CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI

Petition No. 467/MP/2019
Petition No. 64/MP/2020
Petition No. 520/MP/2020
Petition No. 612/MP/2020
Petition No. 613/MP/2020
and
Petition No. 730/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: 30.09.2021

Petition No. 467/MP/2019

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 Simhadri Super Thermal Power Station Stage-II (2x500 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. AP Eastern Power Distribution Company Limited (APEPDCL),
Corporate Office,
P&T Colony, Seethammadhara,
Visakhapatnam-530 013 (AP).

2. AP Southern Power Distribution Company Limited (APSPDCL),
Corporate Office
Back Side Srinivasa Kalyana Mandapam, Tiruchhanur Road,
Kesavayana Gunta, Tirupathi-517 503 (AP).

3. Telangana State Northern Power Distribution Company Limited (TSNPDCL),
H. No. 2-5-31/2, Vidyut Bhavan,
Nakkalagutta, Hanamkonda
Warangal-506 001 (AP).

4. Telangana State Southern Power Distribution Company Limited (TSPDCL),
Mint Compound,
Corporate Office,
Hyderabad-500 063 (AP).

5. Tamil Nadu Generation & Distribution Corporation Limited (TANGEDCO),
(Formerly TNEB),
144, Anna Salai,
Chennai-600 002.

6. Bangalore Electricity Supply Company Limited (BESCOM),
Krishna Rajendra Circle,
Bangalore-560 009.

7. Mangalore Electricity Supply Company Limited (MESCOM),
MESCOM bhavana,
Corporate Office,
Bejai, Kavoor Cross Road,
Mangaluru-575004, Karnataka.

8. Chamundeshwari Electricity Supply Corp. Limited (CESC),
Corporate Office, No. 29,
Vijayanagar, 2nd stage, Hinkal,
Mysore-570 017.

9. Gulbarga Electricity Supply Company Limited (GESCOM),
Main road, Gulbarga, Karnataka,
Gulbarga-585 102.

10. Hubli Electricity Supply Company Limited (HESCOM),
Corporate office, P. B. Road, Navanagar,
Hubli-580 025.

11. Kerala State Electricity Board Limited (KSEBL),
Vaidyuthi Bhavanam, Pattom,
Thiruvananthapuram-695 004.

12. Electricity department,
Government of Puducherry,
137, Netaji Subhash Chandra Bose Salai,
Puducherry-605001. **…..Respondents**

Petition No. 64/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 Simhadri Super Thermal Power Station Stage-I (2X500 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. AP Eastern Power Distribution Company Limited (APEPDCL),
   Corporate Office,
   P&T Colony, Seethammadhara,
   Visakhapatnam-530 013 (AP).

2. AP Southern Power Distribution Company Limited (APSPDCL),
   Corporate Office,
   Back Side Srinivasa Kalyana Mandapam, Tiruchhanur Road,
   Kesavayana Gunta,
   Tirupathi-517 503 (AP).

3. Telangana State Northern Power Distribution Company Limited (TSNPDCL),
   H. No. 2-5-31/2, Vidyut Bhavan,
   Nakkalagutta, Hanamkonda
   Warangal-506 001 (AP).

4. Telangana State Southern Power Distribution Company Limited (TSPDCL),
   Mint Compound
   Corporate Office
   Hyderabad-500 063 (AP). **…..Respondents**

Petition No. 520/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 Talcher Super Thermal Power Station Stage-II (4x500

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. AP Eastern Power Distribution Company Limited (APEPDCL),
Corporate Office,
P&T Colony, Seethammadhara,
Visakhapatnam-530013 (AP).

2. AP Southern Power Distribution Company Limited (APSPDCL),
Corporate Office,
Back Side Srinivasa Kalyana Mandapam
Tiruchhanur Road, Kesavayana Gunta,
Tirupathi-517503 (AP).

3. Telangana State Northern Power Distribution Company Limited (TSNPDCL),
H. No. 2-5-31/2, Vidyut Bhavan,
Nakkalagutta, Hanamkonda,
Warangal-506001 (AP).

4. Telangana State Southern Power Distribution Company Limited (TSPDCL),
Mint Compound,
Corporate Office,
Hyderabad (AP)-500063.

5. Tamil Nadu Generation & Distribution Corporation Limited (TANGEDCO),
144, Anna Salai,
Chennai-600002.

6. Bangalore Electricity Supply Company Limited (BESCOM),
Krishna Rajendra Circle,
Bangalore-560009.

7. Mangalore Electricity Supply Company Limited (MESCOM),
MESCOM Bhavana,
Corporate Office,
Bejai, Kavoor Cross Road,
Mangaluru-575004 Karnataka.

7. Chamundeshwari Electricity Supply Corp. Limited (CESC),
Corporate Office No. 29,

Vijayanagar, 2nd stage, Hinkal,
Mysore-570017.

8. Gulbarga Electricity Supply Company Limited (GESCOM),
Main road, Gulbarga, Karnataka.
Gulbarga-585102.

9. Hubli Electricity Supply Company Limited (HESCOM),
Corporate office, P. B. Road, Navanagar,
Hubli-580025.

10. Kerala State Electricity Board Limited (KSEBL),
Vaidyuthi Bhavanam, Pattom,
Thiruvananthapuram-695004.

11. Electricity department,
Government of Puducherry,
137, Netaji Subhash Chandra Bose Salai,
Puducherry-605001

12. Grid Corporation of Orissa Limited,
Vidyut Bhavan,
Janpath, Bhubaneshwar-751022. **…..Respondents**

Petition No. 612/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 Ramagundam 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. AP Eastern Power Distribution Company Limited (APEPDCL),
Corporate Office,
P&T Colony, Seethammadhara,
Visakhapatnam-530 013 (AP).

2. AP Southern Power Distribution Company Limited (APSPDCL),
Corporate Office,
Back Side Srinivasa Kalyana Mandapam Tiruchhanur Road,
Kesavayana Gunta,
Tirupathi-517 503 (AP).

3. Telangana State Northern Power Distribution Company Limited (TSNPDCL),
H. No. 2-5-31/2, Vidyut Bhavan,
Nakkalagutta, Hanamkonda,
Warangal-506001 (AP).

4. Telangana State Southern Power Distribution Company Limited (TSPDCL),
Mint Compound,
Corporate Office,
Hyderabad-500063 (AP).

5. Tamil Nadu Generation & Distribution Corporation Limited (TANGEDCO),
144, Anna Salai,
Chennai-600002.

6. Bangalore Electricity Supply Company Limited (BESCOM),
Krishna Rajendra Circle,
Bangalore-560 009.

7. Mangalore Electricity Supply Company Limited (MESCOM),
MESCOM bhavana,
Corporate Office,
Bejai, Kavoor Cross Road,
Mangaluru-575004, Karnataka.

8. Chamundeshwari Electricity Supply Corp. Limited (CESC),
Corporate Office, No. 29,
Vijayanagar, 2nd stage, Hinkal,
Mysore-570017.

9. Gulbarga Electricity Supply Company Limited (GESCOM),
Main road, Gulbarga, Karnataka,
Gulbarga-585102.

10. Hubli Electricity Supply Company Limited (HESCOM),
Corporate office, P. B. Road, Navanagar,
Hubli-580025.

11. Kerala State Electricity Board Limited (KSEBL),
Vaidyuthi Bhavanam, Pattom,
Thiruvananthapuram-695004.

12. Electricity department,
Government of Puducherry,

137, Netaji Subhash Chandra Bose Salai,
Puducherry-605001 **…..Respondents**

Petition No. 613/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 Kudgi Super Thermal Power Station Stage-I (3X800 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. AP Eastern Power Distribution Company Limited (APEPDCL),
Corporate Office,
P&T Colony, Seethammadhara,
Visakhapatnam-530 013 (AP).

2. AP Southern Power Distribution Company Limited (APSPDCL),
Corporate Office,
Back Side Srinivasa Kalyana Mandapam, Tiruchhanur Road,
Kesavayana Gunta,
Tirupathi-517503 (AP).

3. Telangana State Northern Power Distribution Company Limited (TSNPDCL),
H. No. 2-5-31/2, Vidyut Bhavan,
Nakkalagutta, Hanamkonda,
Warangal-506 001 (AP).

4. Telangana State Southern Power Distribution Company Limited (TSPDCL),
Mint Compound,
Corporate Office,
Hyderabad-500063 (AP).

5. Tamil Nadu Generation & Distribution Corporation Limited (TANGEDCO),
144, Anna Salai,
Chennai-600002.

6. Bangalore Electricity Supply Company Limited (BESCOM),
Krishna Rajendra Circle,
Bangalore-560009.

7. Mangalore Electricity Supply Company Limited (MESCOM),
MESCOM bhavana,
Corporate Office,
Bejai, Kavoor Cross Road,
Mangaluru-575004, Karnataka.

8. Chamundeshwari Electricity Supply Corp. Limited (CESC),
Corporate Office, No. 29,
Vijayanagar, 2nd stage, Hinkal,
Mysore-570017.

9. Gulbarga Electricity Supply Company Limited (GESCOM),
Main road, Gulbarga, Karnataka,
Gulbarga-585102.

10. Hubli Electricity Supply Company Limited (HESCOM),
Corporate office, P. B. Road, Navanagar,
Hubli-580025.

11. Kerala State Electricity Board Limited (KSEBL),
Vaidyuthi Bhavanam, Pattom,
Thiruvananthapuram-695 004. **…..Respondents**

Petition No. 730/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 Ramagundam Super Thermal Power Station Stage-I & II (3X200+ 3X500 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. AP Eastern Power Distribution Company Limited (APEPDCL),
Corporate Office,
P&T Colony, Seethammadhara,
Visakhapatnam-530013 (AP).

2. AP Southern Power Distribution Company Limited (APSPDCL),
Corporate Office,
Back Side Srinivasa Kalyana Mandapam Tiruchhanur Road,
Kesavayana Gunta,
Tirupathi-517503 (AP).

3. Telangana State Northern Power Distribution Company Limited (TSNPDCL),
H. No. 2-5-31/2, Vidyut Bhavan,
Nakkalagutta, Hanamkonda,
Warangal-506001 (AP).

4. Telangana State Southern Power Distribution Company Limited (TSPDCL),
Mint Compound,
Corporate Office,
Hyderabad-500063 (AP).

5. Tamil Nadu Generation & Distribution Corporation Limited (TANGEDCO),
144, Anna Salai,
Chennai-600002.

6. Bangalore Electricity Supply Company Limited (BESCOM),
Krishna Rajendra Circle,
Bangalore-560 009.

7. Mangalore Electricity Supply Company Limited (MESCOM),
MESCOM Bhavana,
Corporate Office,
Bejai, Kavoor Cross Road,
Mangaluru-575004, Karnataka.

8. Chamundeshwari Electricity Supply Corp. Limited (CESC),
Corporate Office, No. 29,
Vijayanagar, 2nd stage, Hinkal,
Mysore-570017.

9. Gulbarga Electricity Supply Company Limited (GESCOM),
Main road, Gulbarga, Karnataka,
Gulbarga-585102.

10. Hubli Electricity Supply Company Limited (HESCOM),
Corporate office, P. B. Road, Navanagar,
Hubli-580025.

11. Kerala State Electricity Board Limited (KSEBL),
Vaidyuthi Bhavanam, Pattom,

Thiruvananthapuram-695004.

12. Electricity department,
Government of Puducherry,
137, Netaji Subhash Chandra Bose Salai,
Puducherry-605001.

13. Electricity department
Government of Goa
Vidyut Bhavan, 3rd Floor, Panaji, Goa-403001. **…..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
Ms. Simaran Saluja, Advocate, NTPC
Shri Rishub Kapoor, Advocate, NTPC
Shri Jayant Bajaj, Advocate, NTPC
Shri Nihal Bhardwaj, Advocate, NTPC
Shri Jatin Ghuliani, Advocate, NTPC
Shri Siddharth Joshi, Advocate, NTPC
Shri A.S. Pandey, NTPC
Shri V. K. Garg, NTPC
Shri Ishpaul Uppal, NTPC

For Respondents : Shri Sidhant Kumar, Advocate, APEPDCL, APSPDCL
Shri S. Vallinayagam, Advocate, TANGEDCO
Shri R.K. Mehta, Advocate, GRIDCO
Ms. Himanshi Andley, Advocate, GRIDCO
Shri R. Alamelu, TANGEDCO
Ms. R. Ramalakshmi, TANGEDCO
Ms. B. Rajeshwari, TANGEDCO
Shri Madhusudan Sahoo, GRIDCO
Shri Sukanta Panda, GRIDCO
Shri Mahfooz Alam, GRIDCO

ORDER

The Petitioner, NTPC, has filed the above-mentioned 6 petitions 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

(hereinafter referred to as “the 2019 Tariff Regulations”) for in-principle 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 ("the MoEFCC Notification") dated 7.12.2015 notified by Ministry of Environment and Forests and Climate Change, Government of India (hereinafter referred to as "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 these petitions:

Petition No. 467/MP/2019

“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, 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.”*

Petition No. 64/MP/2020

“i) Grant approval for under taking implementation of 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, 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.

Petition No. 520/MP/2020

"i) Grant approval for under taking implementation of ECS scheme 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, 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) Allow the petitioner to file hard copies of the petition along with affidavit duly notarized, once normalcy is resumed.

vi) Pass such orders as deemed fit and necessary in the facts and circumstances of the present case."

Petition No. 612/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."

Petition No. 613/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."

Petition No. 730/MP/2020

"a. Grant approval for under taking implementation of 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, if required.

c. Allow additional water consumption, 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. 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. The petitions covered in the instant order are as follows:

A. Petition No. 467/MP/2019-Simhadri Super Thermal Power Station Stage-II (SSTPSS-II)

4. The Petitioner has sought approval of ACE on account of installation of various ECS at SSTPSS-II (2X500 MW) (COD of Unit-I and Unit-II was 16.9.2011 and 30.9.2012 respectively) in compliance with the MoEFCC Notification. The petition was admitted on 27.2.2020 and order was reserved on 13.8.2021. Andhra Pradesh Eastern Power Distribution Company Limited (APEPDCL), Respondent No. 1 and Andhra Pradesh Southern Power Distribution Company Limited (APSPDCL), Respondent No. 2 have filed their combined reply vide affidavit dated 23.4.2021 and Written Submissions dated 17.7.2021. Tamil Nadu Generation & Distribution Corporation Limited (TANGEDCO), Respondent No. 5 has field its reply vide affidavit dated 5.3.2020. The Petitioner has filed its combined rejoinder to the reply of APEPDCL and APSPDCL vide affidavit dated 28.4.2021. The Petitioner has filed its rejoinder to the reply of TANGEDCO vide affidavit dated 25.5.2020. The Petitioner

has filed reply to the queries raised in RoPs dated 27.2.2020, 12.3.2021, 29.4.2021 and 13.8.2021 vide affidavits dated 19.3.2020, 25.3.2021, 24.5.2021 and 14.8.2021 respectively and Written Submission dated 26.8.2021.

B. Petition No. 64/MP/2020-Simhadri Super Thermal Power Station Stage-I (SSTPSS-I)

5. The Petitioner has sought approval of ACE on account of installation of various ECS at SSTPSS-I (2X500 MW) (COD of Unit-I and Unit-II was 1.9.2002 and 1.3.2003 respectively) in compliance with the MoEFCC Notification. The petition was admitted on 27.2.2020 and order was reserved on 13.8.2021. APEPDCL, Respondent No. 1 and APSPDCL, Respondent No. 2 have filed their combined reply vide affidavit dated 23.4.2021 and Written Submissions dated 17.7.2021 and the Petitioner has filed its combined rejoinder vide affidavit dated 28.4.2021. The Petitioner has filed reply to the queries raised in RoPs dated 27.2.2020, 12.3.2021 and 13.8.2021 vide affidavits dated 19.3.2020 25.3.2021 and 14.8.2021 respectively and Written Submissions dated 26.8.2021.

