

CENTRAL ELECTRICITY REGULATORY COMMISSION

NEW DELHI

Petition No:168/MP/2019

(On remand)

Coram: Shri Jishnu Barua, Chairperson

Shri Ramesh Babu V, Member

Shri Harish Dudani, Member

Date of Order: 20th June, 2025

In the matter of: Petition, under Section 79 of the Electricity Act, 2003 read with Article 13 of the Power Purchase Agreement dated 22.04.2007 and Clause 4.7 of the Competitive Bidding Guidelines and this Hon'ble Commission's Order dated 17.09.2018 in Petition No. 77/MP/2016.

AND

IN THE MATTER OF:

Coastal Gujarat Power Limited

Through its Authorized Representative

having its registered office at:

C/o The Tata Power Company Limited,

34, Sant Tuka Ram Road, Carnac Bunder,

Mumbai - 400 021

... Petitioner

VERSUS

1. Gujarat Urja Vikas Nigam Ltd.

Through its General Manager (Commerce),

Sardar Patel Vidyut Bhavan, Race Course,

Vadodara – 390 007, Gujarat

2. Maharashtra State Electricity Distribution Company Ltd.



Through its Chief Engineer (Power Purchase),
4th Floor, Prakashgad, Plot No. G-9,
Bandra (East), Mumbai - 400 051, Maharashtra

3. Ajmer Vidyut Vitaran Nigam Ltd.
Through its Chairman and Managing Director,
Hathi Bhata, Old Power House,
Ajmer, Rajasthan

4. Jaipur Vidyut Vitaran Nigam Ltd.
Through its Chairman and Managing Director,
Vidyut Bhawan, Janpath,
Jaipur, Rajasthan

5. Jodhpur Vidyut Vitaran Nigam Ltd.
Through its Chairman and Managing Director
New Power House, Industrial Area,
Jodhpur, Rajasthan

6. Punjab State Power Corporation Limited,
Through Chief Engineer
PP&R, Shed T-1, Thermal Design,
Patiala – 147 001

7. Uttar Haryana Bijli Vitran Nigam Limited,
Chief Engineer,
Vidyut Sadan, Plot No.C-16, Sector 6,
Panchkula – 134 112, Haryana

8. Dakshin Haryana Bijli Vitran Nigam Limited,
Vidyut Nagar, Vidyut Sadan,
Hissar, Haryana - 125005

9. Central Electricity Authority



Sewa Bhawan,
R. K. Puram, Sector-1,
New Delhi - 110 066

... Respondents

Parties Present:

Shri Sanjay Sen, Sr. Advocate, CGPL
Shri Abhishek Munot, Advocate, CGPL
Shri Kunal Kaul, Advocate, CGPL
Shri Samikrith Rao, Advocate, CGPL
Ms. Poorva Saigal, Advocate, Haryana & Rajasthan Utilities, PSPCL
Ms. Reeha Singh, Advocate, Haryana & Rajasthan Utilities, PSPCL
Ms. Tanya Singh, Advocate, Haryana & Rajasthan Utilities, PSPCL
Ms. Ranjitha Ramachandran, Advocate, GUVNL
Shri Vyom Chaturvedi, Advocate, MSEDCL

Order

1. Coastal Gujarat Power Ltd. (CGPL), the Petitioner, is a power generation company that operates the Mundra Ultra Mega Power Project (UMPP) in Mundra, Gujarat, with an installed capacity of 4,150 MW (5×830 MW). The respondents primarily consist of distribution licensees that purchase electricity generated from the Mundra UMPP. These entities entered into Power Purchase Agreements (PPAs) with the Petitioner on 22.04.2007, following tariff determination through competitive bidding conducted under Section 63 of the Electricity Act, 2003.
2. The Ministry of Environment, Forest and Climate Change, Government of India ("MoEF&CC"), through its notification dated 07.12.2015, prescribed revised emission standards applicable to thermal generating stations. In response, the Petitioner filed Petition No. 77/MP/2016 under Article 13 of the PPA. The Commission, vide its Order dated 17.09.2018, adjudicated as follows:
 - a) The introduction of the Revised Norms constitutes a Change in Law event;
 - b) CGPL is required to implement the Revised Norms in accordance with the 2015 Notification, in consultation with the Central Electricity Authority (CEA);



