Executive Summary

2 X 660 MW COAL BASED SUPERCRITICAL THERMAL POWER PLANT

PROJECT PROPONENT

MAHAGENCO

MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED

ENVIRONMENT CONSULTANT

Pollution and Ecology Control Services

Accreditation no: NABET/EIA/2023/SA 0165 valid upto 10th April 2023

EXECUTIVE SUMMARY

1.0 INTRODUCTION

Maharashtra State Power Generation Company Ltd. (MAHAGENCO), a leading power generation in Maharashtra strives to provide reliable supply of power to the consumers. The company operates one of the thermal power station at Koradi in Nagpur district having existing installed capacity of 2190 MW. To meet the increasing power demand and to generate power at cost lower than the average cost of power generation, Maharashtra State Power Generation Co. Ltd. (MAHAGENCO) is planning to set up a thermal power plant (2 x 660 MW) at Koradi in its Thermal Power Plant Premises. The proposed plant will be based on Supercritical Technology. Proposed project comes under Category "A", 1(d) Thermal power plants as per EIA Notification dated 14th September, 2006 and requires Prior Environmental Clearance before the plant to be set-up.

Initially this proposed 2x660MW Supercritical Thermal Power Plant considered in replacement of the following units at various locations in Maharashtra (under MAHAGENCO).

PROPOSED REPLACEMENT UNITS	**NAME OF UNIT TO BE REPLACED**	**UNIT CAPACITY IN MW**	**RETIRING IN / RETIRED**
Koradi (2x 660MW) Shall be considered as a replacement project of Supercritical technology	Nasik Unit-4	210	2028-29
	Nasik Unit-5	210	2024-25
	Parli Unit-4	210	2019-20
	Chandrapur Unit-3	210	2028-29
	Parli Unit-5	210	2019-20
	Koradi Unit-5	200	2016-17
	Total	1250	

Now after more detailing of other operational units following units are considered to be replaced with proposed 2x660 MW TPP at Koradi.

PROPOSED REPLACEMENT UNITS	NAME OF UNIT TO BE REPLACED	UNIT CAPACITY IN MW	RETIRING IN / RETIRED
Koradi (2x 660MW) Shall be considered as a replacement project of Supercritical technology	Parli Unit-4	210	30.11.2019
	Parli Unit-5	210	30.11.2019
	Koradi Unit-5	200	02.03.2017
	Chandrapur Unit-1	210	01.09.2015
	Chandrapur Unit-2	210	12..01.2016

	Bhusawal Unit-3	210	In service, (After commissioning of U#12 Koradi Project) 2027-2028
	Total	1250	

These units are old and either closed or schedule for permanent shut down. The proposed 2x660MW Thermal Power Plant unit will definitely operate more efficiently in view of resource availability (coal, water & land) and with more efficient air pollution control devices including installation of FGD.

2.0 PROJECT DESCRIPTION

Maharashtra State Power Generation Company Limited (MAHAGENCO) has initiated action for setting up a 2x660 MW thermal power plant taking advantages of the inherent features and infrastructures of existing Koradi TPS. Land for 2x660 MW project will be made available by demolishing existing structures/buildings of 4x120 MW units and 200MW unit and associated structure at existing Koradi TPS.

MAHAGENCO is already having four (4) thermal power units total capacity 2190 MW at Koradi TPS.

Project Design Features

SR. NO.	PARTICULAR	DETAILS
1.	Project Authority	Maharashtra State Power Generation Company Limited (MAHAGENCO).
2.	Plant Capacity	1320 MW (2x660MW) Supercritical Thermal Power plant.
3.	Location	Village Koradi, Taluka Kamptee of Nagpur District in Maharashtra
4.	Seismic Zone	Zone-II as per IS 1893-1984.
5.	Main Fuel	The main fuel considered for the project is coal. Total coal required for 2x660MW Supercritical thermal power plant will be 7.18 MMTPA with consideration of worst coal of GCV 3200 Kcal/kg at BMCR at 85% PLF. Initially, it has been proposed to utilize coal from the existing coal linkages of those units which are either closed or going to be closed. CEA has recommended long term linkage under SHAKTI para B (i) 7.079 MMTPA Coal. The details of linkage to proposed units will be finalized after SLC(LT) recommendations. In future coal will be source from captive coal mines at Gare

