

**JOINT COMMITTEE REPORT ON THE MATTER RELATED TO M/S
CHANDRAPUR SUPER TPS & M/S WESTERN COAL FIELD IN
CHANDRAPUR, MAHARASHTRA**

(In compliance of order dated 29.10.2020 of Hon'ble National Green Tribunal (NGT),
Principal Bench, New Delhi in Original Application No. 74/2020 (WZ) [Madhusudan v/s
State of Maharashtra & Ors.]

Jointly Prepared By:



CENTRAL POLLUTION CONTROL BOARD



MAHARASHTRA POLLUTION CONTROL BOARD

For submission to
HON'BLE NATIONAL GREEN TRIBUNAL, PRINCIPAL BENCH, NEW DELHI
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1. BACKGROUND

In the matter Original Application No. 74/2020 (WZ), (Madusudan Vs. State of Maharashtra & Ors.), Hon'ble NGT vide order dated 29.10.2020 constituted a joint committee comprising of Central Pollution Control Board (CPCB) and the state PCB (i.e. Maharashtra Pollution Control Board-MPCB). Hon'ble NGT directed "...latest status of compliance of environmental norms by thermal plants in question..." The State PCB is the nodal agency for coordination and compliance. Accordingly, a joint committee comprising of following officials from CPCB and MPCB along with supporting team visited and carried out monitoring in compliance of order of Hon'ble NGT from 04.01.2021 to 06.01.2021. During visit Shri A.M. Kare, In-charge MPCB Regional Office-Nagpur also participated along with the joint committee on 06.01.2021.

Members of Joint Committee

- Shri Amit Thakkar, Scientist D, CPCB, RD Vadodara
- Shri Ajit Patil, SRO-Chandrapur, MPCB

Team members from CPCB

- Shri Manoj Sharma, SSA, CPCB RD Vadodara
- Shri Dharmesh Rana, SLA, CPCB RD Vadodara

Team member from MPCB

- Shri U.B. Bhadule, FO-Chandrapur, MPCB

The following Officials from M/s Chandrapur Super Thermal Power Station (CSTPS) were present during Visit and monitoring:

- Shri. K.M. Raut, Dy. Chief Engr-I
- Shri. R.M. Rajgadkar, Dy. Chief Engr-II
- Shri.D. Y. Choudhary, Exe. Engr (MAHAGAMS)
- Shri. S.S. Nishanrao, Exe. Engr (ODP-II)
- Dr. V. S. Yeul, Exe. Chemist (WTP-I)

The committee has also interacted with Shri. P.A. Sapate, Chief Engineer, CSTPS Chandrapur during visit.

2. APPROACH

The joint committee has discussed about the matter based on the order of Hon'ble NGT dated 29.10.2020 wherein transfer of proceedings vide order dated 29.01.2020 from High Court of Bombay at Nagpur in PIL No. 02 of 2018 regarding petition against the violation of norms by Maharashtra State Power Co. Ltd., Mumbai, Chandrapur Super Thermal Power Station (CSTPS), Chandrapur and Western Coalfields Ltd., Chandrapur to Hon'ble NGT was mentioned. It is also mentioned in the order that thereafter no one has entered appearance on behalf of the applicant and the matter has been referred by Pune Bench to Principal Bench. Accordingly, the committee has collected information about the above companies mentioned in the said order of Hon'ble NGT. It is gathered that M/s Maharashtra State Power Co. Ltd., Mumbai is the corporate head office of M/s Chandrapur Super Thermal Power Station, Chandrapur and M/s Western Coal Fields, Chandrapur is the Coal Mines in Chandrapur Area. Brief information about the coal mines of M/s Western Coal Fields, Chandrapur and environmental compliance status of the Thermal Plant i.e. M/s CSTPS is reported in the subsequent section of the report.

The Environmental Compliance of the Thermal Plant i.e. M/s CSTPS was carried out by the way of monitoring of all the operational stacks attached to the various boilers, monitoring of wastewater management and monitoring of Ambient Air Quality. Three locations for the ambient air quality monitoring were identified by the committee considering the source, prominent wind direction, feasibility and accessibility for setting up the monitoring stations. Samples collected were sealed in front of the representative of the unit and were analyzed at the laboratory of CPCB Regional Directorate (West), Vadodara. In addition to it, records pertaining to Ash Management, Coal consumption, water consumption etc. were collected from the CSTPS.

3. ABOUT WESTERN COAL FIELDS LTD. CHANDRAPUR

There are 10 coal mines in Chandrapur Area of M/s Western Coalfields limited, a subsidiary of Coal India Limited (a Maharatna Company) located in the Chandrapur district of the Maharashtra state. There are 04 opencast mines and 06 underground mines. Brief information about all the mines are given below:

- Bhatadi Opencast Mine (BOCM) started in the year 1995 having area 847.37 Ha. The Mine is in operational and coal from this mine is supplied to Chandrapur Super Thermal Power Station (CSTPS). Coal production from this mine is 1.465 Million ton per annum. The major consumer for coal is CSTPS. The Current mode of Transportation of Coal is through tarpaulin covered trucks from mine area to consumers. Presently installation of about 7.2 km pipe conveyor is under progress at Bhatadi Opencast.