C. Petition No. 520/MP/2020- Talcher Super Thermal Power Station Stage-II (TSTPSS-II)

6. The Petitioner has sought for approval of ACE on account of installation of various ECS at Talcher Super Thermal Power Station Stage-II (4X500 MW) (COD of Unit-I, Unit-II, Unit-III and Unit-IV was 1.8.2003, 1.3.2004, 1.11.2004 and 1.8.2005 respectively) in compliance with the MoEFCC Notification. The petition was admitted on 21.8.2020 and order was reserved on 13.8.2021. APEPDCL, Respondent No. 1 and APSPDCL, Respondent No. 2 have filed their combined reply vide affidavit dated 23.4.2021 and Written Submissions dated 17.7.2021. Tamil Nadu Generation & Distribution Corporation Limited (TANGEDCO), Respondent No. 5, has filed its

reply vide affidavit dated 1.9.2020. GRIDCO, Respondent No. 7 has filed its reply to the petition vide affidavit dated 24.4.2021 and Written Submissions dated 6.8.2021. The Petitioner has filed its combined rejoinder to the reply filed Respondent No. 1 and 2 vide affidavit dated 28.4.2021. The Petitioner has also filed its rejoinder to replies of TANGEDCO and GRIDCO vide affidavits dated 15.9.2020 and 28.4.2021 respectively. The Petitioner has filed reply to the queries raised in RoPs dated 21.8.2020, 29.4.2021, 7.4.2021 and 13.8.2021 vide affidavits dated 15.9.2020, 24.5.2021, 9.4.2021 and 14.8.2021 respectively and Written Submission dated 26.8.2021.

D. Petition No. 612/MP/2020- Ramagundam Super Thermal Power Station Stage-III (RSTPSS-III)

7. The Petitioner has sought approval of ACE on account of installation of various ECS at RSTPSS-III (1X500 MW) (COD: 25.3.2005) in compliance with the MoEFCC Notification. The petition was admitted on 12.3.2021 and order was reserved on 13.8.2021. APEPDCL, Respondent No. 1 and APSPDCL, Respondent No. 2 have filed their combined reply vide affidavit dated 23.4.2021 and Written Submissions dated 17.7.2021. Tamil Nadu Generation & Distribution Corporation Limited (TANGEDCO), Respondent No. 5 has field its reply vide affidavit dated 5.11.2020. Kerala State Electricity Board Limited (KSEBL), Respondent No. 10 has filed its reply to the petition vide affidavit dated 3.3.2021. The Petitioner has filed its combined rejoinder to the reply filed by Respondent No. 1 and 2 vide affidavit dated 28.4.2021. The Petitioner has also filed its rejoinder to the reply filed by TANGEDCO and KSEBL vide affidavit dated 3.1.2021 and 17.3.2021 respectively. The Petitioner has filed reply to the queries raised in RoPs dated, 12.3.2021, 29.4.2021 and

13.8.2021 vide affidavits dated 25.3.2021, 24.5.2021 and 14.8.2021 respectively and Written Submissions dated 26.8.2021.

E. Petition No. 613/MP/2020- Kudgi Super Thermal Power Station Stage-I (KSTPSS-I)

8. The Petitioner has sought approval of ACE on account of installation of various ECS at KSTPSS-I (3X800 MW) (COD of Unit-I, Unit-II and Unit-III was 31.7.2017, 31.12.2017 and 15.9.2018) in compliance with the MoEFCC Notification. The petition was admitted on 12.3.2021 and order was reserved on 13.8.2021. APEPDCL, Respondent No. 1 and APSPDCL, Respondent No. 2 have filed their combined reply vide affidavit dated 23.4.2021 and Written Submissions dated 17.7.2021. Tamil Nadu Generation & Distribution Corporation Limited (TANGEDCO), Respondent No. 5 and Kerala State Electricity Board Limited (KSEBL), Respondent No. 10 have filed their reply to the petition vide affidavits dated 5.11.2020 and 3.3.32021 respectively. The Petitioner has filed the rejoinder to the reply filed by TANGEDCO and KSEBL vide affidavits dated 3.2.2021 and 17.3.2021 respectively. The Petitioner has filed its reply to the queries raised in RoPs dated 12.3.2021, 29.4.2021 and 13.8.2021 vide affidavits dated 25.3.2021, 24.5.2021 and 14.8.2021 respectively and Written Submissions dated 26.8.2021.

F. Petition No. 730/MP/2020- Ramagundam Super Thermal Power Station Stage-I & II (RSTPSS-I&II)

9. The Petitioner has sought approval of ACE on account of installation of various ECS at RSTPSS-I&II (3X200 + 3X500 MW) (COD of Unit-I, Unit-II, Unit-III, Unit-IV, Unit-V and Unit-VI was 1.3.1984, 1.11.1984, 1.5.1985, 1.11.1988. 1.9.1989 and 1.4.1991 respectively) in compliance with the MoEFCC Notification. The petition was admitted on 12.3.2021 and order was reserved on 13.8.2021. APEPDCL, Respondent No. 1 and APSPDCL, Respondent No. 2 have filed their combined reply

vide affidavit dated 23.4.2021 and Written Submissions dated 17.7.2021. Tamil Nadu Generation & Distribution Corporation Limited (TANGEDCO), Respondent No. 5 has field its reply vide affidavits dated 11.3.2021, 26.3.2021, 19.4.2021 and 11.6.2021. Kerala State Electricity Board Limited (KSEBL), Respondent No.10 has filed its reply to the petition vide affidavit dated 3.3.2021. The Petitioner has filed its combined rejoinder to the reply filed by Respondent No. 1 and 2 vide affidavit dated 28.4.2021. The Petitioner has further filed its rejoinder to replies of TANGEDCO vide affidavits dated 30.3.2021 and 28.4.2021 and KSEBL vide affidavit dated 17.3.2021. The Petitioner has filed reply to the queries raised in RoPs dated, 12.3.2021, 29.4.2021 and 13.8.2021 vide affidavits dated 25.3.2021, 24.5.2021 and 14.8.2021 respectively and Written Submissions dated 26.8.2021.

Background

10. Brief facts of the instant 6 petitions are as follows:

(a) In exercise of the powers conferred by Sections 6 and 25 of the Environment (Protection) Act, 1986, 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 new TPPs. As per the MoEFCC Notification, all TPPs were mandatorily required to comply with the revised norms within a period of two years from the date of the MoEFCC Notification dated 7.12.2015. The deadline for compliance of the revised norms has been subsequently modified to 2022 vide notification dated 31.3.2021 of MoEFCC. The amended norms prescribed by the MoEFCC Notification are as follows:

"

Sr. No.	Industry	Parameter	Standards
1	2	3	4
5A.	Thermal Power Plant (Water consumption limit)	Water consumption	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^3/MWh within a period of two years from the date of publication of this notification. II. All existing CT-based plants reduce specific water consumption up to maximum of 3.5 m^3/MWh within a period of two years from the date of publication of this notification. III. New plants to be installed after 1st January, 2017shall have to meet specific water consumption up to maximum of 2.5 m^3/MWh and achieve zero waste water discharged
25.	Thermal Power Plant	TPPs (units) installed before 31st December, 2003*	
		Particulate Matter	100mg/Nm^3
		Sulphur Dioxide (SO_2)	600 mg/Nm^3 (Units Smaller than 500 MW capacity units) 200 mg/Nm^3 (for units having capacity of 500 MW and above)
		Oxides of Nitrogen (NOx)	600 mg/Nm^3
		Mercury (Hg)	0.03 mg/Nm^3 (for units having capacity of 500 MW and above)
		TPPs (units) installed after [1st January, 2004]#, up to 31st December, 2016*	
		Particulate Matter	50 mg/Nm^3
		Sulphur Dioxide (SO_2)	600 mg/Nm^3 (Units Smaller than 500 MW capacity units) 200 mg/Nm^3 (for units having capacity of 500 MW and above)
		Oxides of Nitrogen (NOx)	300 mg/Nm^3
		Mercury (Hg)	0.03 mg/Nm^3
		TPPs (units) to be installed from 1st January, 2017**	
		Particulate Matter	30 mg/Nm^3
		Sulphur Dioxide (SO_2)	100 mg/Nm^3
		Oxides of Nitrogen (NOx)	100 mg/Nm^3
		Mercury (Hg)	0.03 mg/Nm^3

**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".*
#Amdended vide Gazette Notification No. 590 dated 7.3.2016

(b) As per the MoEFCC Notification, water consumption norms for TPPs with Once Through Cooling (OTC), existing CT-based TPPs and new TPPs commissioned after 1.1.2017 were specified. Further, norms for particulate matter, sulphur dioxide (SO_2), nitrogen dioxide (NO_x) and Mercury (Hg) for TPPs commissioned before 31.12.2003; TPPs commissioned after 1.1.2003 upto 31.12.2016; and TPPs commissioned after 1.1.2017 were also specified. Subsequently, MoEFCC relaxed the norms of NO_x for TPPs commissioned

during the period 1.1.2004 and 31.12.2016 from 300 mg/Nm^3 that was stipulated through the MoEFCC Notification of 7.12.2015 to 450 mg/Nm^3 vide Notification G.S.R. 662(E) dated 19.10.2020.

(c) For implementation of ECS notified by MoEFCC, the Central Electricity Authority (CEA) was entrusted with planning and coordination. CEA along with Regional Power Committees formulated a phasing plan up to 2024 which was subsequently planned to be achieved by 2022 as per revised action plan of Ministry of Power. Further, Hon'ble Supreme Court 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) The Ministry of Power (MoP) in exercise of the power under Section 107 of the Electricity Act, 2003, 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 extracted hereunder:

> *"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 'Operational Norms for Thermal Generating Stations for the Tariff Period 2019-2024' recommended various technologies to comply with revised emission control norms as specified by the MoEFCC Notification.

(g) However, prior to recommendation of CEA dated 21.2.2019, the Petitioner had identified Wet Limestone based Flue Gas Desulpherisation (WFGD) system for reduction of SO_2 emissions and Combustion Modification System as Primary Control, Selective Non Catalytic Reduction (SNCR) and Selective Catalytic Reduction (SCR) as Secondary Control for reduction in NO_x emissions suitable for its various generating stations to achieve the revised environmental norms specified by MoEFCC. Adoption of WFGD technology is in line with the technologies identified by CEA vide letter dated 21.2.2019. Accordingly, the Petitioner has filed the instant petitions for approval of ACE for implementation of ECS as per Regulation 29 of the 2019 Tariff Regulations.

(h) The Commission amended the 2019 Tariff Regulations vide the 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_2 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 31.3.2021, for implementation of ECS to comply with the revised ECNs through the Environment (Protection) Amendment Rules, 2021. The said Notification dated 31.3.2021 also provides for constitution of task force and environment compensation for operating TPPs beyond the specified timelines.

11. The Petitioner has filed the instant 6 petitions under the 2019 Tariff Regulations for in-principle approval of the capital cost for implementation of the ECS as ACE. 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.

12. The Petitioner 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 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

13. The submissions made by the Petitioner in the instant petitions are similar in nature and, hence, they are dealt together. The gist of the submissions made by the Petitioner in these petitions is 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 as per the 2019 Tariff Regulations are considered for working out indicative tariff based on the capital cost.

(d) The MoEFCC Notification mandates reduction in water consumption, particulate matter, SO_2, NO_x, and Mercury emission. To comply with the revised ECS, it is proposed to only implement (a) WFGD for reduction in SO_2 and (b) Combustion Modification, SCR and SNCR for NO_x 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 taken up

in future.

(e) CEA in its recommendations vide letter dated 21.2.2019 has recommended four technologies for reduction of SO_2 emissions, namely WFGD, Lime Spray Drier/ Semi-dry FGD, Dry Sorbent Injection based FGD and Furnace Injection in CFBC Boilers.

(f) 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_2 reduction from coal-fired utility boilers. It removes SO_2 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 counters current to the spray liquor flowing downward through the absorber. It is envisaged that it would reduce SO_2 emissions to less than 200 mg/Nm^3 from current levels of around 1000 mg/Nm^3.

(g) The shut-down period required for installation of the WFGD system is approximately 30 to 45 days.

(h) There are two kinds of technologies for NO_X control (a) primary control technologies wherein the amount of NO_X produced in the combustion/ furnace zone is reduced by modifying fuel burners and (b) secondary control technologies reduces NO_x present in the flue gas by injection of reagent (ammonia [NH3] or urea) in flue gas path where it reacts with NO_x to reduce it to N_2 and water.

(i) In De-NO_x Combustion Modification (CM) System, the normal burners installed in the unit boilers are to be replaced by Low-NO_x Burners (LNB). A LNB limits NO_x 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 NO_x formation. Due to 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-NO_x LNB retrofit.

(j) De-NO_x Selective Non Catalytic Reduction (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 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 in the instant generating stations is proposed to be based on urea. This system requires low capital cost, having moderate NO_x removal and it involves non-toxic chemical and it requires low energy injection. Further, due to formation of water particles during NO_x reduction, it increases the wet loss of Boilers leading to deterioration of Unit Heat Rate ranging about 0.1%-0.6%. The deterioration of Station Heat Rate due to installation of De-NO_x systems would be claimed by the Petitioner based on the actual performance of these systems.

(k) De-NO_x Selective Catalytic Reduction (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 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 in instant generating stations 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 NO_x within in the presence of the catalyst and oxygen. The use of a catalyst results in two primary advantages of SCR technology - higher NO_x control efficiency and reactions within a broader temperature range. This system requires high capital cost, having high NO_x removal and involves toxic chemical. Due to formation of water particles during NO_x 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

NTPC generating stations and implementation of SNCR shall be taken up based on the reports of SNCR pilot tests.

(m) With the implementation of Combustion Modification System, NO_x emission is anticipated to come down to below 400 mg/Nm^3 and with the installation of SNCR, it is envisaged that the level of NO_x emission shall come down to below 300 mg/Nm^3.

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

(o) With the installation of revised 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 system and other ECS were not installed at various generating stations, the expenditure on account of them was not considered while framing the norms. Further, the actual O&M Expenses data on account 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 system/ other ECS, norm for additional O&M Expenses @4% of capital cost per annum may be considered and the same has been considered to compute the indicative tariff.

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

(q) Unit have to be taken under shutdown for about 45 days for each unit for implementation of ECS and stabilization of the same would take would take some more time. During the period of shut down of unit, there would be loss of availability of the generating station and would lead to under-recovery of Annual Fixed Charges (AFC). Accordingly, the shutdown period of unit for implementation of these ECS in compliance of MoEFCC Notification may be treated as deemed availability. Loss of availability of unit/station for implementation of ECS may be considered as deemed availability under Regulation 76 of the 2019 Tariff Regulations.

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

(s) The Petitioner will file a separate supplementary tariff petition 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.

14. During hearing on 12.3.2021 and 29.4.2021, the learned counsel for the Petitioner made the following additional submissions:

(a) NTPC has proposed to install WFGD for reduction in SO_2 and SNCR technology for reduction in NO_x. However, with relaxation of the emission standards for NO_x from 300mg/Nm^3 to 450mg/Nm^3 for plants installed between 1.1.2004 to 31.12.2016 vide notification of MoEFCC dated 19.10.2020, there may not be requirement for installation of SNCR for NO_x control in case of the TPPs covered in the instant petitions.

(b) The information sought by the Commission vide Record of Proceeding (RoP) dated 12.3.2021 has been submitted by the Petitioner vide affidavit dated 24.3.2021 and the same was also served on the beneficiaries.

(c) While examining the mandate for the Petitioner under Regulation 29 of the 2019 Tariff Regulations, the Commission should take into consideration the circumstances under which the Petitioner proceeded to award the contracts for

installation of ECS and the fact that the implementation of ECS was being monitored by Hon'ble Supreme Court of India, which had prescribed a strict timeline for implementation of revised ECNs.

(d) Neither the MoEFCC Notification nor the 2014 Tariff Regulations nor the 2019 Tariff Regulations specify a particular type of technology for a power plant. CEA also does not prescribe selection of any particular type of technology for power plants. Regulation 29 of the 2019 Tariff Regulations does not mandate consulting CEA for selection of technology for installation of ECS.

(e) The Petitioner has invited bids for installation of ECS in lots instead of inviting bids on plant/ station basis to avail the benefits of economies of scale and discover the lowest possible price through domestic competitive bidding (DCB).

(f) The Board of Directors approved the proposal to award the contracts for the FGD package. The investment approval for each of the project has also been accorded by the Board of Directors.