SR. NO.	PARTICULAR	DETAILS
		Palma II coal mine, Chhattisgarh allotted to MAHAGENCO
6.	Fuel Transportation	By rail in rake loads of BOX-N wagons and pipe conveyor.
7.	Water	a. Total water requirement for proposed thermal power plant is estimated to be 34.69 MM3/Year. b. The source of water for power generation & cooling purpose will be tertiary treated sewage water from Treatment plant of Nagpur Municipal Corporation. c. About 27m3/day fresh water from Pench dam will be used for domestic purpose. d. Specific water consumption shall not exceed 3.0 cubic meter /MWh as per Notification dated 28th June 2018. e. Also, 5.2 MM3/Year (i.e. 15% of total water requirement) fresh water allocation shall be kept as backup source considering non availability of Tertiary treated water (TTW) as per CEA notification no. 252/Sewage treated water/TPP&D/CEA/2022/468-649 dtd 24.11.2022.
8.	Land for proposed plant	Proposed coal based thermal power plant will be established in land of closed 4x120MW and 200MW unit and associated structure at existing Koradi TPS. Earlier 275.39 Acre land was identified (inclusive of Ash bund, Railway siding & Green belt) for proposed 2x660 MW supercritical thermal power plant. After detailed layout design and area calculation total 168.75 acres (68.28 Ha) land (excluding ash bund, railway siding) is sufficient and is available for proposed project. The existing Koradi ash bund will be used for proposed project. There are about 2800-3000 well grown trees in the land identified for proposed project. The layout has been design in such a way that minimum tree cutting is required. Around 840 – 900 trees to be removed. Possibilities of transplantation will be explore. Additional plantation will be carried out in plant premises for no. of trees cut. Proper permission from authority will be taken for tree cutting if required. Contract for demolishing, cleaning, disposal of debris, metal, equipment's etc. was given to authorized company through national tender system in 2019. All work was carried out under supervision of MAHAGENCO
9.	Power Generating Unit	2x 660MW Supercritical Thermal Power Unit.

SR. NO.	PARTICULAR	DETAILS
10.	Steam Turbine Generator Steam Generator	The Steam Turbine will be single shaft, multi-cylinders, tandem compound single reheat, regenerative, condensing unit directly coupled to AC Generator giving a continuous rated output of 660 MW at generator terminals. Steam Generator will be Super-critical pressure balanced draft furnace, single reheat, radiant, dry bottom type, sliding (variable) pressure operating, suitable for outdoor installation designed for firing pulverized coal as main fuel.
11.	Cooling System	Semi-open recirculating condenser cooling system with wet-type natural draft cooling tower.
12.	Coal Handling System	Coal handling facility, which comprises unloading by Wagon Tipplers with on-line crushing and stacking by stacker-cum-reclaimer in the coal yard and finally feeding the bunker level conveyors. The system capacity considered is 2000 TPH
13.	Ash Disposal System	Dry extraction provision for high concentration slurry of disposal for fly ash and wet disposal for bottom ash is considered.
14.	Power Evacuation	At 400 kV level.
15.	Environmental Aspects	Two Separate Wet stacks have been considered as per MoEF&CC guidelines with internal diameter of the chimney estimated @ 6.5 m, flue gas velocity of 19.8m/sec and a temperature of 90°C at stack exit after installation of FGD. Adequately designed electrostatic precipitators with more than 99.89% efficiency are envisaged. The amount of SOx emissions shall be less than 100mg/Nm3 after installation of FGD (Flue Gas Desulfurizer) system for each unit by combining common utilities and the installation of chimney as per MOEF guidelines. The amount of NOx emissions shall be less than 100mg/Nm3 after installation of Selective Catalytic Reduction (SCR) for each unit after economizer outlet when the units are operating at MCR. Waste water quality to be maintained as per MoEF&CC notification. Most of the waste water and ash water would be recycled back to the system after treatment for use in less priority areas.
16.	Project Time Frame	Fifty-one (51) months for erection of 1st Unit & fifty-seven (57) months for 2nd Unit from zero date i.e. the date of 'Letter of Award' to the EPC contractors for BTG package to commercial operation. The construction activity will be initiated after grant of Environmental Clearance and issue of Consent to Establish from Maharashtra Pollution Control Board

SR. NO.	PARTICULAR	DETAILS
17.	Project Cost	Present day cost Rs.10625 Crores including interest during construction and financing charges.

