Singrauli thermal power station is the oldest station run by NTPC Ltd. It is a 2,000 MW plant with five units of 200 MW and two units of 500 MW (see Table 1: Compliance deadlines for units in Singrauli thermal power station). The plant is situated in the critically polluted area of Singrauli – Sonbhadra, where moratorium on expansion or establishment of new project prevailed. It sources coal from nearby NCL coal mines and water from Rihand dam.

Data Quality- CEMS data of SO$_2$ and NO$_x$ emissions are underestimated. For e.g.: CSE based on coal quality data stoichiometrically estimates emissions over 1000 mg/N.cu.m but CEMS data reports about half of the actual emissions. The CEMS data is severely underreported, without installation of NO$_x$ control system like SCR achieving emissions in the range of 205 mg/N.cu.m is not possible.

Table 1: Compliance deadlines for units in Singrauli thermal power station

<table>
<thead>
<tr>
<th>Unit No.</th>
<th>Capacity in MW</th>
<th>Commissioning Year</th>
<th>Compliance deadline</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>200</td>
<td>1982</td>
<td>Dec 2021</td>
</tr>
<tr>
<td>2</td>
<td>200</td>
<td>1982</td>
<td>Dec 2021</td>
</tr>
<tr>
<td>3</td>
<td>200</td>
<td>1983</td>
<td>Aug 2021</td>
</tr>
<tr>
<td>4</td>
<td>200</td>
<td>1983</td>
<td>Apr 2021</td>
</tr>
<tr>
<td>5</td>
<td>200</td>
<td>1984</td>
<td>Feb 2021</td>
</tr>
<tr>
<td>6</td>
<td>500</td>
<td>1986</td>
<td>NA</td>
</tr>
<tr>
<td>7</td>
<td>500</td>
<td>1987</td>
<td>Dec 2020</td>
</tr>
</tbody>
</table>

Source: Central Electricity Authority, 2019

EMISSIONS AND SUGGESTED TECHNOLOGY

- **Particulate matter:** The plant violates limits of particulate matter emissions, reduction over 25 per cent is required to meet the new norms (see Table 2: Particulate Matter emissions in Singrauli thermal power station). Plant need to do minor up-gradations to meet the norms.

Table 2: Particulate Matter emissions in Singrauli thermal power station

<table>
<thead>
<tr>
<th>Unit No.</th>
<th>CEMS</th>
<th>Lab</th>
<th>Norm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>122-136</td>
<td>NA</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>123-134</td>
<td>NA</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>121-136</td>
<td>NA</td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td>123-135</td>
<td>NA</td>
<td>100</td>
</tr>
<tr>
<td>5</td>
<td>123-133</td>
<td>NA</td>
<td>100</td>
</tr>
<tr>
<td>6</td>
<td>124-135</td>
<td>NA</td>
<td>100</td>
</tr>
<tr>
<td>7</td>
<td>122-137</td>
<td>NA</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Centre for Science and Environment, 2019
**CURRENT STATUS**

- **Sulphur dioxide:** The plant violates limits of sulphur dioxide emission, reduction to over 50 per cent in 210 MW units and over 80 percent in the 500 MW units is required to meet the new norms (see Table 3: Sulphur Dioxide emissions in Singrauli thermal power station). CSE based on coal quality data stoichiometrically estimates emissions over 1000 mg/N.cu.m but CEMS data reports about half of the actual emissions.

**ACTION PLAN**

- CSE has prepared unit-wise action plan for all three pollutants. The action plan is based on deadlines given under Section 5 notices sent by the Central Pollution Control Board in December, 2017, which were also submitted to the Supreme Court. In turn, the deadlines were based on the Phase-in Plan prepared by the CEA and the Regional Power Committees.

- The Action plan has been based on discussions with industry experts and manufacturers on time taken for various stages. We have converted the major project processes/stages into key milestones that can be used by PCB officials to track progress.

- A fair share of activities has been presumed to have already been undertaken. Below stage of work completion is required to meet the norms.