(g) The Petitioner has now shared all the possible information in compliance of Regulation 29 of the 2019 Tariff Regulations with respect to installation of ECS at various stations/ plants of the Petitioner. Accordingly, the obligation of the Petitioner under Regulation 29 of the 2019 Tariff Regulations stands discharged.

Maintainability

15. TANGEDCO, APEPDCL, APSPDCL, KSEBL and GRIDCO have contended that the instant petitions are not maintainable for the reasons that (a) the Petitioner has not followed the procedure laid down in the Tariff Regulations; (b) case-specific recommendations of CEA have not been submitted; and (c) the MoEFCC Notification is not applicable to old/ retiring plants. 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 Tariff Regulations

16. TANGEDCO, in Petition. No. 467/MP/2019 has submitted that the Petitioner is required to obtain prior approval of the Commission before undertaking the expenditure for installation of ECS to meet the revised ECNs as per Regulation 26 and Regulation 29 of the 2019 Tariff Regulations. While Regulation 29(1) specifically mandates sharing its proposal with the beneficiaries and filing a petition before Commission for undertaking ACE for compliance of the revised ECNs, Regulation 29(4) requires filing of a petition for determination of tariff due to the implementation of ECS for such ACE actually incurred or projected to be incurred. The Petitioner in the case of SSTPSS-II has awarded the contract on 24.5.2019 without following the procedure laid down in Regulation 29 of the 2019 Tariff Regulations. In the absence of the approval of the Commission, the Petition may be dismissed and the Petitioner may be directed to follow the procedure as laid down in Regulation 29 of the 2019 Tariff Regulations and submit a revised petition.

17. In response, the Petitioner has submitted that the Petitioner is required to implement ECS in all its generating stations within the specified timelines. The whole process from conceptualization to final installation and commissioning of ECS takes substantial time in comparison to other schemes involving additional capital expenditure. Therefore, immediately after the MoEFCC Notification was notified, the Petitioner took various steps such as finalization of the schemes, cost estimates, etc. for implementation of ECS at its generating stations including SSTPSS-II. The Petitioner had approached the Commission through Petition No. 98/MP/2017 for approval of ACE towards ECS and the Commission vide order dated 20.7.2018 had declared that such expenditure has to be admitted under “change-in-law” event after prudence check. The Petitioner took various steps such as issue of NIT for FGD for

various stations including SSTPSS-II, submission of bids by vendors, bid-evaluation etc. before the final award to the qualified lowest bidder through competitive bidding. Normally, time taken from stage of NIT to bid evaluation and final award is about 8-10 months. The 2019 Tariff Regulations was notified on 7.3.2019 and accordingly, the Petitioner has filed the instant petition to get approval of ACE towards installation of ECS to comply with revised ECNs as per the MoEFCC Notification in terms of Regulation 29 of the 2019 Tariff Regulations. The Petitioner in the instant Petition has also shared the proposed technology, schedule of completion, estimated completion cost, computation of indicative tariff etc. Therefore, to comply with the revised ECNs in time, work of installation of FGD system was awarded and the proposal was taken up with the beneficiaries in the form of the instant Petition.

18. APEPDCL and APSPDCL in Petition No.467/MP/2019, Petition No.612/MP/2020, Petition No.730/MP/2020 and Petition No.613/MP/2020 have also raised similar objections as TANGEDCO and they are as follows:

(a) As per the provisions of Regulation 11 of the 2019 Tariff Regulations, prior notice is to be given to the beneficiaries along with underlying assumptions, estimates and justification for expenditure, if the estimated expenditure exceeds ₹100 crore. Similarly, Regulation 29 of the 2019 Tariff Regulations provides for sharing the proposal for ACE for installation of ECS containing all relevant information with the beneficiaries. Thereafter, an application under Regulation 29(3) would be maintainable before the Commission for approval of additional expenditure. Only on such approval by this Commission, and after completion of implementation of the revised ECNs that any petition for determination of tariff lie. Both Regulations 11 and 29 of the 2019 Tariff Regulations require and mandate prior approval of ACE proposed to be incurred after prior notice to the beneficiaries. The Petitioner, contrary to the aforesaid provisions, has directly approached the Commission after having already incurred ACE on implementation of the revised ECNs by award of

various tenders and contracts. The Petitioner has unilaterally awarded the contract for installation of FGD system and even initiated their installation process, without even consulting or sharing the proposal with the beneficiaries.

(b) The Petitioner having delayed the implementation of the MoEFCC Notification is now seeking to take advantage of its own lapses. The claim of the Petitioner does not contain the mandatory requirements as per the Tariff Regulations including cost-benefit analysis, reasonableness of cost estimates, IDC, additional incidental expenditure, scope of work, phasing of expenditure, and other pertinent factors.

(c) Non-compliance of Regulation 29 of the 2019 Tariff Regulations attracts a penalty under Regulation 142 of the Electricity Act, 2003. The Petitioner has itself admitted that it has not complied with the dual requisites (i) no prior notice to the beneficiaries and (ii) no prior approval of ACE before awarding contracts under Regulation 29 of the 2019 Tariff Regulations before filing the petitions. In view of the aforesaid admissions, the Commission ought to impose penalty on the Petitioner for the said non-compliance.

(d) While admitting non-compliance with the 2019 Tariff Regulations, the Petitioner has sought to justify the same by relying on the orders and directions passed by the Hon'ble Supreme Court in W.P. (C) No. 13029/1985. The submission of the Petitioner that the early implementation of the MoEFCC Notification was mandated by the Hon'ble Supreme Court is not tenable. As per the MoEFCC Notification, the revised ECNs were to be implemented by 6.12.2017. Admittedly, the Petitioner did not initiate steps until March 2017. Consequently, after the timelines prescribed by MoEFCC lapsed, the Hon'ble Supreme Court was constrained to take cognizance of the issue on 13.12.2017.

(e) The Supreme Court's monitoring does not justify the Petitioner's non-compliance. It cannot be the case of the Petitioner that timelines laid down by MoEFCC or the Hon'ble Supreme Court constrained the Petitioner to overlook the procedure prescribed under the 2019 Tariff Regulations. Non-compliance with the 2019 Tariff Regulations allegedly on account of monitoring by Hon'ble

Supreme Court is only a pretext and the Petitioner was itself in default of the prescribed timeline.

19. In response, the Petitioner has submitted that the beneficiaries were always informed about the intent of the Petitioner to comply with the revised ECNs. Moreover, the 2019 Tariff Regulations were only notified in March 2019, whereas the Petitioner had taken steps to prepare IFB (invitation for bids) much prior to the notification of the 2019 Tariff Regulations and IFB was issued before the notification of 2019 Tariff Regulations. Moreover, Regulation 29 of the 2019 Tariff Regulations does not stipulate that before award of contract or during preparation of IFB, any consent/ approval of beneficiaries is required.

20. The Petitioner has further submitted that as per the MoEFCC Notification, the existing and future TPPs were required to abide by the revised ECNs within a period of two years from the date of the Notification, failing which punitive actions would follow. Therefore, the Petitioner was constrained to immediately undertake various steps in compliance of the said Notification for its TPPs which included activities such as finalization of schemes and cost estimates. Post issuance of revised ECNs, the Petitioner in Petition No. 98/MP/2017 sought an 'in-principle' approval for ACE on account of installation of various ECS in compliance of the MoEFCC Notification and the Commission vide order dated 20.7.2018 observed that the MoEFCC Notification constitutes "change in law" and that ACE incurred for implementation of ECS in terms of the MoEFCC Notification shall be admissible after due prudence check under Regulation 14 of the 2014 Tariff Regulations. Thereafter, the Commission notified the 2019 Tariff Regulations. Therefore, though action was initiated before the notification of the 2019 Tariff Regulations, the Petitioner is constrained to file the instant petitions in terms of Regulation 29 of the 2019 Tariff Regulations. The

compliance of the MoEFCC Notification cannot be subject to prior concurrence of the beneficiaries. In Petition No. 98/MP/2017, the Petitioner had categorically averred that once the MoEFCC Notification is declared as a “change in law”, the Petitioner will proceed to implement the same once regulatory certainty is granted by the Commission. Therefore, the beneficiaries were always informed about the intent of the Petitioner to comply with the revised ECNs.

21. The Petitioner has submitted that it has fulfilled the substantial requirement of Regulation 29 of the 2019 Tariff Regulations by its conduct in Petition No. 98/MP/2017 and further by sharing its proposal and other information as sought by the Commission. The essence of Regulation 29 of the 2019 Tariff Regulations in all aspects has been complied with and all information as envisaged under Regulation 29(2) of the 2019 Tariff Regulations has been provided to beneficiaries/ Respondents. No prejudice is being caused to the Respondents as they have been given ample opportunities to raise their objections and feedback on the proposal in the instant petition. However, the Respondents despite getting all the information have not been able to point out any material irregularity in the bidding process.

22. TANGEDCO, in case of RSTPSS-I and II in Petition No. 730/MP/2020 has submitted that the Petitioner has incorrectly stated that the Commission has granted “in-principle” approval for the installation of ECS vide order dated 20.7.2018 in Petition No. 98/MP/2017. In response, the Petitioner has submitted that the bare perusal of the order dated 20.7.2018 in Petition No. 98/MP/2017 shows that the Commission had duly held the MoEFCC Notification to be “change in law” and has also held that ACE incurred in compliance of “change in law” is to be allowed.

23. TANGEDCO, in case of RSTPSS-III in Petition No. 612/MP/2020 has

contended that the Petitioner has failed to comply with the mandatory provisions of the Regulation 11 and Regulation 29 of the 2019 Tariff Regulations. It has failed to provide information as required under Regulation 29(2) of the 2019 Tariff Regulations. In response, the Petitioner has submitted that Regulation 11 of the 2019 Tariff Regulations is applicable for ACE other than ACE not covered under Regulation 29 of the 2019 Tariff Regulations. The Petitioner has filed the instant petition to comply with revised ECNs as per the MoEFCC notification and Regulation 29 of the 2019 Tariff Regulations.

24. TANGEDCO in case of KSTPSS-I in Petition No.613/MP/2020 has submitted that the Petitioner was aware of the MoEFCC Notification and it is mandatory to comply with the directions. The Petitioner has failed to take necessary steps to install ECS as per the MoEFCC notification before bringing the units into commercial operation. The Petitioner has not taken any action after the MoEFCC Notification for about 34 months and is now incurring ACE under ECS. The Petitioner has not complied with provisions of Regulation 11 and 29 of the 2019 Tariff Regulations and the Petitioner has not shared the necessary details as required under Regulation 19(2) of the 2019 Tariff Regulations. In response, the Petitioner has submitted that the investment approval for KSTPSS-I was accorded on 28.12.2011 by its Board of Directors subject to Environment Clearance. The Ministry of Environment and Forest granted Environmental Clearance on 25.1.2012. Therefore, the MoEFCC Notification on revised environmental norms was after the investment approval. At the time of the notification, the scope of work for KSTPSS-I was already finalized and packages had been awarded. The units were in the advance stage of commissioning. TANGEDCO is wrongly linking installation of ECS with COD of KSTPSS-I. It is after the MoEFCC Notification that the Petitioner proceeded for award and for installing

ECS which involved various steps from selection of technology to design, layout, NIT etc. Therefore, the expenditure on ECS installation would have been incurred in either case i.e. before or after COD.

25. We have considered the submissions of the Respondents and the clarifications given by the Petitioner. The instant petitions are for in-principle approval of ACE towards installation of ECS in compliance of the MoEFCC Notification. The instant petitions are filed under Section 79 of the Electricity Act, 2003 read with Regulation 29 of the 2019 Tariff Regulations. The Respondents, TANGEDCO, APEPDCL and APSPDCL in Petition No.467/MP/2019, Petition No.730/MP/2020, Petition No.612/MP/2020 and Petition No.613/MP/2020, and GRIDCO in Petition No.520/MP/2020 have contended that the Petitioner has not shared the proposal for incurring ACE towards installation of ECS with the Respondents as required under Regulation 29 of the 2019 Tariff Regulations. The Respondents have also contended that strict timelines for meeting ECNs cannot be a reason for not complying with the procedure laid down in the 2019 Tariff Regulations.

26. In response, the Petitioner has submitted that neither the 2014 Tariff Regulations nor the 2019 Tariff Regulations require beneficiaries' consent, prior approval or ratification before incurring ACE and that Regulation 29(1) of the 2019 Tariff Regulations does not mandate prior consultation with the beneficiaries. It merely provides knowledge or notice to the beneficiaries of the process undertaken for implementation of ECS.

27. The Commission has specified the procedure for claiming ACE on account of implementation of the revised ECNs 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."

28. As per the procedure prescribed in Regulation 29 of the 2019 Tariff Regulations, a generating company intending to incur ACE towards installation of ECS has to share its proposal with the Respondents/ beneficiaries and file a petition for undertaking ACE under Regulation 29(1) of the 2019 Tariff Regulations. The proposal should contain the details of the proposed technology as specified by CEA and other relevant information under Regulation 29(2) of the 2019 Tariff Regulations. On an application by the generating station, the Commission may approve ACE towards the implementation of ECS after prudence check in accordance with Regulation 29(3) of the 2019 Tariff Regulations. The generating station after implementation of ECS shall file a petition for determination of tariff under Regulation 29(4) of the 2019 Tariff Regulations.

29. It is observed that the Petitioner had initiated action for implementation of ECS

in compliance of the MoEFCC Notifications in the 2014-19 tariff period in case of all its generating stations keeping in view the strict timelines specified in the MoEFCC Notification and the fact that the installation of ECS was being monitored by Hon'ble Supreme Court. Invitation for Bids (IFBs) were issued in case of SSTPSS-II, SSTPSS-I, RSPTSS-I&II and KSTPSS-I during the 2014-19 tariff period and in case of TSPTSS-II and RSTPSS-III, IFB was issued during the 2019-24 tariff period. Notice of Award (NoA) was issued in case of KSTPSS-I during the 2014-19 tariff period and in case of the other five TPPs, NoA was issued during the 2019-24 tariff period as per the details given in the following table:

Petition Number	Generating station/ unit Capacity (MW)	Date of issue of IFB	Date of issue of NoA
467/MP/2019	SSTPSS-II (2X500)	31.8.2018	24.5.2019
64/MP/2020	SSTPSS-I (2X500)	31.8.2018	24.5.2019
520/MP/2020	TSTPSS-II (4x500 MW)	27.8.2019	30.3.2020
612/MP/202O	RSTPSS-III (1X500)	27.8.2019	7.4.2020
613/MP/2020	KSTPSS-I (3x800)	30.6.2017	31.7.2018
730/MP/2020	RSTPSS-I & II (3X200+3X500)	28.9.2018	22.8.2019

30. As per Regulation 29(1) of the 2019 Tariff Regulations, the Petitioner is required to share the proposal for installation of ECS and the details of the consequent ACE with the Respondents and thereafter file the petition before the Commission. 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 become effective since 1.4.2019. The Petitioner could not have shared the proposal for installation of ECS in case of SSTPSS-II, SSTPSS-I, RSPTSS I&II and KSPTSS-I with the Respondents before issuing IFBs as the mandate for sharing such proposal was introduced only in the 2019 Tariff Regulations after IFBs were issued.

31. In the case of RSTPSS-III and TSTPSS-II, IFBs were issued on 27.8.2019; NoA was issued on 7.4.2020 for RSTPSS-III and on 20.3.2020 for TSTPSS-II, i.e.

during the 2019-24 tariff period. Therefore, the Petitioner should have shared the proposal for installation of ECS with the Respondents in case of RSTPSS-III and TSTPSS-II 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/ beneficiaries 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. At the same time, we observe that Regulation 29(1) of the 2019 Tariff Regulations does not provide 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/ beneficiaries. Therefore, as per this Regulation, the Petitioner has to share the proposal for installation of ECS with the Respondents/ beneficiaries for their information prior to or at the time of filing the Petition.

32. It is observed that though the Petitioner had failed to share the proposal for installation of ECS in the case of RSTPSS-III and TSTPSS-II with the Respondents/ beneficiaries as per Regulation 29(1) of the 2019 Tariff Regulations, the Petitioner has subsequently shared the proposal with the Respondents/ beneficiaries on the filing of the petition and 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. Therefore, we are unable to agree with the Respondents that the instant petitions are not maintainable. Further, not considering the prayers of the Petitioner at this stage would only delay 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 do not accept the contentions of the Respondents.