Details of Site Location

<table>
<tr><th>SR. NO.</th><th>PARTICULAR</th><th>DETAILS</th></tr>
<tr><td>1</td><td>Project Authority</td><td>Maharashtra State Power Generation Company Limited (MAHAGENCO).</td></tr>
<tr><td>2</td><td>Location</td><td>Village Koradi, Taluka Kamptee of Nagpur District in Maharashtra

<table><tr><th></th><th>Latitude</th><th>Longitude</th></tr><tr><td>A</td><td>21°14'26.51"N</td><td>79° 5'20.09"E</td></tr><tr><td>B</td><td>21°14'39.52"N</td><td>79° 5'36.73"E</td></tr><tr><td>C</td><td>21°14'56.78"N</td><td>79° 5'33.93"E</td></tr><tr><td>D</td><td>21°14'59.17"N</td><td>79° 5'40.86"E</td></tr><tr><td>E</td><td>21°14'50.39"N</td><td>79° 5'45.13"E</td></tr><tr><td>F</td><td>21°14'54.36"N</td><td>79° 6'1.13"E</td></tr><tr><td>G</td><td>21°14'16.42"N</td><td>79° 5'57.85"E</td></tr><tr><td>H</td><td>21°14'15.95"N</td><td>79° 5'49.29"E</td></tr><tr><td>I</td><td>21°14'27.35"N</td><td>79° 5'46.96"E</td></tr><tr><td>J</td><td>21°14'20.87"N</td><td>79° 5'19.60"E</td></tr></table></td></tr>
<tr><td rowspan="5">3</td><td>Nearest Major Towns</td><td>Mahadula Nagar Parishad : 640 m (W)
Boundary of Nagpur City : 4.0 km (SE)</td></tr>
<tr><td>Nearest School/Collage</td><td>Sewanand Mahavidyalaya : 200 m (NW)
Samsidh Tuli Public School : 2.8 Km (SW)
SN public school : 4.2 Km (SW)
Mahatma Gandhi School : 5.9 Km (SSW)</td></tr>
<tr><td>Nearest Hospital</td><td>Mahagenco Hospital : 600 m (SW)
Suradevi Primary Health Sub Centre : 640 m (E)
MCH Multicare Hospital : 1.0 km (NW)</td></tr>
<tr><td>Nearest Forest land</td><td>Balasaheb Thakre Gorewada International Zoo
(earlier known as Gorewada Zoo) : 5.28 Km (SW)</td></tr>
<tr><td>Nearest Water Body</td><td>Kanhan River : 4.0 Km (NE)
Pench river : 8.0 Km (ENE)
Kolar river : 2.0 Km (NE)
Pili nadi : 4.5 Km (SSE)
Gorewada lake : 6.5 Km (SW)</td></tr>
</table>

SR. NO.	PARTICULAR	DETAILS
		Futala Lake : 10.0 Km (SSW) Koradi lake : 1.0 km (NNW) Shukrawari Lake : 10.0 Km (S) Ambajhari Lake : 12.5 Km (SSW)

TECHNOLOGY AND PROCESS DESCRIPTION

Steam Generator and Auxiliaries

For the proposed station, two-unit configuration has been planned with overall capacity of 1320 MW with supercritical steam parameters by the project proponent. The choice of supercritical steam parameters in once-through boiler is prima facie guided by the improvement in combustion efficiency as listed above. The choice is, however, beset with use of higher alloy steels in the heat transfer surfaces.

For the present study, the details of power cycle equipment for 660 MW supercritical units are given in following table.

Power Cycle Equipment Details

S.No.	EQUIPMENT	DETAILS
1.	Boiler	Once-Through
2.	Turbine	1HP+1 IP+2LP (HP: High Pressure, LP: Low Pressure)
3.	Generator (MVA)	780
4.	LP Heaters	Three(3) to Four(4) Nos.
5.	HP Heaters	Two(2) to Three(3) Nos.
6.	Deaerator	One(1) No.
7.	Condensate Extraction Pumps	3 x 50%
8.	Boiler Feed Pump	2x50% of BMCR TD + 2x30% of BMCR MD
9.	Vacuum Pumps	2 x 100%
10.	Condensate Polishing Units	3 x 50%/4 x 33.3%
11.	HP Bypass Valves	Two(2) Nos.
12.	LP Bypass Valves	Two(2) to Four(4) Nos.
13.	Recirculation Pumps	Two(2) Nos.

