

**CENTRAL ELECTRICITY REGULATORY COMMISSION  
NEW DELHI**

**Petition No. 183/MP/2020**  
**Petition No. 333/MP/2020**  
**Petition No. 342/MP/2020**  
**Petition No. 508/MP/2020**  
**Petition No. 517/MP/2020**  
**and**  
**Petition No. 522/MP/2020**

**Coram:**

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

**Date of order: 31.10.2021**

**Petition No. 183/MP/2020**

**In the matter of:**

Petition under Section 79 of the Electricity Act, 2003 read with Regulation 29 of the Central Electricity Regulatory Commission (Terms and Condition of Tariff) Regulations, 2019 for approval of additional expenditure on installation of various Emission Control Systems at Barh Super Thermal Power Station Stage-II (2x660 MW) in compliance of Ministry of Environment and Forests and Climate Change, Government of India notification dated 7.12.2015.

**And in the matter of:**

NTPC Limited,  
NTPC Bhawan,  
Core-7, Scope Complex,  
7, Institutional Area, Lodhi Road,  
New Delhi-110003.

**....Petitioner**

**Vs**

1. South Bihar Power Distribution Company Limited,  
1st Floor, Vidyut Bhawan, Bailey Road,  
Patna-800001.
2. North Bihar Power Distribution Company Limited,



1st Floor, Vidyut Bhawan, Bailey Road,  
Patna-800001.

3. Jharkhand Urja Vikas Nigam Limited,  
Engineering Building, HEC Township, Dhurwa,  
Ranchi-4.
4. Gridco Limited,  
Vidyut Bhawan, Janpath,  
Bhubaneshwar-751007.
5. Power Department,  
Government of Sikkim, Kazi Road,  
Gangtok, Sikkim-737101.

.....Respondents

**Petition No. 333/MP/2020**

**In the matter of:**

Petition under Section 79 of the Electricity Act, 2003 read with Regulation 29 of the Central Electricity Regulatory Commission (Terms and Condition of Tariff) Regulations, 2019 for approval of additional expenditure on account of installation of various Emission Control Systems at Talcher Super Thermal Power Station Stage-I (1000 MW) in compliance with the Ministry of Environment and Forests and Climate Change, Government of India notification dated 7.12.2015.

**And in the matter of:**

NTPC Limited,  
NTPC Bhawan,  
Core-7, Scope Complex,  
7, Institutional Area, Lodhi Road,  
New Delhi-110003.

....Petitioner

**Vs**

1. West Bengal State Electricity Distribution Company Limited,  
Vidyut Bhawan, Block-DJ,  
Sector-II, Salt Lake City,  
Kolkata-700091.
2. North Bihar Power Distribution Company Limited,  
1st Floor, Vidyut Bhawan, Bailey Road,  
Patna-800001.



3. South Bihar Power Distribution Company Limited,  
1st Floor, Vidyut Bhawan, Bailey Road,  
Patna-800001.
3. Jharkhand Bijlee Vitran Nigam Limited,  
Engineering Bhawan,  
Heavy Engineering Corporation, Dhurwa,  
Ranchi-834004.
4. GRIDCO Limited,  
Vidyut Bhawan, Janpath  
Bhubaneshwar-751007.
5. The Energy & Power Department,  
Government of Sikkim, Kazi Road,  
Gangtok, Sikkim-737101.
7. Damodar Valley Corporation,  
DVC Towers, VIP Road,  
Kolkata-700054.
8. Assam Power Distribution Company Limited,  
Bijulee Bhawan, Paltan Bazar,  
Guwahati-781001.
9. Tamil Nadu Generation & Distribution Company Limited,  
NPKRP Maaligail, 800, Anna Salai,  
Chennai-600002.

.....Respondents

**Petition No. 342/MP/2020**

**In the matter of:**

Petition under Section 79 of the Electricity Act, 2003 read with Regulation 29 of the Central Electricity Regulatory Commission (Terms and Condition of Tariff) Regulations, 2019 for approval of additional expenditure on account of installation of various Emission Control Systems at Farakka Super Thermal Power Station, Stage-III (1x500 MW) in compliance with the Ministry of Environment and Forests and Climate Change, Government of India notification dated 7.12.2015.

**And in the matter of:**

NTPC Limited,



NTPC Bhawan,  
Core-7, Scope Complex,  
7, Institutional Area, Lodhi Road,  
New Delhi-110003.

....Petitioner

**Vs**

1. West Bengal State Electricity Distribution Company Limited,  
Vidyut Bhawan, Block-DJ, Sector-II, Salt Lake City,  
Kolkata-700091.
2. Bihar State Power Holding Company (BSHPCL),  
Vidyut Bhawan, Bailey Road,  
Patna-800001.
3. Jharkhand State Electricity Board,  
Engineering Building,  
Heavy Engineering Corporation, Dhurwa,  
Ranchi-834004.
4. GRIDCO Limited,  
24, Janpath,  
Bhubaneshwar-751007.

....Respondents

**Petition No. 508/MP/2020**

**In the matter of:**

Petition under Section 79 of the Electricity Act, 2003 read with Regulation 29 of the Central Electricity Regulatory Commission (Terms and Condition of Tariff) Regulations, 2019 for approval of additional expenditure on account of installation of various Emission Control Systems at Farakka Super Thermal Power Station, Stage-I & II (1600 MW) in compliance with the Ministry of Environment and Forests and Climate Change, Government of India notification dated 7.12.2015.

**And in the matter of:**

NTPC Limited,  
NTPC Bhawan,  
Core-7, Scope Complex,  
7, Institutional Area, Lodi Road,  
New Delhi-110003.

....Petitioner

**Vs**



1. West Bengal State Electricity Distribution Company Limited,  
Vidyut Bhawan, Block-DJ, Sector-II, Salt Lake City,  
Kolkata-700091.
2. Bihar State Power Holding Company (BSHPCL),  
Vidyut Bhawan, Bailey Road,  
Patna-800001.
3. Jharkhand Bijlee Vitran Nigam Limited (JUVNL),  
Engineering Bhawan,  
Heavy Engineering Corporation, Dhurwa,  
Ranchi-834004.
4. Grid Corporation of Orissa Limited,  
Vidyut Bhawan, Janpath,  
Bhubaneshwar-751007.
5. Haryana Power Purchase Centre (HPPC),  
Shakti Bhawan, Sector-6, Panchkula,  
Haryana-134109
6. Power Department,  
Government of Sikkim, Kazi Road,  
Gangtok, Sikkim-737101.
7. Tamil Nadu Generation & Distribution Company Limited (TANGEDCO),  
144, Anna Salai,  
Chennai-600002.
8. Punjab State Power Corporation Limited (PSPCL),  
The Mall,  
Patiala-147001
9. Uttar Pradesh Power Corporation Limited,  
Shakti Bhawan, 14, Ashok Marg  
Lucknow-226 001
10. Power Development Department (J&K),  
Government of J&K Secretariat,  
Srinagar.
11. Assam Power Distribution Company Limited,  
Bijulee Bhawan, Paltan Bazar,  
Guwahati-781001.



12. BSES Rajdhani Power Limited,  
BSES Bhawan, Nehru Place,  
New Delhi-110019.
13. BSES Yamuna Power Limited,  
Shakti Kiran Building, Karkardooma,  
Delhi
14. Tata Power Delhi Distribution Limited,  
33 kV Sub-Station Building,  
Hudson Lane, Kingsway Camp,  
New Delhi.
15. Rajasthan Urja Vikas Nigam Limited (RUVNL),  
Vidyut Bhawan, Janpath,  
Jaipur-302005 (Rajasthan).

.....Respondents

**Petition No. 517/MP/2020**

**In the matter of:**

Petition under Section 79 of the Electricity Act, 2003 read with Regulation 29 of the Central Electricity Regulatory Commission (Terms and Condition of Tariff) Regulations, 2019 for approval of additional expenditure on account of installation of various Emission Control Systems at Kahalgaon Super Thermal Power Station, Stage-II (1500 MW) in compliance with the Ministry of Environment and Forests and Climate Change, Government of India notification dated 7.12.2015.

**And in the matter of:**

NTPC Limited,  
NTPC Bhawan,  
Core-7, Scope Complex,  
7, Institutional Area, Lodhi Road,  
New Delhi-110003.

....Petitioner

**Vs**

1. GRIDCO Limited,  
24, Janpath,  
Bhubaneshwar-751007.
2. Power Department,  
Government of Sikkim,



Kazi Road,  
Gangtok, Sikkim-737101.

3. Gujarat Urja Vikas Nigam Limited,  
Sardar Patel Vidyut Bhawan, Race Course,  
Baroda-390007.
4. Madhya Pradesh Power Management Company Limited,  
Shakti Bhawan, Vidyut Nagar,  
Jabalpur-482008.
5. Maharashtra State Electricity Distribution Company Limited,  
'Prakashgard', Bandra (East),  
Mumbai-400 051.
6. Chhattisgarh State Power Trading Company Limited,  
Po. Sundernagar, Dhagania,  
Raipur-492013.
7. Electricity Department,  
Administration of Dadra and Nagar Haveli (DNH),  
Silvassa, via VAPI.
8. Electricity Department,  
Administration of Daman & Diu (DD),  
Daman-396210.
9. Uttar Pradesh Power Corporation Limited,  
Shakti Bhawan, 14, Ashok Marg  
Lucknow-226 001
10. Uttarakhand Power Corporation Limited,  
Urja Bhawan, Kanwali Road,  
Dehradun-248001.
11. Rajasthan Urja Vikas Nigam Limited,  
(on behalf of the Discoms of Rajasthan)  
Vidyut Bhawan, Janpath,  
Jaipur-302005 (Rajasthan).
12. Power Development Department (J&K),  
Government of J&K Secretariat,  
Srinagar.
13. BSES Rajdhani Power Limited,



BSES Bhawan, Nehru Place,  
New Delhi-110019.

14. BSES Yamuna Power Limited,  
Shakti Kiran Building, Karkardooma,  
Delhi-110006.
15. TATA Power Delhi Distribution Limited,  
338 kV Sub-Station Building,  
Hudson Lane, Kingsway Camp  
New Delhi-110011,
16. Haryana Power Purchase Centre (HPPC),  
Shakti Bhawan, Sector-6, Panchkula,  
Haryana-134109
17. Punjab State Power Corporation Limited (PSPCL),  
The Mall,  
Patiala-147001.
18. Himachal Pradesh State Electricity Board,  
Vidyut Bhawan,  
Shimla-171004.
19. Chandigarh Electricity Department (CED),  
Union Territory of Chandigarh.  
Additional Office Building, Sector-9D,  
Chandigarh.

.....Respondents

**Petition No. 522/MP/2020**

**In the matter of:**

Petition under Section 79 of the Electricity Act, 2003 read with Regulation 29 of the Central Electricity Regulatory Commission (Terms and Condition of Tariff) Regulations, 2019 for approval of additional expenditure on account of installation of various Emission Control Systems at Kahalgaon Super Thermal Power Station Stage-I (4x210 MW) in compliance with the Ministry of Environment and Forests and Climate Change, Government of India notification dated 7.12.2015.

**And in the matter of:**

NTPC Limited,  
NTPC Bhawan,  
Core-7, Scope Complex,  
7, Institutional Area, Lodhi Road,





New Delhi-110003.

....Petitioner

**Vs**

1. Bihar State Power (Holding) Company Limited,  
Vidyut Bhawan, Bailey Road,  
Patna-800001.
2. Jharkhand Bijlee Vitran Nigam Limited,  
Engineering Building,  
Heavy Engineering Corporation, Dhurwa,  
Ranchi-834004.
3. GRIDCO Limited,  
24, Janpath,  
Bhubaneshwar-751007.
4. West Bengal State Electricity Distribution Company Limited,  
Vidyut Bhawan, Block-DJ,  
Sector-II, Salt Lake City,  
Kolkata-700091.
5. Power Department,  
Government of Sikkim,  
Kazi Road,  
Gangtok , Sikkim-737101.
6. Assam Power Distribution Company Limited,  
Bijulee Bhawan, Paltan Bazar,  
Guwahati-781001.
7. Tamil Nadu Generation & Distribution Company Limited,  
NPKRP Maaligail, 800, Anna Salai,  
Chennai-600002.
8. Uttar Pradesh Power Corporation Limited,  
Shakti Bhawan, 14, Ashok Marg  
Lucknow-226 001
9. Rajasthan Urja Vikas Nigam Limited (RUVNL),  
Vidyut Bhawan, Janpath,  
Jaipur-302005 (Rajasthan).
10. Power Development Department (J&K),  
Government of J&K Secretariat,  
Srinagar.



11. Haryana Power Purchase Centre (HPPC),  
Shakti Bhawan, Sector-6, Panchkula,  
Haryana-134109
12. BSES Rajdhani Power Limited,  
BSES Bhawan, Nehru Place,  
New Delhi-110019.
13. BSES Yamuna Power Limited,  
Shakti Kiran Building, Karkardooma,  
Delhi
14. Tata Power Delhi Distribution Limited,  
33 kV Sub Station Bldg.,  
Hudson Lane, Kingsway Camp,  
New Delhi.

.....Respondents

**For Petitioner** : Shri Venkatesh, Advocate, NTPC  
Shri Ashutosh K. Srivastava, Advocate, NTPC  
Shri Suhael Buttan, Advocate, NTPC  
Shi Abhiprav Singh, Advocate, NTPC  
Shri Abhishek Nangia, Advocate, NTPC  
Shri Neil Chatterjee, Advocate, NTPC  
Ms. Mehak Verma, Advocate, NTPC  
Shri Anant Singh, Advocate, NTPC  
Shri Siddharth Joshi, Advocate, NTPC  
Shri Rishub Kapoor, Advocate, NTPC  
Shri Jayant Bajaj, Advocate, NTPC  
Shri Nihal Bhardwaj, Advocate, NTPC  
Shri Jatin Ghuliani, Advocate, NTPC  
Shri A.S. Pandey, NTPC  
Shri V. K. Garg, NTPC  
Shri Ishpaul Uppal, NTPC

**For Respondents** : Shri Shashwat Kumar, Advocate, BSPHCL  
Shri Rahul Chouhan, Advocate, BSPHCL  
Shri S. Vallinayagam, Advocate, TANGEDCO  
Shri R. K. Mehta, Advocate, GRIDCO  
Ms. Himanshi Andley, Advocate, GRIDCO  
Shri Amit Kapur, Advocate, BRPL and BYPL  
Shri Rahul Kinra, Advocate, BRPL and BYPL  
Shri Anupam Varma, Advocate, BRPL and BYPL



Shri Aditya Gupta, Advocate, BRPL and BYPL  
Shri Utkarsh Singh, Advocate, BRPL and BYPL  
Shri Nitin Kala, Advocate, TPDDL  
Shri Kunal Singh, Advocate, TPDDL  
Ms. Suparna Srivastava, Advocate, PSPCL  
Shri Tushar Mathur, Advocate, PSPCL  
Shri R. Alamelu, TANGEDCO  
Ms. R. Ramalakshmi, TANGEDCO  
Ms. B. Rajeswari, TANGEDCO  
Shri Madhusudan Sahoo, GRIDCO  
Shri Sukanta Panda, GRIDCO  
Shri Mahfooz Alam, GRIDCO  
Ms. Megha Bajpeyi, BRPL  
Shri Sameer Singh, BYPL  
Shri S.E. SPA TC, UPPCL  
Shri Brijesh Kumar Saxena, UPPCL  
Ms. Shefali Sobti, TPDDL  
Shri Anurag Naik, MPPMCL

### **ORDER**

NTPC has filed these six petitions under Section 79 of the Electricity Act, 2003 (hereinafter referred to as “the 2003 Act”) read with Regulation 29 of the Central Electricity Regulatory Commission (Terms and Condition of Tariff) Regulations, 2019 (hereinafter referred to as the “2019 Tariff Regulations”) for approval of Additional Capital Expenditure (ACE) on account of installation of various Emission Control Systems (ECS) in compliance with the Environment (Protection) Amendment Rules, 2015 dated 7.12.2015 (hereinafter referred to as "the MoEFCC Notification") notified by the Ministry of Environment, Forests and Climate Change, Government of India (MoEFCC). The MoEFCC Notification mandates all thermal power plants (TPPs) to comply with the revised Emission Control Norms (ECNs) as specified in the MoEFCC Notification.



2. The petitioner has made the following prayers:

**In Petition No. 183/MP/2020, Petition No.333/MP/2020 and Petition No. 342/MP/2020**

- “i) Grant approval for under taking implementation of various schemes mentioned above in order to meet Revised Emission Standards.*
- ii) Grant liberty to approach Hon’ble Commission for approval of implementation of Revised Emission Schemes on account of mercury, specific water consumption, Particulate Matter, if required.*
- iii) Allow additional APC, Gross station heat Rate, additional water consumption, additional O&M Expenses, Cost of Reagents etc. as per Regulation-76 i.e. “Power to relax” of the Tariff Regulations 2019.*
- iv) Allow deemed availability of the station/unit on account of shutdown for the implementation of ECS as per Regulation-76 i.e. “Power to relax” of the Tariff Regulations 2019.*
- v) Pass such orders as deemed fit and necessary in the facts and circumstances of the present case.”*

**In Petition No. 508/MP/2020**

- “i) Grant approval for under taking implementation of Wet Lime Based Flue Gas Desulphurisation schemes mentioned above in order to meet Revised Emission Standards.*
- ii) Grant liberty to approach Hon’ble Commission for approval of implementation of Revised Emission Schemes on account of NOx, mercury, specific water consumption, Particulate Matter, if required.*
- iii) Allow additional APC, Gross station heat Rate, additional water consumption, additional O&M Expenses, Cost of Reagents etc. as per Regulation-76 i.e. “Power to relax” of the Tariff Regulations 2019.*
- iv) Allow deemed availability of the station/unit on account of shutdown for the implementation of ECS as per Regulation-76 i.e. “Power to relax” of the Tariff Regulations 2019.*
- v) To allow the petitioner to file affidavit and hard copy of petition once normalcy is resumed.*
- vi) Pass such orders as deemed fit and necessary in the facts and circumstances of the present case.”*

**In Petition No. 517/MP/2020**

- “i) Grant approval for under taking implementation of various schemes mentioned above in order to meet Revised Emission Standards.*
- ii) Grant liberty to approach Hon’ble Commission for approval of implementation of Revised Emission Schemes on account of mercury, specific water consumption, Particulate Matter, if required.*



- iii) *Allow additional APC, Gross station heat Rate, additional water consumption, additional O&M Expenses, Cost of Reagents etc. as per Regulation-76 i.e. "Power to relax" of the Tariff Regulations 2019.*
- iv) *Allow deemed availability of the station/unit on account of shutdown for the implementation of ECS as per Regulation-76 i.e. "Power to relax" of the Tariff Regulations 2019.*
- v) *To allow the petitioner to file affidavit and hard copy of petition once normalcy is resumed.*
- vi) *Pass such orders as deemed fit and necessary in the facts and circumstances of the present case."*

**In Petition No. 522/MP/2020**

- a. *Grant approval for under taking implementation of various schemes mentioned above in order to meet Revised Emission Standards.*
- b. *Grant liberty to approach Hon'ble Commission for approval of implementation of Revised Emission Schemes on account of mercury, specific water consumption, Particulate Matter, if required.*
- c. *Allow additional APC, Gross station heat Rate, additional water consumption, additional O&M Expenses, Cost of Reagents etc. as per Regulation-76 i.e. "Power to relax" of the Tariff Regulations 2019.*
- d. *Allow deemed availability of the station/unit on account of shutdown for the implementation of ECS as per Regulation-76 i.e. "Power to relax" of the Tariff Regulations 2019.*
- e. *Allow the petitioner to file affidavit and hard copy of petition once normalcy is resumed.*
- f. *Pass such orders as deemed fit and necessary in the facts and circumstances of the present case."*

3. The instant order covers six petitions filed by the Petitioner. The prayers made by the Petitioner are almost similar in all the six petitions and the relief sought is also identical in all these petitions. Moreover, the issues raised by the Respondents in these petitions are also similar in nature. Accordingly, a combined order is issued in these six petitions. A brief about the petitions and generating stations covered in the instant order are given in the following paragraphs.

**(a) Petition No. 183/MP/2020 - Barh Super Thermal Power Station, Stage-II (BSTPSS-II)**



4. The Petitioner has sought approval of ACE on account of installation of ECS at BSTPSS-II (2x660 MW; COD: 8.3.2016) in compliance with the MoEFCC Notification. The petition was admitted on 21.7.2020 and order was reserved on 13.8.2021. South Bihar Power Distribution Company Limited (SBPDCL), Respondent No.1 and North Bihar Power Distribution Company Limited (NBPDCCL), Respondent No. 2 have filed a combined reply vide affidavit dated 14.8.2020 and Written Submissions dated 11.6.2021 and the combined rejoinder has been filed by the Petitioner vide affidavit dated 28.8.2020. The Petitioner has filed reply to the queries raised in RoPs/ TV letters vide affidavits dated 14.8.2020, 24.5.2021, 9.4.2021, 14.8.2021 and 3.9.2021 and Written Submissions dated 26.8.2021.

**(b) Petition No. 333/MP/2020 - Talcher Super Thermal Power Station, Stage-I (TSTPSS-I)**

5. The Petitioner has sought approval of ACE on account of installation of ECS at TSTPSS-I (2X500 MW; COD: 1.7.1997) in compliance with the MoEFCC Notification. The petition was admitted on 21.7.2020 and order was reserved on 13.8.2021. Tamil Nadu Generation & Distribution Company Limited (TANGEDCO), Respondent No. 9 has filed its reply vide affidavit dated 1.9.2020 and rejoinder has been filed by the Petitioner vide affidavit dated 15.9.2020. NBPDCCL, Respondent No. 2 and SBPDCL, Respondent No. 3 have filed combined Written Submissions on 11.6.2021. The Petitioner has filed reply to the queries raised in RoPs/ TV letters vide affidavits dated 14.8.2020, 24.5.2021, 9.4.2021, 14.8.2021 and 3.9.2021 and Written Submissions dated 26.8.2021.



**(c) Petition No. 342/MP/2020 - Farakka Super Thermal Power Station, Stage-III (FSTPSS-III)**

6. The Petitioner has sought approval of ACE on account of installation of ECS at FSTPSS-III (1x500 MW; COD 4.4.2012) in compliance with the MoEFCC Notification. The petition was admitted on 21.7.2020 and order was reserved on 13.8.2021. GRIDCO Limited (GRIDCO), Respondent No. 4 has filed its reply vide affidavit dated 25.5.2021. However, no rejoinder has been filed by the Petitioner to the reply of GRIDCO. Bihar State Power Holding Company (BSHPCL), Respondent No. 2 has filed its Written Submissions on 11.6.2021. The Petitioner has filed reply to the queries raised in RoPs/ TV letters vide affidavits dated 14.8.2020, 24.5.2021, 9.4.2021, 14.8.2021 and 3.9.2021 and Written Submissions dated 26.8.2021.

**(d) Petition No. 508/MP/2020- Farakka Super Thermal Power Station, Stage-III (FSTPSS-I&II)**

7. The Petitioner has sought approval of ACE on account of installation of ECS at FSTPSS-I&II (3X200 + 2X500 MW; COD of Units I, II, III, IV and V: 1.11.1986, 1.10.1987, 1.9.1988, 1.7.1996, 1.4.1995 respectively) in compliance with the MoEFCC Notification. The petition was admitted on 21.7.2020 and order was reserved on 13.8.2021. Uttar Pradesh Power Corporation Limited (UPPCL), Respondent No. 9 has filed its replies vide affidavits dated 16.7.2020 and 5.5.2021 and rejoinder has been filed by the Petitioner vide affidavit dated 28.8.2020 and no rejoinder has been filed by the Petitioner for reply dated 5.5.2021. BSES Rajdhani Power Limited (BRPL) though not a party to the proceedings has filed its reply vide affidavit dated 14.10.2020 and rejoinder has been filed by the Petitioner vide affidavit



dated 22.12.2020, we are not considering the same. BSES Yamuna Power Limited (BYPL), Respondent No.13 has filed combined replies along with BRPL (which is not a party in the petition) vide affidavits dated 23.4.2021 and 11.6.2021 and the combined rejoinder has been filed by the Petitioner vide affidavit dated 28.4.2021 and no rejoinder has been filed by the Petitioner for reply dated 11.6.2021. Rajasthan Urja Vikas Nigam Limited (RUVNL), Respondent No. 15 has filed its reply vide affidavit dated 7.4.2021 and no rejoinder has been filed by the Petitioner. Tamil Nadu Generation & Distribution Company Limited (TANGEDCO), Respondent No. 7 has filed its reply vide affidavit dated 26.4.2021 and no rejoinder has been filed by the Petitioner. Tata Power Delhi Distribution Limited (TPDDL), Respondent No. 14 has filed its Written Submissions on 11.6.2021 and Bihar State Power Holding Company (BSHPCL), Respondent No. 2 has filed its Written Submissions on 11.6.2021. The Petitioner has filed reply to the queries raised in RoPs/ TV letters vide affidavits dated 14.8.2020, 24.5.2021, 9.4.2021, 14.8.2021 and 3.9.2021 and Written Submissions dated 26.8.2021.