33. As regards TANGEDCO's contention that the Petitioner has incorrectly stated in order dated 20.7.2018 in Petition No. 98/MP/2017 that the Commission has granted in-principle approval for the installation of ECS, it is observed that the Commission in order dated 20.7.2018 has clearly stated that ACE on account of "change in law" or compliance with any existing law is allowable and accordingly ACE on account of installation of ECS is admissible. 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."*

34. As regards APEPDCL and APSPDCL's contention that there was delay on the part of the Petitioner in installation of ECS, it is observed that as per the MoEFCC Notification dated 7.12.2015, 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 the 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. We note that though the Petitioner had initiated the 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. More so, since MoEFCC has subsequently revised timelines for implementation of ECS to December 2022.

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

35. The Petitioner has submitted that it selected WFGD technology for its generating stations as it is the most appropriate technology and it is in accordance with CEA Guidelines and also meets SO_2 emission norms stipulated by MoEFCC.

36. TANGEDCO has submitted that the Petitioner has not consulted CEA while selecting the technology and finalizing the cost of SSTPSS-II. Instead, the Petitioner has adopted the norms specified by CEA as broad guidelines for installation of ECS as the basis for deciding the technology and cost. TANGEDCO has submitted that the Petitioner has not submitted details of Sulphur content of the coal, availability of reagent (if any), disposal and handling of by-product, plant life and space requirement etc. TANGEDCO made similar submissions in the case of RSPTSS-I&II in Petition No. 730/MP/2020, wherein it has been stated that the Petitioner has proceeded with issuing IFB for installation of ECS without consulting CEA.

37. In response, the Petitioner has submitted that CEA's Advisory dated 7.2.2020 is only advisory in nature and it is not mandatory. As per the Advisory, the Petitioner is required to select appropriate FGD technology based upon various parameters. The Advisory prescribes that the technologies mentioned therein need to be evaluated on a case-to-case basis. The said Advisory has been issued post the

issue of NoA for installation of FGD (except in the case of TSTPSS-II and RSTPSS-III). Nevertheless, the technology adopted by the Petitioner is in line with the CEA's recommendations/ guidelines. It is not mandatory as per the 2019 Tariff Regulations to consult CEA or MoEFCC for the purpose of installation of ECS.

38. We have considered the submissions of TANGEDCO and the clarifications given by the Petitioner. The Respondent has contended that the Petitioner has not submitted plant-specific recommendations of CEA. It is observed that CEA has been entrusted with the planning and coordination of implementation of 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 on 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_2 emissions, which are applicable for TPPs in general. Further, as submitted by the Petitioner, there is no requirement for plant-specific CEA recommendations under the MoEFCC Notification or the 2019 Tariff Regulations, as amended by the 2020 Amendment Regulations. As observed above, 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. We also observe that the Petitioner has undertaken all due prudent process to determine the most competitive price. 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 where plant-specific recommendations are made by CEA, the same needs to be followed by concerned TPPs.

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

39. TANGEDCO in Petition No. 467/MP/2020 has submitted that the Petitioner has not furnished the present emission levels of SO_2 and NO_x. In response, the Petitioner has submitted that the present emission level SO_2 is in the range of 1000-1200 mg/Nm^3 and that of NO_x is approximately 500 mg/Nm^3.

40. APEPDCL and APSPDCL in Petition. No. 612/MP/2020 has submitted that the emission profile has not been furnished by the Petitioner to substantiate the requirement of FGD system. It has further submitted that this data is imperative to ascertain if the subject plant is currently meeting the revised emission norms or not and ultimately determine appropriate FGD technology in the subject plant. This is non-compliance of not only Regulation 29(3) of the 2019 Tariff Regulations, but also of the Commission's orders and directions. The absence of an emission profile, coupled with the absence of a certificate from a competent authority like CEA, raises serious doubts and questions regarding use and necessity of the FGD technology in the subject plant.

41. In response, the Petitioner has submitted that WFGD technology adopted by the Petitioner meets the evaluation criteria of the Advisory issued by CEA on 7.2.2020 and it will also meet SO_2 emission norms stipulated in the MoEFCC Notification.

42. GRIDCO in the case of TSTPSS-II in Petition No. 520/MP/2020 has submitted that the Petitioner has confirmed that there is no requirement to install ECS for control of NO_x emission as the present NO_x level is within the allowable limit of 450 mg/Nm^3. However, the Petitioner has not furnished the present emission level of SO_2 of TSTPSS-II. GRIDCO has further submitted that the present emission level of SO_2 should have been reflected in the NIT/Tender Specification as the design and the manufacture of the WFGD system would require the existing level of SO_2 emission to be brought down to the required level. In response, the Petitioner has submitted that the present SO_2 emission level is 1250 mg/Nm^3 and the maximum level is 1400 mg/$Nm^{3.}$ The Petitioner has submitted that it is mandatory to comply with the statutory norms and in the absence of a technology being specified, NTPC cannot withhold such compliance.

43. We have considered the submissions of the Respondents and the Petitioner. The Petitioner has submitted that the present SO_2 and NO_X emission levels in case of SSTPSS-II; SO_2 emission level in case of TSTPSS-II; and NO_x emission level in case of RSTPSS-I is more than the norms prescribed by MoEFCC. Therefore, there is a requirement for installation of ECS in the instant generating stations of the Petitioner in order to bring down the emission levels to the norms prescribed by MoEFCC. Some of the Respondents have contended that the Petitioner should have given the present emission level of SO_2 in the NIT/ tender specification as the design and the manufacture of WFGD system would require the existing level of SO_2. We understand the concerns expressed by the Respondents as SO_2 removal efficiency can be tested only when the present 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 present emission level is an essential parameter, which would have been necessarily considered while selecting, designing and manufacturing the system for removal of SO_2. In this regard, it is also observed that the Petitioner has selected WFGD technology to bring down the present emission level of SO_2 in its generating stations on the basis of the various parameters prescribed by CEA.

Emission norms not applicable for old/ retiring plants

44. APEPDCL and APSPDCL in case of RSTPSS-I&II in Petition No. 730/MP/2020 have submitted that CEA has notified the list of TPPs which have completed or would complete their useful life on 1.1.2022 and are being considered for retirement. Hence, RSTPSS-I&II are exempted from complying with the revised ECNs as notified by MoEFCC by notification dated 31.3.2021. No petition has been filed by the Petitioner for extension of life in respect of RSTPSS-I&II as mandated under the 2019 Tariff Regulations. Consequently, there exists no approval by the Commission for the extended functioning of RSTPSS-I&II after 1.4.2016. Regulation 3(73) of the 2019 Tariff Regulations defines the useful life of a thermal power plant to be 25 years. Admittedly, the subject plant was declared under commercial operation on 1.4.1991 and, therefore, has completed its useful life on 1.4.2016. RSTPSS-I & II is running on Special Allowance under Regulation 28 of the 2019 Tariff Regulations. Special Allowance is a compensation granted for meeting the expenses of TPPs which are running beyond their useful life. The MoEFCC Notification dated 31.3.2021 has further exempted TPPs declared to retire before 31.12.2022 and 31.12.2025, depending on the category determined by the task force, from meeting the revised emission specified norms in the MoEFCC Notification. The objective of granting such exemption is to eliminate the unnecessary financial expenditure on

plants which will either become non-operational or near non-operation till the time ECS is finally commissioned in such plants, thereby rendering such expenditure infructuous. The Respondents have further submitted that the installation of WFGD system in retired or retiring plants is a waste of scarce national resources. Such ACE is not only unnecessary but is also a financial burden for the power distribution companies which are already under financial constraints.

45. In response, the Petitioner has submitted that being a prudent utility, it has planned essential R&M works through the option of Special Allowance dispensation provided in the Tariff Regulations. The Special Allowance 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 Special Allowance 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 in accordance with Regulation 29(2) read with Regulation 33(10)(c) of the 2019 Tariff Regulations.

46. TANGEDCO has submitted that as per the MoEFCC Notification 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.

47. In response, the Petitioner has submitted that as per the MoEFCC Notification dated 31.3.2021, CPCB shall categorise TPPs on the basis of their location to comply with the revised ECNs within the extended timelines. The Petitioner has submitted that the Petitioner has no plans to retire the units of station in the near future. Accordingly, instant station is required to comply with ECNs prescribed by the MoEFCC Notification. The Petitioner has also submitted that Special Allowance is being availed in RSTPSS-I&II in lieu of R&M and its fixed charges are low. The station is also running with high availability and PLF.

48. We have considered the submissions of the Petitioner and the Respondents. The Respondents have contended that installation of ECS in RSTPSS-I&II, which has completed its useful life on 1.4.2016, would increase the financial burden on the power distribution companies. The Respondents have also contended that as per the MoEFCC Notification dated 31.3.2021, it is not mandatory to implement ECS in the retiring plants like RSTPSS-I&II. The Petitioner has submitted that Special Allowance in terms of Regulation 28 of the 2019 Tariff Regulations is being availed by the Petitioner for RSTPSS-I&II and it does not intend to retire these plants in the near future and that it is mandatory to comply with the MoEFCC Notification in respect of these plants too. It is observed that though RSTPSS-I&II have completed useful life in 2016, the Petitioner is able to run them by availing Special Allowance of ₹9.5 lakh/MW/year in lieu of Renovation & Modernisation (R&M). Further, the fixed charges of RSTPSS-I&II is low and is also running with high availability and PLF.

49. 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 @₹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 reproduced below.

" (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[1].*	*Up to 31st December 2022*	*Up to 31st December 2022*
2	*Category B*	*Within 10 km radius of Critically Polluted Areas[2] or Non-attainment cities[2]*	*Up to 31st December 2023*	*Up to 31st December 2025*
3	*Category C*	*Other than those included in category A and B*	*Up to 31st December 2024*	*Up to 31st December 2025*

*[1] As per **2011** census of India.*
[2] 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.* ”

”

50. As per the above-quoted Notification, it is necessary to categorise TPPs into retiring or non-retiring TPPs by the task force. No document has been produced by the Respondents to show that RSTPSS-I&II have been categorised by the task force as retiring units as prescribed in the said Notification. Though RSTPSS-I&II 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.

51. TANGEDCO in Petition No. 612/MP/2020 has submitted that the Petitioner has stated that RSTPSS-III is having remaining useful life of 7.98 years and the Petitioner has to clarify whether there is any proposal for R&M works or life extension. In response, the Petitioner has submitted that the useful life of the station is up to 24.3.2030. However, as per the provisions of the 2020 Amendment Regulations, the depreciation towards installation of ECS petition is to be recovered over balance useful life of the generating station or unit thereof plus fifteen years as the instant station is in operation over 15 years. Extension of life is not envisaged for the instant station at this stage. Any R&M activity may be undertaken by the Petitioner at the end of the useful life based on the extant Tariff Regulations.

52. Similar contentions have been raised by the TANGEDCO in Petition No. 520/MP/2020 in case of TSTPSS-II wherein it has been submitted that the plant has

already served nearly 20 years. In response, the Petitioner has submitted that the useful life of the station is up to 31.7.2030. Presently, extension of life is not envisaged for the instant generating station.

53. TANGEDCO in Petition No. 730/MP/2020 in case of RSTPSS-I&II has submitted that as per Regulation 28 of the 2019 Tariff Regulations, if the Petitioner opts to avail Special Allowance instead of R&M, ACE cannot be allowed to the Petitioner till retirement of the Units. However, in spite of such clear prohibition in the 2014 Tariff Regulations, the Petitioner has claimed Special Allowance and ACE in Petition No. 292/GT/2014, which has been disallowed by the Commission in order dated 24.1.2017. However, the Petitioner has filed Appeal No. 96/2017 before the APTEL which is pending adjudication. To avoid ambiguity in future, the Commission may issue clear instructions that there shall be no claims in future for any expenses of capital nature since the Petitioner has stated that it will meet the repairs and maintenance cost through Special Allowance. In response, the Petitioner has submitted that the installation of ECS is mandatory as per the MoEFCC Notification. The compliance of revised ECNs cannot be considered for any cost assessment as it affects the life and health of citizens in the country. The Petitioner has further submitted that the MoEFCC Notification being a “change in law” event, the Petitioner is under obligation to comply with the same and install ECS at its TPPs. The requirement to conduct the RLA/ R&M Study was never directed by the Commission, CEA or MoEFCC.

54. APEPDCL and APSPDCL have submitted in case of RSTPSS-I&II that ACE towards installation of ECS should be met by the Petitioner out of the Special Allowance approved under Regulation 28 of the 2019 Tariff Regulations.

55. We have considered the submissions of the Respondents and the clarifications given by the Petitioner. As regards contention of the Respondents that the Petitioner should meet ACE towards installation of ECS from the Special Allowance granted, we are of the view that the Special Allowance is for meeting the requirement of expenses beyond the useful life of the generating station in case a generating station does not opt for R&M and ACE towards ECS, which is due to "change in law" event that involves huge expenditure and is in no way related to extension of useful life of a generating station, cannot be met from Special Allowance. As regards contention of the Respondents that the Petitioner should inform if it is going to avail R&M in respect of plants that are completing their useful life in future, we are of the view that any such proposal of the Petitioner shall be dealt with in accordance with law in terms of the then applicable Tariff Regulations.

56. In view of the above discussions, we hold that the instant petitions filed by NTPC are maintainable.

Analysis and Decision

57. The Petitioner has made similar prayers in the instant six petitions and they are as follows: (A) approve ACE for undertaking implementation of ECS in order to meet revised ECNs; (B) grant liberty to approach Commission for approval of implementation of remaining ECS in future, if required; (C) allow additional APC of 1%; (D) allow additional GSHR; (E) Allow additional water consumption; (F) additional O&M Expenses @ 4%; (G) allow cost of reagent; and (H) allow deemed availability of the station/ unit on account of shutdown on account of implementation of ECS. As the prayers made by the Petitioner are similar in nature they are dealt together in the following paragraphs.

(A) ACE for implementation of ECS

58. The Petitioner has sought in principle approval of ACE towards implementation of ECS in order to meet revised ECNs as per the MoEFCC Notifications. The Petitioner has proposed WFGD technology for control of SO_2 in all the generating stations covered in the instant six petitions. The Petitioner had proposed Combustion Modification as the primary measure and SNCR/SCR as the secondary measure to control NO_x emissions initially in the petition. Later, with the revision of norms for NO_x emissions from 300 mg/Nm^3 to 450 mg/Nm^3, the Petitioner is claiming ACE only towards installation of Combustion Modification in SSTPSS-II, RSTPSS-III and TSTPSS-II. The Petitioner has considered the capital cost of the ECS discovered through competitive bidding and certain other operating parameters to arrive at the indicative supplementary tariff initially in the petition. 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 Commission for the purpose of prudence check and on the basis of the concerns raised by the Respondents during the proceedings in these petitions, directed the Petitioner to submit certain information pertaining to the capital cost claimed towards ECS, the proposed technology for control of NO_x emissions, the approvals of the Petitioner's Board, etc. considered by the Petitioner for the subject generating stations. ACE claimed for implementation of ECS is specific to a generating station and it is accordingly dealt separately for each generating station.

The petition-wise claims made by the Petitioner for the subject generating stations are given in the following paragraphs.

59. ACE claimed in Petition No. 467/MP/2019 in respect of SSTPSS-II (2 x 500 MW):

(a) The Petitioner has claimed ACE towards installation of WFGD system for control of SO_2 emission and Combustion Modification for NO_x emission control for SSTPSS-II. The Petitioner has considered the following capital cost and operating parameters for computing the indicative supplementary tariff:

Sl. No.	Description	FGD*	SNCR (not proposed now)	Combustion Modification System	Remarks
1	Capital Cost	Rs. 565.23 crore	Rs. 50 crore (without tax/IDC etc.)	Rs. 17.53 crore	SNCR implementation shall be decided based on pilot test report.
5	Normative Specific Limestone/Reagent Consumption (kg/kWh)	0.0158 (Limestone)	0.0015 (Urea)	Nil	
6	Additional APC	1%	0.2%	Nil	
7	Additional O&M Expenses	4% of capital cost			
8	Shutdown Period	30-45 days for each unit	15 days for each unit	45 to 60 days for each unit	
9	Increase in GSHR		11.8 Kcal/kWh	18.87 Kcal/kWh	0.8% increase: due to Combustion modification 0.4 to 0.6% increase: due to SNCR

(b) The indicative supplementary tariff impact (without considering the impact on GSHR) due to installation of ECS to meet revised ECNs is FC (fixed charges): 19.80 paise/kWh, VC (variable charges): 6.09 paise/kWh (1st year) and FC: 19.10 paise/kWh (levelised). There would be further increase in

Energy Charge Rate and per unit Fixed Charge (@ 85% scheduled generation) of the station by about 8-9 paise/kWh due to increased APC and Station Heat Rate.