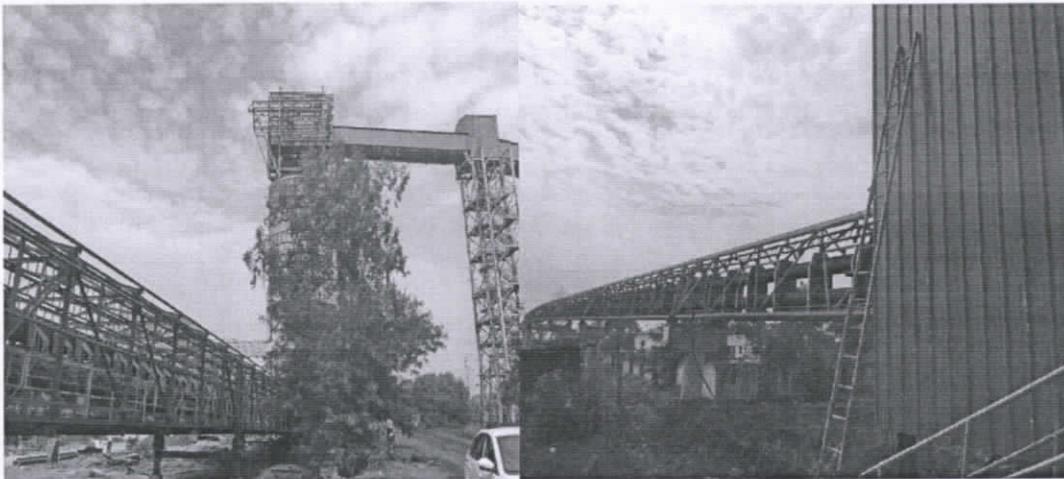


Figure 1: Installation of Pipe conveying system, to transfer coal from Bhatadi Open Cast Mine to CSTPS

Mine water is pumped out of bottom sump to surface to keep the coal face exposed for mining. At Surface, settling tanks are provided. Mine water generated from the Bhatadi mine is utilized for various purposes such as water sprinkling, firefighting etc. and also provided to a pond in Tirwanja Village, excess mine water is discharged into the natural nallah.

- Chanda Rayatwari Colliery (CRC) started in the year 1973 having area 194.30 Ha. Mine is not in operation and is proceeding for final closure. As informed, Coal production stopped since 10th August, 2017.
- Durgapur Opencast Mine started in the year 1980 having area of 1622.50 Ha. Presently, the mine is in operation and coal from this mine is supplied to Chandrapur Super Thermal Power Station (CSTPS). Rated Coal production capacity from this mine is 3.0 Million ton per annum (MTPA) as per EC and CTO. However, as informed the actual average coal production of this mine for last 5 years is below 2.0 MTPA. Current mode of Transportation of Coal through this mine to CSTPS is dedicated Ariel Rope way. Mine water generated is pumped out from the dip most point and after sedimentation it is used for the various purposes and remaining excess mine water is discharge into the natural drain.
- Durgapur Rayatwari Colliery underground mine started in the year 1982 having area 779.29 Ha. It has EC and CTO capacity of 0.92 MTPA however as informed, average production from this mine is approx. 0.15 MTPA. Coal is transported with tarpaulin covered trucks to CSTPS. Mine water generated is pumped out and is used for the various purposes and remaining excess mine water is discharged into the natural drain.
- Hindustan Lalpeth Colliery No.1 underground mine started in the year 1924 having area 748.97 Ha. Mine is not in operation since 12th October, 2017. Mine is proceeding for final closure. No Mining activity is being carried out at this mine. Production is stopped however Mine water generated is pumped out and used for various purposes and remaining excess mine water is discharge into the natural drain.
- Hindustan Lalpeth Opencast Mine started in the year 1985 having area 311.66 Ha. Mine is not in operation since April, 2018. As the opencast mine is non-operational hence presently no pumping of mine water is carried out.
- Manna Incline UG Mine started in the year 1998 and Nandgaon Incline UG Mine started in the year 1980 having total area of 606.52 Ha. Both are underground Mines and are operational. Rated Coal Production capacity as per EC and CTO is 0.2 MTPA (for Manna Incline) and 0.3 MTPA (for Nandgaon Incline) however separate actual production is less

than 0.1 MTPA. Coal from both the mines are transported with tarpaulin covered trucks to CSTPS. Mine water generated is pumped out and is used for the various purposes and remaining excess mine water is discharge into the natural drain.

- Mahakali Colliery Underground Mine started in the year 1974 having area 404.98 Ha. The Mine is in an underground mine of WCL-Chandrapur area. It has EC and CTO capacity of 0.4 MTPA however average production from this mine is approx. 0.15 MTPA. Coal is transported with tarpaulin covered trucks to CSTPS. Mine water generated is pumped out and is used for the various purposes and remaining excess mine water is discharge into the natural drain.
- Padmapur Opencast Mine started in the year 1985 having area 733.58 Ha. Mine is in operation and coal from this mine is supplied to Chandrapur Super Thermal Power Station (CSTPS) and other power plants. Rated Coal production capacity from this mine is 2.5 Million ton per annum (MTPA) as per EC and CTO, however the actual average coal production of this mine for last 5 years is approx 1.0 MTPA. Current mode of Transportation of Coal through this mine to CSTPS is dedicated Merry Go Round (MGR). Mine water generated is pumped out and is used for the various purposes and remaining excess mine water is discharge into the natural drain.

4. ABOUT M/S CHANDRAPUR SUPER THERMAL POWER STATION

Chandrapur Super Thermal Power Station (CSTPS) is a unit of Maharashtra State Power Generation Co. Ltd. (MAHAGENCO) Government of Maharashtra undertaking company. The plant site is located at Urjanagar, 10 Km away from Chandrapur city. The total factory area is 10907 hectare; out of this 9790 hectare is operational area and remaining 1117 hectare open space is available for plantation. The plant site is surrounded by villages Kachrala, Gunjala, Tadali Kawati Tirvanja, Chhota Nagpur, Ambhora, Khairgaon, Chargaon, and Tadoba National Park along with Western Coal fields (WCL) Bhatadi, Durgapur and Padmapur open cast mines. Chandrapur Super Thermal Power Station is presently having installed capacity of 2920MW (2 x 210MW + 5 x 500MW) power generation. The details are as below

Table 1: Details of various units at CSTPS

Unit No.	Power Generation Capacity (MW)	Date of Commissioning	Operational Status
1.	210	15.08.1983	Decommissioned 28.08.2014
2.	210	11.07.1984	Decommissioned 12.01.2016
3.	210	03.05.1985	Operational
4.	210	08.03.1986	Operational
5.	500	22.03.1991	Operational
6.	500	11.03.1992	Operational
7.	500	01.10.1997	Operational
8.	500	04.06.2016	Not Operational during visit
9.	500	24.11.2016	Operational