**(e) Petition No. 517/MP/2020- Kahalgaon Super Thermal Power Station, Stage-II (KSTPSS-II)**

8. The Petitioner has sought approval of ACE on account of installation of ECS at KSTPSS-II (3X500 MW; COD: 20.3.2010) in compliance with the MoEFCC Notification. The petition was admitted on 21.8.2020 and order was reserved on 13.8.2021. Uttar Pradesh Power Corporation Limited (UPPCL), Respondent No. 9 has filed its replies vide affidavits dated 19.8.2020 and 20.10.2020 and rejoinders





have been filed by the Petitioner vide affidavits dated 18.9.2020 and 22.12.2020. Madhya Pradesh Power Management Company Limited (MPPMCL), Respondent No. 4 has filed its reply vide affidavit dated 9.11.2020 and rejoinder has been filed by the Petitioner vide affidavits dated 22.12.2020. Punjab State Power Corporation Limited (PSPCL), Respondent No. 17 has filed its reply vide affidavit dated 13.11.2020 and rejoinder has been filed by the Petitioner vide affidavits dated 4.12.2020. Maharashtra State Electricity Distribution Company Limited (MSEDCL), Respondent No. 5 has filed its reply vide affidavit dated 4.11.2020 and rejoinder has been filed by the Petitioner vide affidavits dated 23.12.2020. Rajasthan Urja Vikas Nigam Limited (RUVNL), Respondent No. 11 has filed its reply vide affidavit dated 13.1.2021 and rejoinder has been filed by the Petitioner vide affidavits dated 29.1.2021. BRPL, Respondent No. 13 and BYPL, Respondent No. 14 have filed their reply vide affidavit dated 11.6.2021 and no rejoinder has been filed by the Petitioner. UPPCL, Respondent No. 9 and GRIDCO, Respondent No. 1 have filed their Written Submissions on 5.5.2021 and 11.5.2021 respectively. The Petitioner has filed reply to the queries raised in RoPs/ TV letters vide affidavits dated 14.9.2020, 24.5.2021, 9.4.2021, 14.8.2021 and 3.9.2021 and Written Submissions dated 26.8.2021.

**(f) Petition No. 522/MP/2020- Kahalgaon Super Thermal Power Station, Stage-I (KSTPSS-I)**

9. The Petitioner has sought approval of ACE on account of installation of ECS at KSTPSS-I (4x210 MW; COD 1.8.1996) in compliance with the MoEFCC Notification. The petition was admitted on 31.3.2021 and order was reserved on 13.8.2021. Tamil Nadu Generation & Distribution Company Limited (TANGEDCO),



Respondent No. 7 has filed its reply vide affidavit dated 19.8.2020 and rejoinder has been filed by the Petitioner vide affidavit dated 4.3.2021. Uttar Pradesh Power Corporation Limited (UPPCL), Respondent No. 8 has filed its reply vide affidavit dated 14.9.2020 and rejoinder has been filed by the Petitioner vide affidavit dated 4.3.2021. Rajasthan Urja Vikas Nigam Limited (RUVNL), Respondent No. 9 has filed its reply vide affidavit dated 4.1.2021 and rejoinder has been filed by the Petitioner vide affidavit dated 8.3.2021. Tata Power Delhi Distribution Limited (TPDDL), Respondent No. 14 has filed its reply vide affidavit dated 23.4.2021 and rejoinder has been filed by the Petitioner vide affidavit dated 28.4.2021. BRPL, Respondent No. 12 and BSES Yamuna Power Limited (BYPL), Respondent No. 13 have filed their combined replies vide affidavits dated 23.4.2021 and 11.6.2021 and a combined rejoinder has been filed by the Petitioner vide affidavit dated 28.4.2021 and no rejoinder has been filed by the Petitioner for reply dated 11.6.2021. Tata Power Delhi Distribution Limited (TPDDL), Respondent No. 14, UPPCL, Respondent No. 8 and Bihar State Power (Holding) Company Limited (BSPHCL), Respondent No. 1, have filed their Written Submissions on 14.5.2021, 5.5.2021 and 11.6.2021 respectively. The Petitioner has filed reply to the queries raised in RoPs dated vide affidavits dated 1.10.2020, 24.5.2021, 9.4.2021, 14.8.2021 and 3.9.2021 and Written Submissions dated 26.8.2021.

### **Background**

10. Brief facts in case of the instant six petitions are as follows:

- (a) In exercise of the powers conferred by Sections 6 and 25 of the Environment (Protection) Act, 1986, (hereinafter referred to as “the 1986 Act”),



MoEFCC vide its Notification No. S.O. 3305(E) dated 7.12.2015 has amended the Environment (Protection) Rules, 1986, introducing revised standards for emission of environmental pollutants to be followed by all existing and under construction TPPs. As per the MoEFCC Notification dated 7.12.2015, all TPPs were mandatorily required to comply with the revised ECNs (emission control norms) within a period of two years from the date of the MoEFCC Notification. The deadline for compliance of the revised ECNs has been subsequently modified to 2022 vide the notification dated 1.4.2021 of MoEFCC. The norms prescribed by the MoEFCC vide Notification dated 7.12.2015 are as follows:

“

<b>Sr. No.</b>	<b>Industry</b>	<b>Parameter</b>	<b>Standards</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>5A.</b>	<b>Thermal Power Plant (Water consumption limit)</b>	<b>Water consumption</b>	<p><i>I. All plants with Once Through Cooling (OTC) shall install Cooling Tower (CT) and achieve specific water consumption up to maximum of 3.5 m<sup>3</sup>/MWh within a period of two years from the date of publication of this notification.</i></p> <p><i>II. All existing CT-based plants reduce specific water consumption up to maximum of 3.5 m<sup>3</sup>/MWh within a period of two years from the date of publication of this notification.</i></p> <p><i>III. New plants to be installed after 1<sup>st</sup> January, 2017 shall have to meet specific water consumption up to maximum of 2.5 m<sup>3</sup>/MWh and achieve zero waste water discharged</i></p>
<b>25.</b>	<b>Thermal Power Plant</b>	<b>TPPs (units) installed before 31<sup>st</sup> December, 2003*</b>	
		Particulate Matter	100mg/Nm <sup>3</sup>
		Sulphur Dioxide (SO <sub>2</sub> )	600 mg/Nm <sup>3</sup> (Units Smaller than 500 MW capacity units) 200 mg/Nm <sup>3</sup> (for units having capacity of 500 MW and above)
		Oxides of Nitrogen (NO <sub>x</sub> )	600 mg/Nm <sup>3</sup>
		Mercury (Hg)	0.03 mg/Nm <sup>3</sup> (for units having capacity of 500 MW and above)
		<b>TPPs (units) installed after [1<sup>st</sup> January, 2004]<sup>#</sup>, up to 31<sup>st</sup> December, 2016*</b>	
		Particulate Matter	50 mg/Nm <sup>3</sup>
Sulphur Dioxide (SO <sub>2</sub> )	600 mg/Nm <sup>3</sup> (Units Smaller than 500 MW capacity units) 200 mg/Nm <sup>3</sup> (for units having capacity of 500 MW and above)		



		Oxides of Nitrogen (NO <sub>x</sub> )	300 mg/Nm <sup>3</sup>
		Mercury (Hg)	0.03 mg/Nm <sup>3</sup>
		<b>TPPs (units) to be installed from 1<sup>st</sup> January, 2017**</b>	
		Particulate Matter	30 mg/Nm <sup>3</sup>
		Sulphur Dioxide (SO <sub>2</sub> )	100 mg/Nm <sup>3</sup>
		Oxides of Nitrogen (NO <sub>x</sub> )	100 mg/Nm <sup>3</sup>
		Mercury (Hg)	0.03 mg/Nm <sup>3</sup>

\*TPPs (units) shall meet the limits within two years from date of publication of this notification.

\*\*Includes all the TPPs (units) which have been accorded environmental clearance and are under construction”.

#amended vide Gazette Notification No.590 dated 7.3.2016.

(b) The water consumption norms for TPPs with Once Through Cooling (OTC), existing CT-based TPPs and new TPPs commissioned after 1.1.2017 were specified in the MoEFCC Notification. Further, norms for particulate matter, sulphur dioxide (SO<sub>2</sub>), oxides of nitrogen (NO<sub>x</sub>) and Mercury (Hg) for TPPs commissioned before 31.12.2003; TPPs commissioned after 1.1.2004 and up to 31.12.2016; and TPPs commissioned after 1.1.2017 were also specified. Subsequently, MoEFCC relaxed the norms of NO<sub>x</sub> for TPPs commissioned during the period 1.1.2004 and 31.12.2016 from 300 mg/Nm<sup>3</sup> that was stipulated through the Notification dated 7.12.2015 to 450 mg/Nm<sup>3</sup> vide Notification G.S.R. 662(E) dated 19.10.2020.

(c) Central Electricity Authority (CEA) was entrusted with planning and coordination for implementation of ECS notified by MoEFCC. CEA alongwith Regional Power Committees formulated a phasing plan up to 2024 which was subsequently reduced to 2022 as per revised action plan of Ministry of Power (MoP). Further, Hon'ble Supreme Court of India issued direction to complete the installation of ECS in highly polluted and densely populated area by December 2021 and other stations latest by December 2022.

(d) MoP in exercise of the power under Section 107 of the 2003 Act issued directions to the Commission vide letter dated 30.5.2018 to consider the



additional cost implication due to the installation of ECS as a pass through in tariff.

(e) As compliance of the MoEFCC Notification requires capital expenditure, the Petitioner filed Petition No. 98/MP/2017 for “in-principle” approval of the capital cost required for installation of ECS and other facilities in Singrauli STPS and Sipat STPS Stage-I. The Commission vide order dated 20.7.2018 in Petition No. 98/MP/2017 held that ACE for implementation of ECS as per the MoEFCC Notification is admissible under “change in law”. The Commission further observed that it would require TPPs to identify suitable technology depending upon location of plant and existing level of emission and accordingly directed CEA to prepare guidelines regarding suitable technology, operation parameters, norms and other technical inputs. The relevant portion of the order dated 20.7.2018 is as follows:

*“46. ....In all these situations, additional capital expenditure on change in law or compliance with any existing law” is allowed. Therefore, additional capital expenditure on implementation of the ECS in terms of the Notification dated 7.12.2015 shall be admissible after due prudence check, under Regulation 14 of the 2014 Tariff Regulations.*

*47. The compliance of the revised norms specified under the MOEFCC Notification by these generating stations would require identification of suitable technology depending upon location of plant and existing level of emission from such plant. Moreover, the scope of work would also differ from plant to plant, depending upon the type of technology to be adopted.....”*

*“48. Therefore, a mechanism needs to be devised for addressing the issues like identification of suitable technology for each plant for implementation of ECS, its impact on operational parameters and on tariff, and the recovery of additional capital and operational cost. The Commission in this regard directs the CEA to prepare guidelines specifying;*

*(a) Suitable technology with model specification for each plant, with regard to implementation of new norms;*

*(b) Operational parameters of the thermal power plants such as auxiliary consumption, O&M expenses, Station Heat Rate etc., consequent to the implementation of ECS.*

*(c) Norms of consumption of water, limestone, ammonia etc., required for operation of the plants after implementation of ECS.*



(d) *Any other detailed technical inputs.”*

(f) On the basis of the directions of the Commission in order dated 20.7.2018 in Petition No. 98/MP/2017, CEA vide letter dated 21.2.2019 on ‘Operation Norms for Thermal Generating Stations for the Tariff Period 2019-2024’ recommended various technologies to comply with revised ECNs as specified by the MoEFCC Notification.

(g) However, prior to recommendation of CEA dated 21.2.2019, the Petitioner had identified technologies such as Wet Limestone based Flue Gas Desulphurisation (WFGD) system for reduction of SO<sub>2</sub> emissions; Combustion Modification (CM) System as Primary Control for NO<sub>x</sub>; and Selective Non Catalytic Reduction (SNCR)/ Selective Catalytic Reduction (SCR) as Secondary Control for reduction in NO<sub>x</sub> emissions suitable for its various generating stations to achieve the revised ECNs specified by MoEFCC. These technologies are in line with the technologies identified by CEA vide letter dated 21.2.2019.

(h) The Commission amended the 2019 Tariff Regulations vide Central Electricity Regulatory Commission (Terms and Conditions of Tariff) (First Amendment) Regulations, 2020 (hereinafter referred to as “the 2020 Amendment Regulations”), wherein separate tariff stream for ECS including determination of capital cost, financial parameters and operational parameters were specified.

(i) CEA on 7.2.2020 issued ‘Advice on FGD Technology selection for different unit size’. As per the Advisory, TPPs are required to select the appropriate FGD technology based on parameters like SO<sub>2</sub> removal efficiency, units’ size, balance plant life and the geographical location of TPPs.

(j) MoEFCC has extended the time limit, vide Notification No. 243(E) dated 1.4.2021, for implementation of the ECS to comply with the revised ECNs



through the Environment (Protection) Amendment Rules, 2021. The said Notification dated 1.4.2021 also provides for constitution of task force and environment compensation for operating TPPs beyond the specified timelines. The relevant portion of the Notification dated 1.4.2021 is reproduced hereunder:

“\* (i) A task force shall be constituted by Central Pollution Control Board (CPCB) comprising of representative from Ministry of Environment and Forest and Climate Change, Ministry of Power, Central Electricity Authority (CEA) and CPCB to categorise thermal power plants in three categories as specified in the Table-I on the basis of their location to comply with the emission norms within the time limit as specified in column (4) of the Table-I, namely: -

**Table-I**

Sl. No.	Category	Location/area	Timelines for compliance	
			Non retiring units	Retiring units
(1)	(2)	(3)	(4)	(5)
1	Category A	Within 10 km radius of National Capital Region or cities having million plus population <sup>1</sup> .	Up to 31 <sup>st</sup> December 2022	Up to 31 <sup>st</sup> December 2022
2	Category B	Within 10 km radius of Critically Polluted Areas <sup>2</sup> or Non-attainment cities <sup>2</sup>	Up to 31 <sup>st</sup> December 2023	Up to 31 <sup>st</sup> December 2025
3	Category C	Other than those included in category A and B	Up to 31 <sup>st</sup> December 2024	Up to 31 <sup>st</sup> December 2025

<sup>1</sup> As per **2011** census of India.

<sup>2</sup> As defined by CPCB.

(ii) the thermal power plant declared to retire before the date as specified in column (5) of Table-I shall not be required to meet the specified norms in case such plants submit an undertaking to CPCB and CEA for exemption on ground of retirement of such plant:

Provided that such plants shall be levied environment compensation at the rate of rupees **0.20** per unit electricity generated in case their operation is continued beyond the date as specified in the Undertaking;

(iii) there shall be levied environment compensation on the non-retiring thermal power plant, after the date as specified in column (4) of Table-I, as per the rates specified in the Table-II, namely:-

**Table-II**

Non-Compliant operation beyond the Timeline	Environmental Compensation (Rs. per unit electricity generated)		
	Category A	Category B	Category C
0-180 days	0.10	0.07	0.05
181-365 days	0.15	0.10	0.075



366 days and beyond	0.20	0.15	0.10.”
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”

(k) The Petitioner has filed the instant six petitions under the 2019 Tariff Regulations for “in-principle” approval of additional capital expenditure (ACE) towards installation of ECS. The Petitioner initially in the petition sought approval of additional APC (Auxiliary Power Consumption), Gross Station Heat Rate (GSHR), additional water consumption, additional O&M Expenses, cost of reagents and availability of the station/unit on account of shutdown for the implementation of ECS under Regulation 76, i.e. “Power to Relax” of the 2019 Tariff Regulations as there were no specific provisions under the 2019 Tariff Regulations. During the pendency of the proceedings, the 2020 Amendment Regulations were notified by the Commission wherein specific provisions have been made which deal with some of the prayers made by the Petitioner. The Petitioner in its later submissions has requested to consider those prayers as per the 2019 Tariff Regulations as amended by the 2020 Amendment Regulations.

11. The Petitioner in Petition No. 508/MP/2020, Petition No.517/MP/2020 and Petition No.522/MP/2020 has submitted that due to COVID-19 pandemic and the subsequent lockdown across the country and restriction on movement of the persons, the Petitioner was unable to file affidavits in support of the petition, reply to the RoPs and rejoinders as required under the Central Electricity Regulatory Commission (Conduct of Business) Regulations, 2010, and requested to allow the Petitioner to file the affidavits after return of normalcy. It is observed that the Petitioner and the Respondents have filed the affidavits in support of the submissions made by them and accordingly the submissions made by the parties are considered in the petition.





## **Submissions of the Petitioner**

12. The submissions made by the Petitioner in the instant six petitions are similar in nature and hence, they are dealt together. The gist of the submissions made by the Petitioner in these petitions are as follows:

(a) In compliance of revised ECNs specified in the MoEFCC Notification dated 7.12.2015, the Petitioner is required to install various ECS in its generating stations.

(b) Regulation 29 of the 2019 Tariff Regulations provides for ACE on account of installation of ECS to meet the revised ECNs. The instant petitions are filed for approval for servicing the expenditure to be incurred in its various generating stations to comply with revised ECNs.

(c) The Petitioner has considered operating parameters recommended by CEA in its letter dated 21.2.2019 for working out indicative tariff. Normative parameters are considered for working out indicative tariff based on the capital cost.

(d) The MoEFCC Notification mandates reduction in water consumption, particulate matter, SO<sub>2</sub>, NO<sub>x</sub>, and Mercury emission. To comply with the revised ECNs, it is proposed to only implement (a) WFGD for SO<sub>2</sub> emission control and (b) CM as primary control for NO<sub>x</sub> emission and (c) Selective Non-Catalytic Reduction System (SNCR) and Selective Catalytic Reduction System (SCR) as secondary control for NO<sub>x</sub> emission control. The norms specified for water consumption, particulate matter and Mercury emission are being met by the instant generating stations/ units and, therefore, there is no proposal to install any ECS for the same. Therefore, liberty may be granted to approach to the Commission as and when the work(s) pertaining to the same are required to be taken up in future.



(e) The Petitioner is committed to implement its Environment Action Plan as per its 444<sup>th</sup> BoD Resolution in the meeting dated 22.3.2017 in all of its generating stations.

(f) CEA in its recommendations vide letter dated 21.2.2019 on TPPs for the 2019-24 tariff period has recommended four technologies for reduction of SO<sub>2</sub> emissions, namely WFGD, Lime Spray Drier/Semi-dry FGD, Dry Sorbent Injection based FGD and Furnace Injection in CFBC Boilers.

(g) WFGD technology is a wet scrubbing process and it uses limestone or lime as a reagent. It is the most frequently selected technology for SO<sub>2</sub> reduction from coal-fired utility boilers. It removes SO<sub>2</sub> by scrubbing the flue gas with limestone slurry. Flue gas is treated in an absorber by passing the flue gas stream through a limestone or lime slurry spray where the gas flows upwards through the absorber counter current to the spray liquor flowing downward through the absorber. The shut-down period required for installation of WFGD system is approximately 30 to 45 days and it is envisaged that it would reduce SO<sub>2</sub> emissions to less than 200 mg/Nm<sup>3</sup> as stipulated by the MoEFCC Notification.

(h) There are two kinds of technologies for NO<sub>x</sub> control (a) primary control technologies wherein the amount of NO<sub>x</sub> produced in the combustion/ furnace zone is reduced by modifying fuel burners and (b) secondary control technologies reduces NO<sub>x</sub> present in the flue gas by injection of reagent (ammonia [NH<sub>3</sub>] or urea) in flue gas path where it reacts with NO<sub>x</sub> to reduce it to N<sub>2</sub> and water.

(i) In De-NO<sub>x</sub> Combustion Modification (CM) System, the normal burners installed in the unit boilers are to be replaced by Low-NO<sub>x</sub> Burners (LNB). A LNB limits NO<sub>x</sub> formation by regulating the temperature profiles of the fuel combustion by controlling the aerodynamic distribution and mixing of the fuel



and air, thereby yielding reduced oxygen in the primary flame zone, which limits the flame temperature, which in turn limits thermal  $\text{NO}_x$  formation. Due to the change in temperature profile of the furnace and heat transfer pattern, LNB retrofits lead to higher economizer inlet temperatures and increase in un-burnt carbon. This increases heat loss of boiler. Accordingly, the unit heat rate is anticipated to increase by around 0.8% on account of De- $\text{NO}_x$  LNB retrofit.

(j) De- $\text{NO}_x$  SNCR process involves injecting nitrogen-containing chemicals into the upper furnace or convective pass of a boiler within a specific temperature window without the use of a catalyst. There are different chemicals, that can be used that selectively react with  $\text{NO}_x$  in the presence of oxygen to form molecular nitrogen and water, but the two most common chemicals are ammonia and urea. SNCR system to be installed is proposed to be based on urea. This system requires low capital cost, having moderate  $\text{NO}_x$  removal and it involves non-toxic chemical apart from low energy injection requirement. Further, due to formation of water particles during  $\text{NO}_x$  reduction, it increases the wet loss of boilers leading to deterioration of Heat Rate by about 0.1%-0.6%. The deterioration of Station Heat Rate due to installation of De- $\text{NO}_x$  systems would be claimed by the Petitioner based on the actual performance of these systems.

(k) De- $\text{NO}_x$  SCR process involves injecting nitrogen-containing chemicals into the upper furnace or convective pass of a boiler within a specific temperature window with the use of a catalyst. SCR process chemically reduces  $\text{NO}_x$  molecule into molecular nitrogen and water vapor. A nitrogen-based reagent such as ammonia or urea is injected into the furnace. SCR system proposed to be installed is based on ammonia. The hot flue gas and reagent diffuse through the catalyst which is composed of active metals or ceramics with a highly porous structure. The reagent reacts selectively with the  $\text{NO}_x$  within the presence of the catalyst and oxygen. The use of a catalyst results in two primary advantages of the SCR, higher  $\text{NO}_x$  control efficiency and



reactions within a broader temperature range. This system requires high capital cost, having high NO<sub>x</sub> removal and involves toxic chemical. Due to formation of water particles during NO<sub>x</sub> reduction, it increases the wet loss of Boilers leading to deterioration of Unit Heat Rate by about 0.1%.

(l) SNCR and SCR demonstration pilot tests are being conducted at generating stations of the Petitioner and implementation of SNCR shall be taken up based on the reports of SNCR pilot tests.

(m) With the installation of CM System, NO<sub>x</sub> is anticipated to come down to below 400 mg/Nm<sup>3</sup> and with the installation of SNCR, it is envisaged that the level of NO<sub>x</sub> shall come down to below 300 mg/Nm<sup>3</sup>.

(n) The Petitioner has issued a certificate dated 20.5.2021 duly certifying and declaring that the bidding for all TPPs of the Petitioner was held in a fair and a competitive manner.

(o) The shut-down period required for installation of CM System and SNCR is approximately 45 to 60 days and 15 days respectively.

(p) WFGD is the most appropriate technology for reduction of SO<sub>2</sub> emissions and it meets the norms specified in the MoEFCC Notification and it adheres to the CEAs' Advisory dated 7.2.2020.

(q) With the installation of ECS, there would be requirement of additional manpower for operation and maintenance of these systems, spares pertaining to these systems etc. on sustained basis. Accordingly, the Petitioner has to incur additional O&M Expenses on account of implementation of ECS. In case of thermal generating stations, the norms of O&M Expenses have been fixed (in lakh/MW) based on actual O&M Expenses of different stations in the last five years. As FGD and other ECS were not installed at various stations, the expenditure on account of them was not considered while framing the norms.



Further, the actual O&M Expenses data on account of installation of FGD system and other ECS is not available. Therefore, as has been provided in case of new hydro stations, a norm in relation to percentage (%) of capital cost may be considered. In case of large hydro stations, O&M norm of 3.5% of capital cost has been provided in the 2019 Tariff Regulations. Since proportion of plant and machinery is more in FGD/ other ECS system, norm for additional O&M Expenses @4% of capital cost may be considered. Therefore, allow additional O&M Expenses equivalent to 4% of capital cost of these schemes per annum and the same has been considered to compute the indicative tariff.

(r) Additional APC may be allowed over and above the normative APC for the generating stations covered in the instant petitions due to implementation of ECS. Further, ACE and associated costs such as increased water charges, cost of chemicals/ reagents (limestone) on account of implementation of ECS, may be allowed.

(s) During the period of shutdown of unit, there would be loss of availability of the generating stations and would lead to under-recovery of Annual Fixed Charges (AFC) on account of implementation of ECS. Accordingly, the shutdown period of unit for implementation of ECS in compliance of the MoEFCC Notification may be treated as deemed availability under Regulation 76 of the 2019 Tariff Regulations.

(t) Additional GSHR may be allowed over and above the normative GSHR for the station, due to implementation of ECS.

(u) The Petitioner will file separate supplementary tariff petitions in terms of Regulations 29(4) based on actual and projected expenditure as the case may be and normative operating parameters/ norms as specified in the 2019 Tariff Regulations and subsequent notification for reagent consumption, etc.



## **Maintainability**

13. BRPL, BYPL, SBPDCL, NBPDC, TANGEDCO, GRIDCO, RUVNL, UPPCL, MSEDCL, PSPCL, BSPHCL and MPPMCL have submitted that the instant petitions are not maintainable for the reasons that (a) the Petitioner has not followed the procedure laid down in the 2019 Tariff Regulations, (b) the Petitioner has not submitted case specific recommendations of CEA, (c) the MoEFCC Notification is not applicable to old/ retiring plants, (d) the Petitioner has not submitted the present emission levels and (e) there is delay in award of contracts. The issues raised by the Respondents and the clarifications given by the Petitioner are dealt in the following paragraphs.

- *Petitioner has not followed the procedure laid down in the 2019 Tariff Regulations*

14. SBPDCL and NBPDC have submitted in Petition No. 183/MP/2020 that the Petitioner is obliged under Regulation 29(1) of the 2019 Tariff Regulations to share the proposal for installation of ECS prior to filing of the petition. They have submitted that, however, the Petitioner has moved ahead with the process for implementation of ECS without prior deliberations with its stakeholders. The petition is premature and deserves to be either dismissed or kept pending as long as the deliberations on the proposed schemes are not completed. The Petitioner has failed to submit details as required under Regulations 29(2) and 29(3) of the 2019 Tariff Regulations. In view of the absence of these details, the requests of Petitioner cannot be entertained and it may not be possible for the Commission or the Bihar Discoms (SBPDCL and NBPDC) to ascertain logic behind the costs claimed by the Petitioner. The Board of



Directors of the Petitioner, on 8.9.2018, approved the proposal to award the contracts for the FGD package and accorded the Investment Approval (IA) for implementation of WFGD system for BTPSS-II. The 2019 Tariff Regulations were notified on 7.3.2019 and as such the Petitioner was aware that it had to share the proposal with the Respondents. The Regulation 29 of the 2019 Tariff Regulations does not envisage the service of proposal by way of a petition. As per the said provision, proposal was to be shared with the beneficiaries and only then the petition could be filed before the Commission. The requirements of Regulation 29 of the 2019 Tariff Regulations are statutory requirements which cannot be dispensed with. The proposal should have been shared by Petitioner, before or at the time of the bidding and all relevant details for purpose of conducting the prudence check pursuant to which the petition should have been filed by the Petitioner. Therefore, the Petitioner has not complied with the mandate of Regulation 29 of the 2019 Tariff Regulations which are binding upon the Petitioner as well as the Commission. The Petitioner has bypassed the procedure laid down in Regulation 29 of the 2019 Tariff Regulations and directly filed the Petition for determination of 'Indicative Tariff' based on 'Estimated Costs' of implementation of ECS. BSPHCL in its written submissions in Petition No. 342/MP/2020 had made almost identical submissions.