(c) SSTPSS-II was commissioned on 30.9.2012 and has been in operation for only 9 years.

(d) Seawater-based FGD is not selected for coastal power stations like SSTPSS-I and SSTPSS-II as it has closed cycle water system and that the Seawater-based FGD system is suitable for Open Cycle Water System. Seawater-based technology is suitable for the stations where once through cooling water system is provided since this requires intake of huge quantity of water which is drawn from sea and then on return is used for FGD system. SSTPSS-II is equipped with closed cooling water system which requires miniscule amount of sea water for cooling purpose and no water goes back to sea. Hence, Seawater-based FGD has not been chosen.

(e) The Board of Directors of the Petitioner in its 444th Meeting held on 22.3.2017 gave their approval for planning and tendering of ECS to comply with the MoEFCC Notification dated 7.12.2015. In the 471st meeting of the Board of Directors of the Petitioner on 3.5.2019, the proposal to award the contracts for the FGD package and Investment Approval to undertake implementation of FGD system was approved. IFB for installation of FGD system was issued by the Petitioner on 31.8.2018. GE Power India Limited emerged as the successful bidder and NoA was issued on 24.5.2019. GE Power India Limited has started the process for installation of FGD system and at present, the civil works is in progress.

(f) As per the 2015 MoEFCC Notification, the emission norms with respect to NO_x was 300 mg/Nm^3. Accordingly, the Petitioner had sought approval of ACE on account of Combustion Modification System i.e. Low NO_x burners (primary control) and SNCR as secondary control. The norm was revised vide Notification dated 19.10.2020 to 450 mg/Nm^3. Therefore, the Petitioner is now proposing only implementation of Combustion Modification as primary system of De-NO_x to bring the level of NO_x emission below 450 mg/Nm^3 and the

secondary De-NO_x system of SNCR proposed initially in the petition will not be implemented for the present.

(g) The estimated cost of implementation of Combustion Modification for NO_x reduction is ₹17.53 crore.

(h) The break-up of the capital cost claimed by the Petitioner for FGD implementation 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)
40.5	43.57	3287.13	1544.8	***	7854.9	264.05	56523.03

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

(i) The variation in the estimated hard cost proposed by Petitioner and the CEA indicative cost is due to efflux of time.

60. ACE claimed in Petition No. 64/MP/2020 in respect of SSTPSS-I (2 x 500 MW):

(a) WFGD has been proposed for control of SO_2 emission in SSTPSS-I (2X500 MW).

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

Sl. No.	Description	FGD
1	Capital Cost	Rs. 565.23 crore
2	Normative Specific Limestone/Reagent Consumption (Kg/ kWh)	0.0158 (Limestone)
3	Additional APC	1%
4	Additional O&M Expenses	4.0% of project cost
5	Shutdown Period	30- 45 days for each unit

(c) The indicative supplementary tariff impact (without considering the impact on GSHR) due to installation of ECS in order to meet revised ECNs is FC: 26.05 paise/kWh, VC: 2.54 Paise/kWh (1st year) and FC: 23.40 paise/kWh (levelised). Further, increase in Energy Charge Rate and per unit Fixed charge

(@ 85 % scheduled generation) of the station by about 4-5 paise/ kWh due to increased APC is anticipated.

(d) SSTPSS-I was put into commercial operation on 1.3.2003 and has been in operation for a period of 18 years.

(e) In line with the CEA advisory, WFGD technology has been selected for reduction of SO_2 emissions. The selection of technology was carried on the basis of best technology available in terms of plant specifications.

(f) The Board of Directors of the Petitioner, in its 444th meeting held on 22.3.2017, gave their approval for planning and tendering of ECS and also accorded the Investment Approval to undertake implementation of FGD system at the instant station. In the 471st meeting dated 3.5.2019, the proposal to award the contracts for the FGD package and the investment approval to undertake and install WFGD system was approved.

(g) IFB was issued on 31.8.2018 on DCB format. GE Power India Limited emerged as the successful bidder and on 24.5.2019, NoA was issued to GE Power India Limited for installation of FGD.

(h) The bidding and award has been carried out in a fair and transparent manner as per DOP (Delegation of Power) of NTPC, which is in line with the Government of India guidelines. At present, the civil works is in progress.

(i) The Petitioner has not proposed implementing any scheme for NO_x reduction in the instant station.

(j) The break-up of the capital cost claimed by the Petitioner for WFGD system installation 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)
40.5	43.57	3287.13	1544.8	***	7854.9	264.05	56523.03

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

61. ACE claimed in Petition No. 520/MP/2020 in respect of TSTPSS-II (4 x 500 MW):

(a) The Petitioner has submitted that WFGD system is being implemented for control of SO_2 emission in TSTPSS-II (4x500 MW).

(b) The following capital cost, phasing of funds and operating parameters have been claimed for computing the indicative supplementary tariff:

Sl. No.	Description	FGD	SNCR ^^ (not proposed now)	Combustion Modification System ^^	Remarks
1	Capital Cost	Rs. 1155.36 crore	Rs. 106.9 crore	Rs. 17.753 crore	SNCR implementation shall be decided based on pilot test report.
2	Normative Specific Limestone/Reagent Consumption (kg/ kWh)	0.0158 (Limestone)	0.002 (Urea)	Nil	
3	Additional APC	1%	0.2%	Nil	
4	Additional O&M Expenses	4% of capital cost			
5	Shutdown Period	45 days for each unit	15 days for each unit	45 to 60 days for each unit	
6	Increase in GSHR for each unit (Unit # 3 & 4)		14.34 Kcal/ kWh	19.12 Kcal/ kWh	0.8 % increase: due to Combustion modification 0.6% increase: due to SNCR

^^ CM and SNCR is being implemented in 2 Units only (Unit # 3 & 4). For the purpose of tariff, estimated impact on Station Heat rate & APC and Urea consumption has been considered on average basis for the Station.

(c) The indicative supplementary tariff (without considering the impact on GSHR) due to installation of ECS in order to meet revised ECNs is: Fixed Cost (FC): 26.22 paise/kWh; Variable Cost (VC): 4.72 paise/kWh (1st year) and FC: 23.55 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 envisaged due to increased APC and Station Heat Rate.

(d) TSTPSS-II (COD of Unit-I, Unit-II, Unit-III and Unit-IV was 1.8.2003, 1.3.2004, 1.11.2004 and 1.8.2005 respectively) and the remaining useful life of the instant station is 9.29 years as on 1.4.2020. Accordingly, as of now, no life extension activity is being carried out by the Petitioner and no life extension beyond useful life is envisaged at this stage.

(e) In order to avoid sudden increase in tariff, the Petitioner has spread the depreciation over 7.29 years from the date of operation of ECS. Therefore, in the Petition to be filed for determination of supplementary tariff as per the provisions of Regulation 29(4) of the 2019 Tariff Regulations, the depreciation shall be computed in accordance with the provisions of the 2019 Tariff Regulations as amended vide the 2020 Amendment Regulations.

(f) The Board of Directors of the Petitioner, in its 444th Meeting held on 22.3.2017, gave their approval for planning and tendering of ECS to comply with the MoEFCC Notification. The Petitioner's Board of Directors in its 482nd Meeting on 19.3.2020 approved the proposal to award the contracts for the FGD package and Investment Approval to undertake implementation of FGD system.

(g) IFB for installation of FGD system at the instant station was issued on 27.8.2019 as per the DCB format. Tata Projects Limited emerged as the successful bidder. Accordingly, on 30.3.2020, NoA was issued to Tata Projects Limited for FGD system installation at the instant station. At present, the Engineering, Ordering by vendor & Civil works is in progress at the instant station.

(h) TSTPSS-II consists of Stage-I (1000 MW) having 2 units of 500 MW and Stage-II having 4 unit of 500 MW, thereby having a combined capacity of 3000 MW. Therefore, NIT for implementation of FGD system for both the stages (i.e. 3000 MW) was clubbed in one package to reap the benefits of economies of scale in order to lower the overall cost of WFGD system and domestic bids were invited to get better competitive price.

(i) ECNs with respect to NO_x emission was 600 mg/Nm^3 for Unit 1 and Unit 2 (Category-I) and 300 mg/Nm^3 for Unit 3 and Unit 4 (Category-II). Accordingly, the Petitioner had sought approval of ACE on account of installation of Combustion Modification System and SNCR in Unit 3 and Unit 4 while no De-NO_x system was envisaged in Unit-1 and Unit-2 of TSTPSS-II. However, with the revision in NO_x emission norms from 300 mg/Nm^3 to 450 mg/Nm^3 by MoEFCC *vide* Notification dated 19.10.2020, the Petitioner is now proposing installation of only Combustion Modification in Unit 3 and Unit 4 to bring the level of NO_x emission below 450 mg/Nm^3. No SNCR is proposed in any of the units.

(j) The contract for installation of Combustion Modification in two units of the instant station has been awarded to GE through Competitive Bidding Route.

(k) The estimated project cost for installation of Combustion Modification system is ₹17.753 crore and ₹1155.36 crore for WFGD system.

(l) The break-up of the capital cost claimed by the Petitioner for WFGD system implementation 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)
40.5	44.54	6863.6	3153.33	***	16034.7	404	115536

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

62. ACE claimed in Petition No. 612/MP/2020 in respect of RSTPSS-III (500 MW):

(a) The Petitioner has claimed ACE toward WFGD system for control of SO_2 emission and Combustion Modification and SNCR for NO_x emission control in RSTPSS-III. The Petitioner has considered the following capital cost and operating parameters for computing the indicative supplementary tariff:

Sl. No.	Description	FGD	SNCR (not proposed now)	Combustion Modification System	Remarks
1	Capital Cost	Rs. 309.76 crore	Rs. 26.92 crore	Rs. 8.86 crore	SNCR implementation shall be decided based on pilot test report.
2	Normative Specific Limestone/ Reagent Consumption (Kg/ kWh)	0.016 (Limestone)	0.002 (Urea)	NIL	
3	Additional APC	1%	0.2%		
4	Additional O&M Expenses		4% of capital cost		
5	Shutdown Period	45 days	15 days	60 days	
6	Increase in GSHR		14.34 Kcal/ kWh	19.12 Kcal/ kWh	0.8 % increase: due to Combustion modification 0.6% increase: due to SNCR

(b) The indicative supplementary tariff impact (without considering the impact on GSHR) due to installation of schemes in order to meet revised ECNs is FC: 27.38 paise/kWh, VC: 6.88 Paise/ kWh (1st year) and FC: 25.43 paise/kWh (levelised). There would be further increase in Energy Charge Rate and per unit Fixed Charge (@85% Scheduled Generation) of the station by about 7 paise/kWh due to increased APC and Station Heat Rate.

(c) RSTPSS-III was commissioned on 25.3.2005 and has been operational only for 16 years.

(d) WFGD system is the most appropriate technology to meet the stipulation as prescribed under the MoEFCC Notification. The Board of Directors of the Petitioner, in its 444th Meeting held on 22.3.2017, gave the approval for planning and tendering of ECS to comply with the MoEFCC Notification.

(e) IFB for installation of FGD system at the instant station was issued on 27.8.2019 on DCB format. Engineering Projects (India) Limited ("EPIL") emerged as a successful bidder. The Board of directors, in the 481st Meeting dated 7.2.2020, accorded the Investment Approval to undertake implementation of WFGD system. In its meeting dated 3.4.2020, the proposal to award the contracts for the WFGD package was approved. Accordingly, on 7.4.2020, NoA was issued to EPIL for WFGD system installation. EPIL has started the process for installation of FGD system at the instant station. At present, the process of engineering and ordering of equipment by the Vendor is in progress.

(f) The break-up of the capital cost claimed by the Petitioner for FGD system implementation is as follows:

Generating station & capacity (MW)	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)
RSTPSS-III 500 MW	40.5	47.01	2297.48	832.14	***	4231.22	108.4	30976.02

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

(g) The variation in the hard cost of WFGD system claimed and the CEA recommended cost is due to efflux of time and the CEA recommended cost is only indicative cost.

(h) The instant station would be able to comply with NO_x norms with installation of Combustion Modification system. The awarded capital cost of Combustion Modification system is ₹8.86 crore (capital cost includes IDC and GST).

63. ACE claimed in Petition No. 613/MP/2020 in respect of KSTPSS-I (3 x 800 MW):

(a) The Petitioner has proposed WFGD system for control of SO_2 emission for KSTPSS-I. The Petitioner has considered the following capital cost and operating parameters for computing the indicative supplementary tariff:

Sl. No.	Description	FGD	SCR	Remarks
1	Capital Cost	Rs. 928.52 crore	Rs. 890.07 crore	SCR implementation shall be decided based on pilot test report.
2	Normative Specific Limestone/ Reagent Consumption (Kg/ kWh)	0.012 (Limestone)	0.001 (Ammonia)	
3	Additional APC	1%	0.3%	
4	Additional O&M Expenses	4% of capital cost		
5	Shutdown Period	45 days	15 days	
6	Increase in GSHR		2.21 Kcal/ kWh	Modification, 0.1% increase: due to SCR

(b) The indicative supplementary tariff impact (without considering the impact on GSHR) due to installation of ECS in order to meet revised ECNs is FC: 23.64 paise/kWh, VC: 7.42 Paise/kWh (1st year) and FC: 22.17 paise/kWh (levelised). There would be further increase in Energy Charge Rate and per unit Fixed Charge (@85% Scheduled Generation) of the station by about 7 paise/kWh due to increased APC and Station Heat Rate.

(c) KSTPSS-I achieved COD on 15.9.2018 and has been in operation for 2.5 years.

(d) The Board of Directors of the Petitioner, in its 444th Meeting held on 22.3.2017, gave their approval for planning and tendering of ECS to comply with the MoEFCC Notification. In the 462nd Meeting of the Board of Directors of the Petitioner on 28.7.2018, the proposal to award the contracts for WFGD package and Investment Approval to undertake implementation of WFGD system at the instant station was accorded. Thereafter, IFB for installation of WFGD system at the instant station was issued on 30.6.2017. ISGEC Heavy Engineering Limited ("ISGEC") emerged as a successful bidder. Accordingly, on 31.7.2018, NoA was issued to ISGEC for installation of WFGD system at the instant station. ISGEC has started the process for installation of WFGD system and at present, the process of civil and erection works is in progress.

(e) Though the CEA Advisory dated 7.2.2020 was issued post the award of contract for installation of WFGD system, the technology adopted by the Petitioner is in compliance with the CEA's recommendations and guidelines.

(f) As per the MoEFCC Notification dated 7.12.2015, the emission norms with respect to NO_x in respect of KSTPSS-I is 100 mg/Nm^3. Accordingly, the Petitioner has sought approval of ACE on account of SCR. SCR is the most widely used technology to reduce NO_x emissions following combustion in coal-fired plant. However, the emission norm of 100 mg/Nm^3 for NO_x is under challenge before the Hon'ble Supreme Court and a relaxation in the stringent norm is being sought by TPPs including the Petitioner. Therefore, the matter is *sub-judice* and the installation of SCR will depend upon the outcome of the judgment of the Hon'ble Supreme Court. Accordingly, no contract has been awarded for installation of SCR for De-NO_x. Further, no Combustion Modification (primary control) is being envisaged in the instant station. Therefore, the indicative cost of ₹890.07 crore claimed for De-NO_x is only towards SCR installation on estimated basis.

(g) The break-up of the capital cost claimed by the Petitioner for FGD system implementation 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)
30	29.66	6007.37	2520	****	12813.56	324.98	92852.35

*** *Extra rupee liability on account of FERV, if any shall be claimed based on actuals*

(h) The hard cost of the WFGD system is comparable with CEA indicative hard cost.