M/s CSTPS has obtained consent to operate from MPCB for electricity generation (Coal Based Thermal Power Plant) (Unit No. 3 & 4 -210 MW each and unit No. 5,6,7,8 & 9 – 500 MW each) total 2920 MW. The CCA is valid upto 31.08.2020. Copy of CCA is attached as **Annexure I.**

Details of coal handling plant (CHP) at CSTPS

The fuel utilized for power generation is coal. The CSTPS has Coal Handling Plant namely CHP-A for Unit 3&4, CHP-B/C for Unit 5,6&7 & CHP-D for Unit 8&9. The daily requirement of coal is about 47,000 MT. Unit 3 & 4 requires about 7000 MT of coal per day, Unit 5 to 7 requires about 24000 MT of coal per day and Unit 8 & 9 requires about 16000 MT coal per day. The requirement of coal is fulfilled by the coal from nearby collieries/mines located in Chandrapur Area, Ballarpur Area, Wani, Ghuggus area etc. There are various mode of transportation of coal from mines to CSTPS which includes rail, ropeway, wagon tripper, trucks etc.

- Coal Receipt and Dispatch Yard at CSTPS contains 7 numbers rail tracks, N Box rakes are received on one of these lines and distributed to Coal Handling Plant CHP-A (210 MW Unit 3&4), CHP-B (2x500MW Unit 5,6&7) & CHP-D (2x500 MW Unit 8&9) for its unloading on wagon tippers. Empty Wagon are collected on these lines and dispatched back.
- CSTPS has provided 02 numbers Aerial Ropeway i.e. ARW-I and ARW-II installed for transportations of coal from Durgapur Open Cast mine to CHP-A CSTPS. Each aerial ropeway system is equipped with 68 tramcars. These tramcars are hauled by loop of steel wire rope. Daily about 7000 MT coal is being transported through tramcars from Loading Terminal to Discharge Terminal
- CSTPS receives coal from Padmapur Open cast mines through owned Unit Train System wagon (BOBR type) and is unloaded at CHP-C track hopper (capacity of track hopper of CHP-C is 3000 MT) and fed to unit 6 & 7 coal bunkers through crusher and conveyer stream (capacity of conveyer stream is 1250 MT PH). The daily coal receipt through Padmapur OCM is @ 3000 MT.
- CSTPS receives coal through trucks from Bhadati Opencast Mines (dedicated mines for CSTPS). The daily coal receipt through road mode is @ 3000-4000 MT. Sometimes the coal from nearby mines like Penganga and Mugoli is also received through road mode.

I. BRIEF ABOUT COAL HANDLING PLANT AT CSTPS

CHP-A for Unit 3&4 (2x210 MW): Coal is received via N-box wagon, Ropeway and Road at CHP-A. CSTPS has provided 2 Numbers of Elecon make Rota side Wagon tippers (Rated capacity of each wagon tippler is 10 trips per hour) to unload the coal received through 'N' rakes. Placement of wagon on tippler table and pushing of empty wagon is done by shunting Locomotive. 3 Nos. of Secondary coal crushers (Rated capacity of crusher is 500 TPH) and vibrating screens are provided to get the desired coal size of about 20mm for further bunkering /stacking. One Elecon make Stacker Reclaimer (Rated capacity of 500 TPH) is provided at CHP-A for stacking and reclaiming of coal. 34 numbers of conveyor belts of 1000mm width and 17 numbers of conveyor belts of 1200mm width having rated

capacity of 500TPH are provided for coal transportation from receiving end to bunkers / stack yards Belt Conveyor systems.

Dust Suppression system is installed at Wagon Tippler, all Transfer Point of conveyor system and each discharge chute of conveyor system. The Ventilation systems are installed at wagon tippler. The rain guns are provided at Stack yard of Stacker Reclaimer and other stack yard of CHP-A.

CHP-B & C for Unit 5,6 & 7 (3x500 MW) :- Coal handling plant B has facility to unload N-BOX type wagon from Wagon Tippler with grill size (450 mm) having 2 Crusher on each Conveyor stream having capacity of 1500 TPH. CHP-B has facility to unload BOBR type wagons at Track Hopper and having storage capacity 4500 MT. The Coal Handling Plant-C is installed to receive coal from Padmapur OCM through our own UTS wagons and unloaded at Track Hopper and fed to Unit 6 & 7 coal bunkers through crusher and conveyer stream.

Plant is equipped with 02 numbers of track hoppers at CHP-B & CHP-C. There are 4 numbers Paddle feeders installed to evacuate the coal from track hopper to feed coal on conveyer stream. These Paddle feeders are hydraulically operated. 02 numbers air compressors are provided to operate door opening/closing mechanism of BOBR wagon to unload coal at track hopper. 2 numbers of Wagon tippers (Rated capacity 20 tips per hrs) are provided to unload the coal received through 'N' rakes. Each wagon tippler is equipped with side arm charger for haulage of wagons, placement of wagon on tippler table and pushing of empty wagon on out haul side. Wagon tippler (Rated capacity of apron feeder is 1500 TPH) is equipped with Apron feeder for feeding coal on conveyer stream.

4 numbers of Hammer mill type crushers are provided along conveyor stream for crushing raw coal to size about 25 mm size for its onwards bunkering / stacking. Two conveyer streams are provided for coal transportation to coal bunkers/ stack yard. Two numbers of stacker cum reclaimer (rated capacity is 2250 TPH) are provided for CHP-B for stacking of coal along with associated conveyer belts. Coal is stored in dedicated bunkers for the units 05, 06, and 07.

CSTPS has provided dust Suppression system at Track Hopper, Wagon Tippler, all Transfer Point of conveyor system, each discharge chute of conveyor system. The Ventilation systems are installed in tunnel area of belt conveyor system and crusher house. The rain guns are provided at Stack yard of Stacker-Reclaimer.