15. GRIDCO in Petition No. 342/MP/2020 and Petition No.517/MP/2020 has submitted that Regulation 29 of the 2019 Tariff Regulations mandates prior approval of the Commission before undertaking the work for installation of ECS. The action of Petitioner in awarding the contract for ECS without prior approval of the Commission



even though it had sufficient time before filing the application is unjustified. It amounts to a fait-accompli. The Commission can grant approval for incurring ACE on account of ECS after only due consideration of the reasonableness of the cost estimates, financing plan, schedule of completion, IDC, use of efficient technology, cost-benefit analysis etc.

16. BRPL and BYPL have made their submissions on the issue of non-compliance of Regulation 29(1) of the 2019 Tariff Regulations in Petition No. 508/MP/2020, Petition No. 517/MP/2020 and Petition No.522/MP/2020. The gist of the submissions made are as follows:

(a) The order dated 28.4.2021 in Petition No. 335/MP/2020 & Ors is not applicable to the facts of the present case wherein the Commission has granted “in-principle” approval for various generating stations of NTPC for installation of ECS under Regulation 11 of the 2019 Tariff Regulations. The facts and circumstances leading to filing of present petition are not the same as those considered by the Commission in order dated 28.4.2021 where the basis of granting “in-principle” approval under Regulation 11 was that the Petitioner had already initiated action for installation of ECS much prior to the notification of the 2019 Tariff Regulations. However, in the present case, the Petitioner has started the bidding process only on 19.8.2019, i.e., this was almost five and a half months after the notification of the 2019 Tariff Regulations.

(b) Having willfully failed to adhere to the requirements of the 2019 Tariff Regulations, the Petitioner is not entitled to the reliefs as prayed for in the present petition. If the reliefs are allowed, then the same would render prudence check under Section 61 of the 2003 Act read with the Regulation 29 of the 2019 Tariff Regulations otiose.





(c) The Petitioner has wrongly relied on the principle of 'substantial compliance' to state that it has complied with substantial part of the 2019 Tariff Regulations and that it has provided all information to the beneficiaries. The Petitioner cannot justify its acts/ omissions as minor 'inconsistencies' for failing to comply with the mandatory requirement of the 2019 Tariff Regulations and the orders of the Commission. It is settled law that when the law provides something to be done in a particular manner, then it has to be done in that manner alone.

(d) The Petitioner has erroneously contended that no prejudice has been caused to the Respondents on account of the Petitioner not following the mandate of Regulation 29 of the 2019 Tariff Regulations and not sharing the information with the beneficiaries on time.

(e) The principles of Section 7 of the 2003 Act have been disregarded by the Petitioner while proceeding with ECS installation. Section 7 of the 2003 Act mandates that the generating station has to comply with the technical standards specified by CEA under Section 73(b) of the 2003 Act.

(f) Section 79(3) of the 2003 Act requires the Commission to follow the principle of natural justice and transparency as a governing principle while discharging its function. The Petitioner cannot circumvent the judicial process established by the Commission by failing to provide the information/ documents sought by the Commission.

(g) The Petitioner cannot resort to order dated 20.7.2018 passed in Petition No. 98/MP/2017, to aver that the Petitioner proceeded on the basis of the said order since the Petitioner has started the bidding process only on 19.8.2019 which was almost five and a half months after the notification of the 2019 Tariff Regulations.



(h) The Petitioner's contention that there was no delay in taking up the implementation of ECS System is wrong and misleading. The Petitioner took almost four years to issue IFB (invitation for bidding) i.e., on 19.8.2019 from the date of issue of the MoEFCC Notification dated 7.12.2015. The delay in implementing FGD is on account of the Petitioner and the additional burden caused on account of the same cannot be fastened upon the consumers in the form of increased tariff. It is only on account of the delay by the Petitioner that the useful life in case of some of the instant generating stations/ units has come to an end.

(i) Contrary to the mandate of Regulation 29 of the 2019 Tariff Regulations, the Petitioner has failed to provide any proposal and/ or consult the beneficiaries in any of the petitions prior to floating/ finalizing of bids for incurring such additional capital expenditure.

(j) The Petitioner has failed to provide any certificate from the competent authority to show that it has complied with the requirements of CEA.

(k) As per the MoEFCC Notification, the initial timeline for compliance of the same was within a period of two years, i.e. by 6.12.2017. The Petitioner did not undertake any action for installation of ECS. Therefore, CPCB was constrained to issue an order on 11.12.2017 directing the Petitioner to complete the installation by 31.12.2019. The Petitioner did not complete the installation even by 31.12.2019. CPCB issued a show-cause notice on 31.1.2020 and imposed penalty on 8.5.2020. However, the Hon'ble Supreme Court stayed the order for recovery of non-compliance fee. The Petitioner started the work with respect to installation of ECS only after the interference of CPCB. BRPL on various occasions through correspondence dated 13.9.2017, 22.6.2018, 8.20219, 11.2.2019 had sought for the details regarding installation of FGD. However, the Petitioner did not share the details.



(l) The Petitioner has failed to comply with the mandate of Regulation 29(3) for installation of ECS. As per Sections 61(b), 61(c), 61(d) and 61(e) of the 2003 Act, for 'in-principle' approval or 'final' approval of the capital cost, a generator is required to follow the provisions of the 2003 Act and the Regulations. As per Section 61(c) of the 2003 Act, the Commission has to consider the factors which would encourage competition, efficiency, economical use of the resources, good performance and optimum investments. Therefore, the said section includes the benchmark for the 'cost benefit analysis' as categorically sought by the Commission under Regulation 29(3) of the 2019 Tariff Regulations which the Petitioner failed to provide.

(m) The Petitioner did not provide information to the beneficiaries despite assuring to do so in its letter dated 25.2.2019. The purported proposal was shared with the beneficiaries by letter dated 2.9.2020 only after the Commission directed the Petitioner to share the proposal with the beneficiaries as per the mandate of Regulation 29(1) of the 2019 Tariff Regulations. The Petitioner had invited the bids before filing of the present Petition and without informing and/ or taking consent of the Respondents.

(n) The sole defense taken by the Petitioner is the stringent timelines for implementing ECS. The Petitioner's actions are callous and in abject disregard of the impact that this ACE will have on the end consumers. For the Petitioner's faults, delays and lackadaisical attitude, the consumers cannot be held liable and made to bear the burden of this expense.

17. TPDDPL in its Written Submissions in Petition No. 508/MP/2020 and Petition No.522/MP/2020 has also advanced similar contentions as raised by Bihar Discoms, GRIDCO, BRPL and BYPL with respect to procedural requirements under Regulation 29 of the 2019 Tariff Regulations. It has submitted that non-compliance with provisions of the 2019 Tariff Regulations has been observed by the Commission in



its RoPs and, therefore, approval cannot be granted under Regulation 29 of the 2019 Tariff Regulations.

18. MSEDCL in Petition No. 517/MP/2020, PSPCL in Petition No. 517/MP/2020, TANGEDCO in Petition No. 522/MP/2020 and RUVNL in Petition No. 522/MP/2020 have also raised the issue of not informing the beneficiaries regarding its plans for installation of FGD and the proposal of the Petitioner not being in accordance with Regulations 11 and 29 of the 2019 Tariff Regulations. MSEDCL has submitted that only after the directives of the Commission in RoP dated 21.8.2020 that MSEDCL received the proposal.

19. MPPMCL in Petition No. 517/MP/2020 has, like other respondents, submitted that the Petitioner has bypassed the steps and procedure contained in Regulation 29 of the 2019 Tariff Regulations and directly filed petition for determination of “indicative tariff” based on “estimated cost” of implementation of ECS. The Petitioner has not submitted when the contract for implementation of FGD at KSTPS-II was awarded but has claimed that implementation would take about 27-30 months from the date of award. MPPMCL has submitted that since the Petitioner has not only floated the tender but also awarded the contract grossly undermining the authority of this Commission, in the interest of justice the Petitioner may be directed to file a revised petition for implementing ECS observing the provisions contained in Regulation 29 of the 2019 Tariff Regulations.



20. UPPCL in Petition No. 517/MP/2020 in its Written Submissions has submitted that after the issue of MoEFCC Notification, BoD of the Petitioner Company took a decision to implement FGD system on 22.3.2017 i.e., after a gap of 1 year and 4 months. IFB was issued after a further delay of about 2 years and 5 months from the date of the decision of BoD. Accordingly, tenders have been issued after a cumulative delay of 3 years and 9 months from the date of issue of Notification. If not for this delay, ECS could have been implemented much before.

21. The Petitioner in its rejoinder to the reply filed by the Respondents and in its Written Submissions has submitted that it has complied with the requirement of Regulation 29(1) of the 2019 Tariff Regulations. The gist of clarifications given by the Petitioner are as follows:

(a) The MoEFCC Notification introduced norms for SO<sub>2</sub> and NO<sub>x</sub> emission for all TPPs in the country for the first time. As per the said notification, all the existing and under construction TPPs were required to comply with the new norms by 31.12.2017. The Petitioner started planning for implementation of various ECS systems that are required to be installed in all its generating stations.

(b) Various technologies available to control SO<sub>2</sub> and NO<sub>x</sub> emission were not in operation or readily identified in the country. ECS for SO<sub>2</sub> and NO<sub>x</sub> was new to the thermal power generation. The Petitioner identified certain technologies for ECS on preliminary basis which were in operation worldwide. The Petitioner also decided to visit coal-based TPPs in various countries where such technologies were reliably operating. Accordingly, teams were formed and sent to various power plants in March 2016 to observe and learn about



challenges involved in respect of operation and maintenance of the plants and availability of vendors/ spares on long term basis.

(c) Meanwhile, the Petitioner on 26.2.2016 submitted a representation before CEA/ MoP, Gol and MoEFCC indicating the challenges and issues involved in the implementation of various ECS within the given timeline. As retrofitting of FGD/De-NO<sub>x</sub> technologies would take about 32 months after award and about 4-5 years in pre-award activities, the Petitioner requested to relax the norms for the units commissioned prior to 2003 and review the chimney height norm in view of reduced emissions after installation of ECS.

(d) Subsequently, the Petitioner took steps for identification of technologies suitable for various unit sizes keeping in view Indian coal. Phasing of implementation of ECS in various units/ stations was also planned.

(e) In a meeting conducted by the Secretary, MoP on 14.9.2016, it was decided that retrofitting would be in phased manner so that newer units install ECS first and older units do so afterwards considering the cost and to avoid power shortage. Accordingly, the Petitioner took approval of the interim internal plan for implementation of ECS of its BoD on 22.3.2017.

(f) The Petitioner proceeded to prepare specifications of various ECS and at the same time surveyed various stations for preparing ECS equipment's layout. The site surveys, layout preparation, equipment sizing/ requirements take considerable amount of time. As layout in units and stations are different and the equipment/ systems have to be retrofitted in a defined space, it took more time.

(g) In a meeting conducted by the Secretary, MoP and the Secretary, MoEFCC on 1.9.2017, action plan for implementation upto 2022 was considered and stakeholders were asked to give their phasing plan. After



receipt of the phasing plan, CPCB issued project-wise ECS implementation and the date was notified in December 2017.

(h) In the meantime, the Petitioner published NIT for installation of FGD system for 27000 MW in different Lots. mainly new units in June and July 2017.

(i) Considering the request of the Petitioner and other factors, MoEFCC changed the norm for chimney height *vide* Notification dated 28.6.2018. Accordingly, the Petitioner had to reconsider the design/ specification for stations where NIT was to be published. The site surveys and ECS lay out finalization for other stations (about 25000 MW in various Lots) took considerable time. Therefore, the NIT was published in August 2019.

(j) The Petitioner being one of the largest power generating companies in the country, owns 23 TPPs for which it required additional time to finalize the engineering designs.

(k) For installation of ECS, substantial capital expenditure is required and, therefore, the Petitioner approached the Commission through Petition No. 98/MP/2017 for approval of the expenditure. The Commission *vide* its order dated 20.7.2018 observed that ACE on implementation of ECS in terms of the MoEFCC Notification shall be admissible under “change in law” after due prudence check. The Respondents were also party to the said petition. The progress of work was not only being monitored in all RPCs, wherein all stakeholders were kept aware of developments, but also by Hon'ble Supreme Court which issued the direction to complete the installation of ECS in highly polluted and densely populated area by December 2021 and in other stations latest by December 2022. The complete installation of ECS in a station from pre-award activities to erection and commissioning of the systems would take at least 3 years. Accordingly, the Petitioner proceeded for tendering and awarding FGD systems as early as possible in a phased manner through a transparent



competitive bidding process in order to comply with the norms. These developments took place during the 2014-19 tariff period. By the time, the Commission notified the 2019 Tariff Regulations, the progress of activities with reference to the installation of ECS were at different stages pertaining to pre-award activities, NIT regarding competitive bidding etc.

(l) After the issuance of the 2019 Tariff Regulations, the Petitioner filed the instant petitions seeking approval of ACE towards installation of ECS and shared the details of various ECS, technology selection, indicative cost and tariff etc. with the respondents.

(m) Regulation 29(1) of the 2019 Tariff Regulations does not specify at what stage the proposal for installation of ECS has to be shared with the beneficiaries. The Petitioner has shared the proposal with beneficiaries vide its letter dated 2.9.2020. Therefore, the terms stipulated in Regulation 29(1) of the 2019 Tariff Regulations stand complied.

(n) Even otherwise on the date of the filing of the petitions, the petitions along with its Annexure were served upon the Respondents. Therefore, the Petitioner has duly complied with the Regulation 29(1) and 29(2) of the 2019 Tariff Regulations.

(o) Moreover, the Petitioner had impleaded all the Respondents in the Petition No. 98/MP/2017 with the objective to keep the beneficiaries informed about ACE that the Petitioner would incur to meet the revised ECNs.

(p) The purpose of contemporaneous intimation is to ensure transparency in the process of ECS installation. The Respondents have misconstrued the purport of Regulation 29(1) of the 2019 Tariff Regulations to contend that prior to any bidding carried out by the Petitioner, prior consent, ratification, consultation with beneficiaries is required. The said contention is bereft of logic





and reasoning as the word prior approval, prior consultation or even intimation before ECS bidding is carried out, is not envisaged.

(q) The Petitioner has fulfilled the substantial requirement of the Regulation by its conduct in Petition No. 98/MP/2017 and further by sharing its proposal and other information sought by the Commission. Sufficient opportunity in terms of Section 79(3) of the 2003 Act has also been provided by the Commission and no irregularity or imprudence has been made out by the Respondents.

(r) The proposal required to be shared under Regulation 29(1) of the 2019 Tariff Regulations has to contain certain specific information as per Regulation 29(2) of the 2019 Tariff Regulations and all such information has been provided to the Respondents.

(s) Relying on the judgment of Commissioner of Central Excise, New Delhi v. Hari Chand Shri Gopal and Ors., (2011) 1 SCC 236 on doctrine of substantial compliance, the Petitioner has submitted that the essence of Regulation 29 of the 2019 Tariff Regulations in all aspects have been complied with and all information as envisaged under Regulation 29(2) of the 2019 Tariff Regulations has been provided to Respondents.

(t) The consequences of non-compliance of the MoEFCC Notification leads to penal penalty under Section 6 of the Environment Protection Act, 1986 read with Rule 3 of the Environment Protection Rules, 1986.

22. We have considered the submissions of the Petitioner and the Respondents. The instant petitions are filed under Section 79 of the 2003 Act read with Regulation 29 of the 2019 Tariff Regulations for “in-principle” approval of ACE towards installation of ECS for reduction of SO<sub>2</sub> and NO<sub>x</sub> emission levels in compliance of the MoEFCC Notification. The Respondents have contended that the instant petitions



are not maintainable for the reason that the Petitioner has not shared the proposal for installation of ECS in the subject generating stations/ units as mandated under Regulations 29(1) of the 2019 Tariff Regulations.

23. The Commission has specified the procedure for claiming ACE on account of implementation of ECS in Regulation 29 of the 2019 Tariff Regulations, which provides as follows:

***“29. Additional Capitalization on account of Revised Emission Standards:***

*(1) A generating company requiring to incur additional capital expenditure in the existing generating station for compliance of the revised emissions standards shall share its proposal with the beneficiaries and file a petition for undertaking such additional capitalization.*

*(2) The proposal under clause (1) above shall contain details of proposed technology as specified by the Central Electricity Authority, scope of the work, phasing of expenditure, schedule of completion, estimated completion cost including foreign exchange component, if any, detailed computation of indicative impact on tariff to the beneficiaries, and any other information considered to be relevant by the generating company.*

*(3) Where the generating company makes an application for approval of additional capital expenditure on account of implementation of revised emission standards, the Commission may grant approval after due consideration of the reasonableness of the cost estimates, financing plan, schedule of completion, interest during construction, use of efficient technology, cost-benefit analysis, and such other factors as may be considered relevant by the Commission.*

*(4) After completion of the implementation of revised emission standards, the generating company shall file a petition for determination of tariff. Any expenditure incurred or projected to be incurred and admitted by the Commission after prudence check based on reasonableness of the cost and impact on operational parameters shall form the basis of determination of tariff.”*

24. As per the procedure prescribed under Regulation 29 of the 2019 Tariff Regulations, a generating company intending to incur ACE towards installation of ECS shall share its proposal with the Respondents and file a petition for undertaking ACE under Regulation 29(1) of the 2019 Tariff Regulations. As per Regulation 29(2)



of the 2019 Tariff Regulations, the proposal has to contain the details of the proposed technology as specified by CEA and other relevant information. The Commission may approve, on an application by the generating station, the proposed ACE towards installation of ECS after prudence check as provided in Regulation 29(3) of the 2019 Tariff Regulations. As per Regulation 29(4) of the 2019 Tariff Regulations, the generating station shall file a petition for determination of tariff after implementation of the ECS.

25. The Petitioner had initiated action for implementation of ECS in the subject generating stations/ units in compliance of the MoEFCC Notification in the 2014-19 tariff period taking into consideration the stringent timelines and the fact that the installation of ECS is being monitored by the Hon'ble Supreme Court. The Invitation for Bidding (IFB) and the Notice of Award (NoA) in case of BSTPSS-II was issued during the 2014-19 tariff period. In case of TSTPSS-I, FSTPSS-III, FSTPSS-I&II, KSTPSS-II and KSTPSS-I, covered in the Petition No. 333/MP/2020, Petition No. 342/MP/2020, Petition No. 508/MP/2020, Petition No. 517/MP/2020 and Petition No. 522/MP/2020 respectively, IFBs and NoAs were issued in the 2019-24 tariff period.

The details are given in the table below:

<b>Petition No.</b>	<b>Generating Station/Unit Capacity (MW)</b>	<b>Date of issue of IFB</b>	<b>Date of issue of NoA</b>
183/MP/2020	BSTPSS-II (2X660)	31.7.2017	18.9.2018
333/MP/2020	TSTPSS-I (2X500)	27.8.2019	30.3.2020
342/MP/2020	FSTPSS-III (1x500)	19.8.2019	27.5.2020
508/MP/2020	FSTPSS-I & II (3X200 + 2X500)	19.8.2019	27.5.2020
517/MP/2020	KSTPSS-II (3X500)	19.8.2019	30.3.2020
522/MP/2020	KSTPSS-I (4X210)	19.8.2019	30.3.2020



26. The requirement of sharing the proposal for implementation of ECS with the Respondents was introduced in the 2019 Tariff Regulations, which were notified in March 2019 and became effective on 1.4.2019. Therefore, the Petitioner could not have shared the proposal for installation of ECS in case of BSTPSS-II where the IFB and NoA were issued before the notification of the 2019 Tariff Regulations wherein the mandate for sharing the proposal of ECS was introduced. In case of TSTPSS-I, FSTPSS-III, FSTPSS-I&II, KSTPSS-II and KSTPSS-I, the Petitioner had initiated the action for installation of ECS and issue of IFB in the 2014-19 tariff period. However, IFB and NoA were issued in the 2019-24 tariff period after the notification of the 2019 Tariff Regulations. Therefore, in our view, the Petitioner should have shared the proposal for installation of ECS with the Respondents in case of TSTPSS-I, FSTPSS-III, FSTPSS-I&II, KSTPSS-II and KSTPSS-I as mandated in Regulation 29(1) of the 2019 Tariff Regulations. However, the Petitioner failed to share the proposal for installation of ECS with the Respondents and the Petitioner has not given any satisfactory explanation for not doing so. The Respondents have also contended that they were not consulted by the Petitioner before taking action for installation of ECS. In this regard, we observe that Regulation 29(1) of the 2019 Tariff Regulations neither provides for or specify any timeline between sharing of the proposal and filing of the petition, nor does it provide for furnishing any comments or objections by the Respondents. Therefore, as per the said Regulation, the Petitioner has to share the proposal for installation of ECS with the Respondents for their information prior to or at the time of filing the Petition. The Petitioner has shared the proposal with the Respondents while filing of the petitions and all other details on the



directions of the Commission. Moreover, a copy of the petition is automatically served on the beneficiaries immediately after the petition is uploaded in the e-filing portal of the Commission. We are of the view that it would have been better if the Petitioner had shared the details of the proposal with the beneficiaries as envisaged in Regulation 29(1) of the 2019 Tariff Regulations before filing the instant petition for “in-principle” approval of ACE. However, we are unable to agree with the Respondents that the instant Petitions are not maintainable on this ground.

27. The instant petitions were filed in 2020 and were admitted on 21.7.2020 and the order was reserved on 13.8.2021 after detailed hearing. The Respondents have been provided sufficient time and opportunities to raise their concerns. Therefore, we are not able to agree with the Respondents that the instant petitions should be rejected and the Petitioner should file fresh petitions following the procedure laid down in Regulation 29(1) of the 2019 Tariff Regulations. If such suggestion of the respondents is agreed, it would not serve any purpose other than delaying the implementation of ECS and the Petitioner would not be able to comply with the timelines specified in the MoEFCC Notification and directions of the Hon'ble Supreme Court. Therefore, we set aside these contentions of the Respondents.

- Non-submission of plant-specific recommendations by the Petitioner

28. The Petitioner has submitted that it selected WFGD technology for its generating stations/ units as it is the most appropriate technology and it is in accordance with the CEA recommendations and its implementation will meet SO<sub>2</sub> emission norms stipulated by MoEFCC.



29. NBPDCCL and SBPDCL in Petition No. 183/MP/2020 have submitted that as per Regulation 29(2) of the 2019 Tariff Regulations, CEA is responsible for recommending the technology to be implemented by a generating station which shall form part of the overall proposal for consideration of the stakeholders and the Commission. CEA through letter dated 20.2.2019 and advisory dated 7.2.2020 has recommended the technologies for emission control. However, the Petitioner submitted that immediately after the issuance of MoEFCC Notification, the Petitioner proceeded for implementation of ECS and conducted pre-award activities such as identification of suitable proven technology based on geographical location of various generating stations, identification of vendors, engineering, tendering, location survey, etc. The Petitioner prepared specifications and proceeded to invite NIT for installation of WFGD System. The Respondents have submitted that from the submissions of the Petitioner it is not clear that whether the Petitioner proceeded with implementation of WFGD Systems based on the CEA recommendations and whether detailed analysis was done for each of the activities by the Petitioner considering the recommendations of CEA.

30. In response, the Petitioner has submitted that there is no project specific recommendation by CEA in letter dated 20.2.2019 or advisory dated 7.2.2020. CEA vide letter dated 20.2.2019 has recommended various technologies. The technology chosen by the Petitioner is in line with the technologies recommended by CEA. So far as the competitive bidding is concerned, the Petitioner Company has issued a certificate dated 20.5.2021, wherein it has been certified and declared that the



bidding for all TPPs of the Petitioner Company has been held in a fair and competitive manner.

31. BRPL in Petition No. 508/MP/2020, Petition No. 517/MP/2020 and Petition No. 522/MP/2020 has submitted that the Petitioner has failed to provide any certificate from the competent authority to show that it has complied with the requirements of CEA. CEA has also recommended that for optimum selection of technology for a TPP, various factors need to be evaluated before finalization of technology, such as: (i) coal quality, (ii) unit size and number of units, (iii) space availability at plant, (iv) availability of reagent and purity level of reagent, (v) disposal of by-product, (vi) balance plant life, (vii) APC, (viii) life cycle costing, (ix) availability of water, etc. The Petitioner ought to have considered plant-specific requirements for life cycle costing keeping CAPEX in consideration.

32. MPPMCL in Petition No. 517/MP/2020 has submitted that the Petitioner is planning to implement WFGD System for SO<sub>2</sub> control and SNCR and CM for NO<sub>x</sub> reduction. This is in gross violation of Regulation 29(2) of 2019 Tariff Regulations which mandates adherence to the technology specified by CEA considering specification for each plant. The Petitioner's own choice of technology without considering the mandatory provisions cannot be justified as the most economical and efficient technology for reduction of SO<sub>2</sub>. The Petitioner out to have considered the recommendation of CEA in advisory dated 7.2.2020 and obtained project/ plant specific recommendations of CEA before reaching the conclusion that WFGD is the most efficient technology. The Petitioner has also failed to conduct open competitive



bidding to discover lowest cost for installing ECS. The Petitioner has only given “tentative estimate for capital cost” for approval and determination of indicative tariff.