- c) The Mundra Ultra Mega Power Project (UMPP) is in compliance with the prescribed standards for particulate matter and mercury as set forth in the 2015 Notification;
 - d) The Power Purchase Agreement (PPA) does not contain any provision for in-principle approval; and
 - e) CGPL shall seek the Commission's approval for the determination of any increase in costs and/or revenue expenditure arising from the implementation of the Revised Norms, in accordance with the Guidelines issued by CEA, along with the prescribed mechanism for recovery of such costs through a monthly tariff.
3. The Petitioner filed Petition No. 168/MP/2019 before the this commission seeking relief under the Change in Law provisions for the additional expenditure incurred in installing Flue Gas Desulphurization (FGD) systems at its 4,150 MW Ultra Mega Power Project (UMPP) in Mundra. Commission vide its order dated 22.6.2020, allowed the pass-through of the Change in Law impact only on a pro-rata basis for 4,000 MW, rather than the full installed capacity of 4,150 MW as claimed by CGPL. In arriving at its decision, the Commission framed four issues for adjudication: (i) whether provisional approval of capital expenditure for the proposed FGD installation could be granted; (ii) whether additional O&M expenses and relaxation in other operating norms due to the FGD installation were admissible; (iii) whether 4,150 MW or 4,000 MW should be considered for determining expenditure and relief; and (iv) the norms and mechanism for adjusting tariff to restore the Petitioner to the same economic position as if the Change in Law event had not occurred. The Appellant was dissatisfied with the Commission's finding on Issue No. 3, wherein although CERC recognized that capital expenditure, operating costs, and auxiliary power consumption should be computed based on the total installed capacity of 4,150 MW, it ruled that the Respondents' liability would be limited to 4,000 MW in accordance with the terms of the Power Purchase Agreement (PPA). A Review Petition filed by the Appellant challenging this determination was subsequently dismissed by the Commission through its order dated 16.08.2021.
4. Aggrieved by the partial relief granted by the Commission in its order dated 22.06.2020, Tata Power Company Limited (TPCL), formerly known as Coastal Gujarat Power Limited (CGPL), preferred Appeal No. 240 of 2022 before the Hon'ble Appellate Tribunal for Electricity (APTEL). The appeal was filed to challenge the Commission's decision to limit the pass-through of the Change in Law impact arising from the installation of the Flue Gas Desulphurization (FGD) system to only 4,000 MW, as opposed to the full installed
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capacity of 4,150 MW. TPCL contended that the restriction was inconsistent with the actual capacity of the Ultra Mega Power Project at Mundra and sought a determination from the Hon'ble APTEL on this issue. The Hon'ble APTEL, after hearing the matter, passed its Order dated 14.05.2024 in Appeal No. 240 of 2022, with the relevant extract of the judgment provided below.

“.....

12. However, we do not find any discussion or findings of the Commission in the entire impugned order with regard to the contention of the Appellant that the expenditure for installing FGD system for installed capacity of 4000 MW could have been same as the expenditure for the system for installed capacity of 4150 MW. It has been the specific case of the Appellant that in case of Mundra UMPP, the size of FGD would have been same for the installed capacity of 4000 MW as well as 4150 MW and no additional capital cost would be required for installation of FGD system for the capacity of 4150 MW. It has been further contention of the Appellant that since there is no change in the size of FGD system with an installed capacity of 4150 MW 'Motor or Electricity Driven Boiler Feed Pump' vis-à-vis installed capacity of 4000 MW with 'Steam Driven Boiler Feed Pump', the various equipment required for FGD will also be the same and hence the total auxiliary power consumption of the FGD will be the same in both the cases.

13. It has been argued on behalf of the Appellant that the fact that there is no tangible difference in the capital cost of installation of FGD system for capacity of 4000 MW as opposed to 4150 MW is evident from CGS general norms for installing ammonia and sea-water based FGD system applicable w.e.f. 20th March, 2019 which prescribed the base capital expenditure of Rs.27 Lakh per MW for installing the FGD in the installed capacity between 800 MW to 830 MW. Thus, according to the Appellant, there would not be any additional expenditure for a unit having an installed capacity of 830 MW vis-à-vis the unit having an installed capacity of 800 MW. A copy of these norms issued by CEA is annexed to the Appeal as Annexure 10.

14. Having regard to these submissions made on behalf of the Appellant on the issue under consideration, we are of the opinion that conclusion arrived at by the Commission in the impugned order, is not justified and sustainable in the absence of any exercise on the part of the Commission to find out whether in fact, there would be no additional capital expenditure or operational expenditure on installation



of FGD system for the capacity of 4150 MW as opposed to the capacity of 4000 MW. In case, it is found that there is no change in the size of FGD for an installed capacity of either 4000 MW or 4150 MW which would indicate no difference in the capital cost of installation of the system as well as in the equipments required for the system, there would be no justification for allowing the expenditure of the FGD system to the Appellant on pro-rata basis corresponding to 4000 MW.

15. In these facts and circumstances of the case, we find it appropriate to remand the case back to the Commission for a fresh consideration on the above noted submissions/contentions raised on behalf of the Appellant.

16. Hence, the impugned order is hereby set aside to the extent it has been assailed in this Appeal. The appeal stands allowed. The case is remanded back to the Commission for fresh consideration on the aspect noted herein above after hearing the parties again. Needless to say that the Commission shall complete the exercise expeditiously and not later than three months from the date of the receipt of this order from this Tribunal.”

Hearing dated 18.6.2024

5. The Commission heard the case on 18.6.2024, wherein, the learned counsel for the Petitioner submitted that following the Hon'ble APTEL judgment dated 14.05.2024 in Appeal No. 240 of 2022, the Commission has been directed to re-examine only the limited issue of whether the Change in Law impact for FGD installation should be based on 4,150 MW (installed capacity) rather than 4,000 MW (pro-rata basis). The Commission allowed the Petitioner to submit additional information and to file for a change in company name. It also instructed the Petitioner to provide an affidavit with supporting technical documents, including Heat Balance Diagrams and justification for auxiliary power consumption and cost equivalence between the two capacity configurations. The relevant extract of the said RoP is extracted below:

“.....The Petitioner was directed to submit on an affidavit within two weeks, the following information along with the supporting documents in regards to Issue No. 3 as dealt with by the Commission vide order dated 22.6.2020 in Petition No. 168/MP/2019:

- a. The Heat Balance Diagram of the plant envisaged for Installed Capacity of the Plant as 4000 MW considered at the time of bidding vis-à-vis the*



Heat Balance Diagram of the Plant actually commissioned with installed capacity of the Plant as 4150 MW.