CHP-D for Unit 8&9 (2x500MW)

The Coal handling plant has installed 3 numbers of Side Discharge Type with hydraulic drive & Hydraulic Clamping ROTASIDE, ELECON make wagon tippler. The N-box received at wagon tippler placed on rail table get tilted through wagon tipping mechanism @150 degree and pass through grill area to Apron feeder and further it is transferred to conveyor system. Wagon tippler consists of Wagon tipping mechanism, Side arm charger, Apron feeder having capacity 1500TPH and wagon tippler capacity of 24 tips/Hr.

CHP-D consist of 12 numbers of Transfer Points, Conveyor belts for conveying the coal, with other auxiliary like wagon tippler, crusher, wobbler feeder and 02 numbers stacker cum reclaimer machines. The raw coal conveying thorough conveyor (conveyor length 13 Km) gets screened through 2 numbers of wobbler screen feeder (capacity 1500 TPH ELECON make). There are 2 numbers of impact crushers (capacity 1500 TPH, ELECON make) for crushing of coal of size bigger than 20mm. Coal (sized about 20mm) is transfer to various transfer point to bunker. There are 2 numbers of Hydraulic Drive (Capacity 1500 TPH ELECON make) Stacker reclaimer and 8 numbers of bunkers.

DFS-Dry Fog system is installed at wagon tippler to suppress the dust disperse while wagon unloading. 3 numbers Ventilation Exhaust System (VES) are installed at wagon tippler area to provide clean air for breathing in tunnel area and to exhaust out dust. Dust suppression System (DSS) system is installed at various discharge chutes and wagon tippler area. 78 numbers of sprinklers are provided to covers entire area of coal stack.

CSTPS has provided dust extraction system (DES) consists cyclone separator and bag filter with solenoid control station where dust particles get intact to bag filter and get settled down due to purging of air at crusher house and bunker house.



Figure 2: Water Sprinkler at Coal Handling Plant

II. ABOUT ENVIRONMENT MANAGEMENT SYSTEM AT CSTPS SOURCE EMISSION CONTROL

CSTPS has installed and commissioned 09 units of varying capacity from year 1983. The old units (unit 1 and unit 2) are now decommissioned. CSTPS has provided Electrostatic Precipitators (ESP's) to all units. ESP of Unit No. 3 to 7 has provided Permanent Flue Gas Conditioning System (FGCS) by Ammonia for improving the surface charge and cohesiveness in fly ash particles thereby minimizing the re-entrainment of particles. Over Fire Air (OFA) to the unit No. 3 to 9 is provided to control NO_x emission. Details about the unit with air pollution control devices provided by CSTPS are tabulated below:

Table 2: Details about the Air Pollution Control Devices at CSTPS

Particulars	Unit - 3	Unit - 4	Unit - 5	Unit - 6	Unit - 7	Unit - 8	Unit - 9
Installed Capacity (MW)	210	210	500	500	500	500	500
Height of Stack (m)	150	150	200	200	275	275	275
Date of Synchronization	03.05.85	08.03.86	22.03.91	11.03.92	01.10.97	04.06.16	24.11.16
System installed For SPM Control	ESP & AFGCS	ESP	ESP				
ESP make	BHEL	BHEL	BHEL	BHEL	ABB	BHEL	BHEL
Total ESP Fields (Nos.)	20	20	48	48	32	72	72
System installed For NOx Control	OFA	OFA	OFA	OFA	OFA	OFA	OFA
Location of OCEMS	Duct	Duct	@40mtr	@40mtr	@40mtr	@72 mtr	@72 mtr

Online Continuous Emission Monitoring Systems (OCEMS) is installed at each unit & are connected to CPCB & MPCB server.

III. ABOUT WATER MANAGEMENT SYSTEM

Source of raw water is from the Irai Dam constructed on Irai River. As per the records provided by CSTPS, during 2019-20 total raw water consumption was 52205742 m³ and the CSTPS achieved ratio of specific water consumption per MW of generation as 3.26. The average raw water consumption for the year 2020-2021 (till December 2020) is 138827.18 m³/day. The Raw water is used for industrial and domestic purposes. As per CCA the CSTPS is permitted 100% recycle/reuse of 97500 m³/day of trade effluent for dust suppression, cooling tower and ash handling. However, as informed the CSTPS is generating trade effluent in the range of 35000 –

40000 m³/day. As per records submitted by CSTPS, during the year 2020-21 (till December 2020) the trade effluent generated from various sources is around 30228 m³/day.

Effluent Treatment and disposal:

CSTPS has provided four effluent treatment plants (ETP) for the treatment of effluent generated from various sources like boiler blow down, cooling tower blow down, DM plant, condenser cooling system etc. having different capacities. The total treatment capacity of 04 units is 2850 m³/hr (68400 m³/day). Treated water from all the ETPs are used for ash slurry preparation, dust suppression in coal handling plants etc. Brief about the ETP:

- **ETP - I. Capacity 1600 m³/hr**, is provided for the treatment of effluent generated from WTP I, WTP II Drains, DM plant, boiler blow downs, power station drain etc. The ETP consists of Collection/Neutralization Tank → Circular settling Tank (3 nos) → flash mixture → Clarifier → Treated water storage Tank. Treated water is used for ash disposal system.

- **ETP - II. Capacity – 500 m³/hr**, is provided for the treatment of effluent generated from condenser, cooling tower blow down, CHP vehicle maintenance and from the ash handling plant etc.

The ETP consists of Raw water collection sump → Circular settler (03 No.) → Flash Mixture → lamella filters → sludge drying beds (03 No.) → Clear water Tank → Treated water used for the preparation of slurry in unit No 3&4 for disposal of fly ash.

- **ETP - III. Capacity – 100 m³/hr**, for the treatment of effluent from coal handling plant (CHP) CHP drains etc.

The ETP consists of Raw water sump → Raw water pump house → Circular settler (02 No.) → Sludge drying bed (03 No.) → laminar filters → treated water used for spraying in CHP and slurry preparation.

- **ETP-IV. Capacity 650 m³/hr** for the treatment of effluent comes from Boiler blow down, NDCT blow down and drains connected to the unit No. 8 &9.