The steam parameters and basic inputs are given hereunder:-

- 660 MW Supercritical:-

  (Main Steam Header)M. S. : 255 atm (a), 568 °C, 2100 TPH

  (Re-heated steam Header)R. H. : 596 °C

  Feed Water Temperature :190.0 °C (BFP Outlet)

  Condensate Flow : 1320 TPH

  Coal Requirement : 7.18 MMT @ 85% PLF

Water Requirement for : 50Cu/sec

Initial years

* Vendor to specify

The main steam from the boiler, after expansion through the HP turbine, would be sent back to the boiler for re-heating. The reheated steam, after expansion through the single casing IP turbine & then through two double flow LP casing would be exhausted into the main condenser. The exhaust steam from the LP turbine would be condensed by circulation of cooling water. Vacuum would be maintained in the condenser by two (1 working + 1 standby) 100% capacity vacuum pumps. The LP feed heating system would consist of three to four stages of low-pressure heaters, one gland steam condenser, and one drain cooler for the low-pressure heater, drain flash tank and one deaerator. HP feed heating system will consist of two 50% capacity parallel trains of high-pressure heaters. However, number of heaters varies from manufacturer to manufacturer. The condensate from the hot well would be extracted by 3 x 50% capacity condensate extraction pumps (2 working + 1 standby) and pumped to the deaerator through gland steam condenser, drain cooler and the LP heaters.

The feed water after being de-aerated in the deaerator would be pumped to the boiler through the high-pressure heaters. Provision would be kept for dosing hydrazine solution in the condensate extraction pump discharge and in deaerator feed tank or boiler feed suction line for oxygen scavenging and pH control of the feed condensate steam cycle. For the unit 2x50% of BMCR turbine driven &2x30% of BMCR motor driven BFP with booster pump mounted on common shaft is envisaged. Normally the steam-driven pumps would be in operation. The boiler feed pumps would be provided with lube oil system, automatic leak off and minimum flow re-circulation valves. Motor-driven BFW pump would be provided with modulating variable speed hydraulic coupling. Condensate drain from the HP heaters would be cascaded to the deaerator feed storage tank and the condensate drains from the LP heaters would be cascaded to the condenser through the drain cooler.

The auxiliary steam for the station would be divided into two sub-systems, one boiler auxiliary steam (BAS) and other turbine auxiliary steam (TAS). Both BAS & TAS would receive steam supply after pressure reducing & de super heating from the inlet of boiler final SH & CRH line. The auxiliary steam supply system of the unit would supply steam to the deaerators, turbine gland sealing system during light load and start-

up conditions. Auxiliary steam will also be supplied for soot blowing, atomisation system etc.

The units will also be provided with HP and LP Turbine bypass system for quick start and large load rejections. The turbine generator units would be so designed that these will be capable of cyclic duty and frequent start-ups and shutdowns during the lifetime. The salient features and parameters of major equipment of the 660 MW sets are furnished hereinafter. The details of the units may vary to some extent as per vendors' standard product. The basis of technical parameters of the main plant and auxiliary equipment for the 2x660MW thermal power plant is discussed hereunder which describes the general requirements but is not intended to be exhaustive.

Steam Turbine

The turbine component and its auxiliaries will be designed and selected to meet the stringent requirements in respect of superior thermal performance, excellent product reliability and operational flexibility.

The turbine manufacturer will have turbine designed based on modular design approach that divides the turbine into three main parts:

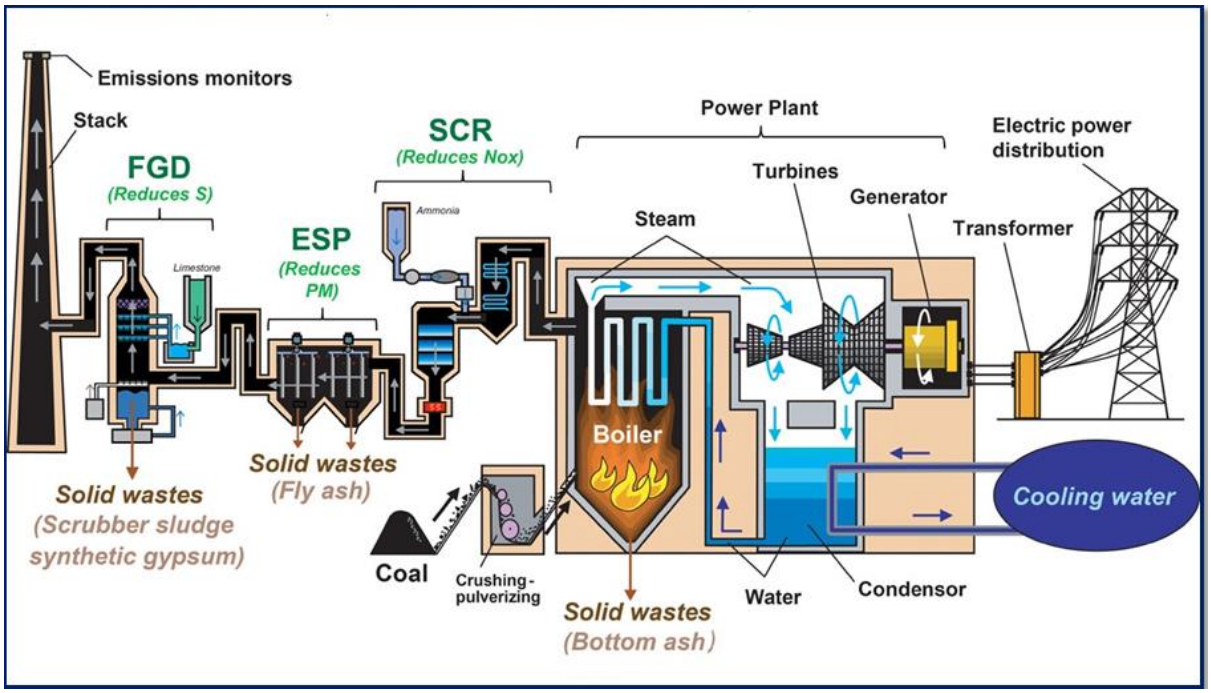
- *high-pressure (HP) section,*
- *intermediate-pressure (IP) section and*
- *low-pressure (LP) section.*

The steam turbine would be 3000 rpm, tandem compound, single reheat, regenerative, condensing, horizontally split, three-cylinder machine with extractions for regenerative feed heating. The turbine would be designed for main stream parameters of corresponding to the boiler output of pressure and temperature, before emergency stop valves of HP turbine and reheat steam parameters to IP turbine. The LP turbine will exhaust to condenser. At turbine valve wide open (VWO) condition the turbo-generator set will be able to operate continuously with a throttle steam flow of about 105% turbine MCR condition.

The bypass station will act not only as a protection to the unit during pressure rise resulting from sudden load throw off but also enable operation of the unit at loads lower than the controllable range of load. This will also permit quick, repeated hot starts of the unit on its tripping.

A fully automatic gland sealing system will be provided for the turbine which will have provision for receiving steam from auxiliary steam header during start-up and low load operation. The turbo-generator will be equipped with electro-hydraulic governing system ensuring stable operation under any grid fluctuation and load throw off condition. The turbo-generator will be equipped with turning gear. The unit will also be provided with self contained lubricating oil system for supplying oil to turbine and generator bearings and also to hydrogen seal oil system of the generator. The lubricating oil will be cooled by Closed Circuit Cooling Water System utilizing sewage treated water as cooling medium.

Generator will be connected to its unit step up transformer. The auxiliary power requirement of the unit will be drawn from its unit auxiliary transformer tapped off from the generator bus duct. All auxiliaries like turbine oil purification system, generator seal oil system etc. as well as necessary protective and supervisory system will be provided to ensure trouble-free, safe and efficient operation of the turbo-generator. The unit will be guaranteed to generate required output at generator terminals continuously. The turbine will be suitable for wet steam washing for which set of auxiliary equipment necessary for the units will be provided. The power generation process is presented in following figure.



Power Generation Chart

3.0 BASELINE ENVIRONMENTAL STATUS

Baseline study have been carried during March to June 2019. The TOR was granted on 26th June 2020, and baseline data was collected on March to June 2019. But as per the Notification dated 8th July 2022, the validity of the baseline data is three years so, three-month baseline monitoring was done again for the period of March to June 2022.

Land use: Majority of the land in the study are is agriculture and covering 158.86 sq km Crop land followed by urban land (81.71 sq km), scrub land (16.69 sq km), fallow land (23.09 sq km), rural land (16.27 sq km) and vegetation in 17.48 sq km, water bodies are covered in 18.28 sq km area. Mining area cover is in 3.43 sq km area.