- b. How the Petitioner arrived at the calculation of a 30 MW higher rating for each unit (150 MW for the entire Plant) in 'Motor or Electrically Driven BFP' compared to 'Turbine Driven BFP'.*
- c. The rationale, backed by the supporting data, for the Petitioner's assertion that the expenditure for installing FGD system for installed capacity of 4000 MW 'Turbine Driven BFP' vis-à-vis that of 4150 MW 'Motor or Electrically Driven BFP' remains the same.*
- d. The rationale, backed by supporting data, for the Petitioner's assertion that the total auxiliary power consumption of the FGD remains the same in both the cases i.e. the Plant with installed capacity of 4000 MW 'Turbine Driven BFP' and 4150 MW 'Motor or Electrically Driven BFP'...."*

6. The Petitioner, vide its affidavit dated 19.7.2024, submitted the information as directed by the Commission in the RoP dated 18.6.2024 and mainly submitted as below:
- a. The Petitioner submitted that, since there has been no change in the boiler design, there is no corresponding increase in capital and operating expenses. Consequently, no additional fuel is being burned to generate the same net exportable quantum of electricity.
 - b. The Turbine Cycle Heat Rate (TCHR) for the 800 MW Unit is 7796 kJ/kWh, and for the 830 MW Unit is 7440 kJ/kWh. While the Turbine Cycle Heat Rate of 7796 kJ/kWh in 800 MW, the Heat Balance Diagram includes consumption by the Turbine Driven Boiler Feed Pump, the Turbine Cycle Heat Rate of 7440 kJ/kWh in 830 MW Heat Balance Diagram is excluding BFP power. Thus, for an apple-to-apple comparison, the BFP power consumption by an electrically driven Motor Driven Boiler Feed Pump in an 830 MW configuration needs to be adjusted to arrive at the Net Turbine Cycle Heat Rate with Motor Driven Boiler Feed Pump. Thus, for an 830 MW Unit at full load for 1 hour, 830,000 kWh (i.e., 830 x 1000 kW x 1h) energy shall be generated with a total heat input of 7440x830,000 kJ (i.e., 7440 kJ/kWh x 830,000 kWh). Since out of 830,000 kWh generated, 30 MW



for 1 hour or 30,000 kWh would be consumed by 2 Motor Driven Boiler Feed Pumps, the net energy available for meeting other Auxiliaries and export shall be 800,000 kWh. In other words, the net Turbine Cycle Heat Rate would be 7719 (i.e., Input Energy in kJ/Net Output Energy in kWh = $7440 \times 830,000 / 800,000$), which marginally improves (by about 76 kJ/kWh) in comparison to 7796 kJ/kWh for the 800 MW Heat Balance Diagram. Thus, there is a minuscule improvement of less than 1% ($76/7796 \times 100 = 0.97\%$) in Turbine Cycle Heat Rate. In other words, there is no material change in the quantum of coal consumption for Mundra UMPP with the installed capacity of 4,000 MW vis-à-vis 4,150 MW.

- c. The rated output of the Steam Turbine is 830,000 kW (830 MW) (i.e., Maximum Continuous Rating (MCR), as per Name Plate Rating and, hence, TPCL cannot continuously generate more than 830 MW.
- d. The net plant capacity is 4000 MW (5 units of 800 MW each) after accounting for the Motor Driven Boiler Feed Pump. Despite the maximum gross generation of 830 MW per unit, the available power for sale remains unchanged due to auxiliary consumption, making no surplus capacity beyond the originally planned 4000 MW.
- e. The additional 30 MW per unit is designated for two Motor Driven Boiler Feed Pumps, each requiring approximately 14.77 MW at full load (830 MW). This totals 29.54 MW per unit, rounded to 30 MW.
- f. The Petitioner submits that the expenditure for the FGD system remains the same for 4000 MW as for 4150 MW. The Petitioner further submits that coal consumption remains nearly unchanged between 4000 MW and 4150 MW. As there was no increase in coal consumption, there was no change in the Boiler Design and Capacity between the two configurations. Consequently, the FGD size remained the same, and therefore, the expenditure did not increase.

7. Respondent No. 1, vide its affidavit dated 16.8.2024, submitted a reply to the additional information filed by the Petitioner in its affidavit dated 19.7.2024, and mainly submitted as below:

- a. The Petitioner submits that the CEA Norms prescribe the cost of the FGD system on a per MW basis, establishing that the cost is directly related to the capacity of the power project. Accordingly, whether the project is 4000 MW or 4150 MW would result in a difference in cost.