33. In response, the Petitioner has submitted that it has complied with the recommendations of CEA vide letter dated 20.2.2019. While selecting WFGD technology for reduction in SO<sub>2</sub>, the Petitioner has followed the evaluation criteria in terms of unit size, geographical location, age of units, availability of space, coal quality, etc. and the CEA Advisory dated 7.2.2020. There is only one technology i.e. WFGD for units of 500 MW and above in the CEA Advisory dated 7.2.2020. KSTPSS-II comprises of 3 units of 500 MW with remaining useful life of about 14 years as on 1.4.2020. Accordingly, the best technology for reduction in SO<sub>2</sub> in KSTPSS-II is WFGD System as it is the most versatile technology for any unit size as per the CEA advisory.

34. UPPCL in Petition No.508/MP/2020 and Petition No. 517/MP/2020 and RUVNL in Petition No. 508/MP/2020 have submitted that the Petitioner has an aggregate thermal capacity of about 60000 MW at different generating stations located across India. The criteria for selection of the technology at each generating station would be different and plant specific depending on quality of coal, existing emission technology, location of the plant, balance useful life of the plant, space availability, availability of reagents at its location etc. The Respondents have submitted that the selection of technology is an intricate matter of science and engineering, normally not comprehensible to a person concerned with the business of distribution of electricity. The Commission vide order dated 20.7.2018 in Petition No. 98/MP/2017 had directed





CEA to prepare guidelines specifying suitable technology with model specification for each plant with regard to the norms on emission control, operational parameters such as auxiliary consumption, O&M Expenses, station heat rate etc. consequent to the implementation of ECS. Therefore, in view of the direction issued to CEA in Petition No. 98/MP/2017, it would be appropriate to consider the recommendations made by CEA and issue guidelines for selection of technology for emission control as mandated by MoEFCC.

35. In response, the Petitioner has submitted that while selecting FGD technology for De-SO<sub>x</sub> in a particular station/ unit, the Petitioner has followed the evaluation criteria of unit size, geographical location, age of units, availability of space, coal quality, etc. and the CEA Advisory dated 7.2.2020. CEA in its “Standard Technical Specification for Retrofit of WFGD system in a typical 2x500 MW thermal power plant” has recommended that for compliance of emission norm of 200 mg/Nm<sup>3</sup>, the required SO<sub>2</sub> removal efficiency of FGD system to be installed has to be in the range 90-95%. WFGD technology with its worldwide footprint, abundance of suppliers, being safer technology, having lower cost for reagent consumption and its suitability for high PLF units is the most suitable technology for the instant generating stations. The adoption of same technology for all units shall provide an added advantage in terms of operating cost in respect of spares, tie-up of reagent suppliers etc. Accordingly, WFGD technology has been selected for SO<sub>2</sub> removal for 1600 MW capacity of FSTPSS-I&II in line with the CEA advisory dated 7.2.2020.



36. PSPCL in Petition No. 517/MP/2020 has submitted that despite the Commission directing the Petitioner to specifically consult CEA with respect to adoption of specific technology and finalizing costs, the Petitioner has failed to obtain any project specific approval from CEA and has based its entire petition only on the indicative parameters provided by CEA. The said guidelines themselves provide that the same are only indicative in nature and as such, in order to enable the Commission to allow prudently incurred cost to the Petitioner, it is imperative for the Petitioner to have a project specific report/ approval from CEA with regard to the use of the specific technology and the cost involved therein. In the absence of the above material particulars, the claims of the Petitioner for allowance of ACE towards installation of the FGD system cannot be adjudicated.

37. TANGEDCO in Petition. No. 522/MP/2020 has submitted that CEA has also recommended that for optimum selection of technology for TPPs, various factors need to be further evaluated before finalization of technology since every plant has specific requirements, which need to be evaluated on a case-to-case basis. However, in the instant case, the Petitioner has not provided the basis to verify the reasonableness of the selected ECS.

38. TPDDL in Petition No. 522/MP/2020 has submitted that there is no mention of a project specific consultation/ recommendation of the CEA and decision of competent authority confirming ECS technology selected is the best suited cost-effective technology in terms of CEA's advisory dated 7.2.2020. TPDDL has submitted that general guidelines issued by CEA are merely indicative and that the Petitioner should



have come up with project-specific recommendations. This aspect was also recognized by the Commission in order dated 23.4.2020 in Petition No. 446/MP/2019 in the matter of Sasan Power Limited (SPL). The Commission vide RoP dated 12.3.2021 had directed the Petitioner to provide the said information. However, the said information has not been made available by the Petitioner in respect of its generating stations/ units. The Petitioner has not even provided the cost breakdown between the main FGD package, electrical power supply package, waste-water treatment, fire protection and detection, spares, engineering, project management and contingency reserve etc. in respect of the additional expenditure being sought. The Petitioner has not mentioned the basis on which cost of technology has been ascertained nor has shared critical details of the competitive bidding process with the procurers or mentioned any project specific CEA recommendations in the Petition, there is a serious risk that the prudent process to determine the most competitive price has not taken place. This is also evident from the fact that the costs sought by the Petitioner are considerably higher than the indicative costs recommended by the CEA even after adjusting the same for efflux of time and price. TPDDL has submitted that in line with directions of the Commission, Maithon Power Limited (MPL) consulted CEA specifically for its project and thereafter filed a petition bearing Petition No. 152/MP/2019 for grant of “in-principle” approval for ACE for installing and operating ECS. TPDDL has submitted the Petitioner has not done so despite being similarly placed to MPL and despite the Commission’s specific direction to consult with CEA.



39. In response, the Petitioner has submitted that the Tariff Regulations, MoEFCC Notification and the order dated 20.7.2018 in Petition No. 98/MP/2017 do not stipulate that concurrence or approval of CEA is a pre-requisite for the Petitioner to implement FGD. The MoEFCC Notification is “change in law” as per the 2014 Tariff Regulations and the 2019 Tariff Regulations. The said issue is now no more res integra as the Commission in order dated 20.7.2018 in Petition No. 98/MP/2017 has already held the MoEFCC Notification to be “change in law”. The Petitioner proceeded to undertake financial commitment on installation of FGD after it had approached the Commission in Petition No. 98/MP/2017 arraying all beneficiaries including Respondent as a party.

40. We have considered the submissions of SBPDCL, NBPDC, TANGEDCO, BRPL, UPPCL, TPDDL and RUPNL and the clarifications given by the Petitioner. The Respondents have contended that the Petitioner has not submitted project-specific recommendations of CEA. We note that CEA has been entrusted with the planning and coordination of implementation of the ECS in compliance with the MoEFCC Notification. The Commission in order dated 20.3.2017 in Petition No. 72/MP/2016 directed CEA to decide specific optimum technology and the associated costs of installation of FGD in case of Maithon Power Limited. Later, the Commission in order dated 20.7.2018 in Petition No. 98/MP/2017, filed by the Petitioner, directed CEA to prepare guidelines regarding suitable technology, operation parameters, norms and other technical inputs. Accordingly, CEA vide its letter dated 21.2.2019 has specified the parameters to be considered for selection of technology, capital



expenditure, operational expenditure and APC for ECS for reduction in SO<sub>2</sub> emissions, which are applicable for TPPs in general. Further, the Commission itself moved away from project specific recommendations of CEA to general guidelines to be issued by CEA. In fact, the operating norms have been notified by the Commission vide the 2020 Amendment Regulations based on CEA's recommendations itself. We are of the view that the norms recommended by CEA vide its Advisories dated 21.2.2019 and 7.2.2020 are applicable to all TPPs including the generating stations covered in the instant petitions and there is no need for plant-specific recommendations. At the same time, we would also like to point out that wherever plant specific recommendations are made by CEA, the same needs to be followed by concerned generating stations/ units.

- Emission norms not applicable for old/ retiring plants

41. RUVNL in Petition No. 508/MP/2020 has submitted that FGD installation involves capital cost of ₹1124.53 crore and the indicative tariff impact is ₹0.34 per unit. FSTPSS-I&II were declared under commercial operation on 1.7.1996 and would complete their useful life by the time installation of FGD system is completed.

42. BRPL has submitted that the notification of MoEFCC dated 31.3.2021 has exempted those TPPs from meeting the revised ECNs that have declared to retire before 31.12.2022 and 31.12.2025 depending on the category determined by the task force. Further, the guidelines dated 22.3.2021 of MoP gives discoms/ beneficiaries the right to exit from the allocation of the generating stations which have completed 25 years of useful life. BRPL has submitted that CEA also in its



recommendations regarding appropriate technology for FGD, has observed that “balance useful life” of the generating station is an important criterion for selection of appropriate technology. Therefore, if the generating station has or is about to complete its useful life or has become inefficient, there is no justification to extend its life beyond the useful life on the basis of installation of FGD. This would cause additional tariff burden on the consumers. The Petitioner has not placed any studies on record to show that FSTPSS-I&II shall run for at least 10 years. No petition has been filed by the Petitioner for extension of life and there is no order of the Commission extending the useful life of FSTPSS-I&II. The capital cost claimed by the Petitioner is commercially unviable and accordingly, ACE claimed by the Petitioner should not be allowed for such generating stations that are nearing the end of their useful life as it will result in tariff shock for the consumers. The Petitioner has planned to run the FSTPSS-I&II on Special Allowance (SA) under Regulation 28 of the 2019 Tariff Regulations. The Petitioner has stated that SA has been availed for Unit I, II, III and IV. Unit V has not completed its useful life as on date and it is not availing the SA. The Petitioner has stated that the additional R&M requirements would be fulfilled under SA of ₹9.5 lakh/MW. Accordingly, in case of FSTPSS-I&II, it would amount to around ₹1 crore/MW over a period of 10 years. The Petitioner is investing hard cost of ₹53 lakh/MW for installation of FGD technology and to recover this cost the Petitioner intends to charge an additional ₹1 crore/MW from the beneficiaries. The Respondent has further submitted that it reserves its right to take appropriate steps for being excused from the rigours of the existing contractual terms in respect of FSTPSS-I &II after completion of 25 years from COD.



43. In response, the Petitioner has submitted that being a prudent utility, it has planned essential R&M works through the option of SA dispensation provided in the Tariff Regulations. SA allowed is ₹9.50 lakh/MW/year. Therefore, considering a recovery of ₹9.50 lakh/MW/year beyond useful life of units and based on factors, such as, the assessment of the residual life of equipment/ systems, obsolescence of the technology, etc., the Petitioner is undertaking appropriate, need-based and essential R&M activities. The units/ stations that have already completed their useful life are proposed to be run till the Petitioner is able to carry out required R&M activities through SA in order to sustain performance and other considerations such as phasing of old units as recommended by CEA. Therefore, it is incorrect to suggest that the implementation of FGD system is not a mandatory condition. The instant claim is made strictly in accordance with Regulation 29(2) read with Regulation 33(10)(c) of the 2019 Tariff Regulations. As regards furnishing of RLA (residual life assessment) and R&M study, the Petitioner has submitted that the requirement and the scope of RLA and R&M study was never a subject matter for the purpose of installation of ECS. The compliance of revised ECNs cannot be drawn into any cost assessment as it affects the life and health of citizens in the country.

44. TANGEDCO in Petition No. 508/MP/2020 and Petition No. 333/MP/2020 has submitted that as per the notification of MoEFCC dated 31.3.2021 TPPs retiring before certain date are not required to meet the specified norms in case such plants submit an undertaking to CPCB and CEA for exemption on the ground of retirement of such plant. Hence, the Petitioner has to spell out the retirement plan of the units



and the details of RLA and R&M study. In absence of such studies, incurring a huge expenditure towards ECS is unwarranted and will lead to huge loss to the exchequer. TANGEDCO has requested to direct the Petitioner to come up with all strategies and costs for keeping the age old plant in service for a further period of 10 years, without which the petition is liable to be rejected.

45. In response, the Petitioner has submitted that the Petitioner has no plan for retiring FSTPSS-I&II in the near future. The Petitioner has submitted that the revised ECNs prescribed by MoEFCC is a statutory mandate which must necessarily be implemented by the Petitioner. Accordingly, the Petitioner is merely seeking allowance of ACE towards installation of ECS in compliance of the MoEFCC Notification. As regards the plants which have either completed their useful life or are about to complete their useful life, the Petitioner has submitted that the Commission has already notified the 2020 Amendment Regulations wherein additional time of 10 years has been granted to plants such as FSTPSS-I&II for recovery of capital expenditure through depreciation. Therefore, when there are provisions for operating the plant beyond the useful life and treatment of cost of ECS, there is no reason to retire FSTPSS I&II, TSTPSS-I. The substantial investment made by the Petitioner in the said generating stations is a national resource. Thus, until and unless the plant is optimally utilised and exhausted, it should not be retired as the same would be against the interest of the consumers. As regards the contention of the Respondents that the Petitioner must submit undertaking to CPCB and CEA for retiring units, the Petitioner has submitted that only the power plants which are declared to retire





before the specified date is required to submit an undertaking to CPCB and CEA for exemption on ground of retirement of such plant.

46. TPDDL in Petition No. 522/MP/2020 has submitted that as per the notification of MoEFCC dated 31.3.2021, Category-A TPPs retiring before 31.12.2022 and Category B&C TPPs retiring before 31.12.2025 are not required to meet the specified norms in case such plants submit an undertaking to CPCB and CEA for exemption on the ground of retirement of such plant. TPDDL has further submitted that the environment compensation @₹0.20 per unit has to be paid by the generator in case their operation is continued beyond the date as specified in the undertaking. Any such environment compensation should be borne solely by the Petitioner and not passed on to the Respondents. In response, the Petitioner has submitted that only the power plants which are declared to retire before the specified date has to submit an undertaking to CPCB and CEA for exemption on ground of retirement of such plant. The said issue falls outside the purview of the present proceedings which is confined to approval of cost as per Regulation 29 of the 2019 Tariff Regulations. The instant petitions are based on the premise that the Petitioner is seeking to install ECS and is seeking approval of expenditure. The Petitioner has submitted that the Petitioner being a prudent utility has planned bare minimum and essential R&M works through the option of SA dispensation provided in the Tariff Regulations. The units/ stations that have already completed their useful life are proposed to be run till the Petitioner is able to carry out required R&M activities through SA in order to



sustain performance and other considerations such as phasing of old units as recommended by CEA.

47. BRPL in Petition No. 522/MP/2020 has submitted that CEA has proposed retirement of various generating stations of the Petitioner during 2022-27 including KSTPSS-I. As such, there is no basis for the Petitioner to claim balance useful life of another 10 years when no consent has been taken from CEA to run this plan beyond 2027. If KSTPSS-I is to be taken out of service in 2027, the Petitioner would inevitably try to recover the balance unrecovered depreciation from its beneficiaries thereby unfairly increasing the cost of power which is to be passed on to the consumers of the beneficiaries. BRPL has further submitted that KSTPSS-I is nearing 25 years of operation and the Petitioner has unilaterally taken the decision to invest an additional amount without providing RLA study to ensure that there is no further cost in the form of R&M that would have to be incurred to further operate KSTPSS-I. The Petitioner is investing ₹582.96 crore for installation of ECS in KSTPSS-I which would require grant of SA of ₹9.5 lakh/MW/year for undertaking bare minimum R&M and O&M activities for operating of KSTPSS-I. BRPL has submitted that if KSTPSS-I, which has capacity of 840 MW, is operated for the next 10 years it would require about ₹798 crore under the head of SA. However, the Petitioner has not obtained the consent of the beneficiaries as required under Regulation 33(10)(c) of the 2019 Tariff Regulations. The Petitioner has neither provided any clarity on the useful life nor placed on record the relevant orders



allowing SA. The Petitioner has even failed to show the details of the repairs, the viability of the repairs and their impact on the increase of life of KSTPSS-I.

48. In response, the Petitioner has reiterated that the installation of ECS is a mandatory requirement as per the MoEFCC Notification. The compliance of revised ECNs cannot be drawn into any cost assessment as it affects the life and health of citizens in the country as was stated by the Hon'ble Supreme Court in its order dated 25.7.2018 passed in Writ Petition No. 13029 of 1985.

49. We have considered the submissions of the Petitioner and the Respondents. The Respondents have contended that installation of ECS in FSTPSS-I&II and KSTPSS-I which have completed their useful life, would increase the financial burden on the power distribution companies. The Respondents have also contended that as per the notification of MoEFCC dated 31.3.2021, it is not mandatory to implement ECS in the retiring plants like FSTPSS-I&II and KSTPSS-I. The Petitioner has submitted that SA is being availed by the Petitioner for FSTPSS-I&II and KSTPSS-I and it does not intend to retire the FSTPSS-I&II and KSTPSS-I in the near future and it is mandatory to comply with the MoEFCC Notification. It is observed that though FSTPSS-I&II and KSTPSS-I have completed their useful life, the Petitioner is able to run FSTPSS-I&II and KSTPSS-I by availing SA of ₹9.5 lakh/MW/year in lieu of R&M.

50. As regards the Respondents' contention that it is not mandatory to install ECS in case of retiring units as per MoEFCC Notification of 31.3.2021, it is observed that as per the said Notification, a task force shall be constituted by CPCB comprising of



the representatives of MoEFCC, MoP, CEA and CPCB to categorise TPPs into non-retiring units and retiring units up to 2025 on the basis of their location. The retiring TPPs are not required to comply with the revised ECNs if they submit an undertaking to CPCB and CEA for exemption on the ground of retirement of the plant and further they may be allowed to continue beyond the date specified in the undertaking on payment of environment compensation of ₹0.20 per unit of electricity. The non-retiring units are required to pay environmental compensation as specified in the Notification. The relevant portion of the MoEFCC Notification dated 31.3.2021 is extracted hereunder:

*“(i) A task force shall be constituted by Central Pollution Control Board (CPCB) comprising of representative from Ministry of Environment and Forest and Climate Change, Ministry of Power, Central Electricity Authority (CEA) and CPCB to categorise thermal power plants in three categories as specified in the Table-I on the basis of their location to comply with the emission norms within the time limit as specified in column (4) of the Table-I, namely: -*

**Table-I**

Sl. No.	Category	Location/area	Timelines for compliance	
			Non retiring units	Retiring units
(1)	(2)	(3)	(4)	(5)
1	Category A	Within 10 km radius of National Capital Region or cities having million plus population <sup>1</sup> .	Up to 31 <sup>st</sup> December 2022	Up to 31 <sup>st</sup> December 2022
2	Category B	Within 10 km radius of Critically Polluted Areas <sup>2</sup> or Non-attainment cities <sup>2</sup>	Up to 31 <sup>st</sup> December 2023	Up to 31 <sup>st</sup> December 2025
3	Category C	Other than those included in category A and B	Up to 31 <sup>st</sup> December 2024	Up to 31 <sup>st</sup> December 2025

<sup>1</sup> As per **2011** census of India.

<sup>2</sup> As defined by CPCB.

*(ii) the thermal power plant declared to retire before the date as specified in column (5) of Table-I shall not be required to meet the specified norms in case such plants submit an undertaking to CPCB and CEA for exemption on ground of retirement of such plant:*



Provided that such plants shall be levied environment compensation at the rate of rupees **0.20** per unit electricity generated in case their operation is continued beyond the date as specified in the Undertaking;

(iii) there shall be levied environment compensation on the non-retiring thermal power plant, after the date as specified in column (4) of Table-I, as per the rates specified in the Table-II, namely:-

**Table-II**

Non-Compliant operation beyond the Timeline	Environmental Compensation (Rs. per unit electricity generated)		
	Category A	Category B	Category C
0-180 days	0.10	0.07	0.05
181-365 days	0.15	0.10	0.075
366 days and beyond	0.20	0.15	0.10. ”

51. As per the above-quoted Notification, TPPs are required to be categorised into retiring or non-retiring TPPs by the task force. However, no document has been produced by the Respondents to show that FSTPSS-I&II and KSTPSS-I have been categorised by the task force as retiring units as prescribed in the said Notification. Further, for FSTPSS-I&II and KSTPSS-I, the Petitioner has been availing Special Allowance under Regulation 28 of the 2019 Tariff Regulations and these generating stations are continuing to be in service. Though FSTPSS-I&II and KSTPSS-I have completed the useful life, it is mandatory to install ECS in compliance of the MoEFCC Notification till it is decided otherwise by the task force as set up vide the above-quoted Notification of MoEFCC.

- Non-submission of the present emission levels of the generating stations

52. NBPDC and SBPDCL in Petition No. 183/MP/2020; TANGEDCO in Petition No. 333/MP/2020 and Petition No. 508/MP/2020; GRIDCO and BSPHCL in Petition No. 342/MP/2020 have submitted that the Petitioner has not provided details of the prevailing emission levels from the generating stations. These details are vital in



ascertaining the requirements of installing ECS. The Petitioner has to also justify whether installation of FGD, CM and SNCR/SCR systems are required to be installed for complying with the MoEFCC Notification. In response, the Petitioner has submitted that the present emission levels of SO<sub>2</sub> in BSTPSS-II Units-IV and V is 1106 mg/Nm<sup>3</sup> and 1096 mg/Nm<sup>3</sup> respectively; that of TSTPSS-I are in the range of 900-1400 mg/Nm<sup>3</sup>; that of FSTPSS-III is minimum 1050 mg/Nm<sup>3</sup> and maximum 1350 mg/Nm<sup>3</sup> depending upon the quality of coal; and that of FSTPSS-I&II is between 850 to 1350 mg/Nm<sup>3</sup>.

53. In Petition No. 517/MP/2020, GRIDCO has submitted that the Petitioner has not given justification for requirement of WFGD System and CM System. The Petitioner has also not furnished the present emission level of SO<sub>2</sub> and NO<sub>x</sub> certified by Competent Authority so as to ascertain the requirement of FGD and CM. MPPMCL in Petition No. 517/MP/2020 has submitted that the Petitioner may be directed to submit the details of SO<sub>2</sub>, NO<sub>x</sub>, Hg, Particulate matter emissions and water consumption for last five years to examine the present level of emissions and to assess the measures required to be implemented to achieve the revised ECNs.

54. We have considered the submissions of the Respondents and the Petitioner. The Respondents have contended that the Petitioner has not submitted the present emission levels to ascertain the requirement of ECS. Subsequent to contentions of the Respondents, the Petitioner has submitted the present SO<sub>2</sub> emission level in case of various generating stations. From the submissions of the Petitioner, it is observed that the present emission levels of SO<sub>2</sub> are higher than the norms



prescribed in the MoEFCC Notification. Therefore, there is a requirement for installation of ECS in the instant generating stations in order to bring down the emission levels to the norms prescribed by MoEFCC. GRIDCO has contended that the Petitioner should have given the present emission level of SO<sub>2</sub> in the NIT/ tender specification as the design and the manufacture of WFGD system would require the existing level of SO<sub>2</sub>. We understand the concerns expressed by the Respondents as SO<sub>2</sub> removal efficiency can be tested only when the inlet emission level is considered at the stage of design and manufacture of the system and without considering the same, ECS cannot be designed. Though the Petitioner has not specifically responded to this concern of the Respondents, we are of the view that the emission level corresponding to worst coal is an essential parameter, which would have been necessarily considered while selecting, designing and manufacturing the system for removal of SO<sub>2</sub>. In this regard, it is also observed that the Petitioner has selected WFGD technology to bring down the present emission level of SO<sub>2</sub> in its generating stations on the basis of the various parameters prescribed by CEA. Needless to mention, the Petitioner needs to ensure that ECNs in respect of SO<sub>2</sub> are achieved once the proposed FGD systems are in place in the generating stations.

55. Also, in our view, current level emissions are required to establish whether there is requirement of ECS or not for meeting the norms as stipulated by MoEFCC. From the information submitted by the Petitioner as regards level of SO<sub>2</sub> emission in various generating stations, the need for installing FGD systems in these generating stations is established as the existing SO<sub>2</sub> emission levels as submitted by the



Petitioner for these stations are on higher side compared to the level that is to be achieved as per the MoEFCC Notification. Also, ECSs including WFGD system are designed for emissions corresponding to worst coal likely to be encountered during the operation of plant. This has been emphasized upon by CEA in its document titled “Standard Technical Specification for Retrofit of Wet Limestone Based Flue Gas Desulphurisation (FGD) System in a Typical 2 X 500 Mw Thermal Power Plant” that has indicated that FGD system shall be designed for worst coal (with 0.5% Sulphur content) with corresponding inlet SO<sub>2</sub> concentration of 1800 mg/Nm<sup>3</sup>. Further, CEA has indicated that guaranteed outlet SO<sub>2</sub> concentration shall be fixed at 150 mg/Nm<sup>3</sup> against the norm of 200 mg/Nm<sup>3</sup> i.e. with a margin of 50 mg/Nm<sup>3</sup>. This translates into FGD efficiency of around 92%  $\{(1800-150) \times 100 / 1800\}$  which can be met by WFGD system.

- Delay in award of contracts

56. UPPCL has submitted that the Petitioner could have avoided the delay of 3 years from the date of issuance of the MoEFCC Notification in implementing ECS by taking timely approval of its BoD and issuance of NIT. The approval of its BoD, invitation of tenders and issuance of LOA could have been completed within 9 months to 12 months from the date of the MoEFCC Notification. However, the Petitioner due to its inaction allowed the time to lapse and as a consequence, the useful life of some of the generating stations/ units has expired.

57. BRPL in Petition No. 517/MP/2020 and Petition No. 522/MP/2020 has submitted that there was a gap of 2 years and 6 months from the approval of the





Petitioner's Board to the date of invitation of bids and gap of 8 months from the date of invitation of bids to date of investment approval. Due to inaction of the Petitioner, the tenders were issued after a cumulative delay of 3 years and 9 months from the date of issue of the MoEFCC Notification. Any delay in implementing ECS is on account of the Petitioner and the additional burden caused on account of the same cannot be fastened upon the consumers in the form of increased tariff.

58. In response, the Petitioner made detailed submissions vide affidavit dated 24.5.2021 regarding the various steps it has to undergo from the date of issue of MoEFCC Notification to issue of IFBs and installation of ECS in its various TPPs, which has already been captured in Paragraph No. 21 of this order. The Petitioner has submitted that there was no imprudence on its part and that there was no delay in taking up the implementation of ECS. The Petitioner was able to publish NIT for installation of FGD systems of more than 50000 MW by August 2019. Moreover, the installation of FGD systems in its TPPs is being monitored by the Hon'ble Supreme Court, CPCB and MoEFCC.