64. ACE claimed in Petition No. 730/MP/2020 in respect of RSTPSS-I&II (3x200 MW + 3x500 MW):

(a) The Petitioner has claimed WFGD system for control of SO_2 emission and Combustion Modification and SNCR for NO_x emission control for RSTPSS-

I&II. The Petitioner has considered the following capital cost and operating parameters for computing the indicative supplementary tariff:

Sl. No.	Description	FGD
1	Capital Cost	Rs. 1254.65 crore
2	Avg. Normative Specific Limestone/Reagent Consumption (Kg/ kWh)	0.01614 (Limestone)
3	Additional APC	1%
4	Additional O&M Expenses	2.0% of (FGD Capital cost excluding IDC & IEDC)
5	Shutdown Period	45 days for each unit

(b) The indicative supplementary tariff impact (without considering the impact on GSHR) due to installation of ECS in order to meet revised ECNs is FC: 18.25 paise/kWh, VC: 2.63 paise/kWh (1st year) and FC: 16.45 paise/kWh (levelised). There would be further increase in Energy Charge Rate and per unit Fixed charge (@ 85 % scheduled generation) of the station by about 3-4 paise/kWh due to increased APC. Further, since combined tariff of all six units (2x300+ 3x500 MW) of RSTPSS-I&II is determined, supplementary tariff has also been considered on the same basis.

(c) RSTPSS-I&II were commissioned on 1.4.1991 and has completed its useful life.

(d) WFGD technology adopted by the Petitioner is in line with the CEA norms and it would meet the evaluation criteria of CEA Advisory dated 7.2.2020 and would also meet the SO_2 emission norms as stipulated by MoEFCC.

(e) The Board of Directors of the Petitioner, in its 444th Meeting held on 22.3.2017, gave their approval for planning and tendering of ECS to comply with the MoEFCC Notification. In the 473rd Meeting dated 1.7.2019 of Board of Directors of the Petitioner, the proposal to award the contracts for WFGD package was approved. The Board of Directors in the 475th Meeting dated 10.8.2019, accorded the Investment Approval to undertake implementation of FGD system at the instant station. IFB for installation of WFGD system at the instant station was issued by the Petitioner on 28.9.2018 on DCB. BHEL emerged as the successful bidder. Accordingly, NoA was issued to BHEL on

22.8.2019 for WFGD system installation at the instant station. BHEL has commenced work at the project site and presently the ordering of civil and engineering equipment's is under progress.

(f) The break-up of the capital cost claimed by the Petitioner for installation of WFGD system 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 (200MW) 40.5 (500MW)	46.16	7653.22	3431.43	***	17447.96	0	125465.72

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

(g) The Petitioner has not proposed any system for NO_x reduction in the instant station.

65. On the basis of the claims made by the Petitioner, the following three issues arise for our consideration (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.

(a) *Approvals and bidding process*

66. GRIDCO in Petition No. 520/MP/2020 has submitted that the Petitioner has not submitted the copy of the recommendations of the Bid Evaluation Committee and it is not clear whether any Bid Evaluation Committee was constituted by the Petitioner and/or what procedure was followed by the Petitioner before finalizing and awarding the contract for installation of FGD system. In response, the Petitioner has submitted that neither the 2019 Tariff Regulations nor other laws prohibit the Petitioner to float tender of multiple units/ stations together. Talcher Station consists of Stage-I (1000 MW) having 2 units of 500 MW each and Stage-II having 4 unit of 500 MW each,

thereby having a combined capacity of 3000 MW. Therefore, IFB for implementation of FGD system for both the stages (i.e. 3000 MW) of Talcher station was clubbed together in one package to reap the benefits of economies of scale in order to lower the overall cost of WFGD system and domestic bids were invited to get better competitive price.

67. We have considered the submissions of the Petitioner and GRIDCO. The Petitioner's Board of Directors considered the revised ECNs notified by MoEFCC pertaining to SO_2 and NO_x in its ~~444~~th Meeting held on 22.3.2017 and gave approval for planning and tendering of ECS to comply with the MoEFCC Notification. Thereafter, the Petitioner went through various stages of selection of technology on the basis of efficiency, 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 on Two-stage Bidding basis, i.e. Techno-commercial Bid and Price Bid. The bidders were evaluated and those found qualified in the first stage (Techno-commercial Bid) were asked to submit price bids through e-tendering portal. Based on the price bids, the L1 bidder was considered for award of contract. IFBs for installation of FGD system in the subject generating stations in the instant six petitions were issued over a period from 30.6.2017 to 27.8.2019. The Petitioner's Board of Directors in its 462nd, 471st and 473rd meetings held over a period from 28.7.2018 to 3.4.2020 approved the award of FGD system packages. The Investment Approval for FGD system packages in its various TPPs was accorded in the 462nd, 471st, 475th, and 481st Board Meetings. Accordingly, the Petitioner issued NoA to the L1 bidders in stages from 31.7.2018 to 7.4.2020. The said details are tabulated as follows:

Petition No. Generating station/unit Capacity (MW)	BoD Meeting number and date of approval of the 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
467/MP/2019 SSTPSS-II (2X500)	444th 22.3.2017	31.8.2018	471st 3.5.2019	471st 3.5.2019	24.5.2019
64/MP/2020 SSTPSS-I (2X500)	444th 22.3.2017	31.8.2018	471st 3.5.2019	471st 3.5.2019	24.5.2019
520/MP/2020 TSTPSS-II (4X500)	444th 22.3.2017	27.8.2019	482st 19.3.2020	482nd 19.3.2020	30.3.2020
612/MP/2020 RSTPSS-III (500)	444th 22.3.2017	27.8.2019	473rd 3.4.2020	481st 7.2.2020	7.4.2020
613/MP/2020 KSTPSS-I (3x800)	444th 22.3.2017	30.6.2017	462nd 28.7.2018	462nd 28.7.2018	31.7.2018
730/MP/2020 RSTPSS-I&II (3x200+3x500)	444th 22.3.2017	28.9.2018	473rd 1.7.2019	475th 10.8.2019	22.8.2019

68. We have perused the extracts of the various meetings of the Petitioner's Board submitted by the Petitioner. The Petitioner has also certified that bidding and award has been carried out in a fair and transparent manner as per Delegation of Power (DoP) of the Petitioner and it is in line with the Government of India guidelines. The Petitioner has also submitted that WFGD is the most appropriate technology to meet ECNs specified in the MoEFCC Notification and it also meets the CEA's Advisory dated 7.2.2019. NoA has been issued by the Petitioner in case of all the generating stations and work is under progress. Based on the submissions made by the petitioner, we are of the view that the whole process from identification of FGD package to NoA was with the approval of the Petitioner's Board and it is as per the procedure laid down under its DoP and the bidding was carried out in a fair and transparent manner.

(b) *Suitability and effectiveness of the ECS*

A. Reduction of SO_2 emissions

69. As per the directions of the Commission in order dated 20.7.2018 in Petition

No.98/MP/2017, CEA on 20.2.2019 issued a letter on 'Operation Norms for Thermal Generating Stations for the Tariff Period 2019-2024' wherein it has recommended four types of technologies for reduction of SO_2 emission levels in order to comply with revised SO_2 emission norms notified by MoEFCC and they are as follows:

(a) Wet Limestone based FGD;

(b) Lime Spray Drier/ Semi-dry Semi FGD;

(c) Dry Sorbent Injection based FGD (DSIFGD); and

(d) Furnace Injection in CFBC Boilers.

70. The Petitioner has proposed WFGD system to comply with the revised SO_2 emission norms in case of the instant six generating stations. The Petitioner has submitted that as per the CEA's Advisory dated 7.2.2020, TPPs should select the appropriate FGD technology based on parameters like SO_2 removal efficiency, units' size, balance plant life and the geographical location of TPPs. Accordingly, suitability of the different technologies for SO_2 removal summarised by the Petitioner is as follows:

Unit Size	Dry Sorbent Injection FGD (DSIFGD)	Ammonia FGD (AFGD)	Limestone FGD (WFGD)	Sea Water FGD (SWFGD)
60-250MW	✓	✓	✓	✓
500 MW & above	×	×	✓	✓
Remarks/ Conclusions	Suitable for low PLF stations	Handling of hazardous chemical. Can cause large physiological damages or even deadly explosions.	Most versatile, suitable for all units and operating conditions	Can be used only where sea water is used for condenser cooling in open cycle

71. The Petitioner has submitted that DSIFGD is suitable only for small units of 60 MW to 250 MW and operating at low PLF. SWFGD is suitable for units/ stations located on sea coast and operating in open cycle-once through cooling system. WFGD is suitable for any size of unit. AFGD is suitable for unit size below 500 MW

but ammonia being a hazardous chemical involves inherent risks.

72. The Petitioner has submitted that it has conducted cost-benefit analysis amongst the technologies and various technologies i.e., WFGD, Lime spray Drier/Semi-dry FGD, DSIFGD and Furnace Injection in CFBC Boilers.

73. The Petitioner has submitted that DSIFGD technologies based on dry sorbent injection is preferable for unit size of 60 MW-250 MW range since the reagent cost in this technology is relatively higher than WFGD and AFGD. It is suitable for units running on low PLF and units with balance operating life of 7-9 years. The Petitioner has submitted that AFGD Technologies based on Ammonium as a reagent are preferable for units below 500 MW. Ammonium based technologies have approximately 10% less CAPEX and APC when compared to WFGD. Moreover, by-product of Ammonia based FGD technologies, i.e. Ammonium Sulphate is easily saleable. However, handling of Ammonium, which is volatile, and its availability are of concern.

74. Accordingly, the Petitioner has proposed WFGD system to comply with the revised SO_2 emission norms in case of all the subject generating stations covered in the instant six petitions. The Petitioner has submitted that WFGD System based on limestone slurry as reagent is most versatile and suitable for any unit size. It has large footprint when compared to Ammonium based and dry type FGD technologies. The Petitioner has submitted that the WFGD System has been selected over other technologies due to the following reasons:

(a) It has been used successfully around the world;

(b) It is capable of very high SO_2 removal efficiency (around 98%);

(c) The process operates with very low Ca/S molar ratio, typically in the range of 1 to 1.1, which brings down the operating cost, particularly when sorbent utilization is vital to plant economics;

(d) The by-product of the process i.e. gypsum is easily marketable and help to bring down the operating cost;

(e) Best suited for high PLF stations;

(f) There are more number of technology providers, leading to advantage on competitive bidding process.

75. The Petitioner has 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 the parameters like SO_2 removal efficiency, units size, balance plant life and the geographical location of TPPs. The Advisory is suggestive in nature and not mandatory. The Petitioner has submitted that the Advisory has been issued post the award of contract for installation of FGD by the Petitioner. The Petitioner has submitted that the technology proposed by the Petitioner is in compliance with the CEA's Advisory and would also meet the SO_2 emission norms specified by MoEFCC. The Petitioner has further submitted that the Commission in the order dated 28.4.2021 in Petition No. 335/MP/2020 & Ors. has already held that identification of WFGD System by the Petitioner was as per the CEA Guidelines. The Petitioner has submitted that FGD technology for individual station has been adopted/ selected on various criteria along with the due prudence in view of comparative cost benefit analysis of such technologies.

76. APEPDCL in Petition No. 467/MP/2019, Petition No. 64/MP/2020, Petition No. 730/MP/29019, Petition No. 612/MP/2020, Petition No. 613/MP/2020 and Petition No. 520/MP/2020 has submitted that the Petitioner has not furnished certificate from competent authority to the effect that ECS adopted by the Petitioner is as per CEA

recommendations and is the most cost-effective technology. The Petitioner has assumed itself to be the competent authority for such certification and has merely furnished extracts of the Minutes of Meeting dated 1.7.2019 of the Board of Directors of the Petitioner to certify that WFGD technology is best suited for its generating stations. The reliance by the Petitioner on Regulation 3(40) of the 2019 Tariff Regulations is misplaced as “competent authority” is not defined in the 2019 Tariff Regulations. Regulation 3(40) of the 2019 Tariff Regulations allows the Board of Directors of the Petitioner to give administrative sanctions and has no authority or technical know-how to certify that ECS technology chosen by the Petitioner is as per CEA recommendations and that the same is the best suited cost-efficient technology. Absence of a certificate from a competent authority like CEA raises serious doubts and questions regarding use and necessity of FGD technology in the subject plants. APEPDCL and APSPDCL have further submitted that in case the Commission comes to the conclusion that WFGD as proposed by the Petitioner is in fact necessary and best-suited for the subject plant, the Commission must ensure the following:

(a) The Petitioner should furnish adequate data about the performance of ECS after installation and the expected Monitoring, Verification & Reporting (MVR) systems for checking the efficiency of ECS in real time operations.

(b) The Petitioner should include the parameters achieved by ECS on a monthly basis in the supplementary bills to be raised.

(c) The Petitioner should transfer the economic value of any by-product yielded on installation of WFGD system to the Respondents.

(d) Prudence check should be conducted for ascertaining additional APC, gross station heat rate, water consumption, additional O&M Expenses, cost of reagents etc.

(e) CEA may be directed to give their recommendation regard the feasibility and need for installation of WFGD along with the technology sought to be used and the corresponding estimate of additional expenditure.

77. In response, the Petitioner has submitted that WFGD technology has been adopted by the Petitioner in compliance of the CEA norms and meets the evaluation criteria of the CEA Advisory dated 7.2.2020. WFGD System adopted by the Petitioner meets SO_2 emission norms stipulated by MoEFCC. The CEA Advisory is merely advisory in nature. Nonetheless, the technology adopted by the Petitioner is in compliance with the Advisory. As regards certificate of the "competent authority", the Petitioner has submitted that Regulation 3(40) of the 2019 Tariff Regulations defines 'competent authority' for approval of Investment Approval. Neither the MoEFCC Notification nor the 2019 Tariff Regulations mandates approval of the "Competent Authority" for filing a petition under Regulation 29 of the Tariff Regulations.

78. TANGEDCO in Petition No. 467/MP/2019 and Petition No.613/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 ECNs notified by MoEFCC. 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. A suitable procedure for checking the emission parameters periodically must be devised and include the parameters achieved on monthly basis in the supplementary bill to be raised as per Regulation 14(2) of the 2019 Tariff Regulations. In response, the Petitioner has submitted that the actual performance data of ECS is not available with the Petitioner as the schemes are under

implementation. However, the station will meet the prescribed norms after implementation of the schemes. The Petitioner has submitted that it is also submitting SO_2 and NO_x emission levels to the Pollution Control Board on regular basis.

79. KSEBL in Petition No. 613/MP/2020 has submitted that the requirement of WFGD system for SO_2 control and SCR for NO_x control be examined by CEA. In response, the Petitioner has submitted that the technology selection of various ECS in the instant station are in line with the advisory of CEA dated 7.2.2020. The detailed description of the technology selection for reduction of flue gases has already been provided in the Petition No. 613/MP/2020.

80. GRIDCO has submitted that the Petitioner should have carried out the cost benefit analysis before approaching for “in-principle” approval for incurring capital expenditure for installation of ECS and that the Petitioner has not provided any information to show that the adopted FGD technology would meet the evaluation criteria indicated in the CEA Advisory and is best cost-effective technology. In response, the Petitioner has submitted that the cost-benefit analysis is not mandatory for the purpose of installation of FGD as per the CEA Advisory and the 2019 Tariff Regulations. As regards the suitability of WFGD system, the Petitioner has submitted that WFGD system is suitable for the units of 500 MW and above as per the CEA and accordingly the same has been selected for TSTPS.

81. The Petitioner in its Written Submissions has submitted that cost benefit analysis of the various ECS technologies like DSIFGD, WFGD, AFGD and SWFGD for reduction of SO_2 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 system is the most cost-effective technology for SO_2 removal and it is in line with the CEA recommendations and has submitted the following details in support of its contention.