- b. CEA report considered the FGD cost on a per MW basis, specifically Rs. 0.30 crores per MW for Coastal Gujarat Power Limited. The expenditure of Rs. 1245 crores was calculated for 4150 MW, whereas for 4000 MW, the cost would be Rs. 1200 crores. Similarly, the CGPL Feasibility Report referred to capital expenditure of Rs. 0.448 crores per MW for a seawater-based FGD, and the CEA Norms dated 20.03.2019 considered Rs. 27 lakhs per MW. Since cost estimation is consistently based on per MW capacity, the cost for 800 MW installed capacity would be lower than that for 830 MW.
 - c. CEA estimated costs at Rs. 0.30 crores per MW, clearly establishing that the costing is determined on a per MW basis. Consequently, a unit of 830 MW would incur a higher cost than a unit of 800 MW, and the total cost for a 4150 MW capacity would be higher than that for a 4000 MW capacity. Therefore, the Petitioner's contention that the costs for 4000 MW and 4150 MW would be the same is incorrect and cannot be accepted.
 - d. The Respondent submits that the design modification has resulted in an increase in auxiliary consumption without affecting the Contracted Capacity. The additional 150 MW is solely for auxiliary consumption, and as a result, the design change provides no corresponding benefit to the Procurers.
 - e. Petitioner's claim that the increase in auxiliary consumption did not affect the quantum of fuel fired is incorrect. It is denied that the capacity of the FGD would remain the same irrespective of whether the plant operates at 4150 MW or 4000 MW. In any case, the FGD is being installed for 4150 MW, whereas the capacity as per the RFP, Bid, and PPA is 4000 MW. Therefore, the costs related to the PPA must be proportionately allocated to 4000 MW.
 - f. Auxiliary Consumption claimed by the Petitioner as 47.85 MW constitutes 1.153% of 4150 MW, which the Petitioner asserts is in line with CEA recommendations. However, if the capacity is considered as 4000 MW, the auxiliary consumption as per CEA recommendations would be 46.12 MW. This clearly indicates that the higher auxiliary consumption is a result of the increased capacity of the power plant.
 - g. The heat balance diagrams, etc, do not provide the conclusion that the size of FGD and cost of FGD would remain the same.
8. The Petitioner, vide its affidavit dated 9.10.2024, submitted a rejoinder to Respondent No.1, GUVNL's reply dated 16.8.2024, and mainly submitted as below:
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- a. It is reiterated that the Petitioner does not have any excess Ex-Bus saleable capacity beyond the contracted 3800 MW, and the entire installed capacity of 4150 MW is solely dedicated to supplying the Procurers. Therefore, the submission by GUVNL that the Procurers cannot be held liable for costs associated with the additional 150 MW is incorrect.

In any case, the Petitioner asserts that despite the increase in installed capacity from 4000 MW to 4150 MW, there has been no impact on:

- (i) the contracted capacity;
 - (ii) the tariff payable by the Procurers;
 - (iii) fuel consumption for supplying the contracted capacity; or
 - (iv) any additional costs being passed on to the Procurers.
- b. It is Petitioner's case that the change in design has not led to any increase in fuel consumption, and net saleable/contracted capacity remains the same even after making the changes.
- c. Any increase in generation is utilized internally for operating the Boiler Feed Pumps (BFP) on the boiler side. Previously, in the 4000 MW configuration, the BFPs were driven by steam energy, whereas in the 4150 MW setup, they are powered by electrical energy. Despite this shift, the net output remains 3800 MW.
- d. The energy savings in steam, which improve the thermal efficiency (SHR) from 7996 to 7440 kJ/kWh, are first converted into electrical energy and then used to run the BFPs. This increase in auxiliary consumption is a result of this shift and is unrelated to the auxiliary consumption of the FGD system.
- e. Accordingly, there is no overall increase in energy input to the boiler or total coal consumption for delivering the 3800 MW net output. As a result, the FGD system size and its auxiliary consumption remain unchanged.
- f. Although a Motor-Driven Boiler Feed Pump results in higher auxiliary consumption compared to a Turbine-Driven Boiler Feed Pump (8.5% vs. 6% total auxiliary consumption), it enhances the overall Design Unit Heat Rate by at least 40 kCal/kWh. In other words, the energy savings from improved efficiency are utilized to operate the BFP motors.
- g. As is evident from the Heat Balance Diagrams, the Turbine Cycle Heat Rate ("TCHR") for the 800 MW Unit is 7796 kJ/kWh and for the 830 MW Unit is 7440 kJ/kWh. While the Turbine Cycle Heat Rate of 7796 kJ/kWh in the 800 MW Heat Balance Diagram includes consumption by Turbine Driven BFP, the Turbine



Cycle Heat Rate of 7440 kJ/kWh in the 830 MW Heat Balance Diagram is excluding BFP power. Thus, for an apple-to-apple comparison, the BFP power consumption of 30 MW by electrically driven Motor Driven Boiler Feed Pump in 830 MW configuration needs to be adjusted to arrive at Net TCHR with Motor Driven Boiler Feed Pump for delivering 800 MW to meet Contracted Capacity (760 MW) and Other Auxiliaries (40 MW).