59. We have considered the submissions of the Petitioner. UPPCL and BRPL have contended that there was delay on the part of the Petitioner in installation of ECS. The Petitioner has submitted that it had to undergo various stages in implementation of the norms specified by MoEFCC which takes time and there is no imprudence on its part. It is observed that as per the MoEFCC Notification dated 07.12.2015, the Petitioner was required to install ECS within two years i.e. by December 2017. The Petitioner initiated steps to implement ECS in its TPPs within the prescribed timeline.



The Petitioner filed Petition No.98/MP/2017 for approval of ACE towards installation of ECS in Singrauli STPS and Sipat STPS Stage-I and the Commission vide order dated 20.7.2018 held that ACE towards installation of ECS is admissible under “change in law” after prudence check. The Commission further directed CEA to prepare guidelines regarding suitable technology, operation parameters, norms and other technical inputs. Accordingly, CEA vide letter dated 21.2.2019 recommended various technologies for implementation of the MoEFCC Notification. Though the Petitioner had initiated action for implementation of ECS soon after the MoEFCC Notification, the process involving conceptualization, identification of technology, bidding, installation and commissioning of ECS is a long drawn process. Needless to mention, the Petitioner being a Central PSU has to follow CVC guidelines in awarding tenders and it takes time. The Petitioner having issued IFBs, as stated above, in case of plants covered in four out of the six petitions even before CEA’s letter of 21.2.2019, it cannot be said that there was delay on the part of the Petitioner especially when MoEFCC has subsequently revised timelines for implementation of ECS to December 2022.

60. In view of the above discussions, we hold that the instant petitions filed by NTPC are maintainable. We now deal with prayers of the Petitioner in the following paragraphs.

### **Prayers of the Petitioner**

61. The Petitioner has prayed to (a) approve undertaking implementation of ECS in order to meet revised ECNs; (b) grant liberty to approach the Commission for



approval of implementation of ECS on account of Mercury, water consumption and particulate matter in future, if required; (c) allow additional APC; (d) allow additional GSHR; (e) allow additional water consumption; (f) allow additional O&M Expenses; (g) allow cost of reagents; and (h) allow deemed availability on account of shutdown. The prayers are common and similar in all the petitions (except for approval of ACE for implementation of ECS which is generating station/ unit specific) and, hence, they are dealt together.

### **ACE for implementation of ECS**

62. The Petitioner has sought approval for undertaking implementation of ECS in order to meet revised ECNs. The Petitioner has proposed WFGD system for reduction in SO<sub>2</sub> emission in all the generating stations/ units covered in the instant 6 petitions and CM system as the primary measure and SNCR as the secondary measure for reduction of NO<sub>x</sub> emissions in case of some of the generating stations/ units. The Petitioner has considered the capital cost of ECS discovered through competitive bidding and certain other operating parameters to arrive at the indicative supplementary tariff. However, the indicative supplementary tariff claimed by the Petitioner on the basis of certain assumptions in the instant petitions is bound to vary as the Commission has introduced the operating parameters in the 2020 Amendment Regulations for additional APC, water consumption and O&M Expenses on account of installation of ECS. The indicative tariff claimed by the Petitioner in the instant petitions before the notification of the 2020 Amendment Regulations is given in the following paragraphs. The Respondents have raised issues like suitability and



effectiveness of the proposed ECS, approvals and bidding process and the capital cost of ECS identified for the subject generating stations/ units.

63. The claims made by the Petitioner in Petition No. 183/MP/2020 in respect of BSTPSS-II (2x660 MW) are as follows:

- (a) WFGD System is being implemented for reduction of SO<sub>2</sub> emission and has proposed SNCR system for reduction of NO<sub>x</sub> in BSTPSS-II.
- (b) The present emission levels of SO<sub>2</sub> is in the range of 1096-1106 mg/Nm<sup>3</sup>. SO<sub>2</sub> emission norm for the instant generating station/ unit commissioned on 8.3.2016 as per the MoEFCC Notification is 200 mg/Nm<sup>3</sup>.
- (c) The following capital cost, and operating parameters for computing the indicative supplementary tariff has been considered:

Sr. No.	Description	FGD*	SNCR	Remarks
1	Capital Cost	₹679.86 crore	₹69.89 crore (with tax etc.)	SNCR yet to be awarded
2	Normative Specific Limestone/Reagent Consumption (kg/kWh)	0.01909 (Limestone)	0.0015 (Urea)	
3	Additional APC	1%	0.2%	
4	Additional O&M	4% of capital cost		
5	Shutdown Period	30-45 days	15 days	
6	Increase in GSHR*		13.46 Kcal/kWh	0.6% increase due to SNCR

\* Additional water consumption for Wet FGD /Increased Heat Rate for Nox systems to be submitted later

- (d) The indicative supplementary tariff (without considering the impact on GSHR) due to installation of ECS in order to meet the revised ECNs is: Fixed Cost (FC): 17.50 paise/kWh; Variable Cost (VC): 10.17 paise/kWh (1st year) and Fixed Cost (FC): 15.98 paise/kWh (levelized). A further increase in Energy Charge Rate and per unit Fixed Charge (@85% scheduled generation) of the station by about 4 paise/ kWh is anticipated due to increased APC and Station Heat Rate.



(e) BSTPSS-II was put into commercial operation on 8.3.2016 and has been in operation for 5 years. The remaining useful life is about 21 years as on 1.4.2020.

(f) BoD of the Petitioner, in its 444<sup>th</sup> meeting held on 22.3.2017, gave approval for planning and tendering of ECS to comply with the MoEFCC Notification.

(g) In the 463<sup>rd</sup> meeting dated 8.9.2018, BoD of the Petitioner approved the proposal to award the contracts for the FGD package and in the same meeting, it accorded the Investment Approval to undertake implementation of FGD system at the instant station.

(h) IFB for installation of FGD system at the instant generating station was issued by the Petitioner on 31.7.2017. BHEL emerged as the successful bidder. Accordingly, on 18.9.2018, NoA was issued to BHEL for FGD installation. Subsequent to the award of contract for installation of FGD, BHEL has started the process for installation of FGD system and engineering, ordering and civil work is in progress.

(i) In the Notification dated 7.12.2015, the emission norm for NO<sub>x</sub> was 300 mg/Nm<sup>3</sup>. Accordingly, initially approval of ACE for installation of SNCR was sought. However, the norm of NO<sub>x</sub> has been revised by MoEFCC vide Notification dated 19.10.2020, to 450 mg/Nm<sup>3</sup>. Accordingly, the secondary De-NO<sub>x</sub> system of SNCR is not being installed now.

(j) The break-up of the capital cost claimed for FGD implementation, vide affidavit dated 9.4.2021, is as follows:

CEA indicative hard cost (₹ lakh per MW)	Hard cost claimed (₹ lakh per MW)	Total IDC & FC claimed (₹ lakh)	Total IEDC claimed (₹ lakh)	Total FERV claimed (₹ lakh)	Total taxes & duties claimed (₹ lakh)	Total other costs claimed (₹ lakh)	Total costs claimed (₹ lakh)
40.50 (500 MW)	39.93	3924.00	1865.00	-	9487.00	-	67986.00

64. The claims made by the Petitioner in Petition No. 333/MP/2020 in respect of TSTPSS-I are as follows:



(a) The present emission levels of SO<sub>2</sub> is in the range of 900-1400 mg/Nm<sup>3</sup>. SO<sub>2</sub> emission norm for the generating station/ unit as per the MoEFCC Notification is 200 mg/Nm<sup>3</sup>. Therefore, WFGD system is being implemented for control of SO<sub>2</sub> emission in TSTPSS-I.

(b) The following capital cost and operating parameters for computing the indicative supplementary tariff has been considered:

SI. No.	Description	FGD
1	Capital Cost	₹519.11 crore
2	Normative Specific Limestone/ Reagent Consumption (kg/kWh)	0.016 (Limestone)
3	Additional APC	1%
4	Additional O&M	
5	Shutdown Period	45 days for each unit
6	Increase in GSHR	-

(c) The indicative supplementary tariff (without considering the impact on GSHR) due to installation of ECS in order to meet the revised ECNs is: Fixed Cost (FC): 25.32 paise/kWh; Variable Cost (VC): 2.58 paise/kWh (1st year) and Fixed Cost (FC): 23.59 paise/kWh (levelized). A further increase in Energy Charge Rate and per unit Fixed Charge (@85% scheduled generation) of the station by about 2 paise/ kWh is anticipated due to increased APC.

(d) TSTPSS-I was put into commercial operation on 1.7.1997 and would complete the useful life of 25 years in 2022.

(e) NO<sub>x</sub> emission limit for instant station is 600 mg/Nm<sup>3</sup> as per MoEFCC Notification. Therefore, Combustion Modification system or SNCR system for NO<sub>x</sub> control are not proposed in the TSTPSS-I.

(f) In the 482<sup>nd</sup> meeting dated 19.3.2020 of BoD of the Petitioner, the proposal to award the contracts for the FGD package was approved. BoD, in the same meeting, accorded the Investment Approval to undertake implementation of FGD system at the instant station.



(g) IFB for installation of FGD system at the instant station was issued by the Petitioner on 27.8.2019. Tata Project Limited emerged as the successful bidder. NoA was issued to Tata Project Limited for installation of WFGD system on 30.3.2020. Tata Project Limited has started the process for installation of WFGD System. At present, engineering, ordering and civil works is in progress at the instant station.

(h) The Petitioner's generating stations being of different vintage, in order to recover depreciation through the supplementary tariff on account of ECS in stations of different vintages, it has considered minimum extended useful life of 5 years or balance useful life of the station, whichever is higher.

(i) The remaining useful life of the instant generating station is 2.5 years as on 1.4.2020. Accordingly, in order to avoid sudden increase in tariff, the depreciation has been spread over 5 years from the date of operation of ECS schemes.

(j) The station has not completed its useful life (25 years) as on date and is not availing SA (Special Allowance). However, the generating station is in its fag end and intends to avail the benefit of SA under applicable provisions of the Tariff Regulations after the useful life of the units/ station. It proposes to run the unit/ station for a minimum of 5 years from the date of operation of ECS in the last unit.

(k) The break-up of the capital cost claimed for WFGD system implementation, vide affidavit dated 9.4.2021, is as follows:

CEA indicative hard cost (₹ lakh per MW)	Hard cost claimed (₹ lakh per MW)	Total IDC & FC claimed (₹ lakh)	Total IEDC claimed (₹ lakh)	Total FERV claimed (₹ lakh)	Total taxes & duties claimed (₹ lakh)	Total other costs claimed (₹ lakh)	Total costs claimed (₹ lakh)
40.50 (500 MW)	44.54	3634.00	1577.00	-	80.17	-	57768.00

65. The claims made by the Petitioner in Petition No. 342/MP/2020 in respect of



FSTPSS-III are as follows:

(a) WFGD System is being implemented for control of SO<sub>2</sub> emission in FSTPSS-III (1x500 MW) and Combustion Modification to control NO<sub>x</sub> emission.

(b) The following capital cost and operating parameters for computing the indicative supplementary tariff has been considered:

Sl. No.	Description	FGD	SNCR	Combustion Modification System	ESP R&M	Remarks
1	Capital Cost	₹247.27 crore	₹26.70 crore	₹8.93 crore	Nil	SNCR implementation shall be decided based on pilot test report
2	Normative Specific Limestone/ Reagent Consumption (kg/kWh)	0.016 (Limestone)	0.0015 (Urea)	Nil	Nil	
3	Additional APC	1%	0.4%	Nil	Nil	
4	Additional O&M	4% of capital cost				
5	Shutdown Period	45 days	15 days	45 to 60 days		
6	Increase in GSHR		11.87 kCal/Kwh	18.99 kCal/kwh		0.8% increase: due to Combustion Modification, 0.4-0.6% increase: due to SNCR

(c) The indicative supplementary tariff (without considering the impact on GSHR) due to installation of ECS in order to meet the revised ECNs is: Fixed Cost (FC): 17.49 paise/kWh; Variable Cost (VC): 5.81 paise/kWh (1st year) and Fixed Cost (FC): 17.38 paise/kWh (levelized). A further increase in Energy Charge Rate and per unit Fixed Charge (@85% scheduled generation) of the station by about 10 paise/kWh is anticipated due to increased APC and Station Heat Rate.





- (d) FSTPSS-III was put into commercial operation on 4.4.2012. The remaining useful life of the plant as on 1.4.2020 is 17 years. Accordingly, station is not eligible for availing SA.
- (e) In order to avoid sudden increase in tariff, the Petitioner has spread the depreciation over 16 years from the date of operation of ECS.
- (f) No life extension activity is being carried out and no life extension beyond 25 years is envisaged at this stage.
- (g) BoD of the Petitioner gave its approval for planning and tendering of ECS to comply with the MoEFCC Notification in its 444<sup>th</sup> meeting held on 22.3.2017.
- (h) BoD of the Petitioner in its 483<sup>rd</sup> Meeting held on 9.5.2020 approved the proposal to award the contracts for the FGD package and accorded the Investment Approval to undertake implementation of FGD system.
- (i) Initially, it was proposed to instal CMS and SNCR to meet the NO<sub>x</sub> emission norm of 300 mg/Nm<sup>3</sup>. However, with the revision of the norms from 300 mg/Nm<sup>3</sup> to 450 mg/Nm<sup>3</sup> by MoEFCC *vide* its Notification dated 19.10.2020, it is now proposed to install only CMS and SNCR proposed earlier shall not be implemented any more.
- (j) IFB for installation of WFGD system was issued on 19.8.2019. Mitsubishi Hitachi Power Systems India Private Limited (MHPSIPL) emerged as the successful bidder and NoA was issued on 27.5.2020 to MHPSIPL for WFGD system installation at the instant station. MHPSIPL has started the process for installation of WFGD system and at present, engineering, ordering and civil works is in progress at the instant station.
- (k) The installation of CMS has been awarded to BHEL through Competitive Bidding Route for Lot-I stations.
- (l) The break-up of the capital cost claimed for WFGD system implementation, *vide* affidavit dated 9.4.2021, is as follows:



CEA indicative hard cost (₹ lakh per MW)	Hard cost claimed (₹ lakh per MW)	Total IDC & FC claimed (₹ lakh)	Total IEDC claimed (₹ lakh)	Total FERV claimed (₹ lakh)	Total taxes & duties claimed (₹ lakh)	Total other costs claimed (₹ lakh)	Total costs claimed (₹ lakh)
40.50 (500 MW)	53.11	2428.00	940.00	-	4780.00	-	34706.00

66. The claims made by the Petitioner in Petition No. 508/MP/2020 in respect of FSTPSS-I&II are as follows:

(a) The units under FSTPSS-I&II were commissioned before 31.12.2003 and, therefore, to comply with the MoEFCC notification, SO<sub>2</sub> emission is to be limited to below 600 mg/Nm<sup>3</sup> level for Units I, II and III and 200 mg/Nm<sup>3</sup> level for Units IV and V. WFGD system is being implemented for control of SO<sub>2</sub> emission.

(b) The following capital cost and operating parameters for computing the indicative supplementary tariff has been considered:

Sr. No.	Description	FGD	Remarks
1	Capital Cost	₹1124.53 crore	
2	Normative Specific Limestone Consumption (kg/kWh)	0.01625 (Limestone)	Normative Specific Limestone/reagent consumption is 7900 Kg/hr for 500 MW and 3400 Kg/hr for 200 MW
3	Additional APC	1%	
4	Additional O&M	4% of capital cost	
5	Shutdown Period	45 days for each unit	

(c) The indicative supplementary tariff (without considering the impact on GSHR) due to installation of ECS in order to meet the revised ECNs is: Fixed Cost (FC): 34.23 paise/kWh; Variable Cost (VC): 2.64 paise/kWh (1st year) and Fixed Cost (FC): 31.86 paise/kWh (levelized). A further increase in Energy Charge Rate and per unit Fixed Charge (@85% scheduled generation) of the station by about 3 paise/kWh is anticipated due to increased APC.



(d) Installation of SNCR and CMS is not proposed as the station was commissioned prior to 2003 and emission norm for NO<sub>x</sub> to be complied is 600 mg/Nm<sup>3</sup>.

(e) The remaining useful life in case of Unit V is 1.5 years as on 1.4.2020. Accordingly, in order to avoid sudden increase in tariff, the Petitioner has spread the depreciation over 5 years from the date of operation of ECS.

(f) Benefit of SA has been availed for Units I, II, III and IV under applicable provisions of the Tariff Regulations. Unit V has not completed its useful life of 25 years as on date and, hence, SA is not claimed. However, as the Unit is in its fag end, it intends to avail SA after the useful life.

(g) As per CEA estimates, for carrying out comprehensive life extension for R&M activities, an expenditure of about ₹2 to 3 crore/ MW is required. Only bare minimum and essential R&M works are carried out under SA. SA allowed is ₹9.5 lakh/MW/Year. Thus, for a period of operation of about 10-11 years, total amount allowed for operation beyond useful life is about ₹1 crore/MW only. The units/ stations that have already completed their useful life are proposed to be run till the Petitioner is able to carry out required R&M activities through SA in order to sustain performance and other considerations such as phasing of old units as recommended by CEA.

(h) BoD of the Petitioner in its 444<sup>th</sup> meeting held on 22.3.2017 gave their approval for planning and tendering of ECS to comply with the MoEFCC Notification. In the 483<sup>rd</sup> meeting held on 9.5.2020, BoD of the Petitioner gave approval to award the contracts for the WFGD package and also accorded the Investment Approval to undertake implementation of FGD system at the instant station.

(i) IFB for installation of FGD system at the instant station was issued by the Petitioner on 19.8.2019 and MHPSIPL emerged as the successful bidder. Accordingly, on 27.5.2020, NoA was issued to MHPSIPL for WFGD system installation and MHPSIPL has started the process for installation of FGD system at the instant station. At present, the civil works is in progress.



(j) The indicative capital cost of WFGD system was projected as ₹1124.53 crore which was based on estimated cost. However, after the transparent competitive bidding process, the cost has reduced and the revised capital cost is envisaged as ₹1110.62 crore based on awarded price. Accordingly, the indicative tariff shall reduce on account of the revised capital cost.

(k) The break-up of the capital cost claimed by the Petitioner for FGD implementation, vide affidavit dated 9.4.2021, is as follows:

CEA indicative hard cost (₹ lakh per MW)	Hard cost claimed (₹ lakh per MW)	Total IDC & FC claimed (₹ lakh)	Total IEDC claimed (₹ lakh)	Total FERV claimed (₹ lakh)	Total taxes & duties claimed (₹lakh)	Total other costs claimed (₹ lakh)	Total costs claimed (₹ lakh)
45.00 (200 MW) 40.50 (500 MW)	53.11	7769.14	3008.76	***	15297.52	-	111062.10

\*\*\* Extra rupee liability due to FERV if any shall be claimed based on actuals

67. The claims made by the Petitioner in Petition No. 517/MP/2020 in respect of KSTPSS-II are as follows:

(a) WFGD system is being implemented for control of SO<sub>2</sub> emission and combination of CMS/SNCR for control of NO<sub>x</sub> emission in KSTPSS-II.

(b) The following capital cost and operating parameters for computing the indicative supplementary tariff has been considered:

Sl. No.	Description	FGD	SNCR	Combustion Modification System	Remarks
1	Capital Cost	₹1040.99 crore	₹82.13 crore	₹26.77 crore	SCNR implementation shall be decided based on pilot test report
2	Normative Specific Limestone/ Reagent Consumption (Kg/kwh)	0.0108 (Limestone)	0.0015 (Urea)	Nil	
3	Additional APC	1%	0.2%	Nil	
4	Additional	4% of capital cost			



	O&M				
5	Shutdown Period	45 days for each unit	15 days for each unit	45 to 60 days for each Unit	
6	Increase in GSHR		14.83 kCal/kWh	19.77 kCal/kWh	0.8% increase: due to Combustion Modification 0.6% increase: due to SNCR

(c) The indicative supplementary tariff (without considering the impact on GSHR) due to installation of ECS in order to meet the revised ECNs is: Fixed Cost (FC): 25.77 paise/kWh; Variable Cost (VC): 4.99 paise/kWh (1st year) and Fixed Cost (FC): 24.05 paise/kWh (levelized). A further increase in Energy Charge Rate and per unit Fixed Charge (@85% scheduled generation) of the station by about 7.60 paise/kWh is anticipated due to increased APC and Station Heat Rate.

(d) KSTPSS-II was put into commercial operation on 20.3.2010 and, hence, has been in operation for 11 years. The remaining useful life of the instant station is 14 years as on 1.4.2020. Accordingly, in order to avoid sudden increase in tariff, the Petitioner has spread the depreciation over balance useful life from the date of operation of ECS schemes.

(e) KSTPSS-II has not completed 25 years and hence is not eligible for availing SA.

(f) The remaining useful life of KSTPSS-II would be 12 years after the installation of ECS in all units of the station. As of now, no life extension activity is being carried out by the Petitioner and, accordingly, no R&M is envisaged beyond 25 years at this stage.

(g) KSTPSS-I is having four units of 210 MW (840 MW) and Stage-II is having three units of 500 MW thereby having a combined capacity of 2340 MW. Therefore, NIT for implementation of FGD system for both stages (i.e. 2340 MW) of Kahalgaon station was clubbed together in one package to reap the benefits of economies of scale. Domestic bids were invited to get better competitive price.



(h) BoD of the Petitioner in its 482<sup>nd</sup> meeting held on 19.3.2020 approved the proposal to award the contracts for the WFGD package and also accorded the Investment Approval to undertake implementation of WFGD system.

(i) As the emission norms for NO<sub>x</sub> was 300 mg/Nm<sup>3</sup> as per the MoEFCC Notification dated 7.12.2015, the Petitioner initially sought approval of ACE towards installation of CMS/SNCR. Norms were revised to 450 mg/Nm<sup>3</sup> vide Notification dated 19.10.2020. Accordingly, the Petitioner is now proposing only CMS.

(j) The BoD of the Petitioner, in its 444<sup>th</sup> meeting held on 22.3.2017, gave their approval for planning and tendering of ECS to comply with the MoEFCC Notification. IFB for installation of WFGD system at the instant station was issued by the Petitioner on 19.8.2019 on DCB format. BHEL emerged as the successful bidder. Accordingly, NoA was issued to BHEL on 30.3.2020 for WFGD installation at the instant station. BHEL has started the process for installation of FGD system and the Engineering works is in progress.

(k) The work for implementing CMS for NO<sub>x</sub> reduction has been awarded to BHEL through competitive bidding for Lot-I stations.

(l) The break-up of the capital cost claimed for FGD system implementation, vide affidavit dated 9.4.2021, is as follows:

CEA indicative hard cost (₹ lakh per MW)	Hard cost claimed (₹ lakh per MW)	Total IDC & FC claimed (₹ lakh)	Total IEDC claimed (₹ lakh)	Total FERV claimed (₹ lakh)	Total taxes & duties claimed (₹ lakh)	Total other costs claimed (₹ lakh)	Total costs claimed (₹ lakh)
40.50	52.76	7544.00	2802.00	***	14246.00	362.00	104099.00

\*\*\* Extra rupee liability due to FERV if any shall be claimed based on actuals

68. The claims made by the Petitioner in Petition No. 522/MP/2020 in respect of KSTPSS-I are as follows:

(a) WFGD system is being implemented for control of SO<sub>2</sub> emission in KSTPSS-I (4x210 MW). The Petitioner is not implementing any scheme for NO<sub>x</sub>



reduction in the instant station. The Petitioner has also proposed augmentation of ESP for reduction of particulate matter.

(b) The following capital cost and operating parameters for computing the indicative supplementary tariff has been considered:

Sl. No.	Description	FGD*	ESP Augmentation*
1	Capital Cost	₹519.166 crore	₹247.24 crore
2	Normative Specific Limestone/ Reagent Consumption (kg/kwh)	0.018 (Limestone)	Nil
3	Additional APC	1%	
4	Additional O&M		
5	Shutdown Period	45 days	
6	Increase in GSHR	Nil	

\* Additional water consumption for Wet FGD/ Increased Heat Rate for Nox systems/ Additional APC due to ESP augmentation to be submitted later

(c) The indicative supplementary tariff (without considering the impact on GSHR) due to installation of ECS in order to meet the revised ECNs is: Fixed Cost (FC): 45.55 paise/kWh; Variable Cost (VC): 3.02 paise/kWh (1st year) and Fixed Cost (FC): 42.38 paise/kWh (levelized). A further increase in Energy Charge Rate and per unit Fixed Charge (@85% scheduled generation) of the station by about 5 paisa/ kWh is anticipated due to increased APC and Station Heat Rate.

(d) KSTPSS-I was put into commercial operation on 1.8.1996 and, hence, the instant station has been in operation for 25 years. Therefore, the useful life of WFGD system for the purpose of tariff shall be governed by Regulation 33 of the 2019 Tariff Regulations. In the present case, WFGD system is anticipated to be operationalised in the year 2024.

(e) In its 444<sup>th</sup> meeting held on 22.3.2017, BoD of the Petitioner gave their approval for planning and tendering of ECS to comply with the MoEFCC Notification dated 7.12.2015. In the 482<sup>nd</sup> meeting held on 19.3.2020, BoD of the Petitioner approved the proposal to award the contracts for the WFGD package and also accorded the Investment Approval to undertake implementation of WFGD system at the instant station.



(f) IFB for installation of WFGD system was issued on 19.8.2019 on DCB format. BHEL emerged as the successful bidder. Accordingly, NoA was issued to BHEL on 30.3.2020 for WFGD system installation. BHEL has started the process for installation of FGD system and at present, the Engineering work is in progress.

(g) The indicative capital cost of FGD was projected as ₹519.17 crore and was based on estimated cost. However, the revised capital cost is envisaged as ₹582.96 crore based on award. Accordingly, the indicative tariff will vary on account of the revised capital cost.