ETP consist of Raw water Inlet Tank → Flash Mixture → Clarifier (750 M³) → Treated water collection Tank (1100M³). Treated water is used for slurry preparation in unit no 8 &9.

Sludge drying beds are provided for dewatering of sludge generated from all ETPs. The dried sludge is disposed at ash bunds. However as per CCA the ETP sludge need to be disposed to CHWTSDF.

Online Continuous Effluent Quality Monitoring Systems (OCEMS) are installed at outlet of ETP-I, II, III & IV for parameters Temperature, pH, TSS, BOD and COD. Separate flow meters are also provided at respective outlet of ETPs. OCEMS and flow meter readings are connected to CPCB & MPCB server.

Fly Ash Management

CSTPS acquired 2668 Hectare of total land of low-lying area for its use as ash bund having catchment area of 96 Sq. Km and submergence of 2668 Hectare. The total capacity of ash bund is 115.99 M³. The ash generated in power station is disposed-off in dry form to Cement Industries and rest is deposited in the form of slurry to ash bund.

CSTPS has made agreements with major cement manufacturer's viz. M/s. Ambuja, ACC, Ultratech and Manikgarh for disposal of ash. As informed, the cement industries have constructed and commissioned their plants in CSTPS premises to collect and transport dry fly ash directly in closed bulkers to respective cement industries.

Table 3: Details about fly ash collection facilities by cement industries inside CSTPS premises

Sr. No	Name of Company	Capacity (MT/Day)	Units & Hoppers
1	M/s ACC Ltd., Chanda Cement Works, Chandrapur	500	U6-12,U7-12
2	M/s Ambuja Cement Ltd.,	1400	U6-24,U6-18,U7-20,U7-32

	Korpana, Chadrapur	1100	U3&4-32, U3&4-48
3	M/s Ultratech Cement Limited, Awarpur Cement Project, Korpana, Chandrapur	1700	U5-18,U5-54,U6-06,U6-12
4	M/s M/s Ultratech Cement Ltd., (Manikgarh Cement Works) Gadchandur, Chandrapur	1500	U1&2-36

The fly ash generated is also utilized for Brick manufacturing, Construction of roads, Agriculture, Land filing and SSI units etc. The remaining ash generated at CSTPS, is transferred to ash bund area through fly ash disposal pipelines. The ash is disposed off through these lines making concentration of 80% water and 20% ash for unit No. 3 to 7 and 30% water and 70% ash for unit no. 8 & 9.

There are total 17 fly ash disposal pipelines having varying length (11 to 17 km). Unit wise detail about the pipeline is tabulated below.

Table 4: Details about fly ash disposal pipelines at CSTPS

Particulars	Unit - 3	Unit - 4	Unit - 5	Unit - 6	Unit - 7	Unit - 8	Unit - 9
No. of Lines	3		2	3	3	6	
Approx. length (Km)	11		12 to 13		15 to 17	14-15 Km	
Diameter (mm)	300		400	400	400	3 HCSD line Dia 225 & 3 line Dia 400 for bottom ash	
No. of drain valve	12		8	12	12	6	
Ash slurry drained during	132		248	253	254	90 for HCSD line	150 for Bottom ash line

Maintenance (m ³)						
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The water utilized for disposal of ash slurry remains stored in huge ash bund area. There are 16 wells (09 are presently active) in the entire ash bund for collection and transfer of water for recycling system through 4 Nos of pipelines length-10 Km with Dia 350NB and 3 drain valve to ash bund water recycling system having capacity of 1200 m³/Hr. The recycled water is again utilized for ash disposal.

IV. STATUS OF ENVIRONMENTAL COMPLIANCE

The present status of environmental compliance of the power plant was assessed by carrying out sampling and monitoring of all stacks attached to operational units during visit, sampling of all 04 ETPs provided for treatment of wastewater, ambient air quality monitoring for 24 hours at 03 locations. Physical observations based on the present operating condition and sampling of wastewater from natural drain based on the discharge observed during visit were also collected and analyzed. Observations based on source emission monitoring, ETP Monitoring, Ambient air quality monitoring, fly ash management and present operating conditions were discussed in subsequent paragraphs.

V. OBSERVATION BASED ON SOURCE EMISSION MONITORING

Joint committee has carried out source emission monitoring of all operational units during visit from 04.01.2021 to 06.01.2021. Analysis reports of source emission carried out at CSTPS Chandrapur are tabulated below:

Table 5: Analysis results of source emission at CSTPS

S.No	Stack attached to	NO _x ppm	NO _x mg/Nm ³	SO ₂ mg/Nm ³	PM mg/Nm ³
1.	Boiler No.3	185.09	347.97	1067.38	37.4
2.	Boiler No. 4	169.96	319.53	1287.72	53.95
Standard limit as per MOEF notification dated 07.12.2015 and MPCB CCA		--	600	600	100
3.	Boiler No. 5	136.85	257.28	1246.30	67.43

4.	Boiler No. 6	176.07	331.01	1078.23	113.70
5.	Boiler No. 7	143.16	269.14	1141.81	53.35
Standard limit as per MOEF notification dated 07.12.2015 and MPCB CCA		--	600	200	100
6.	Boiler No. 9	247.12	464.59	1578.36	38.2
Standard limit as per MOEF notification dated 07.12.2015 and MPCB CCA		--	450	200	50