Soil quality: Five Soil samples were collected and analyzed for physico-chemical characteristics at selected locations in the study area to assess the existing soil conditions around the proposed project site. The observations of soil characteristics are discussed below:

a) Texture of soil samples was Silty Loam, Sand loam and loam.
b) Colour of soil samples was brown or black in colour.
c) The bulk density of soil samples was in the range of 1.58 to 1.90 g/cc
d) pH values of soil samples varied between 7.2 to 7.7.
e) Soil samples have conductivities between 0.145 to 0.234 mmhos/cm
f) Organic matter and organic carbon ranged from 0.40 to 1.02 % and 0.19 to 0.66 % respectively.
g) Nutrient values in the form of NPK were found in the range of 126 to 443 kg/ha, 85.2 to 288 kg/ha and 24.0 to 175.9 kg/ha. respectively

Air Environment

The baseline environmental quality was assessed in an area of 10 km radius around the proposed project site. The predominant wind directions are North East and East. The ambient air quality monitored at 8 locations selected based on predominant wind direction, indicated the following ranges;

PM10 – 39.9 to 80.6 $\mu g/m^3$.

PM2.5 – 19.3-39.9 $\mu g/m^3$

SO2 – 9.6-38.1 $\mu g/m^3$

NOx – 14.4 – 38.7$\mu g/m^3$

CO - 0.137 – 0.736 mg/m^3.

The concentrations of PM10, PM2.5, SO2 and NOx were found within the National Ambient Air Quality Standards (NAAQ).

Water Environment

A total 16 samples including eight surface & eight ground water samples were collected and analyzed. The water samples were analyzed as per Standard Methods for Analysis of Water and Wastewater, American Public Health Association (APHA) Publication. The data indicates that the ground water as well as the surface water quality are below the stipulated standard for drinking water (IS 10500 – 2012).

Noise Environment

Noise levels measured eight stations are within limit of 55.0 dB (A) for Residential Area or 75.0 dB (A) for industrial area as given in MoEF Gazette notification for National Ambient Noise Level Standard.

Biological Environment

There are no patches of reserved forest and protected forest in 10 Km study area of project under consideration.

Demography and Socio-Economic Environment

The area selected for the study constitutes 46 inhabited villages. The village size as estimated from the number of inhabitants as per the 2011 census indicated that 2 villages fall within 1-500 population size, 13 village fall in range of 501-1000 population size, 14 villages fall in range of 1001-2000 population size, 16 villages fall in range of 2000-10000 population size while 1 village is having population more than 10000. The demographic structure and the amenities available in the study area, opinion of the people regarding proposed project and the quality of life of the people existing in the study area all are given in Chapter 3.

4.0 ANTICIPATED IMPACTS & MITIGATION MEASURES

Maximum Incremental Levels (μg/m^3)

In fifth scenario, the proposed two units each of the proposed 660 MW are taken into consideration. **(With FGD)**	
Parameters	**Maximum Incremental Levels (μg/m^3)**
PM_{10}	1.73
Distance/Direction	1.6 Km/ ESE
SOx	5.28
Distance/Direction	1.5 Km/ ESE
NOx	1.89
Distance/Direction	1.4 Km/ ESE

Air Pollution & control measures

- Since the ash content in coal is expected to be in the range of 31%, to 42% a sizeable quantity of fly ash in the form of particulate matter would be generated. An efficient electrostatic precipitator will be provided to limit emission of particulate matter to 30 mg/Nm3. A properly designed Air Pollution Control System would keep the stack emissions i.e. SOx (100 mg/Nm3) & NOx (100 mg/Nm3) as per amended notification of MoEF & CC dtd.07/12/2015.
- Dust suppression system will be provided in the form of water sprinklers.
- Regular monitoring of air quality etc.
- Green belt shall be provided around the plant area. Plantation along the internal roads in the plant premises will also be undertaken
- Water spraying will be practiced frequently

Impact on Water Environment

Total water requirement for proposed thermal power project is estimated to be **34.69** MM^3 per annum at PLF of 85%. The source of water will be tertiary treated sewage water from Nagpur Municipal Corporation. Water would be conveyed through cross country pipeline at a distance of 11Km. 27KLD fresh water for domestic use purposed from Pench dam water will be used. No fresh water will be used for power generation and cooling purpose in proposed 2x660 MW TPP at Koradi. RO plant of 2X100 m^3/hr (1 in operation + 1 standby) are proposed for DM water requirement.