- h. The claim that design modifications have led to an increase in the FGD system's auxiliary consumption is denied. The actual auxiliary consumption is based on the total kWh usage, which is a function of the kW ratings of the FGD auxiliary equipment and their operational duration, driven by SO_x loading. GUVNL has incorrectly assumed that, using a normative auxiliary consumption rate of 1.153%, the auxiliary load would be 47.85 MW for a 4150 MW plant and 46.12 MW for a 4000 MW plant. This suggests, as per GUVNL's argument, that a 4000 MW plant would have resulted in lower FGD auxiliary consumption—an assumption that is incorrect.
- i. With respect to the Petitioner's submission on the scope of Change in Law, the Petitioner submitted that GUVNL's assertion regarding the conversion of the Section 63 PPA to a Section 62 PPA is entirely unfounded. There is no demonstrated prejudice to the Procurers arising from the increase in plant capacity from 4000 MW to 4150 MW, nor from the size of the currently installed FGD system, which remains the same for a 4000 MW capacity and has not changed.

Hearing dated 18.6.2024

- 9. The counsel for Respondent Nos. 3-8 requested permission to file their respective replies in the matter. In response, the Commission granted all Respondents three weeks to submit their replies, with a copy provided to the Petitioner, who may file rejoinders within three weeks thereafter.
- 10. Respondent Nos. 7 and 8, Haryana utilities, filed a reply via its affidavit dated 15.10.2024 in response to the additional affidavit dated 19.7.2024 filed by the Petitioner. The brief of their reply is as follows:
 - a. No claim can now be raised for any additional cost in relation to the said 150 MW, whether as part of the tariff or as part of a change in law. Haryana Utilities and other



Procurers cannot be made liable in any manner for any cost associated with the said 150 MW.

- b. The CEA report and related documents consistently assess FGD costs on a per MW basis. For example, the cost of ₹0.30 crores per MW was considered specifically for Tata Power's plant, based on prices discovered through competitive bidding. Accordingly, a 4150 MW plant would cost ₹1245 crores, while a 4000 MW plant would cost ₹1200 crores. Tata Power's own feasibility report also referenced a per MW cost of ₹0.448 crores for a seawater-based FGD. Similarly, the CEA norms dated 20.03.2019 indicate a cost of ₹27 lakhs per MW. These references clearly show that capacity directly influences cost, and a lower installed capacity (e.g., 800 MW vs. 830 MW) would result in proportionately lower expenditure.
- c. Therefore, the contention of Tata Power that the costs for 4000 MW and 4150 MW would be the same cannot be accepted. If such were the case, the costs would not be provided on a per MW basis. Since the MW capacity is a factor for considering the prudence of the costing of the FGD, Tata Power cannot now contend that the cost is the same whether it is 4000 or 4150 MW.
- d. It is incorrect for Tata Power to assert that the fuel consumption remains unchanged despite an increase in auxiliary consumption. The claim that the FGD capacity would remain the same for both 4000 MW and 4150 MW is also denied. In any event, the FGD is being installed for a 4150 MW capacity, whereas the RFP, Bid, and PPA are all based on a 4000 MW capacity. Therefore, the associated costs under the PPA must be proportionately allocated to the 4000 MW capacity.
- e. Tata Power has merely asserted that there is no increase in emissions and that the FGD system is dependent on coal consumption and resulting emissions. However, its claim that the FGD size remains unchanged between 800 MW and 830 MW is unsubstantiated and not supported by any documentary evidence. Furthermore, Tata Power has not provided any documentation to demonstrate that the cost of the FGD system would be identical for both 4000 MW and 4150 MW capacities.
- f. Tata Power's claim implies that coal consumption remains the same whether auxiliary consumption is 40 MW (for 800 MW units) or 70 MW (for 830 MW units), which is inconsistent with its own submissions. In earlier petitions, including under Section 11 of the Electricity Act, 2003, Tata Power has used an auxiliary consumption of around 8.5% to calculate coal costs. This is at odds with its current position. If only 40 MW of the 70 MW auxiliary load actually consumes coal, then



the coal-based auxiliary consumption would be closer to 5% rather than 8.5%. Consequently, coal costs should be adjusted accordingly. This inconsistency is further highlighted in Petition No. 179/MP/2023, where Tata Power again sought to claim 8.5% auxiliary consumption.

11. The reply on behalf of Respondent Nos. 3 to 5, the Rajasthan utilities, was filed through an affidavit dated 13.10.2024 in response to the additional affidavit dated 19.7.2024 filed by the Petitioner. In their submission, the Rajasthan utilities reiterated the same contentions as raised by Respondent Nos. 7 and 8. Similarly, Respondent No. 6, Punjab State Power Corporation Limited (PSPCL), filed a reply vide its affidavit dated 11.10.2024 to the additional affidavit dated 19.7.2024 filed by the Petitioner, also reiterated the contentions raised by Respondent Nos. 7 and 8. In response, the Petitioner filed a rejoinder, vide its affidavit dated 16.11.2024, addressing the replies from Haryana, Rajasthan, and Punjab procurers, and reiterating the facts previously stated in their submissions.

Hearing dated 26.12.2024

12. The matter was heard virtually. The learned senior counsel for the Petitioner began arguments by referring to a Note of Arguments but requested a physical hearing due to the technical complexity of the matter. The Respondents did not oppose this suggestion, although the counsels for PSPCL and HPPC requested that the Petitioner be directed to share the Note. The Commission agreed and directed the Petitioner to provide a copy of the Note of Arguments to the Respondents.