- During visit the unit no. 08 was not in operation due to annual maintenance. The remaining units numbered 03, 04, 05, 06, 07 and 09 were operational.
- The analysis results of stack attached to unit 3 & 4 reveals that the concentration of NO_x and PM were found within the standard limit. However, the concentration of Sulphur Dioxide (SO₂) for the unit no. 3 & 4 were observed to be 1067.38 mg/Nm³ and 1287.72 mg/Nm³ respectively exceeding the standard limit of 600 mg/Nm³.
- The analysis results of stack attached to unit No. 05 reveal that the concentration of NO_x and PM were found within the standard limit. However, the concentration of Sulphur Dioxide (SO₂) for unit no. 05 observed to be 1246.30 mg/Nm³ exceeding the prescribed standard limit of 200 mg/Nm³.
- The analysis results of stack attached to unit no 06 reveals that concentration of NO_x was found within the standard limit. However, the concentration of Sulphur Dioxide (SO₂) 1078.23 mg/Nm³ (Limit: 200 mg/Nm³) and Particulate matter (PM) 113.70 mg/Nm³ (Limit 100 mg/Nm³).
- The analysis results of stack attached to unit 07 reveal that the concentrations of NO_x and Particulate matter (PM) were observed within the limits. The concentration of SO₂ observed to be 1141.81 mg/Nm³ exceeding the standard limit of 200 mg/Nm³ as per CCA.
- The analysis results of stack attached to unit 09 reveals that the concentration of PM observed within the limits as mentioned in the CCA. However, the concentration of NO_x

and SO₂ found to be 464.59 mg/Nm³ (limit 450 mg/Nm³) and 1578.6 mg/Nm³ (limit 200 mg/Nm³) respectively exceeding the limits as per CCA.

VI. OBSERVATION BASED ON ETP MONITORING

The joint team has collected grab samples of wastewater from inlet and outlet of all 04 ETPs on 05.01.2021. Analysis results of the waste water from ETPs are depicted as below:

Table 6: Analysis results of wastewater samples from ETPs

Parameters	E.T.P. No. 1		E.T.P. No.2		E.T.P. No. 3		E.T.P. No. 4		MPCB Standards
	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	
pH	7.55	7.33	6.51	7.25	7.41	7.19	7.88	7.9	6.5 to 8.5
TSS	33.7	17.2	480.2	56.1	161.1	23.2	251	12.5	100
TDS	276	842	272	257	522	387	595	669	2100
COD	10.5	4.8	14.8	8.5	64.8	10.5	76.4	14	250
BOD	0.8	0.5	0.9	1	5.5	1.4	7.7	1.1	30
PO ₄ -P	0.031	0.045	0.031	0.014	0.036	0.039	0.13	0.096	5
O&G	--	0.77	--	0.8	--	0.44	--	0.6	10
Cu	--	0.01	--	0.01	--	0.01	--	0.01	<1
Cr	--	BDL	--	BDL	--	BDL	--	BDL	<0.2
Pb	--	BDL	--	BDL	--	BDL	--	BDL	--
Zn	--	0.072	--	0.041	--	0.034	--	0.144	<1
Fe	--	0.09	--	0.97	--	0.673	--	0.66	<1

Note: all values are expressed as mg/l except pH.

The analysis results of all ETPs reveals that ETP achieving the norms prescribed by the MPCB. The treated water from ETP is reused for various purposes in the plant.

During visit OCEMS are found operational. OCEMS reading during the sampling period is tabulated below:

Table 7: OCEMS reading at outlet of various ETPs at CSTPS

ETP	pH	TSS	BOD	COD
ETP 01	7.52	35.6	7.07	28.3
ETP 02	7.50	28.7	7.29	28.0
ETP 03	7.22	29.8	11.6	38.8
ETP 04	7.50	37.73	9.19	112.04

Note: all values are expressed as mg/l except pH.

OCEMS values are found within limits; however they vary with the monitoring values as per Table 6.

VII. OBSERVATION BASED ON AMBIENT AIR QUALITY MONITORING

The joint committee has carried out the ambient air quality monitoring at 03 locations for 24 hours from (04.01.2021 to 05.01.2021). The ambient air quality monitoring was carried out for the parameters of PM₁₀, PM_{2.5}, SO₂ and NO₂. As per the information provided for meteorological condition regarding prominent wind direction in Chandrapur area 03 monitoring locations were selected to cover all cross sections of the wind directions surrounding the CSTPS. The ambient air monitoring locations are marked in the Google Map is shown below:

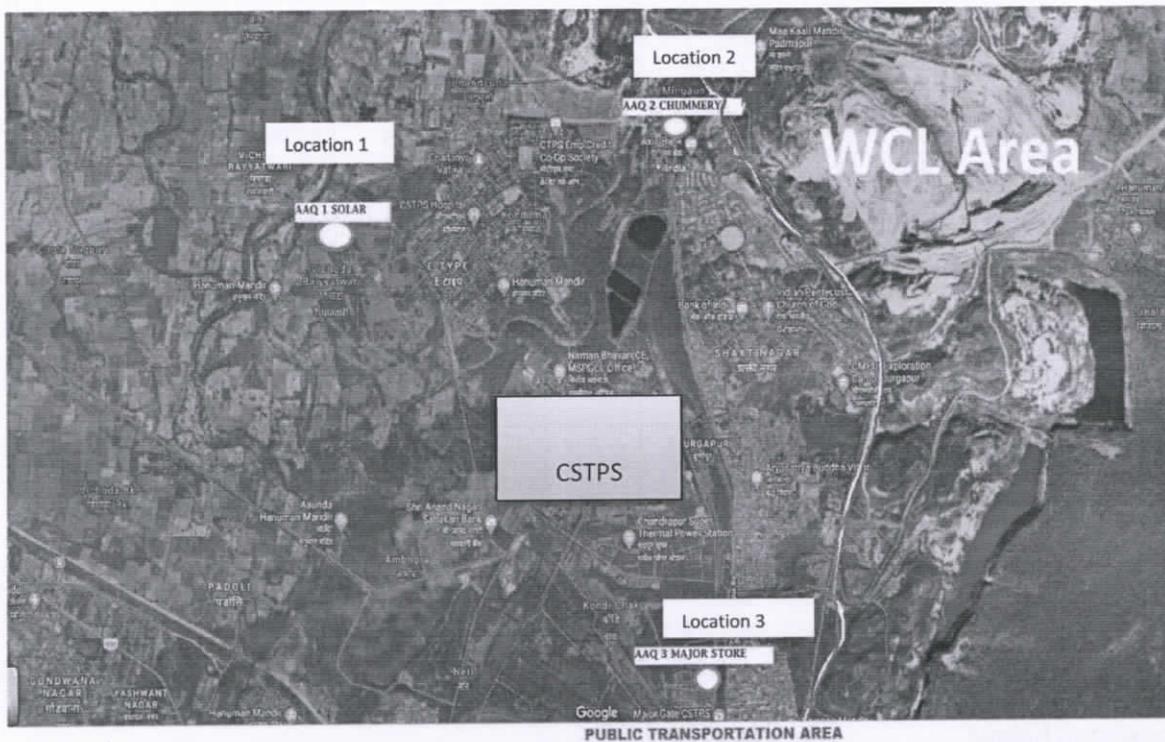


Figure 3: Ambient Air Monitoring locations in map

Table 8: Location coordinates of Ambient Air Quality stations in CSTPS

Location	Location of AAQ	Coordinates
Location 01	Control Room tarrace of 1 MW Solar Plant	20.1.18 N, 79.16.15 E
Location 02	Tarrace of Chummary Guest House	20.1.35 N, 79.17.43 E
Location 03	Major store, Old Admn Building	19.59.36 N, 79.17.56 E

Table 9: Status of Ambient Air Quality at monitoring locations during 04.01.2021 to 05.01.2021

S. No	Name of the Location	Parameters (24 hour average)			
		PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³
1	Control Room tarrace of 1 MW Solar Plant	127.46	74.40	12.41	12.32
2	Tarrace of Chummary Guest House	247.11	34.14	13.38	11.85
3	Major store, Old Admn Building	160.82	118.95	13.65	13.53
	NAAQ Standard	100	60	80	80

- The analysis results of Ambient Air Quality reveal that PM₁₀ concentration exceeds the NAAQ standard limits at all three locations. The concentration of PM_{2.5} exceeds the NAAQ standard limits at location No. 1 and location no 3. The remaining monitored parameters are found within NAAQ Standards.

VIII. OBSERVATION BASED ON FLY ASH MANAGEMENT

The joint committee has visited dry ash hoppers allotted to cement plants for direct filling and transportation of dry ash, wet slurry preparation plant, ash bunds, ash recycling pumping station and collected data for the fly ash disposal.



Figure 4: Ash hoppers for cement plants



Figure 5: Dry Fly ash collection and filling station

During visit of ash bund, it was observed that fly ash slurry is prepared from premises and is transferred through pipelines to ash bunds located around 17 km from the plant premises. Huge area is provided for dumping of fly ash. Fly ash slurry disposed at bunds gets settled and supernatant ash water through gravity reaches the dip point. Wells are provided to collect and recycle the ash water.



Pipeline for transfer of fly ash slurry to ash bund



Ash Bund at CSTPS

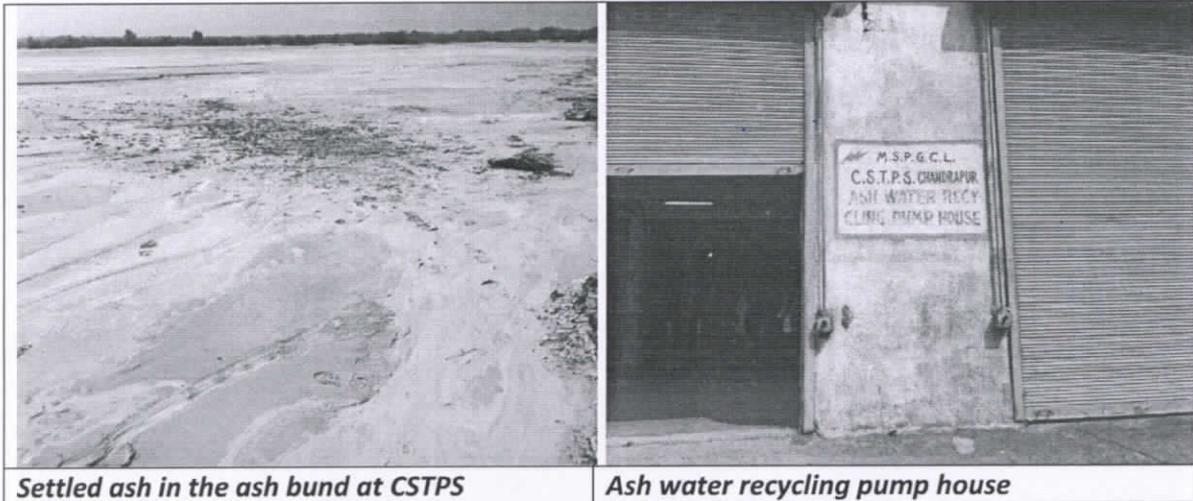


Figure 6: Pictures of ash slurry handling and storage

- Grab sample of ash recycle water was collected during visit. The analysis result of the sample collected is shown below:

pH	TSS	TDS	COD	BOD	PO ₄ -P	Fe	Zn	Pb	Cr	Cu
7.29	14.7	451	11.1	1.2	0.023	0.7	BDL	BDL	BDL	BDL

**All values are reported in mg/l except pH*

The analysis result reveals that the concentration of monitored parameters found within limits of CCA conditions as mentioned in Schedule I.

- During visit, it was observed that due to sudden maintenance work, one of the fly ash slurry pipeline was flushed from drain point near pole numbered 948. Fly ash slurry was found spread in the downstream area and was finding its way in the natural drain. The joint committee has collected a grab sample of this wastewater. The analysis result of the sample collected is shown below:

pH	TSS	TDS	COD	BOD	PO ₄ -P	Cr	Zn	Cu	Pb	Fe
7.38	586	450	9.4	1.1	0.146	0.006	0.017	BDL	BDL	BDL

**All values are reported in mg/l except pH*

The analysis results reveal high concentration of TSS in the ash slurry. The joint committee has followed the natural drain to understand the further condition.



Location 01: Just after discharge near Pole 948



Location 02: about 500 m down stream from location 01.



Location 03: About 1.5km further down stream from location 1

Figure 7: Ash slurry flushed from pipeline finding its way to natural drain

- It is found that ash from the ash slurry water gets settles in the downstream and quantity of water also found decreasing may be due to partial percolation and evaporation or absorbed by vegetation in the downstream. This natural flow ultimately meets the River Irai which is about 6 km from the discharge location. The dried ash bunds in the sides of the natural trench shows that such discharges occur whenever there is maintenance in ash slurry pipeline.