Petition No. 467/MP/2019 - SSTPSS-II

(₹ in crore)

Particulars	**DSIFGD**	**WFGD**	**AFGD**	**SWFGD**
Annual Supplementary Capacity Charges (A)	24.84	94.06	86.28	223.36
Annual Supplementary Energy Charges (B)	168.29	27.66	90.77	34.11
Annual Supplementary Charges (C=A+B)	193.13	121.72	177.05	257.47

Petition No.64/MP/2020 **-** SSTPSS-I

(₹ in crore)

Particulars	**DSIFGD**	**WFGD**	**AFGD**	**SWFGD**
Annual Supplementary Capacity Charges (A)	25.68	98.20	90.00	223.40
Annual Supplementary Energy Charges (B)	170.55	28.50	92.27	35.18
Annual Supplementary Charges (C=A+B)	196.23	126.70	182.27	268.59

Petition No. 520/MP/2020 - TSTPSS-II

(₹ in crore)

Particulars	**DSIFGD**	**WFGD**	**AFGD**
Annual Supplementary Capacity Charges (A)	50.43	195.88	179.53
Annual Supplementary Energy Charges (B)	387.63	46.40	194.21
Annual Supplementary Charges (C=A+B)	438.06	242.27	373.74

Petition No. 612/MP/2020**-** RSTPSS-III

(₹ in crore)

Particulars	**DSIFGD**	**WFGD**	**AFGD**
Annual Supplementary Capacity Charges (A)	12.17	51.03	46.69
Annual Supplementary Energy Charges (B)	102.25	13.59	52.89
Annual Supplementary Charges (C=A+B)	114.42	64.62	99.58

Petition No. 613/MP/2020 **-**KSTPSS-I

(₹ in crore)

Particulars	**DSIFGD**	**WFGD**	**AFGD**
Annual Supplementary Capacity Charges (A)	57.49	153.29	141.58
Annual Supplementary Energy Charges (B)	146.26	25.69	80.57
Supplementary Charges (C=A+B)	203.75	178.99	222.15

Petition No. 730/MP/2020 - RSTPSS-I&II

(₹ in crore)

Particulars	Ramagundam-I			Ramagundam-II		
	DSI FGD	WFGD	AFGD	DSI FGD	WFGD	AFGD
Annual Supplementary Capacity Charges (A)	18.30	77.37	70.61	45.75	193.44	176.52
Annual Supplementary Energy Charges (B)	117.41	15.99	61.01	293.54	39.98	152.54
Annual Supplementary Charges (C=A+B)	135.71	93.37	131.62	339.29	233.42	329.06

B. Reduction of NO_x emissions

82. The Petitioner had initially considered Combustion Modification as the primary measure and SNCR and SCR as the secondary measure to meet the norms w.r.t. NO_x emission. Later, with the revision of emission norms for NO_x for TPPs installed during the period from 1.1.2004 to 31.12.2016 from 300 mg/Nm^3 to 450 mg/Nm^3 by MoEFCC vide Notification G.S.R. 662(E) dated 19.10.2020, the Petitioner has proposed installation of only Combustion Modification as primary system of De-NO_x to bring the level of NO_x emission below 450 mg/Nm^3 in SSTPSS-II, TSTPSS-II and RSTPSS-III i.e. in three out of the six generating stations covered in this order and the secondary De-NO_x system of SNCR proposed initially is not being implemented in any generating station. In case of KSTPSS-I, the Petitioner has proposed only SCR to meet the revised NO_x emission norm of 100 mg/Nm^3, applicable to generating stations/ units commissioned on or after 1.1.2007. The Petitioner has submitted that the matter seeking relaxation in emission norms for revising NO_x emission norm of 100 mg/Nm^3 applicable to generating stations commissioned on or after 1.1.2017 is *sub judice* before the Hon'ble Supreme Court. Therefore, installation of SCR is dependent on the outcome of the Hon'ble Supreme Court judgment.

83. TANGEDCO has submitted that the Petitioner in case of SSTPSS-II in Petition

No. 467/MP/2020 has submitted that the Petitioner is intending to replace the existing boiler burners with Low-NO_x burners. However, the Petitioner has not stated whether OEM of the boiler was consulted in this regard and, if so, it has not submitted the recommendation of OEM. Due to change in temperature profile of the furnace and pattern, LNB retrofits lead to higher economizer inlet temperatures and increase in unburnt carbon. This increases the heat loss of boiler, resulting in increase of heat rate. The increase in unburnt carbon will warrant consumption of more coal, which will increase the emission of SO_2 and NO_x, thereby offsetting any reduction due to installation of ECS. Hence, the effectiveness of this methodology in terms of consumption of more coal due to increase in unburnt carbon has to be verified before implementation. The quantum of increase in coal consumption due to increase in unburnt carbon has not been detailed by the Petitioner.

84. In response, the Petitioner has submitted that the emission norm for NO_x for SSTPSS-II was initially 300 mg/Nm^3 as per the MoEFCC Notification. Accordingly, as per CEA recommendations, Low NO_x Burners (Primary Control) and SNCR (Secondary Control) systems were proposed to be installed to bring down the NO_x level within the norm of 300 mg/Nm^3. Regarding TANGEDCO's apprehension about the increase in SO_2 and NO_x emissions due to increase in consumption of coal and offsetting any reduction due to installation of ECS, the Petitioner has submitted that the station shall meet the prescribed norm of SO_2 and NO_x after installation of the ECS. The Petitioner vide affidavit dated 25.3.2021 has clarified that it is implementing only Combustion Modification for NO_x reduction and the estimated cost of implementation is ₹17.53 crore.

85. TANGEDCO in case of RSTPSS-III in Petition No. 612/MP/2020 has submitted

that to meet the revised NO_x emission norm of 300 mg/Nm^3, the Petitioner has proposed installation of SNCR and Combustion Modification System for controlling of NO_x. The cost claimed towards installation of SNCR is ₹29.62 crore and Combustion Modification System is ₹8.66 crore. The Petitioner has not submitted the justification for selection of SNCR and Combustion Modification system.

86. In response, the Petitioner has submitted that the estimated cost of SNCR system is based on tentative estimates and the cost of Combustion Modification is based on the awarded values which have been discovered through transparent competitive bidding process. The Petitioner has submitted that in view of the MoEFCC Notification dated 19.10.2020, relaxing the NO_x emission norms from 300 mg/Nm^3 to 450 mg/Nm^3, SCNR system is not required for the instant station.

87. TANGEDCO in case of KSTPSS-I in Petition No. 613/MP/2020 has submitted that to meet the revised NO_x norm of 100 mg/Nm^3, the Petitioner has proposed installation of SCR and Combustion Modification System for controlling of NO_x emission. The Petitioner should have given the existing NO_x emission level and justification for selection of SCR system.

88. In response, the Petitioner has submitted that the instant station will meet the revised ECNs after implementation of proposed scheme. The value of NO_x is in the range of 500 mg/Nm^3. As per norms, value of NO_x has to be met always and not on average basis. NO_x limit set by MoEFCC is maximum and it varies depending on Nitrogen in coal, mill combination, operating load etc. Accordingly, SCR is essential in order to comply with the revised norms. The matter seeking relaxation in emission norms of NO_x is sub-judice before the Hon'ble Supreme Court. Therefore, installation of SCR will depend upon the outcome of the judgment of the Hon'ble Supreme

Court. Accordingly, no contract is awarded for installation of SCR for De-NO_x. No Combustion Modification is being envisaged in the instant station. Therefore, the indicative cost of ₹890.07 crore claimed for De-NO_x is only towards SCR installation and is on estimated basis.

89. TANGEDCO in case of TSTPSS-II of 4x500 MW in Petition No. 520/MP/2020 has submitted that to meet the revised NO_x norm of 600 mg/Nm^3 for two units under category (i) and 300 mg/Nm^3 for two units under category (ii), the Petitioner is implementing SNCR and Combustion Modification System. The cost indicated in the petition towards SNCR is ₹106.9 crore and for Combustion Modification System is ₹17.753 crore. The Petitioner has not given any details about the existing NO_x emission data and justification for selection of technology for SNCR and Combustion Modification system.

90. In response, the Petitioner has submitted that presently monthly average value of NO_x is in the range of 300-580 mg/Nm^3 in two units of the station and as per MoEFCC notification they have to meet the target of 300 mg/Nm^3. Accordingly, as per CEA recommendations, combination of Low NO_x Burners (Primary Control) and SNCR (Secondary Control) systems were proposed to bring down the present NO_x level within the prescribed norm. The Petitioner has subsequently submitted that with the revision of NO_x emission norms from 300 mg/Nm^3 to 450 mg/Nm^3, SNCR for NO_x control is not required for the instant station.

91. GRIDCO in case of TSTPSS-II in Petition No.520/MP/2020 has submitted that CEA has not recommended Combustion Modification for NO_x abatement up to 450 mg/Nm^3 as proposed by NTPC. Therefore, there is no justification for allowing Combustion Modification proposed by the Petitioner and the consequent cost. In

response, the Petitioner has submitted that the MoEFCC Notification mandates the generating stations to comply with ECNs of NO_x within a stipulated period. As per the MoEFCC Notification, the emission norm with respect to NO_x was 600 mg/Nm^3 for Units l and 2 and 300 mg/Nm^3 for Units 3 and 4. Accordingly, the Petitioner in petition has sought approval of additional expenditure on account of installation of Combustion Modification System i.e. Low NO_x burners (primary control) and SNCR (secondary control) in its Unit 3 and Unit 4. No De-NO_x technology (primary and secondary) was envisaged in Unit-1 and Unit-2 of TSTPSS-II. However, as NO_x norm was revised from 300 mg/Nm^3 to 450 mg/Nm^3 by MoEFCC vide its Notification dated 19.10.2020, the Petitioner is now proposing only the Combustion Modification in Unit 3 and Unit 4 of TSTPSS-II to bring the level of NO_x emission below 450 mg/Nm^3, and the proposed secondary De-NO_x system of SNCR will not be implemented any more. The Petitioner has further submitted that the compliance with statutory norms is a mandate and in the absence of a technology being specified, the Petitioner cannot withhold such compliance.

92. We have considered the submissions of the Respondents and the Petitioner. As regards the Respondents contention that there must be a system to measure and monitor the emission levels after installation 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.

93. The Respondents have contended that the Petitioner has not submitted the CEA recommendations in case of individual generating stations/ units on feasibility, suitability and cost of ECS proposed by the Petitioner. The Respondents have also contended that the Petitioner has not produced the certificate from the "competent authority" regarding suitability and effectiveness of the 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. As regards plant-specific recommendation of ECS, we have already held that there is no requirement for plant-specific recommendations of CEA. Moreover, ECS proposed to be installed by the Petitioner is in line with the recommendations of CEA. As regards the other contention that the Petitioner has not submitted the certificate from the "competent authority", the Petitioner has submitted the Minutes of the Meetings of its Board of Directors approving the installation of ECS in its generating stations and has also stated on affidavit that the ECS proposed/ adopted 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 Board of Directors and affidavit submitted by the Petitioner is sufficient.

94. Compliance with the MoEFCC Notification is mandatory for all TPPs including those of the Petitioner and they were to be complied within a strict timeframe. Considering the fact that the implementation of ECNs as mandated through the MoEFCC Notification is being monitored by the Hon'ble Supreme Court and the serious consequence of non-compliance of the directions issued by MoEFCC under Section 6 of the Environment Protection Act, 1986 read with Rule 3 of the Environment protection Rules, 1986, the Petitioner has initiated the process for

implementation of ECS in 2017. The Petitioner had identified Combustion Modification (Primary Control) and SNCR and SCR (Secondary Control) Systems for reduction of NO_x emission Ievels of individual generating stations/ units taking into consideration various other factors. The Petitioner had issued IFBs in the years 2017, 2018 and 2019 and thereafter has issued NoAs in 2018, 2019 and 2020. The details of ECS proposed by the Petitioner for reduction in NO_x emissions in the subject generating stations/ units are as follows:

Petition Number & Generating station/unit Capacity (MW)	**COD**	**For reduction of NO_x emissions**	**Estimated capital cost claimed**
467/MP/2019 SSTPSS-II (2X500)	16.09.2011 30.09.2012	Combustion Modification	Rs.17.53 crore
64/MP/2020 SSTPSS-I (2X500)	1.09.2002 1.03.2003	Not implementing NO_x	-
520/MP/2020 TSTPSS-II (4x500)	Unit 1:1.08.2003 Unit 2: 1.03.2004 Unit 3: 1.11.2004 Unit 4: 1.08.2005	Combustion Modification*	Rs.17.753 crore
612/MP/2020 RSTPSS-III (500)	25.03.2005	Combustion Modification	Rs.8.86 crore
613/MP/2020 KSTPSS-I (3x800)	31.07.2017 31.12.2017 15.09.2018	SCR based on the outcome of SC judgement	-
730/MP/2020 RSTPSS-I&II (3x200+3x500)	1.03.1984 1.11.1984 1.05.1985 1.11.1988 1.09.1989 1.04.1991	SNCR based on pilot test	-

*Units 3 and 4

95. The Petitioner initially proposed installation of Combustion Modification and SNCR systems in SSTPSS-II and RSTPSS-III and SNCR and Combustion Modification System for Units 3 and 4 (and no De-NO_x was envisaged in Unit-1 and Unit-2) of TSTPSS-II to bring down the present NO_x level within the norms prescribed by MoEFCC. However, as NO_x norm was revised from 300 mg/Nm^3 to 450 mg/Nm^3 by MoEFCC vide its Notification dated 19.10.2020, the Petitioner is now proposing only the Combustion Modification in SSTPSS-II, RSTPSS-III and TSTPSS-II. The three generating units in KSTPSS-I were commissioned in 2017 and

2018 and accordingly NO_x norm for those units is 100 mg/Nm^3. To meet the stringent norm, the Petitioner had proposed installation of SCR in KSTPSS-I. However, the matter is before the Hon'ble Supreme Court for relaxing the norm of 100 mg/Nm^3 for NO_x emissions and the matter is sub-judice. The Petitioner has submitted that installation of SCR will depend upon the outcome of the judgment of the Hon'ble Supreme Court and, therefore, no contract has been awarded for installation of SCR in KSTPSS-I. Some of the Respondents have contended that no technology has been recommended by CEA for reduction of NO_x emissions. Absence of any recommendation by CEA cannot be a reason for not taking action for controlling/ reduction in the emission levels of NO_x as it is mandatory for the Petitioner to comply with the MoEFCC Notification. Though the Petitioner had initially proposed combination of Combustion Modification and SNCR/ SCR, is now proposing to install only Combustion Modification System in SSTPSS-II, TSTPSS-II and RSTPSS-III in view of the revision of norms from NO_x norms by MoEFCC. The Petitioner has also approached the Hon'ble Supreme Court for relaxing the norms in case of NO_x of TPPs commissioned after 1.1.2017. It is observed that the Petitioner has been careful to reduce the cost of De-NO_x by opting for only Combustion Modification System. In view of the above discussion, we are of the view that the Petitioner has been diligent in selecting Combustion Modification System for reducing the emission levels of NO_x and accordingly approve installation of the same in SSTPSS-II, RSTPSS-III and TSTPSS-II.

(c) *Capital cost of identified ECS*

96. The Petitioner has claimed the following capital cost towards implementation of WFGD System to control the SO_2 emissions in the subject generating stations:

(₹ in lakh)

Petition Number & Generating station/unit Capacity (MW)	CEA indicative hard cost (Rs lakh/MW)	Hard cost claimed (Rs lakh/MW)	Total IDC claimed	Total IEDC claimed	Total taxes and duties claimed	Total other costs claimed	Total costs claimed
467/MP/2019 SSTPSS-II (2X500)	40.50	43.57	3287.13	1544.80	7854.90	264.05	56523.03
64/MP/2020 SSTPSS-I (2X500)	40.50	43.57	3287.13	1544.80	7854.90	264.05	56523.03
520/MP/2020 TSTPSS-II (4x500)	40.50	44.54	6863.60	3153.33	16034.70	404.00	115536.00
612/MP/2020 RSTPSS-III (500)	40.50	47.01	2297.48	832.14	4231.22	108.40	30976.02
613/MP/2020 KSTPSS-I (3x800)	30.00	29.66	6007.37	2520.00	12813.56	324.98	92852.35
730/MP/2020 RSTPSS-I&II (3x200+3x500)	45.00 (200 MW) 40.50 (500 MW)	46.16	7653.22	3431.43	17447.96	0	125465.72

97. The hard cost of WFGD system claimed by the Petitioner is higher than the CEA recommended hard cost in case of all the generating stations/ units except in the case of KSTPSS-I, where it is marginally lower.

98. 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 orders dated 11.11.2019 in Petition No.152/MP/2019, dated 23.4.2020 in Petition No. 446/MP/2019 and 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.