Hearing dated 28.1.2025

13. During the hearing, the senior counsel for the Petitioner and the counsels for the Respondents presented their arguments regarding whether the Petitioner is entitled to claim capital and operational expenditure (Capex and Opex) for the FGD system based on the full installed capacity of 4,150 MW or the 4,000 MW considered earlier. After hearing both sides, the Commission directed the Petitioner to submit its written submissions within two weeks, with the Respondents given two weeks thereafter to file their responses. The matter was then reserved for order.

Analysis and Decision



14. We have considered the submissions made by the parties. As noted above, the Petitioner filed Appeal No. 240 of 2022 before the Hon'ble APTEL challenging the CERC's Order dated 22.06.2020 in Petition No. 168/MP/2019, specifically on Issue No. 3. While CERC acknowledged that capital expenditure, operating costs, and auxiliary power consumption should be calculated based on the total installed capacity of 4,150 MW, it held that the Respondents' liability was limited to 4,000 MW, in line with the provisions of the Power Purchase Agreement (PPA). The relevant extract of the Commission's Order dated 22.6.2020 in Petition NO.168/MP/2019 is as under:

“....

56. We also take notice of the submission of the Petitioner that the FGD system has been designed for 4150 MW capacity and the costs have been accordingly claimed. It has contended that the capital cost of the project for 4000 MW capacity would not proportionately come down and, therefore, it would also be incorrect to consider a proportionate reduction. The emission of SO₂ is dependent on amount of coal to be fired and Sulphur content in the coal. The installation of 4150 MW plant capacity in place of 4000 MW by CGPL is to cater to the power consumption requirement of electrical motor driven BFPs keeping same contractual output of 3800 MW to procurers. Selection of 4000 MW plant with turbine driven BFP would have accounted for higher heat rate which in turn would have required higher coal consumption and higher SO₂ emission for the same contractual output. However, we note that the Petitioner has not explained the rationale for such assertions. Moreover, this Petition has been filed for claim of costs related to installation of FGD system. Any claim of the Petitioner for granting costs for 4150 MW is not subject matter of this Petition. Accordingly, we hold that the calculations for capital expenditure, operating expenditure and auxiliary power consumption shall be done corresponding to installed capacity of 4150 MW, but the Respondents shall be liable to pay the expenses on pro-rata basis corresponding to 4000 MW in terms of PPA.”

15. Aggrieved by the above Commission's findings, the Petitioner filed a Review Petition (No. 30/RP/2020), which was dismissed on 16.08.2021. Subsequently, on 04.10.2021, the Petitioner filed Appeal No. 240 of 2022 to the Hon'ble Appellate Tribunal for Electricity, challenging the Commission's Order dated 22.06.2020, particularly its conclusion that Procurers are liable to pay capital and operational costs on a pro-rata basis for 4,000 MW, while TPCL's costs are considered for 4,150 MW. On 14.05.2024,



the Hon'ble Appellate Tribunal set aside the Commission's Order to the extent challenged and remitted the matter back for fresh consideration. The relevant extract of the Hon'ble APTEL's Order dated 14.05.2024 in Appeal No. 240 of 2022 is as under:

“.....

12. However, we do not find any discussion or findings of the Commission in the entire impugned order with regard to the contention of the Appellant that the expenditure for installing FGD system for installed capacity of 4000 MW could have been same as the expenditure for the system for installed capacity of 4150 MW. It has been the specific case of the Appellant that in case of Mundra UMPP, the size of FGD would have been same for the installed capacity of 4000 MW as well as 4150 MW and no additional capital cost would be required for installation of FGD system for the capacity of 4150 MW. It has been further contention of the Appellant that since there is no change in the size of FGD system with an installed capacity of 4150 MW 'Motor or Electricity Driven Boiler Feed Pump' vis-à-vis installed capacity of 4000 MW with 'Steam Driven Boiler Feed Pump', the various equipments required for FGD will also be the same and hence the total auxiliary power consumption of the FGD will be the same in both the cases.

13. It has been argued on behalf of the Appellant that the fact that there is no tangible difference in the capital cost of installation of FGD system for capacity of 4000 MW as opposed to 4150 MW is evident from CGS general norms for installing ammonia and sea-water based FGD system applicable w.e.f. 20th March, 2019 which prescribed the base capital expenditure of Rs.27 Lakh per MW for installing the FGD in the installed capacity between 800 MW to 830 MW. Thus, according to the Appellant, there would not be any additional expenditure for a unit having an installed capacity of 830 MW vis-à-vis the unit having an installed capacity of 800 MW. A copy of these norms issued by CEA is annexed to the Appeal as Annexure 10.

14. Having regard to these submissions made on behalf of the Appellant on the issue under consideration, we are of the opinion that conclusion arrived at by the Commission in the impugned order, is not justified and sustainable in the absence of any exercise on the part of the Commission to find out whether in fact, there would be no additional capital expenditure or operational expenditure on installation of FGD system for the capacity of 4150 MW as opposed to the capacity of 4000 MW. In case, it is found that there is no change in the size of FGD for an



installed capacity of either 4000 MW or 4150 MW which would indicate no difference in the capital cost of installation of the system as well as in the equipments required for the system, there would be no justification for allowing the expenditure of the FGD system to the Appellant on pro-rata basis corresponding to 4000 MW.