(h) The break-up of the capital cost for FGD implementation, vide affidavit dated 9.4.2021, is as follows:

CEA indicative hard cost (₹ lakh per MW)	Hard cost claimed (₹ lakh per MW)	Total IDC & FC claimed (₹ lakh)	Total IEDC claimed (₹ lakh)	Total FERV claimed (₹ lakh)	Total taxes & duties claimed (₹ lakh)	Total other costs claimed (₹ lakh)	Total costs claimed (₹ lakh)
45.00	52.76	4428.30	1569.07	***	7977.84	-	58296.00

\*\*\* Extra rupee liability due to FERV shall be claimed based on actuals, if any.

69. We have considered the submissions made by the Petitioner. The Petitioner has sought approval for installation of ECS and the consequent ACE towards installation of ECS to meet the revised ECNs notified by MoEFCC. The Commission is considering the instant six petitions for “in-principle approval” under Regulation 11 of the 2019 Tariff Regulations.

70. On the basis of the claims made by the Petitioner, the three issues that arise for our consideration are: (a) approvals and the bidding process, (b) suitability of the ECS selected by the Petitioner and (c) the capital cost of the identified ECS, which are dealt in the following paragraphs.





Approvals and the bidding process

71. NBPDCCL and SBPDCL in Petition No. 183/MP/2020 and Petition No. 333/MP/2020 have submitted that the petition filed by the Petitioner is devoid of any details with respect to the competitive bidding conducted for selection of vendor for installation of ECS. The Petitioner should have consulted the beneficiaries before even conducting such bid process and, therefore, the Petitioner may be directed to furnish details of the bid so conducted along with details of all bid participants and the bids submitted by each eligible participant.

72. In response, the Petitioner has submitted that the bid opening/ closing date was 29.9.2017. Six bidders placed their bids for the purpose of installation of FGD system and BHEL emerged as successful bidder. IFB for installation of FGD system was issued by the Petitioner on 31.7.2017. The Petitioner has followed the policy as per its Delegation of Power (“DOP”) in the competitive bidding process for award of FGD package. The Petitioner has also issued a certificate dated 20.5.2021 wherein it has duly certified and declared that the bidding for all TPPs of the Petitioner has been held in a fair and a competitive manner.

73. GRIDCO in Petition No. 342/MP/2020 has submitted that as per NIT, the bidders should have furnished the past performance certificates of their FGD system along with their bids and the Petitioner should submit the same.

74. The gist of submissions of UPPCL in Petition No. 508/MP/2020 and Petition No.517/MP/2020 and RUVNL in Petition No. 522/MP/2020 are similar and are as follows:



(a) The Petitioner has not shared critical factors of NIT and its concluding aspects (such as competitive costs received by it, lowest rate, gestation time, additional auxiliary consumption, additional associated cost, requirement of additional manpower, useful life etc.) on the basis of which the decision for selection of the technology was based on.

(b) The Petitioner has not submitted any prior approval obtained by it either from BoD or any other competent authority for undertaking an investment on WFGD, CM and SNCR systems and augmentation of ESP. The Petitioner has sought approval of the investment proposal without any proof that the cost ascertained by it is optimum in nature and arrived at through any method widely recognized for determination of such cost. As such, the proposal is not in accordance with Section 61 of the 2003 Act and might be subject to strict scrutiny.

(c) The Petitioner is required to obtain investment approval from its BoD or any other competent authority conveying administrative sanction for the project including funding of the project and the timeline for the implementation. The Petitioner has not submitted the details of the tendering process, date of start of work and scheduled dated of commissioning of ECS, determination of balance life of the generating station and usefullife of ECS System for the purpose of depreciation and determination of tariff thereof.

75. In response to the contentions of UPPCL and RUVNL, the Petitioner has made the following submissions:

(a) All the technicalities pertaining to NIT with respect to FSTPSS-I&II, KSTPSS-II and KSTPSS-I were submitted vide additional affidavit filed on 9.4.2021.

(b) The tendering of KSTPSS-I was clubbed with KSTPSS-II so as to reap the benefit of economies of scale so that the WFGD system could be installed



at the lowest possible cost. As per the CEA advisory, WFGD is most versatile technology and suited for all unit sizes. Two different technologies at KSTPSS-I and KSTPSS-II would have increased the overall cost of FGD system installation. While selecting WFGD technology, the Petitioner has followed the evaluation criteria in terms of unit size, geographical location, age of units, availability of space, coal quality, etc. as per the CEA Advisory dated 7.2.2020. The principles decided by the Commission in order dated 20.7.2018 in Petition No. 98/MP/2017 as well as the guidelines notified by the CEA thereafter have been taken into account while deciding that the WFGD technology is suitable for its generating stations.

(c) The reliance on the principles of Section 61 of the 2003 Act support the Petitioner since the cost of the technology chosen by the Petitioner is reasonable and balances the interest of the consumers and the Petitioner. The estimates are prepared based on the works/ material to be consumed and existing market rates of the works/ material cost. Other factors such as location and layout of the system are also considered while preparing estimates.

(d) The implementation period for the installation of FGD system in KSTPSS-II is 27-30 months and the date of start of work was 30.3.2020. This generating station achieved commercial operation on 20.3.2010 and has been in operation for 11 years. Therefore, the useful life of FGD system for the purpose of tariff shall be governed by Regulation 33 of the 2019 Tariff Regulations. The balance extended life of this generating station is 25 years and FGD will be operationalized in the year 2024 in view of the MoP OM dated 20.1.2021.

(e) The installation of ECS in KSTPSS-I would take about 32 months (from award to commissioning) depending upon the shutdown period available for installing the same. The Petitioner's Board in its 482<sup>nd</sup> meeting held on 19.3.2020 has accorded Investment Approval for implementation of FGD system for KSTPSS-I.



76. The gist of contentions of BRPL in Petition No. 508/MP/2020, Petition No.517/MP/2020 and Petition No.522/MP/2020 and TPDDL's Written Submissions in Petition No.508/MP/2020 are similar and are as follows (those submissions which have been captured in the previous paragraph are not repeated):

(a) The Petitioner should have provided the certificate from a Competent Authority and not merely self-certified that the technology adopted is as per the recommendation of CEA. The submission of the Petitioner that the Regulation 3(40) of the 2019 tariff Regulation stipulates 'Competent Authority' for the specific purpose for Investment Approval and the said term has not been carried forward to Regulation 29 of the 2019 tariff Regulation is misplaced. The submission of the Petitioner that ECS Technology was selected on basis of the Petitioner's internal study and is also in compliance with CEA recommendations, is incorrect. The certification regarding the installation of ECS is not a commercial consideration to be taken by the Petitioner and, therefore, Regulation 3(40) of the 2019 tariff Regulation is not applicable.

(b) The Commission had specifically directed the Petitioner to provide the certificate from 'Competent Authority'. However, instead of complying with the directions, the Petitioner has first tried to self-certify the technology that it has adopted and thereafter merely said that there is no 'Competent Authority' in this regard.

(c) CEA is a statutory body constituted under Section 70 of the 2003 Act while under Section 73 of the 2003 Act, CEA is entrusted with the responsibility of specifying the technical and safety standards for construction of the power plants. CEA has issued guidelines as per the directions of the Commission in order dated 20.7.2018 in Petition No. 98/MP/2017 and the Petitioner claims to have adhered to them. Therefore, the Petitioner should obtain a certificate from



CEA regarding the selection of the ECS technology after conducting a proper audit of the ECS proposed to be installed.

(d) The Petitioner has failed to provide the recommendation of the Bid Evaluation Committee and has instead provided the minutes of the 483<sup>rd</sup> meeting dated 9.5.2020 and 19.3.2020 wherein its BOD accorded the investment approval for WFGD technology.

(e) The Petitioner has submitted that ICB was carried out in case of Lot-1A under Mega Power Project Policy as these projects have advantages of deemed export. BRPL has submitted that the Petitioner has failed to justify the cost benefit analysis of only conducting a domestic bidding and not international bidding. International bidding would have increased the competition and might have invited more bidders. The reliance placed by the Petitioner on order dated 1.11.2019 in Petition No. 152/MP/2019 titled MPL v. TPDDL wherein DCB was allowed for approval of FGD and order dated 28.4.2021 in Petition No. 335/MP/2020 wherein the Commission observed that the bidding process undertaken with the approval of NTPC's BoD as part of the procedure laid down under its DoP is misplaced as in the order dated 1.11.2019 in Petition No. 152/MP/2019, the Commission has not given any specific findings on whether the Petitioner should have conducted either the domestic bidding or international bidding. As regards the order dated 28.4.2021 in Petition No. 335/MP/2020, the facts of the said case are different from the present matters. In Petition No. 335/MP/2020, there was no evidence to show any deficiency in the bid/ award process as conducted by the Petitioner. However, in the present case, Respondents have categorically pointed out several errors and omissions on part of NTPC while carrying out the bidding process.

77. In response to the contentions of BRPL and TPCCL, the Petitioner has made the following submissions:



(a) Regulation 3(40) of the 2019 Tariff Regulations stipulates 'Competent Authority' for a specific purpose of Investment Approval. The said term has not been carried forward to Regulation 29 of the 2019 Tariff Regulation. The selection of technology was carried on the basis of internal study of the Petitioner and is also compliant with the CEA recommendations. Neither the MoEFCC Notification nor the Tariff Regulations establish a Competent Authority whose approval is a pre-requisite for filing a petition under Regulation 29 of the 2019 Tariff Regulations. No such 'Competent Authority' is there to provide certificate that the bidding has been carried out in a fair and transparent manner. The Petitioner is a company controlled by Government of India and is mandatorily complying with the norms laid down by CAG, and various other statutory authorities.

(b) The Petitioner in its affidavit dated 9.4.2021 has placed on record Minutes of the 483<sup>rd</sup> Meeting wherein its BoD had accorded the investment approval. Thereafter, the Petitioner awarded the contract for the FGD Package to the successful bidder following a transparent bidding process.

78. MPPMCL in Petition No. 517/MP/2020 has submitted that the Petitioner has not provided the detailed note on bidding as directed by the Commission and has also failed to conduct open competitive bidding to discover lower cost for KSTPSS-II. The Petitioner has only given "tentative estimate for capital cost" for approval and determination of indicative tariff. Regulation 29 of the 2019 Tariff Regulation does not provide for approval of capital cost and determination of indicative tariff on the basis of "tentative estimates".

79. In response, the Petitioner has submitted that the Petitioner has complied with the procedure laid down in the Regulation 29 of the 2019 Tariff Regulations. The



petition containing the details of ECS proposed to be implemented in the instant station and details have already been shared with all the Respondents including the MPPMCL. The details submitted include ACE to be incurred, technologies being adopted for SO<sub>2</sub> and NO<sub>x</sub> control, impact on normative parameters and indicative levelised tariff etc.

80. PSPCL in Petition No. 517/MP/2020 has submitted that details of the competitive bidding process conducted to arrive at the capital cost claimed has not been submitted by the Petitioner and as such, additional burden is being sought to be passed on to the consumers without proper justification for the same.

81. MSEDCL in Petition No. 517/MP/2020 has submitted that the Petitioner has not given the reasons for adopting ICB and any documents related to competitive bidding. Thus, there is no clarity regarding provisions for escalation in prices in the contract which may result in increase of contract value and in turn supplementary charges to be borne by beneficiaries. Furthermore, in case of procurement of imported equipment by the qualified bidder BHEL, the sole purpose of invitation of DCB gets defeated.

82. In response, the Petitioner has submitted that the details of the bidding have been submitted in detail vide affidavit dated 14.9.2020. The demand for FGD system and domestic suppliers was available in the domestic market at the time of bidding of FGD system for KSTPSS-II. In case of ICB for Barh-I, BRBCL, Dadri-I, Kudgi, Gadrwara, Lara, NPDCL, Tanda-II, NPGCL, Darlipalli etc., the response of domestic



suppliers was more than foreign bidders and the rates quoted by them were more competitive too. Accordingly, the contracts for FGD system installation in all these stations have been awarded to domestic bidders (being L1 bidder). The competitive prices discovered through DCB have not only given opportunity to the domestic suppliers to show their efficiency but also contributed to the 'Make in India' movement.

83. GRIDCO in Petition No. 517/MP/2020 in its Written Submissions has submitted that Petitioner has failed to justify the requirement, cost, technology, performance, suitability and useful life period etc. of ECS with full details and supporting documents. GRIDCO has also submitted that the price discovered through DCB cannot be construed as valid as the Petitioner has failed to comply with the directions of the Commission in order 23.4.2020 in Petition No. 446/MP/2019 (Sasan Power Limited vs. MPPMCL & Ors) and order dated 6.5.2020 in Petition No. 209/MP/2019 (Sembcorp Energy India Ltd. Vs. SPDCTL & Ors.) wherein the Commission has observed that the generating companies such as the Petitioner are required to discover the price through ICB.

84. TANGEDCO in Petition No. 522/MP/2020 has submitted that the Petitioner has not furnished any data about the performance of ECS after installation and the clauses included/ proposed to be included in the contracts for achieving the norms stipulated by MoEFCC. The Petitioner has failed to explain the methodology for measurement and checking the performance of the system and whether the installation has achieved the performance for which it was intended. The Petitioner





should furnish the details of tender awarded, if any, and the response received and the basis for ascertaining the reasonability of rates.

85. We have considered the submissions of the Petitioner and the Respondents. The Respondents have contended that the Petitioner has not submitted the details of the bidding process as directed by the Commission and has not produced the certificate from the “competent authority” regarding suitability and effectiveness of ECS adopted by the Petitioner as directed by the Commission and has assumed itself to be the “competent authority”. The Respondents have contended that the “competent authority” is CEA. The Petitioner has submitted that subject generating stations/ units meet the revised ECNs in case of water consumption, particulate matter and Mercury. Accordingly, the Petitioner’s BoD considered the revised ECNs notified by MoEFCC pertaining to SO<sub>2</sub> and NO<sub>x</sub> in its 444<sup>th</sup> meeting held on 22.3.2017 and approved the “Proposal for interim Environmental Action Plan for meeting the New Emission Norms (notified by MOEF&CC on 7/12/2015)” and gave approval for planning and tendering of ECS to comply with the MoEFCC Notification. Thereafter, the Petitioner went through the various stages of selection of technology on the basis of removal efficiency of pollutants, capital and operating costs, location of plant, reliability, availability of suppliers, supply chain and disposal, etc. The Petitioner went through the pre-award activities like detailed engineering, NIT approval and publication of IFB, etc. The bids were called under DCB. Based on the price bids, L1 bidder was considered for award of contract. IFBs for installation of WFGD system in the subject generating stations/ units covered in the instant six



petitions were issued during 31.7.2017 and 19.8.2019. BoD of the Petitioner approved the award of FGD package and granted Investment Approval in their 463<sup>rd</sup>, 482<sup>nd</sup> and 483<sup>rd</sup> held on 8.9.2018, 19.3.2020 and 9.5.2020 respectively. Accordingly, the Petitioner issued NoA for installation of SO<sub>2</sub> to L1 bidders on 18.9.2018, 30.3.2020 and 27.5.2020. The said details are as follows:

Petition Number	Generating station/unit Capacity (MW)	BoD Meeting Number and date of approval of proposal for FGD	Date of issue of IFB	BoD Meeting Number and date of approval of award of FGD	BoD Meeting Number and date of Investment Approval for FGD	Date of issue of NoA
183/MP/2020	BSTPSS-II (2X660)	444 <sup>th</sup> 22.03.2017	31.07.2017	463 <sup>rd</sup> 08.09.2018	463 <sup>rd</sup> 08.09.2018	18.09.2018
333/MP/2020	TSTPSS-I (2X500)	444 <sup>th</sup> 22.03.2017	27.08.2019	482 <sup>nd</sup> 19.03.2020	482 <sup>nd</sup> 19.03.2020	30.03.2020
342/MP/2020	FSTPSS-III (1x500)	444 <sup>th</sup> 22.03.2017	19.08.2019	483 <sup>rd</sup> 09.05.2020	483 <sup>rd</sup> 09.05.2020	27.05.2020
508/MP/2020	FSTPSS-I & II (3X200+ 2X500)	444 <sup>th</sup> 22.03.2017	19.08.2019	483 <sup>rd</sup> 09.05.2020	483 <sup>rd</sup> 09.05.2020	27.05.2020
517/MP/2020	KSTPSS-II (3X500)	444 <sup>th</sup> 22.03.2017	19.08.2019	482 <sup>nd</sup> 19.03.2020	482 <sup>nd</sup> 19.03.2020	30.03.2020
522/MP/2020	KTPSS-I (4X210)	444 <sup>th</sup> 22.03.2017	19.08.2019	482 <sup>nd</sup> 19.03.2020	482 <sup>nd</sup> 19.03.2020	30.03.2020

86. It is observed that the Petitioner has submitted the information sought by the Commission. We have perused the extracts of the various minutes of meetings of the Petitioner's Board submitted by the Petitioner. It is observed that the whole process from identification of the suitable technology to issue of NoA to the L1 bidders was with the approval of the Petitioner's BoD. The Petitioner has also certified that bidding and award has been carried out in a fair and transparent manner as per DoP of the Petitioner and it is in line with the Government of India guidelines. NoA has been issued by the Petitioner in case of all the generating stations and work is under progress. A similar process of bidding and award of contracts was adopted by the



Petitioner for installation of Combustion Modification for reduction of NO<sub>x</sub> emission levels. We are satisfied with the process from identification of suitable technology to issue of NoA that was with the approval of the Petitioner's BoD and as per the procedure laid down under its DoP and that the bidding was carried out in a fair and transparent manner.

87. As regards contention of the Respondents that the Petitioner has not submitted the certificate from the "competent authority", we note that the Petitioner has submitted the Minutes of the Meetings of its BoD approving the installation of ECS in its generating stations and has also stated on affidavit that ECS proposed by the Petitioner would comply with the norms prescribed in the MoEFCC Notification. There being no competent authority specifically defined in the 2019 Tariff Regulations or the MoEFCC Notification, approval of the Petitioner's BoD and affidavit submitted by the Petitioner is sufficient.

88. The Respondents have further contended that the Petitioner should have adopted ICB which would have attracted more bidders and competitive prices, instead of DCB. The Petitioner has submitted that it adopted ICB for installation of FGD in respect of Lot-1A stations implemented under Mega Power Project Policy of Government of India. The Petitioner has submitted that the Lot-1A were qualified for deemed export benefits. The Petitioner during the hearing on 13.8.2021 has submitted that the successful bidders in ICB in case of all the projects under Lot-1A were domestic bidders and most of these domestic bidders also had technology transfer arrangement with established international vendors. The Petitioner has



submitted that for stations not covered under the Mega Power Project Policy, DCB was adopted as Customs Duty could be avoided and the overall cost of FGD system installation could be lowered. The Petitioner has further submitted that the price received through DCB route is lower than the price received through ICB in some cases and, therefore, DCB was adopted for other projects in subsequent lots. It is observed that the Petitioner initially adopted ICB and subsequently adopted DCB. The successful bidders in case of ICB were domestic vendors and most of them had international tie-ups. Further, the prices received and discovered through DCB were competitive and, hence, the Petitioner has adopted DCB. As the price discovered through DCB is competitive, we do not find any infirmity in Petitioner adopting DCB instead of ICB based on its initial experience.

#### Suitability and effectiveness of ECS

##### (a) Reduction in SO<sub>2</sub> emissions

89. The Petitioner has submitted that on the basis of the directions of the Commission in order dated 20.7.2018 in Petition No. 98/MP/2017, CEA vide letter dated 21.2.2019 on 'Operation Norms for Thermal Generating Stations for the Tariff Period 2019-2024' has recommended the following four technologies to comply with revised SO<sub>2</sub> emission norms.

- (a) WFGD;
- (b) Lime Spray Drier/ Semi-dry Semi FGD;
- (c) Dry Sorbent Injection based FGD; and
- (d) Furnace Injection in CFBC Boilers.



90. The Petitioner has submitted that WFGD system is better than the other three FGD systems for the following reasons:

(a) In case of Dry Sorbent Injection/ Dry type FGD, SO<sub>2</sub> removal efficiency is low (typically 30%-50%) which can be increased to 70%, but with very high consumption of reagent. This leads to high operational expenses.

(b) There are very few providers of Ammonia based FGD technology when compared to WFGD technology leading to less competition. Also, storage and handling of aqueous ammonia is potentially risky/ hazardous when compared to handling of limestone. Further, Ammonia Based FGD Technologies are preferable for units below 500 MW. However, Ammonia based FGD technologies have approximately 10% less CAPEX and APC when compared to WFGD systems and by-product of Ammonia based FGD technologies, i.e. Ammonium Sulphate is easily saleable.

(c) Sea Water FGD system is suitable only for coastal power stations as sea water is required for de-sulphurisation process. The generating stations covered in the instant six petitions are not located near the coast and, hence, this technology was not considered.

(d) Dry Sorbent Injection (DSI)/Dry type FGD technologies based on dry sorbent injection is preferable for unit size of 60-250 MW since the reagent cost in this technology is relatively higher than WFGD system or Ammonia based FGD system. It is more suitable for units running on low PLF and units with balance operating life of 7-9 years.

91. The Petitioner has proposed WFGD systems to comply with the revised SO<sub>2</sub> emission norms in case of all the subject generating stations covered in the instant six petitions. The Petitioner has submitted that WFGD technologies based on limestone slurry as reagent is most versatile and suitable for any unit size and, thus,



has a large footprint. The Petitioner has submitted that the WFGD technology has been selected over other technologies because of its successful implementation, high SO<sub>2</sub> removal efficiency, marketability of the by-product gypsum, it being best suited for high PLF stations and availability of large number of vendors.

92. The Petitioner has further submitted that CEA on 7.2.2020 issued 'Advice on FGD Technology selection for different unit size'. As per the Advisory, TPPs should select the appropriate FGD technology based on parameters like SO<sub>2</sub> removal efficiency, units' size, balance plant life and the geographical location of TPPs. The Petitioner has submitted that the said Advisory has been issued post the award of contract for installation of FGD by the Petitioner. However, the technology proposed by the Petitioner is in compliance with the recommendations issued by the CEA vide letter dated 21.2.2019.

93. NBPDC, SBPDC, GRIDCO, UPPCL, RUVNL, TANGEDCO, BRPL, BYPL, TPDDL, MSEDCL, MPPMCL, PSPCL and BSPHCL have raised the issue of suitability, both on technical and cost aspects, of WFGD technology selected by the Petitioner.

94. In Petition No. 183/MP/2020, NBPDC and SBPDC have submitted that the Petitioner should establish that the steps taken by the Petitioner for implementation of FGD are in consonance with the CEA recommendations dated 20.2.2019. The Petitioner should provide a comparative analysis of all the technologies recommended by CEA so that the relevance of each technology qua components



such as cost, implementation period, performance parameters, feasibility, operating parameters, balance life of the plant, etc. could be ascertained and an informed choice can be made. Similarly, for complying with the emission standards pertaining to NO<sub>x</sub> control, a detailed analysis of technologies recommended by CEA should also be provided by the Petitioner in support of its proposal to implement SNCR system to control the emission of NO<sub>x</sub> after combustion of fuel inside the furnace.

95. Similar contention has been raised by the UPPCL and RUVNL in Petition No. 508/MP/2020 and 522/MP/2020 regarding the selection of suitable technology considering various factors like Sulphur content in coal, balance plant life, availability of reagent and space requirement as per the CEA norms.

96. TANGEDCO in Petition No. 508/MP/2020 and Petition No. 522/MP/2020 has submitted that the Petitioner is required to furnish all details as per the directions of the CEA such as the Sulphur content of the coal, availability of reagent (if any), disposal and handling of by-product and space requirement etc. TANGEDCO has further submitted that the Petitioner has failed to explain the methodology of measurement and checking the performance of the system and whether the installation has achieved the performance for which it was intended.

97. BRPL in Petition No. 508/MP/2020, Petition No. 517/MP/2020 and Petition No. 522/MP/2020 has made the following submissions:

- (a) The Petitioner has failed to place on record the "Life Cycle Cost benefit analysis". Instead of providing the cost benefit analysis for FGD system, the Petitioner has provided one sided and arbitrary figures to show that incremental



increase in tariff is least in the case of WFGD technology and that WFGD technology is most suited. Life cost benefit analysis will enable to ascertain whether incurring such huge expenditure is reasonable and justifiable for a plant, which is at the fag-end of its life and completing 25 years.

(b) The Petitioner has not provided the cost breakdown between the main FGD package, electrical power supply package, waste-water treatment, fire protection and detection, spares, engineering, project management and contingency reserve etc. There is no prudent basis to verify the reasonableness of the cost estimates provided by the Petitioner and as such no approval can be granted.

(c) The Petitioner has chosen to install WFGD system across all its stations and units (except for Dadri-I), without considering that different units have different requirements. Units less than 500 MW are only required to meet SO<sub>2</sub> norm of 600 mg/Nm<sup>3</sup>. Further, CEA has prescribed different technologies for stations with less balance useful life and low PLF. Accordingly, high CAPEX intensive technologies for such stations are not suited and other technologies should be considered.

98. TPDDL in Petition No. 508/MP/2020 and Petition No.522/MP/2020 has also made similar submissions as in case of BRPL as regards conducting “*life cycle cost-benefit analysis*” while choosing from the available FGD technologies and as regards adherence to recommendations of No such analysis was conducted at the time of filing the petition and it was only done on the directions of the Commission. CEA.

99. BSPHCL in its Written Submissions in Petition No. 508/MP/2020 has submitted that the Petitioner has not furnished the details of the coal quality, APC of the FGD System etc. as required under Advisory of CEA.





100. MPPMCL in Petition No. 517/MP/2020 has submitted that the Petitioner has not conducted the cost benefit analysis, as mandated in Regulation 29(3) of the 2019 Tariff Regulations, in respect of the proposed ACE before undertaking the project. MPPMCL has further submitted that the Petitioner has failed to consider CEA recommendations dated 7.2.2020 before selecting of WFGD technology. No justification has been provided for selection of WFGD technology.

101. PSPCL in Petition No. 517/MP/2020 has submitted that the Petitioner has based its entire petition on the indicative parameters given by CEA in its guidelines and the guidelines themselves provide that the same are only indicative in nature. As such, in order to enable the Commission to allow prudently incurred cost to the Petitioner, it is imperative to have a project specific report/ approval from CEA with regard to the use of the specific technology and the cost involved therein. The Petitioner has failed to place on record the “Life Cycle Cost benefit analysis” and has proceeded to award the contract for its implementation at a cost which is beyond the CEA prescribed norms and for which no details have been provided.