99. As stated earlier, the Petitioner has proposed installation of Combustion Modification System for reduction of NO_x emissions. The Petitioner has discovered the cost of the Combustion Modification System also through DCB.

100. TANGEDCO has raised the issue of higher hard cost of WFGD system in Petition No. 467/MP/2019, Petition No. 520/M/2020 and Petition No.613/MP/2020 pertaining to SSTPSS-II, TSTPSS-II and KSTPSS-I respectively. The gist of the submissions made by TANGEDCO is as follows:

(a) The hard cost of WFGD system claimed by the Petitioner is higher than the CEA recommended cost. The Petitioner has submitted that the deviation is due to efflux of time and other reasons but it has not submitted the detailed reasons for claiming higher hard cost than the CEA recommended cost.

(b) Though the Petitioner has contended that the hard cost of WFGD system claimed is based on the price discovered through competitive bidding and the estimated capital cost includes hard cost besides the GST, IDC, IEDC, financing charges (FC), etc., the Petitioner has not submitted the details of tender awarded, the responses received and reasonability of rates.

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

(d) The Petitioner has not submitted the details of reduction in cost of WFGD system in case of generating stations where there is more than one unit.

(e) The Petitioner should elaborate the basis for arriving at estimated capital cost of SNCR and Combustion Modification System.

101. In response to the contentions of TANGEDCO, the Petitioner has made the following submissions:

(a) The hard cost of FGD system recommended by CEA is only indicative and it would vary depending upon various other factors. It does not include the other components of final cost i.e. taxes and duties, IDC, FC, engineering charges etc. The capital cost of project varies depending upon the scope of work involved in the implementation of scheme like interconnection facility, electrical works etc.

(b) The Petitioner has carried out tendering process for installation of FGD system for the complete fleet of its station in various phases/ lots based on the vintage of units/ stations, technology, timelines prescribed etc. 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.

(c) The bidding process for WFGD system was carried out by clubbing similar units/ stations to discover the minimum possible cost.

(d) The sharing of common facilities with other stations is not feasible in case of single unit stations.

102. APEPDCL and APSDPCL have raised the issue of high capital cost of ECS in all the subject petitions. APEPDCL and APSDPCL have submitted that the Petitioner has not given the reasons for higher cost of ECS when compared to the CEA benchmark cost and that the Petitioner has merely stated the deviation is due to

efflux of time and uncontrollable factors. In the absence of such information, there cannot be any transparency in the instant proceedings and have requested that the Petitioner may be directed to provide the said information. The Petitioner has failed to justify such substantial deviation ranging between ₹16.06 lakh/MW to ₹21.45 lakh/MW for various projects. Even the hard cost of the ECS ranges from ₹43.57 lakh/MW to ₹47.01 lakh/MW which is substantially higher than cost indicated by CEA. The Respondents have submitted the following details of deviation for each of the generating station:

Petition Number & Generating station/unit Capacity (MW)	CEA indicative hard cost (₹ in lakh/ MW)	Petitioner's hard cost (₹ in lakh/MW)	Petitioner's estimated cost (₹ in lakh/MW)	Deviation from CEA indicative cost (₹ in lakh/MW)	Total deviation (₹ in crore)
467/MP/2019 SSTPSS-II (2X500)	40.50	43.57	56.56	16.06	160.60
64/MP/2020 SSTPSS-I (2X500)	40.50	43.57	56.56	16.06	160.60
520/MP/2020 TSTPSS-II (4x500)	40.50	44.54	57.77	17.27	345.40
612/MP/2020 RSTPSS-III (500)	40.50	47.01	61.95	21.45	107.25
730/MP/2020 RSTPSS-I&II (3x200+3x500)	45.00 (200 MW) 40.50 (500 MW) on an average 41.78	46.00	59.75	17.97	377.37
Total		**-**	**-**	**-**	**1151.22**

103. APEPDCL and APSDPCL have further submitted that cost recommended by CEA is indicative, but the same does not justify deviation to the tune of Rs. 1151.22 crore in respect of the above-mentioned generating stations. It is incumbent on the Petitioner to give particulars about such parameters which would be affected by efflux of time, or which would cause a deviation to such as extent. Merely stating that the increase in cost is due to efflux of time without any details raises questions on the cost-benefit analysis undertaken by the Petitioner. The Petitioner has been changing its position regarding the deviation from the CEA indicative cost. Initially,

the Petitioner submitted that deviation was on account of increase in cost due to efflux of time, without reference to even a single uncontrollable factor. However, by way of the Additional Submissions dated 24.5.2021, the Petitioner has stated that the deviation is on account of an additional pre-treatment plant to meet the water requirement and/ or additional electrical/ switchgear works, to support the new FGD technology. However, no information about such pre-treatment plant or electrical works has been shared with the Respondents or the Commission. Neither the tender floated by the Petitioner, nor any notification of award granted by the Petitioner include such additional work under the scope of works. There is discrepancy in the stand of the Petitioner. CEA in its letter dated 21.2.2019 had stated that increase in the number of units will reduce the cost due to use of common facilities. However, despite some plants having more than one unit, the Petitioner has completely ignored the use of common facilities and has calculated a cost higher than the CEA indicative cost. Therefore, they have requested that only the CEA indicative cost may be allowed.

104. In response, the Petitioner has submitted generating station-wise % variation in the estimated hard cost of WFGD system from the CEA recommended hard cost as under:

Generating station/ unit Capacity (MW)	CEA indicative hard costs (₹ in lakh per MW)	Hard cost claimed (₹ in lakh per MW)	Variation (%)
SSTPSS-II 2x500	40.50	43.57	7.50
SSTPSS-I 2 x 500	40.50	43.57	7.50
RSTPSS-I&II 3 x 200 + 3 x 500	45 (200 MW) & 40.5 (500 MW) Weighted Average 41.78	46.16	10.00
RSTPSS-III 500	40.50	47.01	17.308
TSTPSS-II 4x500	40.50	44.54	10.00

105. The gist of the submissions made by the Petitioner in response to reply of APEPDCL and APSDPCL is as follows:

(a) The cost indicated by CEA is only indicative in nature and it is the base cost and does not include other cost like taxes duties, IDC & IEDC etc. This base cost may vary depending upon site conditions. There is a slight increase in the estimated hard cost as proposed by the Petitioner from the hard cost recommended by CEA. 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 system installation has increased possibly due to various reasons specified therein. Therefore, the prices discovered are reasonable for the unit size and have been discovered through a transparent process of competitive bidding and is subject to prudence check by the Commission.

(b) The hard cost of FGD system installation is comparable to the CEA indicative cost. Additional pre-treatment plant is being installed, as part of WFGD package, to fulfil the requirement of additional water for operation of WFGD system in some stations. Accordingly, there has been slight increase in the overall cost.

(c) Units of RSTPSS-I&II are comparatively older and were installed during the period from 1984 to 1991. Because of the shortage of space between the units and around the units and due to layout constraints, certain equipment/ systems pertaining to FGD system is being installed at a distance from the Units which has resulted in increase in ducts and piping length. Hence, there is a slight increase in the cost of FGD system. In any case, the cost estimation given by CEA is merely indicative in nature and is only the base cost. The base cost may further vary depending upon site conditions.

(d) RSTPSS-III has one single Unit of 500 MW. To accommodate additional electrical supply for the equipment such as blowers, high rating equipment such as booster fan, etc., additional electrical system is being installed. This has led to increase in the cost of the FGD system. Further, cost on account of common facility like Makeup Water System, etc. is on the higher side on per MW basis for single Unit stations.

(e) As per CEA advisory, the cost of WFGD system also depends upon other factors such as range of SO_2 removal, chimney layout etc. Prices have been discovered through transparent competitive bidding process. The TSTPSS-II is 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 especially high rating equipment such as booster fan, limestone mills etc. This has led to installation of additional switchgear/ electrical works which has led to slight increase in the overall cost of the FGD system.

106. KSEBL in Petition No. 730/MP/2020 has submitted that the Petitioner has not provided valid justification substantiating the increase over the benchmark cost. Prudence check may be done on the proposed expenditure and the cost of FGD system may be limited to the benchmark cost fixed by CEA and advice of CEA may be obtained on the proposed technology. The reasonableness of the expenditure may be studied to ascertain what benefits it will bring to consumers before passing it on to beneficiaries.

107. In Petition No. 612/MP/2020 and 613/MP/2020, KSEBL has submitted that as per the estimate of the Petitioner, the cost of ECS is very high compared to the CEA indicative cost. The Petitioner has not provided any valid justification substantiating the increase over the benchmark cost. Prudence check may be done on the proposed expenditure and the life of the plant may also be assessed before granting the approval for the expenditure.

108. In response, the Petitioner has submitted that bidding process for FGD system was carried out by clubbing similar units/ stations to discover the minimum possible cost. The CEA indicative cost may not be sufficient for a large project of 500 MW units as the same depends upon various other factors such as layout,

technology, norms to be met, time of tendering etc. The capital cost of project varies depending upon the scope of work involved in the implementation of scheme like interconnection facility, electrical works etc. and various other factors as indicated in the said CEA letter. The price indicated by the Petitioner for installation of ECS is arrived after competitive bidding process and is reasonable. Further, the balance useful life for recovering the full depreciation of the expenditure incurred towards ECS has been notified by the Commission vide the 2020 Amendment Regulations.

109. As regards the deviation in the cost in Petition No. 612/MP/2020, the Petitioner has submitted that the Petitioner carried out tendering process of FGD for the complete fleet of its stations in various phases/ Lots, based on the vintage of units/ stations, technology, timelines prescribed etc. Accordingly, FGD system for KSTPSS-I (3X800 MW) was included in the Lot-1 for tendering process in such lots combining with other stations and was awarded to L1 bidder. The prices have been discovered through transparent competitive bidding process where number of bids was received. Therefore, the prices discovered are reasonable for the unit size, location, layout etc.

110. GRIDCO in Petition No. 520/MP/2020 has submitted that the Petitioner has proposed installation of WFGD system and Combustion Modification system at the cost of ₹1155.26 crore and ₹17.75 crore respectively which was discovered through bidding as claimed by the Petitioner. Thus, the total cost for implementation of ECS is ₹1173.01 crore, which is ₹363.01 crore more than the indicative base cost. No justification has been given by Petitioner for the said increase in cost.

111. In response, the Petitioner has submitted that the capital cost of WFGD system and the Combustion Modification System claimed is based on the contract awarded

to the successful bidder. The cost indicated by CEA is base cost and does not include other cost like taxes & duties, IDC and IEDC, etc. This base cost may vary depending upon site conditions.

112. We have considered the contentions of TANGEDCO, APEPDCL and APSPDCL, KSEBL and GRIDCO and the clarifications of the Petitioner. 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.

113. We have considered the submissions of the Petitioner and the Respondents. The instant order covers six petitions and it includes three type of units, i.e. 200 MW, 500 MW and 800 MW. CEA has recommended WFGD system hard cost of ₹45.00 lakh/MW, ₹40.50 lakh/MW and ₹30.00 lakh/MW for units for 200 MW, 500 MW and 800 MW respectively. It is observed that the capital cost of WFGD system claimed by the Petitioner in case of all generating stations except one is higher than the capital cost recommended by CEA. 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 that 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 tendering process for installation of WFGD system and Combustion Modification 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 been duly approved by the Board of Directors of the Petitioner.

114. It is also noted 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 and that it 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 letter dated 21.2.2019.

115. 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 are of the view that costs indicated by CEA in its letter dated 21.2.2019 are only indicative in nature. As the costs for ECSs in present petitions are being discovered by the Petitioner on the basis of open and transparent process of competitive bidding, we in-principle approve the following hard cost claimed by the Petitioner towards installation of WFGD system:

Petition Number & Generating station/unit Capacity (MW)	**Hard Cost Approved (Rs. lakh/MW)**
467/MP/2019 SSTPSS-II (2X500)	43.57
64/MP/2020	43.57

SSTPSS-I (2X500)	
520/MP/2020 TSTPSS-II (4x500)	44.54
612/MP/2020 RSTPSS-III (500)	47.01
613/MP/2020 KSTPSS-I (3x800)	29.66
730/MP/2020 RSTPSS-I&II (3x200+3x500)	46.16

116. The Petitioner has claimed estimated capital cost towards installation of Combustion Modification Systems of ₹17.53 crore, ₹17.753 crore and ₹8.86 crore for reduction of NO_x emission in SSTPSS-II, TSTPSS-II and RSTPSS-III respectively. The Petitioner has stated that ₹8.86 crore in case of RSTPSS-III includes IDC and GST and 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 SSTPSS-II and TSTPSS-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_x in SSTPSS-II, TSTPSS-II and RSTPSS-III. The Petitioner is directed to submit all details including the hard cost of the Combustion Modification System and the other related costs in the petition under Regulation 29 (4) of these regulations for determination of tariff.

117. Besides the hard cost towards installation of WFGD system and De-NO_x systems, the Petitioner has also claimed IDC, IEDC, FERV, taxes and duties and other costs. As the instant petitions are for "in-principle" approval of ACE towards installation of ECS to comply with the MoEFCC Notification, the Petitioner's claim for the same 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

118. The Petitioner has submitted that the MoEFCC Notification mandates reduction in water consumption, mercury and particulate matter, besides SO_2 and NO_x. As the generating stations of the Petitioner meet the norms in respect of water consumption, mercury and particulate matter as stipulated by the MoEFCC Notification, 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.

119. We have considered the Petitioner's prayer. Some of the Respondents 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.

120. The Petitioner has further prayed for additional APC, additional water consumption, additional O&M Expenses, cost of reagents, Gross Station Heat Rate (GSHR) and for allowing deemed availability on account of shutdown for installation of ECS under Regulation 76, i.e. Power to Relax of the 2019 Tariff Regulations. As the instant petition is for "in-principle" approval of ACE towards installation of ECS, we would not like to go into these prayers at this stage in this order and they would be considered in petitions to be filed by the Petitioner under Regulation 29(4) of the

2019 Tariff Regulations after completion of installation of ECS. However, we would like to point out that after filing of the instant petitions by the Petitioner and during the instant proceedings the Commission has introduced a separate tariff stream for ECS by amending the 2019 Tariff Regulations vide the 2020 Amendment Regulations. The 2020 Amendment Regulations take care of some of the prayers of the Petitioner like APC, additional water consumption and additional O&M Expenses and they will be dealt as per the newly introduced provisions. The other three prayers of the Petitioner 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 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.

Summary

121. 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 Board of Directors 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 system for reduction in the SO_2 emissions and Combustion Modification Systems 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 System and Combustion Modification System have been discovered through a competitive bidding process and the hard costs claimed by the Petitioner for WFGD system is higher than the indicative cost recommended by CEA but the petitioner has provided justification and reasons for the same.

(d) Installation of Combustion Modification Systems in SSTPSS-II, TSTPSS-II and RSTPSS-III is approved in-principle for reduction of NO_x emission levels. However, the cost is not approved at present as the hard cost of the Combustion Modification has not been submitted by the petitioner.

122. 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_2 emissions (hard cost for WFGD system). We also accord "in-principle" approval for installation of Combustion Modification System for emission control of NO_x in SSTPSS-II, TSTPSS-II and RSTPSS-III.

123. The details of the hard cost of WFGD system approved for the subject generating stations are as follows:

Petition Number	Generating station/unit capacity (MW)	Hard cost of WFGD system (₹ in lakh/MW)
467/MP/2019	SSTPSS-II (2X500)	43.57
64/MP/2020	SSTPSS-I (2X500)	43.57
520/MP/2020	TSTPSS-II (4X500)	44.54
612/MP/2020	RSTPSS-III (500)	47.01
613/MP/2020	KSTPSS-I (3x800)	29.66
730/MP/2020	RSTPSS-I&II (3x200+3x500)	46.16

124. 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 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.

125. The instant order disposes of Petition No. 467/MP/2019, Petition No.

64/MP/2020, Petition No. 520/MP/2020, Petition No. 612/MP/2020, Petition No. 613/MP/2020 and Petition No. 730/MP/2020 in terms of the above discussion and findings.

sd/-	sd/-	sd/-	sd/-
(P. K. Singh)	**(Arun Goyal)**	**(I. S. Jha)**	**(P. K. Pujari)**
Member	**Member**	**Member**	**Chairperson**