15. In these facts and circumstances of the case, we find it appropriate to remand the case back to the Commission for a fresh consideration on the above noted submissions/contentions raised on behalf of the Appellant.

16. Hence, the impugned order is hereby set aside to the extent it has been assailed in this Appeal. The appeal stands allowed. The case is remanded back to the Commission for fresh consideration on the aspect noted herein above after hearing the parties again. Needless to say that the Commission shall complete the exercise expeditiously and not later than three months from the date of the receipt of this order from this Tribunal.”

16. On perusal of the above Hon'ble APTEL's Order dated 14.05.2024 in Appeal No. 240 of 2022, the following conclusion can be drawn from the order:

- a. That the Hon'ble Appellate Tribunal for Electricity (APTEL), after considering the submissions made on behalf of the Appellant, has held that the conclusion arrived at by the Central Electricity Regulatory Commission (CERC) in the impugned order is not justified and sustainable. The Hon'ble Tribunal observed that the Commission failed to undertake any exercise to ascertain whether there would, in fact, be any additional capital expenditure or operational expenditure for the installation of the FGD system for a capacity of 4150 MW as opposed to 4000 MW.
- b. That the Hon'ble Tribunal noted that in the absence of such an assessment, it cannot be conclusively determined whether there is any change in the size of the FGD system for an installed capacity of either 4000 MW or 4150 MW. If it is found that the size and specifications of the system remain unchanged, indicating no difference in the capital cost of installation or the equipment required, then the allocation of expenditure on a pro-rata basis corresponding to 4000 MW would be unjustified.
- c. That in view of these findings, the Hon'ble Tribunal deemed it appropriate to remand the matter back to the Commission for fresh consideration of the



contentions raised by the Appellant. Accordingly, the Hon'ble Tribunal set aside the impugned order to the extent it was assailed in the present Appeal and remanded the case back to the Commission for reconsideration of the above aspects.

- d. That the Hon'ble Tribunal further directed the Commission to undertake the necessary assessment after affording both parties an opportunity of hearing and to complete the exercise expeditiously, preferably within a period of three months from the date of receipt of the order.

17. On 18.06.2024, the Commission heard the matter and, based on the Hon'ble APTEL's judgment dated 14.05.2024 in Appeal No. 240 of 2022, decided to re-examine the limited issue of whether the Change in Law impact for FGD installation should be based on 4,150 MW instead of 4,000 MW. The Commission directed the Petitioner to submit technical documents, including Heat Balance Diagrams and data supporting auxiliary power consumption and cost equivalence between the two capacity configurations. The Petitioner submitted that despite the increase in installed capacity from 4,000 MW to 4,150 MW, there has been no change in boiler design, resulting in no additional capital or operational expenditure, and no increase in fuel consumption. The increase in capacity is due to the use of Motor Driven Boiler Feed Pumps (BFPs), which consume approximately 30 MW per unit, and not due to any enhancement in net exportable electricity. A technical comparison shows a marginal improvement (less than 1%) in Turbine Cycle Heat Rate (TCHR) for 830 MW units after adjusting for BFP power consumption, indicating a negligible change in efficiency or coal usage. Despite each unit being rated for 830 MW, the net plant capacity remains 4,000 MW, including auxiliary consumption. As the FGD system was designed for the original boiler and coal usage remains nearly unchanged, the Petitioner asserts that there is no increase in FGD-related costs between the two configurations. In response, the Respondents, including Haryana Utilities (Respondents 7 and 8), Rajasthan Utilities (Respondents 3 to 5), Punjab State Power Corporation Limited (Respondent 6), and Gujarat Urja Vikas Nigam Limited (Respondent 1), opposed the Petitioner's claim that the costs related to the 150 MW increase (from 4000 MW to 4150 MW) should be recoverable under Change in Law. They argued that the capacity enhancement was unilaterally undertaken by the Petitioner after the bid submission and PPA execution, without consent from the Procurers, who derive no benefit from the additional capacity. The Respondents maintained that the cost of FGD is intrinsically linked to installed capacity, citing industry



norms and CEA guidelines that calculate FGD cost on a per MW basis. They also rejected the Petitioner's assertion that the costs and emissions remain the same for both configurations, emphasizing that the claimed improvement in efficiency due to Motor Driven Boiler Feed Pumps is minimal and contradicted by the Petitioner's previous claims of higher auxiliary consumption (8.5%) in other regulatory filings. Moreover, the Respondents highlighted the lack of documentary evidence supporting the claim that FGD costs and design remain unchanged between the two capacities.

18. The Commission undertook a detailed assessment of the Petitioner's submissions regarding the impact of increased installed capacity from 4000 MW to 4150 MW on the capital cost of the Flue Gas Desulphurization (FGD) system. Commission agrees with the Petitioner's assertion that the FGD system's design and cost are primarily determined by environmental regulations aimed at controlling SO₂ emissions based on total fuel consumption, not merely installed capacity. The Commission found that the size of the FGD system (wet, dry, or semi-dry) is primarily determined by the following factors:

- (a) Flue gas flow rate: Proportional to the amount of fuel burned and combustion air used.
- (b) SO₂ concentration: The sulphur content of the fuel and combustion conditions.
- (c) SO₂ removal efficiency: Dictated by environmental regulations (e.g., >90% for wet FGD systems).