102. MSEDCL in Petition No. 517/MP/2020 has also submitted that the Petitioner has not submitted the cost benefit analysis for KSTPSS-II.

103. GRIDCO in Petition No. 342/MP/2020 and Petition No. 342/MP/2020 has submitted that the Petitioner has not furnished the ‘Life Cycle Cost Benefit analysis’, as mandated by CEA in its Advisory dated 7.2.2020. GRIDCO has submitted that the



Petitioner is required to consider the factors like coal quality, APC before finalization of FGD Technology in terms of CEA Advisory dated 7.2.2020.

104. The clarification given by the Petitioner, in response, are as follows:

(a) While selecting FGD technology for De-SO<sub>x</sub> in a particular station/ unit, the Petitioner has followed the evaluation criteria in terms of unit size, geographical location, age of units, availability of space, coal quality, etc. as per the CEA Advisory dated 7.2.2020. There is only one technology i.e. WFGD for units of 500 MW and above in the CEA advisory dated 7.2.2020. BSTPSS-II comprises of 2x660 MW units and its remaining useful life is about 21 years and, therefore, WFGD technology is the best for control of SO<sub>2</sub> emissions. The WFGD system for individual station has been adopted/ selected on various criteria, along with the due prudence in view of comparative cost benefit analysis conducted by the Petitioner of such technologies.

(b) The Petitioner has also conducted cost benefit analysis as directed by the Commission during the hearing on 29.4.2021 and the details of the same has been provided in the respective petitions.

(c) Conducting life cycle cost benefit analysis is not a pre-requisite for filing a petition under Regulation 29(2) of the 2019 Tariff Regulations. The MoEFCC Notification is a “change in law” and the Petitioner has to comply with the same or else consequences would ensue.

(d) FSTPSS-I&II (3x200 MW+2x500 MW) was declared under commercial operation on 1.7.1996. Therefore, to comply with the MoEFCC Notification dated 7.12.2015, SO<sub>2</sub> emission has to be limited to below 600 mg/Nm<sup>3</sup> level for 200 MW units and 200 mg/Nm<sup>3</sup> level for 500 MW units. CEA has recommended FGD System for SO<sub>2</sub> removal efficiency to be in the range 90-95%. Accordingly, WFGD system has been selected for SO<sub>2</sub> removal for 1600 MW capacity of FSTPSS-I&II in line with the CEA advisory dated 7.2.2020. In case



of FSTPSS-I&II, NoA was already issued on 27.5.2020 to MHSPi. The balance/ extended life of the FSTPSS-I&II is 10 years.

(e) The commissioning schedule of FGD of all units has been revised to December 2024 as per the MoP OM dated 20.1.2021. The installation of FGD system in all the units would take about 27-30 months. The Commission in order dated 22.6.2020 in Petition No. 168/MP/2019 has observed that the installation and commissioning of ECS has to be synchronized with overhauling of units. Accordingly, the installation of WFGD would be done during the overhauls as discussed and agreed by the stakeholders in the OCC/ RPC forums on best effort basis and keeping in view the deadline specified by CPCB/ MoEFCC.

(f) The remaining useful life of KSTPSS-II is about 14 years as on 1.4.2020. The Petitioner has preferred installation of WFGD technology at KSTPSS-II, which is in line with the CEA Advisory dated 7.2.2020. The prices have been discovered through transparent competitive bidding process and the actual expenditure duly certified by the Auditors, shall be submitted at the time of filing the petition for determination of supplementary tariff in terms of Regulation 9(4) of the 2019 Tariff Regulations.

105. We have considered the contentions of the Respondents and the clarifications given by the Petitioner. The Respondents have submitted that the Petitioner has not submitted whether the factors recommended by CEA were considered while selecting the De-SO<sub>x</sub> technology, the life cycle cost benefit analysis of the technology adopted, comparative study of the various technologies and whether the technology adopted would meet the norms fixed by MoEFCC, and whether a system has been put in place to check the effectiveness of the technology adopted.



106. As regards the Respondents contention that the Petitioner has not submitted whether the technology adopted is in conformity with the CEA recommendations, the Petitioner has submitted that it has considered the unit size, geographical location, age of units, availability of space, coal quality, Sulphur content in coal, balance plant life, availability of reagent and space requirement and accordingly selected the WFGD technology which is in conformity with CEA recommendations dated 21.2.2019 and Advisory dated 7.2.2020.

107. The Respondents have contended that the Petitioner has not submitted the life cycle cost benefit analysis and generating station/ unit specific comparative study of the various technologies. In response, the petitioner has submitted that it is not a pre-requisite for filing a petition under Regulation 29(2) of the 2019 Tariff Regulations and the MoEFCC Notification is a “change in law” and the Petitioner has to comply with the same. The Petitioner has submitted that it has conducted the cost benefit analysis of the suitable technologies and it was found that WFGD is the most suitable and cost-effective technology. As regards the Respondents contention that the Petitioner has not submitted the generating station/ unit specific comparative study of the various technologies, it is observed that the Petitioner in its Written Submissions has submitted that comparative study of the various ECS technologies like DSIFGD, WFGD, AFGD and SWFGD for reduction of SO<sub>2</sub> emission levels was conducted for each generating station/ unit considering the parameters like capital cost, debt equity ratio, specific reagent consumption (gm/kWh), additional APC, estimated cost of reagent, rate of interest and balance useful life. The Petitioner has submitted that as



per the analysis, WFGD is the most cost-effective technology for SO<sub>2</sub> removal and it is in line with the CEA recommendations and has submitted the following details in support of its contention:

Petition No. 183/MP/2020- BSTPSS-II

(₹ in crore)

Particulars	DSIFGD	WFGD	AFGD
Annual Supplementary Capacity Charges (A)	31.36	109.43	100.50
Annual Supplementary Energy Charges (B)	241.35	31.75	124.92
Annual Supplementary Charges (A+B)	272.71	141.17	225.43

Petition No. 333/MP/2020- TSTPSS-I

(₹ in crore)

Particulars	DSIFGD	WFGD	AFGD
Annual Supplementary Capacity Charges (A)	29.73	110.67	101.11
Annual Supplementary Energy Charges (B)	171.01	22.81	85.82
Annual Supplementary Charges (A+B)	200.74	133.48	186.93

Petition No. 342/MP/2020- FSTPSS-III

(₹ in crore)

Particulars	DSIFGD	WFGD	AFGD
Annual Supplementary Capacity Charges (A)	11.88	39.84	36.60
Annual Supplementary Energy Charges (B)	78.96	11.12	40.76
Annual Supplementary Charges (A+B)	90.84	50.96	77.36

Petition No. 508/MP/2020- FSTPSS-I&II

(₹ in crore)

Particulars	DSIFGD	WFGD	AFGD
Annual Supplementary Capacity Charges (A)	17.78	89.21	81.17
Annual Supplementary Energy Charges (B)	110.40	16.40	58.30
Annual Supplementary Charges (A+B)	128.19	105.61	139.47

Petition No. 517/MP/2020- KSTPSS-II

(₹ in crore)

Particulars	DSIFGD	WFGD	AFGD
Annual Supplementary Capacity Charges (A)	35.63	165.88	151.53
Annual Supplementary Energy Charges (B)	286.87	37.36	145.01
Annual Supplementary Charges (A+B)	322.51	203.24	296.55



Petition No. 522/MP/2020- KSTPSS-I

(₹ in crore)

Particulars	DSIFGD	WFGD	AFGD
Annual Supplementary Capacity Charges (A)	25.01	110.19	100.43
Annual Supplementary Energy Charges (B)	159.44	21.24	81.09
Annual Supplementary Charges (A+B)	184.45	131.43	181.52

108. As regards TANGECO's contention regarding the methodology of measurement and checking the performance of ECS, it is observed that CPCB vide its letter dated 5.2.2014 issued directions to SPCBs under Section 18(1)b of the Air (Prevention and Control of Pollution) Act, 1981 asking TPPs to install online effluent quality and emission monitoring systems. Accordingly, Continuous Emission Monitoring Systems (CEMS) are in place as per detailed guidelines issued by CPCB in August 2018. As a system has already been put in place by CPCB to continuously monitor the emission levels, we are of the view that there is no need to give any further directions in this regard.

109. The Petitioner has proposed installation of WFGD system in all its six generating stations to keep SO<sub>2</sub> emission levels within the norms prescribed in MoEFCC. WFGD system is being installed and the same has also been recommended by CEA. The Petitioner has selected the WFGD technology taking into consideration of its advantages over other technologies, as it is successfully implemented around the world, easy availability, suitable for high PLF stations and capable of high SO<sub>2</sub> removal. Taking into consideration the justification given by the Petitioner, we approve the Petitioner's proposal for implementation of WFGD



technology for control of SO<sub>2</sub> emissions in the generating stations covered in the instant six petitions.

(b) Reduction in NO<sub>x</sub> emissions

110. The Petitioner had initially considered CM as the primary measure and SNCR and SCR as the secondary measure to control NO<sub>x</sub> emission. Later, with the revision of emission norms for NO<sub>x</sub> for TPPs installed during the period from 1.1.2004 to 31.12.2016 from 300 mg/Nm<sup>3</sup> to 450 mg/Nm<sup>3</sup> by MoEFCC vide Notification G.S.R. 662(E) dated 19.10.2020, the Petitioner has proposed installation of only CM as primary system of De-NO<sub>x</sub> to bring the level of NO<sub>x</sub> emission below 450 mg/Nm<sup>3</sup> in FSTPSS-III and KSTPSS-II i.e. in two out of the six generating stations covered in this order. Secondary De-NO<sub>x</sub> system of SNCR/SCR proposed initially is not being implemented in any of the generating stations. The Petitioner has claimed ₹8.93 crore and ₹26.77 crore towards installation of CM in FSTPSS-III and KSTPSS-II respectively. However, the Petitioner has not submitted whether the said amount is just the hard cost of CM System or it includes other costs as well. Moreover, the Petitioner has not submitted the present emission levels of NO<sub>x</sub> in FSTPSS-III and KSTPSS-II which are required to assess necessity for installation of CM System in two generating units. Therefore, we are not inclined to grant “in-principle” approval for installation and cost of CM in FSTPSS-III and KSTPSS-II at this stage. However, the Petitioner may install CM system for control of NO<sub>x</sub> in the said generating stations if the existing emission levels of NO<sub>x</sub> are more than the norms prescribed by MoEFCC and claim the same after installation in the petition to be filed under



Regulation 29(4) of the 2019 Tariff Regulations. Accordingly, the submissions made by the Petitioner and the Respondents on this aspect are not dealt in this order.

111. The Petitioner has also proposed augmentation of ESP (electro-static precipitator) in KSTPSS-I besides WFGD system to comply with the new norms. The Environment Clearance for KSTPSS-I was accorded with particulate emission limit of 150 mg/Nm<sup>3</sup> by the State Pollution Control Board. Accordingly, ESP was installed to meet the said norms which were supplied by BHEL with rigid discharge framework type design to meet the particulate emission limit of 150 mg/Nm<sup>3</sup>. As per the MoEFCC Notification, particulate matter emission norm for units installed before 31.12.2003 is 100 mg/Nm<sup>3</sup>. In order to comply with the revised norm, the Petitioner has submitted that augmentation of ESP is a must for the instant station as the present particulate emission is higher than revised norm of 100 mg/Nm<sup>3</sup>. Therefore, augmentation of ESPs of all units of KSPTSS-I is being carried out by the Petitioner to reduce the emission level to the desired level with worst coal firing and all the fields in service. ESPs consist of four passes with each pass having six fields in series along with fixed type collecting electrodes, emitting electrodes, rapping mechanism with controllers, ESP hoppers etc. No R&M as regards ESP has been carried out in past other than the proposed augmentation of ESP in view of the new environment norms. The Proposed augmentation of ESPs would largely cover the following:

- (a) Augmentation of the pollution control capability of the existing ESPs mainly by way of providing additional collection surface to the tune of about 34500 m<sup>2</sup> at 400 mm spacing.





(b) Provision of moving electrode in combination with existing rigid framework by utilizing some of existing fields and/or new fields for moving electrodes is also kept.

(c) Modification/ restoration of existing internals such as collecting & emitting electrodes, rapping mechanism etc. to work in tandem with above changes so that the overall collection efficiency of ESP increases.

(d) The present average SPM level from Unit-I to IV is around 130 to 148 mg/Nm<sup>3</sup> against the existing maximum allowable limit of 100 mg/ Nm<sup>3</sup>.

(e) The ash utilization of the instant station is about 76% for the year 2019-20. In addition, augmentation of ESP would not affect the ash generation level of the station as the same is dependent on the generation level (scheduling by the beneficiaries) and the coal quality.

112. TANGEDCO in Petition No. 522/MP/2020 has submitted that the Petitioner is augmenting ESP to meet the revised SPM norm of 100 mg/Nm<sup>3</sup> and has claimed capital cost of ₹247.74 crore towards augmentation of ESP for providing additional collection surface to the tune of about 34500 m<sup>2</sup> at 400 mm spacing. SPM would vary from plant to plant on the basis of coal used for generation. Accordingly, the Petitioner should submit the existing ESP technology and details of R&M, if any, carried out, present SPM level and the ash collections/ disposals for the past 5 years so as to evaluate the existing ESP system and need for augmentation. BRPL has submitted that KSTPSS-I is nearing 25 years of operation and the Petitioner has unilaterally taken the decision of investing an additional amount of ₹247 crore for ESP without providing an RLA study to ensure that there is no further cost in the form of R&M that may have to be incurred to further operate the KSTPSS-I. UPPCL has



submitted that the Petitioner has claimed augmentation of ESP without explaining how the amount of ₹247.24 crore has been arrived at and whether any competitive bids were invited.

113. In response, the Petitioner has submitted that the capitalization cost in KSTPSS-I for ESP Augmentation system is based on the awarded values, which have been discovered through transparent competitive bidding process.

114. We have considered the submissions of the Petitioner and the Respondents. The Petitioner has claimed an amount of ₹247.24 crore towards augmentation of ESP in KSTPSS-I to bring down the particulate matter emissions to MoEFCC prescribed limit of 100 mg/Nm<sup>3</sup>. Installation of FGD system also reduces SPM levels. We note that the Petitioner has not provided details in this regard as to the impact of FGD system installation on SPM and the need for augmenting the existing ESPs. Therefore, presently, we are not inclined to allow this expenditure.

(c) Capital cost of identified ECS

115. The capital cost claimed by the Petitioner towards installation of WFGD, CM and ESP for reduction in SO<sub>2</sub>, NO<sub>x</sub> and particulate emissions respectively in the subject generating stations are as follows:

									(₹ in lakh)
Petition Number & Generating station/unit Capacity MW)	CEA indicative hard cost	Hard cost claimed	Total IDC claimed	Total IEDC claimed	Total FERV claimed	Total taxes and duties claimed	Total other costs claimed	Total costs claimed	Total capital cost of CM/ESP (₹ in crore)
183/MP/2020 BSTPSS-II (2X660)	37.00 (660 MW)	39.93	3924.00	1865.00	***	9487.00	**	67986.00	



333/MP/2020 TSTPSS-I (2X500)	40.50 (500 MW)	44.54	3634.00	1577.00	**	80.17	**	57768.00	
342/MP/2020 FSTPSS-III (1x500)	40.50 (500 MW)	53.11	2428.00	940.00	-	4780.00	-	34706.00	8.93
508/MP/2020 FSTPSS-I & II (3X200 + 2X500)	45.00 (200 MW) 40.50 (500 MW)	53.11	7769.14	3008.76	***	15297.52		111062.1 0	
517/MP/2020 KSTPSS-II (3X500)	40.50	52.76	7544.00	2802.00	***	14246.00	362.00	104099.0 0	26.77
522/MP/2020 KSTPSS-I (4X210)	45.00	52.76	4428.30	1569.07	***	7977.84		582.96	247.24*

\* Augmentation of ESP.

116. The Petitioner has submitted that due to efflux of time, the per MW hard cost of WFGD system claimed by the Petitioner is higher than the CEA recommended per MW hard cost. Per contra, the Respondents have contended that the hard cost claimed by the Petitioner being higher, it should be restricted to the CEA recommended hard cost.

117. In Petition No. 183/MP/2020 and Petition No. 333/MP/2020, NBPDC and SBPDCL have submitted that the Petitioner has failed to mention the cost breakdown between the main FGD package, electrical power supply package, waste-water treatment, fire protection and detection, spares, engineering, project management and contingency reserve etc.

118. TANGEDCO in Petition No. 333/MP/2020 has submitted that the Petitioner has not submitted the detailed reasons for claiming higher hard cost than the CEA recommended cost. CEA in its guidelines has stated that the indicative cost for units of 500 MW is ₹40.50 lakh and it is arrived based on open competitive bidding already



awarded. The Petitioner has not submitted the bifurcation of the claimed total estimated capital cost, the details of chimney layout such as usage existing chimney as wet stack, chimney above absorber etc. as directed by CEA.

119. GRIDCO in Petition No. 342/MP/2020 has submitted that since cost of ECS has to be borne by the beneficiaries and ultimately the consumers, it is incumbent upon the Petitioner to justify the cost of ECS with full details and supporting documents. GRIDCO has submitted that the total hard cost claimed by the Petitioner for installation of FGD system is ₹53.11 lakh per MW which is more than the CEA indicative cost of ₹40.5 lakh/MW. GRIDCO in Petition No. 517/MP/2020 has submitted that the Petitioner may justify the variation in the hard cost of FGD of ₹52.76 lakh/MW claimed by Petitioner and the CEA indicative cost of ₹40.50 lakh/MW.

120. BSPHCL in Petition No. 342/MP/2020 has submitted that the contract for FGD System has been awarded for FSTPSS-I, II and III whereas the petition for approval of ACE on ECS is for FSTPSS-III. The Respondent has further submitted that the lowest price does not depend only on the number of units and it is quoted taking into account the existing condition of the units i.e. SO<sub>2</sub> emission levels and other factors, terms and conditions of the tender, etc. BSPHCL has submitted that both FSTPSS-I and II are nearing end of their useful life of 25 years. The efficiency and emission level of these retiring plants cannot be compared with FSTPSS-III which was commissioned in 2012 and still has a useful life of 16 years. FSTPSS-III which has higher efficiency and lower emission levels as compared to FSTPSS-I&II may have



to bear the additional cost to compensate the lower efficiency and higher emission levels of FSTPSS-I&II units.

121. BRPL in Petition No. 508/MP/2020, Petition No. 517/MP/2020 and Petition No. 522/MP/2020 has submitted that the Petitioner has failed to provide the reasons for deviation from CEA recommended cost and has merely made a general submission that the cost of CEA is indicative. The Petitioner ought to have provided the details and reasons for escalation of the cost. The reliance placed by the Petitioner on the acknowledgement by the Commission in its various orders that the costs may change is not sufficient. By placing reliance on the order dated 23.4.2020 in Petition No. 446/MP/2019, BRPL has submitted that the Commission may consider approving the cost of FGD system provisionally at the existing CEA rate subject to adjustment after the revision of the CEA cost estimates.

122. Other submissions made by BRPL are as follows:

(a) The Petitioner has provided the cost breakup. However, the basis of arriving of the same is not clear. The Petitioner has conveniently omitted to share reasons for the increase in estimated cost or the uncontrollable factors that caused the increase in actual procurement cost.

(b) FSTPSS-I&II is nearing 25 years of operation and the Petitioner has unilaterally taken the decision of investing an additional amount of Rs 1110.62 crore without providing an RLA study to ensure that there is no further cost in the form of R&M that would have to be incurred to further operate the plant.

(c) The Petitioner is investing ₹1110.62 crore for installation of ECS system in the station which would require grant of SA of ₹9.5 lakhs/MW for



undertaking bare minimum R&M and O&M activities for operating the generating station. This would mean that the 1600 MW plant if operated for the next 10 years would require ₹1520 crore under the head of SA. However, the Petitioner has not taken consent of the beneficiaries as required under Regulation 33(10)(c) of the 2019 Tariff Regulations.

(d) The tariff of FSTPSS-I&II is already on the higher side and power is available in the open market at lower tariff. BRPL does not wish to schedule power from FSTPSS-I&II after it has completed its useful life. In this regard, it has already issued letters dated 28.5.2021 and 18.5.2021 to the Delhi Electricity Regulatory Commission and reserves their right to initiate appropriate steps in accordance with law including exercising its statutory rights under Regulation 17 of the 2019 Tariff Regulations as well as guidelines dated 24.3.2021 issued by the MoP which enables beneficiary to seek exit from plants which have completed 25 years from COD.

(e) The cost estimates as per the CEA were issued in February 2019. The NIT for FSTPSS-I&II and KSTPSS-II was issued by the Petitioner on 19.8.2019, i.e., merely after six months of the CEA estimates. Accordingly, the Petitioner cannot claim that due to passage of time and on account of inflation, the cost estimates have changed.

(f) The Commission in its order dated 23.4.2020 passed in Petition No. 446/MP/2019 had allowed an additional capex cost of ₹0.42 crores per MW for the FGD system subject to true-up, while holding that the remaining cost shall be allowed as per actuals. The Commission may follow the approach as adopted in order dated 23.4.2020 in Petition No. 446/MP/2019 and may allow the total cost for the FGD installation at the hard cost recommended by the CEA.



(g) The Petitioner has stated that FSTPSS-I&II is comparatively older and the present switchgear/ transformers have no spare capacity to accommodate additional electrical supply. However, the Petitioner has failed to share the details of the existing load on the switchgears and the erection schemes of FGD. It shows that FSTPSS-I&II of the Petitioner is older and requires R&M activities and, therefore, there is no justification to incur such high cost on such generating station.

(h) The Commission may appoint a retired Member of CEA or the Commission to give its report with regard to installation of ECS and actual cost incurred by Petitioner towards the ECS.

(i) The hard cost of KSTPSS-II is ₹52.76 lakh/MW against CEA recommended hard cost of ₹40.5 lakh/MW. The Petitioner has stated that due to layout constrains certain equipment/systems pertaining to FGD is being installed at a distance from the units which consequently, resulted in increase in ducts and piping length. Further, to accommodate additional electrical supply for the equipment such as blowers, high rating equipment such as booster fan, etc., additional electrical system (transformers/ switchgear/ power cables) is being installed. The reasons provided under the “uncontrollable factors” which led to an increase in the cost are vague and lacks details. The Petitioner ought to have provided the complete details of the electrical supply units and electrical system that has led to an increase in the total cost.

(j) CEA’s Indicative hard cost is ₹45.50 lakh/MW for KSTPSS-I. The Petitioner has claimed ₹52.67 lakh per MW. Even though the cost breakup has been provided, the basis of arriving at ₹582.96 crore is not clear.

(k) KSTPSS-I is nearing 25 years of operation and the Petitioner has unilaterally taken the decision of investing an additional amount of ₹582.96 crore and additional ₹247 crore for ESP without providing an RLA study to



ensure that there is no further cost in the form of R&M that may have to be incurred to further operate KSTPSS-I.

(l) The Petitioner is investing ₹582.96 crore for installation of ECS in KSTPSS-I which would require grant of SA of ₹9.5 lakh/MW for undertaking bare minimum R&M and O&M activities for operating the plant. This would mean that the 840 MW plant if operated for the next 10 years would require about ₹798 crore under the head of SA. However, the Petitioner has not taken consent of the beneficiaries as required under Regulation 33(10)(c) of the 2019 Tariff Regulations.

123. As regards NO<sub>x</sub> Reduction, BRPL has submitted that the Petitioner has claimed that FSTPSS-I&II and KSTPSS-I are meeting NO<sub>x</sub> emission levels prescribed by MoEFCC and has not proposed any NO<sub>x</sub> control system. BRPL has submitted that if at a later stage the Petitioner seeks to claim approval for investment of meeting the NO<sub>x</sub> levels prescribed by MoEFCC Notification, such a claim should be rejected.

124. UPPCL in Petition No. 508/MP/2020, Petition No. 517/MP/2020 and Petition No. 522/MP/2020 has submitted that the Petitioner has not provided the basis on which the cost has been ascertained. CEA is in the process of reviewing the cost, so the Commission may consider approving the cost of FGD system provisionally at existing CEA rate subject to adjustment after CEA conveys the revised cost estimates. UPPCL has further submitted that in deciding the capital cost of FGD system, the Commission may also consider the delay caused by the Petitioner in





invitation of tenders as this delay has resulted in escalation in prices. The gist of generating station/ unit specific submissions are as follows:

(a) UPPCL in Petition No. 508/MP/2020 has submitted that Petitioner has not shown the basis on which the cost of the technology has been ascertained by it. The Petitioner had prepared specification and proceeded to invite NIT but it is not clear if the capital cost of ₹1124.53 crore on WFGD system is based on any competitive bids invited by the Petitioner or there had been some other basis.

(b) There has to be established guidelines to ascertain the manner of discovery of cost of different employable technologies. This may either be done by inviting competitive bids for the generating stations or by fixation of the normative cost of each such technology by the Commission on the basis of national and international data. The Commission has adopted such approach in case of renewal sources of energy in the Central Electricity Regulatory Commission (Terms and Conditions of Tariff determination from Renewable Energy Sources) Regulations, 2012. These Regulations have fixed normative capital cost of various renewal energy source based generating stations.

(c) The Petitioner has put up proposal for approval without any proof that the cost ascertained by it is optimum and that it has been arrived at through any method widely recognized for determination of such cost.

(d) Section 61 of the 2003 Act provides that investment and expenditure made by the generating company should be optimum and arise from good performance, economical use of resources and the tariff determined based on optimum investment/ expenditure. Such optimum investment/ expenditure should reflect cost of supply of electricity and ensure safeguarding of the interest of the consumers.



(e) The revised ECNs do not impact generation of electricity. Therefore, the cost and expenditure involved in implementation and operation of the selected technology is essentially not a cost incidental to generation of electricity.

