served upon HMEL.

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

Dated : 02.02.2022

sd/-
SECRETARY