Impact on Noise Environment

The major sources of noise during the construction phase are vehicles and construction equipment like scrapers, concrete mixers, cranes, pumps, compressors, pneumatic tools, saws, vibrators etc. The operation of these equipment can generate noise levels in the range 85-90 dB (A) near the source. These noise levels will be temporary during the day time only and ear muff will be provided to the construction workers near the high noise level equipment/ machineries and high noise level prone areas. Moreover heavy plantation is available inside the plant area and the TPS complex. This will also restrict / attenuate the noise levels. Hence the proposed project will not have any significant impact on surrounding during construction phase.

Biological Environment

The proposed expansion project will be located within the existing Koradi TPS. New facilities will be installed in place of old retired unit. There will be minimum cutting of trees if required.

Solid Waste generation and its Management

The major solid waste generated will be fly ash. MAHAGENCO intends to utilize 100% of fly ash utilization in accordance with MoEFF&CC notifications, for which MAHAGENCO has established its 100% own subsidiary company i.e MAHAGAMS to carry out ash utilization business.

Socio Economic Environment

M/s MAHAGENCO would aid in the overall social and economic development of the region. The plant will give direct employment to about 534 people of local area. In order to mitigate the adverse impacts likely to arise in the proposed project activities and also to minimize the apprehensions to the local people, it is necessary to formulate an affective EMP for smooth initiation and functioning of the project. The suggestions are given below:

- Communication with the local people will be established on regular basis by project authority to provide an employment opportunity for local youth.
- Project authorities will undertake regular environmental awareness program on environmental management.
- Job opportunities are the most demanding factor, the local people as per their education will be employed.

- For social welfare activities to be undertaken by the project authorities, collaboration will be sought with the local administration, gram panchayat, block development office etc. for better coordination.
- Labor Colony will have facility of electricity, ventilation system, water supply and community latrines with semi-permanent structure for their workers.
- Community latrines and Septic tanks will be constructed.
- Facility for collection, conveyance and disposal of solid wastes will be developed.
- The working hour will be reasonable as per prescribed by India's laws and regulations.
- The workers will be paid as per the Minimum Wages Act.
- The power plant will have adequate supply of drinking water, and workers will not be allowed to bath or wash their cloths adjacent to drinking water.
- Canteen facilities will be provided.
- For personal hygiene, workers will be provided with toilets and bathrooms.

Occupational Health and Safety

Health hazards are mainly due to dust generation, gas cutting, welding, noise and high temperature and micro ambient conditions, which may be due to heat and gases generated. The precautionary measures which will be taken to reduce the health risk due to dust to the workers engaged in and around the material handling areas are:

- Almost all material handling systems will be automatic thereby reducing the manpower. The workers engaged in material handling area will be provided with personal protective equipment (PPEs) like dust masks, respirators, helmets, face shields etc;
- All workers engaged in material handling system will be regularly examined through PFT (Pulmonary Function Test) tests for lung diseases.
- Any worker found with positive symptoms of dust related diseases will be given medical treatment immediately.
- M/s. MAHAGENCO will supply potable water to the construction workers of project. The safety department will supervise the safe working of the contractor and their employees. Work place will be maintained clean, with optimum lighting and enough ventilation to eliminate dust/fumes.
- Action plan for protecting the workers from the occurrence of hazardous waste will be taken by safety department.

- A Medical doctor will be appointed for regular health check-up of the workers

5.0 ENVIRONMENTAL MONITORING PROGRAMME

Environmental Monitoring will be carried out on regular basis. The ambient air quality, meteorological data, water quality, noise levels etc. are being monitored as per the CPCB guidelines.

6.0 ADDITIONAL STUDIES

The additional studies as per the ToR issued by MoEF&CC are Public Consultation, Risk Assessment, & Disaster Management Plan.

8.0 ENVIRONMENTAL MANAGEMENT CELL

An environmental monitoring and control cell has been established. The Environmental Cell function under the control of the General Manager along with the EMS team of the company to monitor the environmental measures.

The cell is/will be responsible for monitoring ambient air quality, stack emission, ambient noise in the plant and vicinity, waste water quality and discharge, quality of water bodies receiving effluent, workplace air quality and maintenance of analytical instruments.