(f) In Petition No. 522/MP/2020, it is submitted that as per Section 61 of the 2003 Act, generation and supply of electricity are conducted on commercial principles and the cost of the electricity is to be recovered in a reasonable manner. The Petitioner has put up investment proposal approval without any proof that the cost ascertained by it is optimum in nature. Therefore, it should be subject to strict scrutiny and cost regulated.

125. MPPMCL in Petition No. 517/MP/2020 has submitted that the Petitioner has claimed the cost of ₹1041 crore for implementation of WFGD system in KSTPSS-II. As per CEA Advisory dated 20.2.2019, the base cost of FGD system is ₹40.50 lakh/MW for unit size of 500 MW and with the increase in number of units, CAPEX will reduce because of common facilities. Accordingly, the estimated capital cost of implementation of ECS in KSTPSS-II would be less than ₹600 crore. However, the cost estimate indicated by the Petitioner is about ₹441 crore (74%) more than CEA indicative cost. MPPMCL has further submitted that the claim of ₹1041 crore is much higher than what is being claimed for other generating stations. Further, in case of similarly placed VSTPS-IV, the Petitioner has claimed only ₹519 crore. The Petitioner has not provided details about the date when the contract for implementation of FGD at KSTPSS-II was awarded but has claimed that implementation would take about 27-30 months from the date of award. The Petitioner has neither given any reference to cost estimates given by CEA for size of KSTPSS-II nor any independent



justification for such cost. The same will have huge inflationary impact on the generation tariff and, therefore, it may not be allowed being without any proper justification. MPPMCL has further submitted that the ACE towards installation of ECS should be met from National Clean Energy Fund and PSDF.

126. PSPCL in Petition No. 517/MP/2020 has submitted the CEA's indicative cost for a unit of 500 MW would be around ₹40.50 lakh/MW. As such, for KSTPSS-III having a capacity of 1500 MW, the estimated capital cost would be ₹607.50 crore. The guidelines provide that the said cost is likely to be reduced with increasing units and may even come down further due to increased number of vendors/ suppliers. The Petitioner has sought approval of capital cost to the tune of ₹1040.99 crore for FGD system which appears to be very high and the Petitioner is liable to justify the same together with the details regarding vendors/ suppliers and the reasons for deviation from the CEA guidelines. In order to enable the Commission to allow prudently incurred cost to the Petitioner, it is imperative for the Petitioner to have a project specific report/ approval from CEA with regard to the use of the specific technology and the cost involved therein. No details are submitted by the Petitioner to demonstrate that the same is optimum in nature and has been arrived at by adopting the prevalent industry practices. PSPCL has further submitted that as per the Petitioner's submissions, SNCR for NO<sub>x</sub> control may not be required due to directions of Hon'ble Supreme Court on revision of NO<sub>x</sub> norms. Therefore, no costs for the same may be allowed to the Petitioner before a revised notification is released by MoEFCC in this regard.



127. RUVNL in Petition No. 517/MP/2020 has made submissions similar to submissions made by UPPCL.

128. TPDDL in its Written Submissions in Petition No. 508/MP/2020 has submitted that the hard cost estimates provided by the Petitioner for units of FSTPSS-I&II is much higher than the indicative cost recommended by the CEA and no explanation has been provided for the same. There are 5 units in FSTPSS-I&II. However, the Petitioner has failed to provide any adequate explanation for the cost difference between CEA's indicative hard cost and hard cost claimed by the Petitioner. The Petitioner has merely stated that CEA had provided an indicative cost and the estimated cost has increased due to efflux of time and other 'uncontrollable factors'. The issue of difference in the hard cost sought by the Petitioner and the CEA indicative cost has been considered by the Commission in its order dated 28.4.2021 in Petition No. 335/MP/2020 & Ors. The facts in the instant case are different from facts in Petition No. 335/MP/2020 & Ors where the deviation was only marginal. However, in the instant case, the deviation is substantial particularly for the two 500 MW units. Accordingly, different approach needs to be adopted by the Commission as followed in order dated 20.7.2019 in Petition No. 446/MP/2019. The costs towards project management and engineering cost are controllable and as such should be restricted to CEA's recommended indicative cost. The costs other than base cost such as IDC, IEDC, taxes etc. are consequential and verifiable costs based on relevant records and their admissibility may be dealt accordingly at the time of tariff fixation on the basis of actuals allowed after prudence check. ACE, if approved,



should not be disbursed as a one-time payment but should be released in tranches, depending upon the progress of the installation and commissioning of FGD system as the same would help in avoiding tariff shock for the end consumers.

129. TPDDL in Petition No. 522/MP/2020 has submitted that the Petitioner has failed to explain the deviation from CEA's indicative cost. Any cost and/or deviation in the cost ought to be allowed only after prudence check. The Petitioner has not stated whether the cost claimed is only the base cost of the project or the total capital expenditure inclusive of GST, IEDC, EPC cost inclusive of taxes, opportunity cost and IDC. The Petitioner has not provided the cost breakdown between the main FGD package, electrical power supply package, waste-water treatment, fire protection and detection, spares, engineering, project management and contingency reserve etc. As the Petitioner has not mentioned the above details, there is no prudent basis for the Commission to verify the reasonableness of the cost estimates provided by the Petitioner and as such no approval can be granted. The capex estimate provided by the Petitioner for its 4 units is higher than usual and no explanation has been provided for the same.

130. The clarifications given by the Petitioner in response to the concerns raised by the Respondents regarding the capital cost of WFGD system are consolidated to avoid duplication and they are as follows:

- (a) The break-up of capital cost of ₹679.86 crore claimed by the Petitioner for BSTPSS-II are given in the petition. The hard cost of BSTPSS-II is ₹39.93 lakh/MW against CEA indicative hard cost of ₹37 lakh/MW for 660 MW and ₹45 lakh/MW for 200 MW. Hence, the actual cost is lower than the indicative CEA



Cost. The discovery of price in the instant case has been done through a transparent process of competitive bidding and the same would be subject to prudence check by the Commission at the time of tariff fixation. If the Commission feels that certain costs which have been incurred by the Petitioner are not reasonable, the same may be disallowed after considering the submissions made by the parties. The cost provided by CEA was only indicative in nature and does not represent the actual cost of installation of ECS and the Commission has itself acknowledged the same in recent orders. Bids for installation of FGD system have been floated by other generating stations as well and these may have led to increase in prices of FGD system in the international and domestic market. Further, the actual expenditure, duly certified by the Auditors, shall be submitted before the Commission at the time of filing of the Petition for determination of supplementary tariff in terms of Regulations 29(4) of the 2019 Tariff Regulations.

(b) Units of TSTPSS-I, FSTPSS-III and FSTPSS-I&II are comparatively older and the present switchgear/ transformers have no spare capacity to accommodate additional electrical supply to equipment such as blowers, gypsum handling system, and high rating equipment such as booster fan, limestone mills, etc. This has led to installation of additional switchgear/ electrical works which has led to a slight increase in the overall cost of the FGD system.

(c) Capital cost of ₹1124.53 crore claimed in case of FSTPSS-I&II and FSTPSS-III is the estimated cost prior to award of the contract. The contract for installation of FGD system has been awarded to MHPSI through competitive bidding. FSTPSS-I&II consists of 3 units of 200 MW and 2 units of 500 MW and FSTPSS-III having one unit of 500 MW. NIT for implementation of FGD system for all the three stages was clubbed together in one package to reap the benefits of economies of scale in order to lower the overall cost of FGD system and domestic bids were invited to get better competitive price.



(d) Based on the prices quoted by the bidders, implementation of FGD system for all the three stages of FSTPSS-I, II & III was awarded to MHPSIL for ₹ 1110 crore. There is provision for escalation in prices in the awarded contract. The awarded cost is apportioned in MW ratio. Accordingly, awarded value for FSTPSS-I&II works out to ₹845.71 crore (excluding IDC, IEDC etc.) on pro-rata basis. The actual expenditure towards the same for the FSTPSS-I&II would be submitted as per the provisions of Regulation 9(3) of the 2019 Tariff Regulations.

(e) The reliance on the principles of Section 61 of the 2003 Act support the Petitioner in FSTPSS-I, II & III since the cost of the technology chosen by the Petitioner is reasonable. The estimates are prepared based on the works/ material to be consumed and existing market rates of the works/ material cost. Other factors such as location and layout of the system are also considered while preparing estimates.

(f) This is not the stage to fix the normative cost of various technologies available for emission control. The Commission has already held that the MoEFCC Notification amounts to “change in law” and generators are entitled to additional capital cost as well as the O&M cost. The Commission has already approved capital cost so as to enable the funding of the same in case of Sasan Power Limited, Coastal Gujarat Power Limited and Adani Power Limited. There is no reason to fix normative cost of technologies and the better approach would be to approve the capital cost specifically sought in the instant petition subject to prudence check at the time of truing up.

(g) The contract for installation of FGD system in KSTPSS-II and KSTPSS-I has been awarded to BHEL through competitive bidding. NIT for implementation of FGD system for both stages was clubbed together in one package to reap the benefits of economies of scale in order to lower the overall



cost of FGD system and domestic bids were invited to get better competitive price. Three Bids were received from the bidders. Based on the prices quoted by the bidders, implementation of FGD system for both the stages was awarded to L1 bidder (BHEL) for ₹1234.24 crore. There is provision for escalation in prices in the awarded contract. The awarded cost is apportioned in the MW ratio. Accordingly, awarded value for KSTPSS-II works out to ₹791 crore on pro-rata basis.

(h) CM is being installed in KSTPSS-II for reduction of NO<sub>x</sub> emissions and it will bring down the NO<sub>x</sub> emission level to approximately 450 mg/Nm<sup>3</sup>. Therefore, installation of SNCR may not be required for NO<sub>x</sub> control. The cost of CM is based on the award value arrived after competitive bidding process.

(i) The cost of installing WFGD system for KSTPSS-II is on higher side when compared with CEA indicative cost. The equipment at KSTPSS-II is placed a little farther away from the units due to space constraint thereby leading to increase in the overall length of ducting, piping cables (both power and control) etc. It is further submitted that cost of equipment, size of equipment does not have linear relationship and equipment are required for more number of units.

(j) As regards MPPMCL's contention, the cost indicated in the instant petition is including the taxes, IDC and other components. The base cost of FGD system is ₹0.53 crore/MW against CEA estimates of ₹0.40 crore/MW for 500 MW units. The CEA indicative cost is based on FGD packages awarded in year 2018. However, the FGD package for KSTPSS-II has been awarded on 30.3.2020, after about 2 years. The cost also depends upon the layout of FGD system, space constraints and geographical location of the station.

(k) The capital cost break-up in case of KSTPSS-I has been submitted vide additional affidavit dated 9.4.2021. The indicative capital cost of FGD





system was projected in the petition as ₹519.17 crore and it was based on estimated cost. However, the revised capital cost i.e. ₹582.96 crore is based on the contract award to the successful bidder.

(l) The implementation of FGD system in KSTPSS-I was awarded to BHEL. There is provision for escalation in prices in the awarded contract. The actual expenditure towards the same for the instant station would be submitted as per the provisions of Regulation 9(3) of the 2019 Tariff Regulations.

(m) It is proposed to augment ESP in KSTPSS-I and the capitalization cost considered in the petition for ESP Augmentation system is based on the awarded values, which have been discovered through transparent competitive bidding process. Therefore, the prices discovered are reasonable.

(n) The cost of WFGD system for KSTPSS-I is around 17% higher than the CEA indicative cost. The cost estimation by CEA is approximately three years old and the cost of FGD installation has increased due to various reasons such as efflux of time and other factors like market dynamics etc.

(o) The gas flow rate of 2x210 MW units is almost equivalent to a 500 MW unit. In such case even the common facilities like limestone milling and handling system, gypsum handling system etc. having same capacity as 500 MW unit may be used. However, connecting the same to two units requires more ducting, piping, cabling etc. and the cost of equipment and size of equipment does not have linear relationship.

(p) The Petitioner has carried out tendering process of FGD for the complete fleet of its station in various phases/ lots based on the vintage of units/ stations, technology, timelines prescribed etc. The bidding process for WFGD was carried out by clubbing the WFGD installation of similar units/ stations to discover the minimum possible cost. The prices have been discovered through transparent competitive bidding process. Therefore, the



prices discovered, which are based on the unit size, location, layout, timeline of bidding/ award etc., are reasonable.

(q) The CEA *vide* its letter dated 24.2.2021 has itself acknowledged that the earlier cost estimation is approximately three years old and the cost of FGD installation has increased due to hike in demand, shortage of indigenous manufacturers, import restrictions etc. CEA has also sought latest tendering cost for different size and technology from TPPs in India.

(r) The requirement to conduct the RLA/ R&M Study was never directed by the Commission, CEA or MoEFCC.

(s) The installation of ECS is a mandatory requirement as per the MoEFCC Notification. The revised ECNs cannot be drawn into any cost assessment as it affects the life and health of citizens in the country. Similar observation was made by Hon'ble Supreme Court in order dated 25.7.2018 in Writ Petition No. 13029 of 1985.

(t) The Petitioner is mandated to comply with the norms specified by the statutory authorities/ government instrumentality from time to time. The installation of FGD system and other equipment is for complying with the revised ECNs notified by MoEFCC. The costs and expenses incurred by NTPC for ECS are necessary for the purpose of generation and sale of electricity. The Commission has already enacted Regulation 29 in the 2019 Tariff Regulations providing the framework for recovery of costs incurred for installation of ECS to comply with the revised ECNs. As MoEFCC Notification amounts to a "change in law", the costs associated therewith ought to be recognized and passed on in tariff.

(u) The 2019 Tariff Regulations as amended also envisage determination of supplementary tariff towards ACE incurred towards installation of ECS. As per Section 61 of the 2003 Act, cost of generation and supply of electricity



should be such that while it recovers all expenses of the generator, it also remains reasonable to the consumer. Accordingly, the technology has been chosen based on optimum utilization of resources.

(v) In principle approval of ACE is claimed in terms of Regulation 29 of the 2019 Tariff Regulations for the approval of the Commission based on the indicative tariff impact for installation of the ECS system. After the system is commissioned and put to use, the petition for determination of supplementary tariff as per Regulation 29(4) of the 2019 Tariff Regulations and in accordance with the operating norms notified for ECS vide 2020 Amendment Regulations.

131. We have considered the contentions of NBPDC, SBPDCL, GRIDCO, UPPCL, RUVNL, TANGEDCO, TPDDL, BSPHCL, MPPMCL, PSPCL, BRPL, BYPL and MSEDCL and the clarifications of the Petitioner on the issue of capital cost of ECS. The Respondents have contended that the hard cost of WFGD system claimed by the Petitioner is higher than the CEA recommended cost and no satisfactory reason for the deviation has been submitted other than stating that it is due to efflux of time. The Petitioner has submitted that due to efflux of time the per MW hard cost of WFGD system claimed by the Petitioner is higher than the CEA recommended per MW hard cost (vide letter dated 21.2.2019). The Petitioner has submitted that the cost provided by CEA was only indicative and that cost of WFGD system in case of subject generating stations is discovered through open competitive bidding. The Petitioner has submitted that the Commission in order dated 11.11.2019 in Petition No.152/MP/2019, order dated 23.4.2020 in Petition No. 446/MP/2019 and order dated 6.5.2020 in Petition No.209/MP/2019 has already recognised that the cost provided by CEA was indicative in nature and the cost of FGD has increased due to



various factors. The Petitioner has further submitted that CEA in its letter dated 24.2.2021 has acknowledged that the earlier cost estimation given in its letter dated 21.2.2019 is approximately three years old and the cost of FGD installation has increased due to increase in demand for FGD equipment, shortage of indigenous manufacturing capacity, import restrictions, etc. and it requires to be revised. The Petitioner has further submitted that the actual capitalisation may vary after the implementation of WFGD system.

132. The instant order covers six petitions and pertains to Barh Super Thermal Power Station, Talcher Super Thermal Power Station, Farakka Super Thermal Power Station and Kahalgaon Super Thermal Power Station and includes four types of units, i.e. 660 MW, 500 MW, 210 MW and 200 MW. CEA has recommended indicative hard cost of FGD system of ₹37.00 lakh/MW for 660 MW units, ₹40.50 lakh/MW for 500 MW units and ₹45.00 lakh/MW for 210 MW and 200 MW units, which are based on the capital cost discovered through open competitive bidding for the projects already awarded. The hard cost of WFGD system claimed by the Petitioner is higher than the CEA recommended hard cost. The Commission in order dated 23.4.2020 in Petition No. 446/MP/2019 (SPL Vs. MPPMCL) and order dated 6.5.2020 in Petition No.209/MP/2019 in case of Sembcorp Energy India Limited has already observed that the cost recommended by CEA is indicative in nature and it is not possible to indicate the exact cost that can be discovered through a competitive bidding process. It is observed that the Petitioner has carried out competitive tendering process for installation of WFGD System and CM System for all its



generating stations in phases based on the vintage of units/ stations, technology, timelines, etc. to discover the minimum possible cost. The cost of the project depends on the scope of work in implementation of scheme like inter-connection facility, electrical works, etc. Moreover, the cost of the common facilities in case of generating units having multiple units is shared among the units leading to reduction in cost, whereas the cost in case of generating stations with single unit is generally more than the generating stations having multiple units. The hard cost discovered through competitive bidding process has also been approved by BoD of the Petitioner.

133. It is further observed that CEA has itself stated that the costs mentioned in its letter dated 21.2.2019 is based upon cost of installation of FGD system as discovered through open competitive bidding for the projects already awarded prior to 21.2.2019. Thus, the same is two to three years old. Further, CEA in its letter dated 24.2.2021 has already recognised the need for revising the hard cost recommended by it in its earlier letter dated 21.2.2019.

134. Taking into consideration that the per MW hard cost suggested for FGD system by CEA is indicative in nature; that the cost claimed by the Petitioner is discovered through a competitive bidding process; that the cost recommended by CEA is more than two-three years old; and that CEA has already recognised the need for revising the cost recommended by it earlier, we grant in-principle approval of the following hard cost claimed by the Petitioner towards installation of WFGD system:



Petition Number	Generating station/unit Capacity (MW)	Hard Cost Approved (₹ lakh/MW)
183/MP/2020	BSTPSS-II (2X600)	39.93
333/MP/2020	TSTPSS-I (2X500)	44.54
342/MP/2020	FSTPSS-III (1x500)	53.11
508/MP/2020	FSTPSS-I & II (3x 200+2 x500)	53.11
517/MP/2020	KSTPSS-II (3x500)	52.76
522/MP/2020	KSTPSS-I (4x210)	52.76

135. The Petitioner has claimed estimated capital cost of ₹8.93 crore and ₹26.77 crore towards installation of CM Systems for reduction of NO<sub>x</sub> emission in FSTPSS-III and KSTPSS-II respectively. The Petitioner has not submitted the hard cost of Combustion Modification System recovered through DCB. It is further not clear whether the capital costs claimed in case of FSTPSS-III and KSTPSS-II includes other costs besides the hard cost. Therefore, we are not inclined to approve the capital cost claimed by the Petitioner towards installation of Combustion Modification System at this stage. However, we accord “in-principle” approval for installation of Combustion Modification System for emission control of NO<sub>x</sub> in FSTPSS-III and KSTPSS-II. The Petitioner is directed to submit all details including the hard cost of the Combustion Modification System, the other related costs and the existing levels of NO<sub>x</sub> emission for the last three years as submitted to respective Pollution Control Boards before putting the CM into operation, in the petition under Regulation 29(4) of these regulations for determination of tariff.

136. As regards the contention of MPPMCL that the Petitioner should explore getting funds from NECF and PSDF, we are of the view that this issue is beyond the scope of the instant petitions which are for accord of “in-principle” approval for implementation of ECS.



137. Besides the hard cost towards installation of WFGD and De-NO<sub>x</sub> systems, the Petitioner has also claimed IDC, IEDC, FERV, taxes and duties and other costs. As the instant petitions are for “in-principle” approval under Regulation 11 of the 2019 Tariff Regulations of ACE towards installation of ECS to comply with the MoEFCC Notification, the Petitioner’s claim of IDC, IEDC, FERV, taxes and duties and other costs is not considered in this order and these claims would be considered on case to case basis on petitions to be filed by the Petitioner for determination of tariff after implementation of ECS as provided under Regulation 29(4) of the 2019 Tariff Regulations.

#### **Liberty to approach the Commission**

138. The Petitioner has submitted that the MoEFCC Notification mandates reduction in water consumption, mercury and particulate matter, besides SO<sub>2</sub> and NO<sub>x</sub>. The Petitioner has submitted that as the generating stations of the Petitioner meet the norms in respect of water consumption, mercury and particulate matter prescribed by MoEFCC, no claim has been made in respect of them. However, the Petitioner has sought liberty to approach the Commission as and when the work(s) pertaining to the same are undertaken in future.

139. We have considered the Petitioner’s submissions. SBPDCL, NBPDC, BSPHCL, UPPCL, MPPMCL and TPDDL have raised their concerns on the Petitioner’s prayer for liberty to approach the Commission when the work pertaining to reduction in water consumption and particulate matter and Mercury emissions are



taken up in future. Without going into the concerns raised by the Respondents, we would like to state that if any application or petition is filed by the Petitioner in this regard in future, it would be dealt as per the applicable laws and regulations.

140. The Petitioner has further prayed for additional APC, additional water consumption, additional O&M Expenses, cost of reagents, Gross Station Heat Rate (GSHR) and allow deemed availability on account of shutdown for installation of ECS under Regulation 76, i.e. Power to Relax of the 2019 Tariff Regulations. SBPDCL, NBPDC, BSPHCL, TPDDL, TANGEDCO, RUVNL, UPPCL, BRPL, MPPMCL, MSEDCL and PSPCL have raised their concerns on the said prayers of the Petitioner. As the instant petition is for “in-principle” approval of ACE towards installation of ECS, we do not deem fit to go into these prayers at this stage and we would consider them in petitions to be filed by the Petitioner under Regulation 29(4) of the 2019 Tariff Regulations after installation of ECS. However, we would like to point out that after filing of the instant petitions by the Petitioner and during the present proceedings, the Commission has introduced a separate tariff stream for ECS by amending the 2019 Tariff Regulations vide the 2020 Amendment Regulations. Accordingly, the Petitioner’s prayer for additional APC, additional water consumption and additional O&M Expenses will be considered as per Regulation 49(E)(f), Regulation 35(1)(6) and Regulation 35(1)(7) of the amended 2019 Tariff Regulations respectively. The Petitioner’s prayer for allowing cost of reagents, GSHR and deemed availability on account of shutdown will be dealt on a case to case basis on a petition filed by the Petitioner under Regulation 29(4) of the 2019 Tariff





Regulations. Accordingly, as stated above, we are not going into submissions made by the Petitioner and the Respondents in this regard.

141. The Respondents have raised the issue of depreciation, useful life and extension of life of the generating stations/ units and the Petitioner has also submitted its clarifications. We are not going into the submissions made by the parties in this order as the instant petitions are for “in-principle” approval of ACE towards installation of ECS. The issues raised by the Respondents will be dealt in the petition to be filed by the Petitioner after installation of ECS under Regulation 29(4) of the 2019 Tariff Regulations for determination of supplementary tariff.

### **Summary**

142. In view of the foregoing discussions, it is observed that

(a) The process from the stage of identification of FGD package to NoA was with the approval of the Petitioner’s BoD and as per the procedure laid down under its DoP and the bidding has been carried out in a fair and transparent manner.

(b) The Petitioner has identified and proposed WFGD systems for reduction in the SO<sub>2</sub> emissions taking into consideration the effectiveness, availability and cost, size of the plants, operational expenses and availability of the reagents.

(c) The costs claimed by the Petitioner towards installation of WFGD Systems have been discovered through a competitive bidding process and the hard costs claimed by the Petitioner for WFGD is higher than the indicative cost recommended by CEA because of the reasons enumerated above in the order.



(d) For approval of installation of CM system in FSTPSS-III and KSTPSS-II for reduction in NO<sub>x</sub> emissions, the Petitioner is required to submit the present emission levels of NO<sub>x</sub> in the said generating stations/units.

143. Therefore, we accord “in-principle approval” of ACE under Regulation 11 of the 2019 Tariff Regulations towards installation of WFGD systems for control of SO<sub>2</sub> emissions (hard cost for WFGD system). The details of the hard cost of WFGD system approved for the subject generating stations are as follows:

<b>Petition Number</b>	<b>Generating station/unit Capacity (MW)</b>	<b>Hard cost of FGD (₹ in lakh/MW)</b>
183/MP/2020	BSTPSS-II (2X660)	39.93
333/MP/2020	TSTPSS-I (2x500)	44.54
342/MP/2020	FSTPSS-III (1x500)	53.11
508/MP/2020	FSTPSS-I &II (3x200+2x500)	53.11
517/MP/2020	KSTPSS-II (3x500)	52.76
522/MP/2020	KSTPSS-I (4X210)	52.76

144. “In-principle” approval for installation of CM system in FSTPSS-III and KSTPSS-II for reduction in NO<sub>x</sub> emissions shall be considered on submission of present emission levels of NO<sub>x</sub> in the said generating stations/ units.

145. We have also not considered the Petitioner’s claim of total capital cost towards installation of FGD, which apart from hard cost includes IDC, IEDC, FERV, taxes and duties and other costs. These claims excluding hard cost would be considered on case to case basis on petitions to be filed by the Petitioner for determination of tariff after implementation of ECS as provided under Regulation 29(4) of the 2019 Tariff Regulations. Accordingly, the Petitioner is directed to file separate petitions for determination of tariff after implementation of the revised ECS as provided in Regulation 29(4) of the 2019 Tariff Regulations.



146. The instant order disposes of Petition No. 183/MP/2020, Petition No. 333/MP/2020, Petition No. 342/MP/2020, Petition No. 508/MP/2020, Petition No. 517/MP/2020 and Petition No. 522/MP/2020 in terms of above discussion and findings.

sd/-  
**(P. K. Singh)**  
Member

sd/-  
**(Arun Goyal)**  
Member

sd/-  
**(I. S. Jha)**  
Member

sd/-  
**(P. K. Pujari)**  
Chairperson