---

**Table 3: Sulphur Dioxide emissions in Singrauli thermal power station**

<table>
<thead>
<tr>
<th>Unit No.</th>
<th>CEMS</th>
<th>Lab</th>
<th>CSE's estimate</th>
<th>Norm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>592-600</td>
<td>297</td>
<td>over 1000</td>
<td>600</td>
</tr>
<tr>
<td>2</td>
<td>632-650</td>
<td>297</td>
<td>over 1000</td>
<td>600</td>
</tr>
<tr>
<td>3</td>
<td>667-680</td>
<td>297</td>
<td>over 1000</td>
<td>600</td>
</tr>
<tr>
<td>4</td>
<td>700-800</td>
<td>297</td>
<td>over 1000</td>
<td>600</td>
</tr>
<tr>
<td>5</td>
<td>663-850</td>
<td>297</td>
<td>over 1000</td>
<td>600</td>
</tr>
</tbody>
</table>

**Table 4: Oxides of nitrogen emissions in Singrauli thermal power station**

<table>
<thead>
<tr>
<th>Unit No.</th>
<th>CEMS</th>
<th>Lab</th>
<th>Norm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>205</td>
<td>NA</td>
<td>600</td>
</tr>
</tbody>
</table>

Note: Unit wise data not available

Source: Centre for Science and Environment, 2019
UNIT 1 – 2 (2X200 MW):
- Particulate matter control
- Sulphur dioxide control
- Critical

Sep-19
- Collect final documents of detailed engineering
- Collect details of detail engineering

2019
Dec-19 2020
- Check status of equipment delivery
- Site mobilisation

Mar-20
- Site mobilisation
- Civil foundation – initiation

Jun-20
- Dismantling of existing equipment
- Civil foundation – final stages

Sep-20
- Erection of new equipment
- Erection of new equipment

Dec-20
- Trial run initiation
- Trial run initiation

2021
Mar-21
- Collect documents on trial run performance
- Collect documents on trial run performance

Sep-21
- Collect documents on PG test performance
- Collect documents on PG test performance

Dec-21
- PG test final reports
- PG test final reports

2022
Dec-21
- PG test final reports
- PG test final reports

Jul-21
- PG test initiation
- PG test initiation

UNIT 3 – 4 (2X200 MW):

Sep-19
- Check status of equipment delivery
- Site mobilisation

2019
Dec-19 2020
- Site mobilisation
- Civil foundation – initiation

Mar-20
- Dismantling of existing equipment
- Civil foundation – final stages

Jun-20
- Erection of new equipment
- Erection of new equipment

Sep-20
- Trial run initiation
- Trial run initiation

Dec-20
- Collect documents on trial run performance
- Collect documents on trial run performance

Aug-21
- PG test final reports
- PG test final reports

2021
Mar-21
- PG test initiation
- PG test initiation

Jul-21
- Collect documents on PG test performance
- Collect documents on PG test performance

Dec-21
- Collect documents on PG test performance
- Collect documents on PG test performance

2022
Dec-21
- Collect documents on PG test performance
- Collect documents on PG test performance
UNIT 5 (200 MW):
- Particulate matter control
- Sulphur dioxide control
- Critical

- Sep-19
  - Site mobilisation
  - Civil foundation – initiation
- Mar-20
  - Erection of new equipment
  - Erection of new equipment

- Sep-20
  - Collect documents on trial run performance
  - Collect documents on PG test performance
- Mar-21
  - Collect documents on PG test performance

- 2019
  - Dec-19
    - Dismantling of existing equipment
    - Civil foundation – final stages
  - 2020
    - Jun-20
      - Trial run initiation

- 2021
  - Dec-20
    - PG test initiation
    - PG test initiation

- April-21
  - PG test final reports
  - PG test final reports

UNIT 6 (500 MW)

- Sep-19
  - Site mobilisation
  - Equipment erection – Booster fan work initiation
- Mar-20
  - Erection of new equipment
  - Electrical and C&I work completion

- Mar-21
  - Collect documents on PG test performance
  - Collect documents on PG test performance

- 2019
  - Dec-19
    - Dismantling of existing equipment
    - Equipment erection – Absorber completion
  - 2020
    - Jul-20
      - Trial run initiation
      - Complete construction – Painting and insulation

- 2021
  - Dec-20
    - PG test initiation
    - PG test initiation

UNIT 7 (500 MW)

- Sep-19
  - Dismantling of existing equipment
  - Equipment erection – Absorber completion
- Mar-20
  - Trial run initiation
  - Complete construction – Painting and insulation

- Sep-20
  - PG test initiation
  - Trial run

- 2019
  - Dec-19
    - Erection of new equipment
    - Electrical and C&I work completion
  - 2020
    - Jul-20
      - Collect documents on trial run performance
      - Functioning equipment

- 2021
  - Dec-20
    - Collect documents on PG test performance
    - PG test performance

Disclaimer – The analysis/timelines mentioned in this document for preparing action plan has been made based on the inputs provided by various technology suppliers.