Additional responsibilities of the cell include the following:

- Conducting annual environmental audit and submit audit report to State pollution Control Board (SPCB);
- Submission of all statutory reports and returns.
- Conduct regular training programs to educate plant personnel on environmental awareness.
- Inform the management regularly about conclusions/results of monitoring and recommend environmental protection measures.

Manpower Requirements

The Company shall give employment to 534 personnel. During employment, preference will be given to local people.

Out of estimated manpower requirement nearly 145 will be deployed for plant operation keeping in view the design and operating philosophy proposed for the station. Approximately 300 persons would be deployed in maintenance of the plant and machineries. The periodic capital maintenance is considered to be done through

contract labours in line with general practice being followed elsewhere. Besides, nearly 90 persons along with a Superintendent Engineer would look after the fuel supply, transportation and handling section.

Green Belt Development

The plantation will help to capture the fugitive emissions and attenuate the noise apart from improving the aesthetics quality of the region. Adequate green belt will be provided all around the plant and inside the plant premises. Locally available types of trees which are resistant to pollutants are planted. Green belt will be developed as 33% of total plant area. Plantation near coal stacks and ash bund to arrest fugitive dust is also proposed. The green belt and plantation, apart from arresting air-borne dust particles and acting as noise-barrier, would help in improvement of ecology and aesthetics of the area.

Existing and Proposed Plantation

Sr. No.	**Existing Planation**		**Proposed Planation**	
1.	Area	1037255 sq mt	Area	1113060.38 sq mt
2.	No. of Trees	260000	No. of Trees	279000

Proposed Schedule of Appraisal and Implementation

The Present-day cost is Rs.10625 Crores including interest during construction and financing charges. The unit of 2x660 MW project would be undertaken only after receiving the Environmental Clearance for the project. The project will be completed in 60 months.

CER for socio-economic development

Community development needs of villages in study area are well known to the MAHAGENCO and demands from the local people during public consultation will be fulfil as part of CER towards improvement in living conditions of local population near the project, particularly in the areas of education, rural infrastructure, community health & sanitation, livelihood development and community environment.

Fund for CER activities are provided as per MOEF&CC OM dated 30.09.2020. Exact cost are based on the concerns/request received during PH & interaction with local communities and shall be update as suggested by EAC

Following activities under CSR were carried out during Covid Period.

- Koradi, Paras & Khaparkheda Power station has provided 1454 Oxygen Cylinder for the Covid patients in the vicinity.
- In Mahagenco Koradi hospital, Dutta Meghe Medical Collage Rural Health & Training Center had formed Covid center with capacity of 20 beds.
- For Mahagenco Koradi Thermal Power Station officials, employees & contractual workers, Covid Vaccination drive was conducted at Vidhut Vihar Colony Hospital.
- Isolation rooms were formed at Mahagenco Koradi Thermal Power Station colony for Covid patients.
- Provision of 35 m^3/hr oxygen plant to Kamthee Hospital.

CONCLUSION

The above discussion clearly highlights that the proposed power plant has been proposed to meet the required power demand from various sectors. While construction and operation of the plant can generate wastes but a detailed waste management programme and Environmental Management plan have been developed to mitigate the pollution potential. The project will meet all the stipulated environmental norms. Fresh water used will be minimised by maximum use of wastewater and by rainwater harvesting. Due to the project activities, Socio - economic condition in and around the project site will improve more substantially. 33% of Greenbelt will be developed in and around the proposed project would also be taken up as an effective pollution control measure.

It can be concluded that with the implementation of EMP the proposed project will not have any adverse impact on local environment.

Additional benefit of this proposed project:

- No additional land is to be acquired. Hence no R&R issue in involved.
- No ground water or surface water will be used for power generation and cooling purpose.
- Treated domestic waste water of Nagpur Municipal Corporation will be used for power generation and cooling purpose.
- Work of installation of FGDs will be initiated simultaneously along with start of construction of 2x660 MW TPP.

Improvement in the socio economic status

Proposed project with an investment of about Rs. 10625 crores in next 60 months will bring new employment, increased business, trade & commerce and service activities in the area to cater project needs. Reliable job prospects, increased income and consumption levels will enhance the demand for additional manpower, infrastructure and services in the area. This will increase revenue to the Central and State Government in form of taxes from development of local business. With project earmarking certain budget for betterment and development of the surrounding areas as part of Environmental Management Plan (EMP), Corporate Social Responsibility (CSR) & Corporate Environmental Responsibility (CER) activities will have a positive impact in betterment of socio economic status and quality of life in the area.