FGD size is typically designed based on the boiler's maximum continuous rating (MCR), which correlates with the fuel input and flue gas volume. Switching from TDBFP to MDBFP, with increased generator terminal output but unchanged ex-bus capacity, does not necessitate a significant change in the FGD system's size. The FGD system's design is driven by flue gas flow and SO₂ concentration, which are primarily tied to boiler fuel input. Since the net power output (ex-bus capacity) remains unchanged, the boiler's fuel consumption and flue gas volume are expected to remain nearly constant or increase only marginally. Any minor increase in flue gas flow would likely be within the FGD system's existing design margins. The FGD system was engineered to handle the entire Plant's fuel usage, and the additional 150 MW, arising from a shift to motor-driven Boiler Feed Pumps (BFPs), did not necessitate any change in the FGD's design or sizing.

19. The Commission also notes that industry norms, particularly those issued by the Central



Electricity Authority (CEA), support the principle of uniform capital cost per megawatt (MW) for thermal power projects within a comparable capacity range. For instance, the CEA's benchmark capital cost norms specify cost estimates such as ₹7.5–₹8.0 crore per MW for supercritical Plants, without proportionate differentiation for small capacity deviations. Moreover, comparative analysis of similar ultra-mega power projects (UMPPs) demonstrates that per MW costs remain consistent across projects with marginal capacity differences. For example:

- (i) Telangana Super Thermal Power Project: Stage I of this project includes two units of 800 MW each, totalling 1,600 MW, with a Total Capital Cost excluding IDC & FC of ₹ 10,280.71 crore, resulting in a per MW cost of approximately ₹6.43 crore.
- (ii) Ghatampur Thermal Power Project: This project comprises three units of 660 MW each, totalling 1,980 MW, with a Total Capital Cost excluding IDC & FC of ₹ 12,463.05 crore, resulting in a per MW cost of approximately ₹6.29 crore.

These projects have followed standardized procurement processes, including bulk tendering of flue gas desulphurization (FGD) systems, boilers, and turbines, which are not sensitive to marginal capacity upgrades of 3–4%, such as the 150 MW addition in the present case.

20. Further, the Commission has established benchmark capital costs for thermal power stations, which indicate a consistent per megawatt (MW) cost across projects of similar capacities. This standardization supports the view that minor capacity enhancements, such as increasing from 4,000 MW to 4,150 MW, do not significantly impact overall capital expenditure. In its order dated 4.6.2012, CERC approved benchmark norms for capital costs of thermal power stations with coal as fuel. The Commission stated:

"In view of the foregoing, we approve the benchmark norms as on December 2011 as per Annexure II to this order for capital cost for Thermal Power Station/Unit size(s) 500/600/660/800 MW which shall be taken into consideration while determining the capital cost in accordance with clause (2) of Regulation 7 of 2009 Tariff Regulations."

This indicates that CERC recognizes a uniform capital cost per MW for thermal power projects within the 500 MW to 800 MW unit size range. Therefore, this supports the view that a small increase in capacity does not significantly raise capital costs, especially for systems like FGD, which depend more on fuel use and emissions than on the Plant's total capacity.

21. In view of the above, the Commission agrees with the Petitioner that the capacity



increase from 4,000 MW to 4,150 MW does not lead to any significant rise in capital costs of installation of the FGD system.

22. With regard to operational expenditure (OPEX), the Commission held that OPEX must be aligned with the contracted power output under the Power Purchase Agreement (PPA), which is limited to 4000 MW. Since the additional 150 MW is utilized exclusively to compensate for internal auxiliary consumption, stemming from the replacement of steam-driven BFPs with more efficient motor-driven ones, it does not contribute to power supplied to Procurers. Consequently, the Commission ruled that Procurers cannot be held liable for operational costs linked to this additional capacity. While the Petitioner maintained that auxiliary power consumption and associated OPEX did not materially increase, and given that the PPA confines Procurers' obligations to 4000 MW, the Commission in its earlier order determined that any incremental operational costs incidental to the extra 150 MW should be borne solely by the Petitioner. Moreover, the efficiency improvements resulting from the design change accrue economic benefits exclusively to the Petitioner, further justifying the exclusion of such costs from the Procurers' financial responsibilities.
23. Based on the above findings, the Commission approves the capital expenditure for the FGD system, recognizing that the FGD system design and costs do not differ between 4000 MW and 4150 MW. However, as far as the operational expenditure related to the FGD system is concerned, it can only be recovered from the Procurers for the contracted capacity corresponding to 4000 MW, in line with the PPA. The Petitioner must bear the incremental operational costs associated with the additional 150 MW capacity.
24. With this order, the directions of APTEL in Appeal No. 240 of 2022 stand implemented, and the Petition stands disposed of to the extent of the remand.

Sd/-
(Harish Dudani)
Member

Sd/-
(Ramesh Babu V)
Member

Sd/-
(Jishnu Barua)
Chairperson