- Records of fly ash disposal were also collected from the CSTPS. Ash utilization percentage of the CSTPS is found with decreasing trend in the financial years 2018-19, 2019-2020 and April 2020 to December 2020. CSTPS is non-complying with the 100% fly ash utilization norms.

Table 10: Fly ash disposal records collected from CSTPS

FY	Total Ash Generated (MT)	Total Bottom Ash generated (MT)	Total Dry Fly Ash Generated (MT)	Total Dry Fly Ash Utilization	Total Wet Ash Utilization	Total Ash Utilization (MT)	Dry Fly Ash Utilization (%)	Total Ash Utilization (%)
18 -19	4413173	1323952	3089221	1036145	38257	1074402	33.54%	24.35%
19-20	4844673	1453403	3391270	1027631	26197	1053828	30.30%	21.75%
April-20 to Dec-20	3725160	1117547	2607613	524031	14133	538163	20.10%	14.45%

IX. GENERAL OBSERVATION

The joint committee has visited the premises of the power plant, coal handling plants, reject coal storage area, etc. Based on the CCA condition and physical observations following points were observed:

- CSTPS installed meteorological and 04 Continuous Ambient Air Quality Monitoring Stations (CAAQMS) to monitor continuously the ambient air quality in the CSTPS premises & all the CAAQMS are connected to MPCB server. CAAQMS locations are: Major Store, Solar Plant Ambhora, Chummery Guest House and ETP –IV. During visit CAAQMS at all the locations were found operational.
- CSTPS has reject coal storage area and runoff water from reject coal storage entering into natural drain namely Ranvendli Nallah in past was informed by MPCB. The Ranvendli Nallah carries domestic sewage and discharge from mines from upstream villages like Durgapur, Tukum etc. and crosses the premises of CSTPS. CSTPS has provided pipeline for the Ranvendli Nallah inside the premises in the portion of reject coal storage area to avoid direct mixing of runoff if any. In addition a grit chamber cum neutralization facility after the reject coal storage area is provided to treat the runoff before mixing into the Ranvendli Nallah further downstream.

During visit, grab samples of Nallah were also collected from two locations viz.

Location 1: Nallah below bridge near reject coal storage area and

Location 2: after grit chamber cum neutralization facility

The analysis results of the samples collected from are tabulated below:

Location	pH	TSS	TDS	COD	BOD	PO ₄ -P	Cr	Zn	Cu	Pb	Fe
Location 01	6.72	45.2	271	22.7	5.5	0.002	BDL	0.083	BDL	BDL	1.28
Location 02	7.02	41.8	357	19.9	5.6	0.008	BDL	0.012	BDL	BDL	0.18

**All values are reported in mg/l except pH*

The analysis results before and after grit chamber cum neutralization facility at Ranvendli Nallah reveal that the monitored parameter slightly varies after the Grit Chamber cum Neutralization facility.

- The coal analysis data collected from CSTPS shows that the Sulphur content in the coal is 0.58%. However, as per CCA the sulphur content of the coal to be used in the project shall not exceed 0.5%.
- As per CCA, CSTPS has to provide flue gas desulphurization (FGD) system on or before 31.03.2021. In this regard, it was informed that tender for installation of FGD is in process at MSPGCL corporate office.

5. CONCLUSION

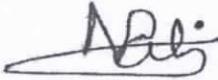
The joint committee constituted by Hon'ble NGT comprising members from MPCB and CPCB has carried out monitoring of the power plant in question, collected information to submit present status of Environmental compliance. In this regard, the joint committee of MPCB and CPCB has visited the power plant during 04-06.01.2021. The joint committee has collected information, surveyed the premises and carried out monitoring as detailed above. Based on the observations it can be concluded as:

- CSTPS has commissioned total 09 units from time to time since 1983. Presently two units are decommissioned and remaining units are in operational condition. However, unit 8

was non-operational during visit due to annual maintenance. CSTPS has provided CAAQMA stations at four locations in its periphery and OCEMS analyzers at all the operational stacks and ETPs. In addition CSTPS also carried out manual monitoring of stacks and ambient air quality monitoring periodically through third party.

- During visit Source emission monitoring of stacks attached to all the operational units were carried out. It was found that all monitored stacks exceed for concentration of Sulphur di-oxide. In addition, it was found that concentration of PM exceeds for unit no. 06 and concentration of NOx for unit no. 09 as per the conditions mentioned in the CCA. It was also observed that the CSTPS uses coal having higher sulphur content than that mentioned in the CCA. It was informed that tender for installation of flue gas desulphurization (FGD) unit is under process. CSTPS need to expedite the process of installation of FGD and also take further steps to meet the emission norms.
- The joint committee has collected samples of water from all 04 ETPs. It was found that all the ETPs meet the MPCB standards mentioned in the CCA. Proper collection and treatment of runoff water from reject coal storage area need to be provided so that runoff water if any will get treated and recycled back. In addition discharge/drainage of ash slurry during ash slurry pipeline maintenance was observed during visit. It is understood that such discharge occurs in case of maintenance in pipeline. Therefore proper arrangements need to be provided by CSTPS to collect and transfer ash slurry. CSTPS also need to collect the accumulated fly ash observed on the side of natural trench during visit.
- The ambient air quality found exceeding the NAAQS for PM 10 at all three monitoring locations and PM 2.5 for two locations. CSTPS need to take more efforts to mitigate the dust emission from various activities. It was observed that coal transfer pipeline work from Bhatadi Open Cast Mine to CSTPS was under progress and it will help in reducing the truck movement for transfer of coal from the said mines to CSTPS.

- CSTPS has not achieved 100% fly ash utilization as per the condition of CCA. Huge quantum of fly ash found dumped in the ash bund. CSTPS need to prepare action plan for 100% utilization of present fly ash generation and plan for legacy ash dumped in the ash bund.



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