

EXECUTIVE SUMMARY

INTRODUCTION

Proponent: M/s Imperial APGCL Power Limited is a Joint venture Company comprising of M/s Imperial Energy & Construction Pvt. Ltd, M/s Imperial Fastners Pvt. Ltd, M/s Intelli Mine Inc. and Assam Power Generation Corporation Ltd (APGCL). Imperial Group of Companies has 74 % equity while Assam Power Generation Company Limited has 26 % Equity.

Project: M/s Imperial APGCL Power Limited has appointed GIS Enabled Environment & Neo-graphic Centre (GreenC) to carry out Environmental Impact Assessment (EIA) study for preparation of Environmental Management Plan (EMP) for the proposed refurbishment of 2×30 MW thermal power plant by replacing existing oil-fired boilers with coal based boilers. The project has already been examined by MoEF and TOR issued on 15th June 2011.

The major highlights of the proposed plant are

- Circulating Fluidized Bed Combustion Boiler;
- Compact layout (67.5 acres of land for 60MW which is much lower than CEA norms);
- Zero discharge concept of effluents;
- Optimum utilization of ash;
- Ideally located at a distance of 1km from water source, 2.5km from railway station, proper road accessibility; and

PROJECT DESCRIPTION

Location: The site is located near Chandrapur in Kamrup District, Assam. The site is accessible from the Guwahati-Jagiroad Expressway which is at a distance of 1 km from site. The nearest railhead is Thakurkuchi located 2.5 km from the site on the Guwahati-Dibrugarh broad-gauge Section. The nearest city and district town is Guwahati, 30 km away.

Land: There is an existing plant in the site, which is being refurbished as part of this project. Thus the land already has an industrial land-use. The main plant area will remain almost the same. Additional land will be required for ash disposal area, green belt, coal handling area, etc. The total land requirement will be 67.5 acres which will include all facilities. The whole land is already under possession of Imperial APGCL. The site will be used only for the purpose of power generation and allied activities.

Coordinate: The coordinates of the plant site including ash pond is latitude 26°14'10.0" N and longitude 91°57'22.0"E.

Water: Water requirement of the proposed plant will be met through Kalang River. The intake point is about 1km from plant site and is already functional for existing plant. The plant water requirement is estimated to be maximum 556 m³/hr.

Fuel: Coal for the project would be indigenous and will be sourced from two sources viz Margherita and Rajmahal. Coal from both sources will be blended. The coal requirement considering a GCV of 4000 Kcal/kg will be about 0.3 MTPA. Light Diesel oil (LDO) will be used as an auxiliary fuel. LDO will be used for cold start-up. The requirement of fuel oil has been estimated to be 4 T/annum.

Power Evacuation: Power Plant Output will be evacuated after stepping up of generation voltage of 11KV to 132KV for matching with the existing 132KV Substation bus of the Power Plant Substation through existing unit connected Generator Transformers. 33KV Bus of Power Plant Substation is already having 33 /132KV Transformers, 132KV Bus, 132KV outgoing feeders

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which will be utilized for power evacuation as well as power selling to the Assam Grid Corporation Limited.

Project Cost: The total cost of the project including all facilities is estimated to be INR 160 crores.

Steam Turbine: Steam Turbine will be condensing type. The set will be complete with Water Cooled Condenser, Air Evacuation System, 2 x 100% Condensate Extraction Pumps, Generator Water Cooling System, Gland Sealing with Gland Vent Condenser, Lube Oil System, etc.

Generator: Generator will be rated for 2 x 30 MW with 0.85 lagging Power Factor, delivering Power at 11 KV, 3 Phase, 50 Hz star connected in IP55 enclosure.

Boiler: Circulating Fluidized Bed Combustion (CFBC) Boiler will be installed.

BASELINE ENVIRONMENT STATUS

The study area is 10 km radial distance from centre of plant site. All the monitoring has been completed in various locations within the study area during the period of March to May, 2011.

The findings of the baseline environmental status on land (topography, geology, soil quality, land use pattern), meteorology (Temperature, Humidity, rainfall, wind speed, wind rose), air (ambient air quality- SPM, PM10, PM2.5, SO₂, NO_x, ozone), water (surface water, ground water), noise level, ecological environment (flora and fauna), socio economic conditions (demographic profile and households condition), are presented in the report and interpreted with reference to environment standards.

Topography: The project site has almost plain topography and has been already graded. The general ground level of the plot is approximately about 282.4 m above MSL. A single terraced level land for the power plant has been considered.

Soil Quality: The soil cover of the study was found to be yellowish brown to reddish brown with clayey loam texture. The pH of the soil samples was found in the range from 6.1 to 7.4. However, texture of some soil samples were clay loam, silty loam and silty clay loam. Organic carbon content of the soil samples was found to be in the range from 2.2 to 4.1. Organic matter content of the soil samples was found in the range from 3.8 to 6.1.

Land-use: The land-use of the project site is industrial and there is a plant existing there. The study area has a major share of forest land which is about 113.52 sq km (36.2%) followed by agriculture land (34.9%). The forest is completely reserved forest. The water bodies include ponds and rivers (Brahmaputra) covering 1.9% and 10.4% respectively.

Meteorology: The average maximum temperature during the study period was 38.4°C while the minimum was recorded at 20.5°C. During the study period, mean humidity was recorded at 64.6% while maximum and minimum humidity were observed as 89.0% & 45.3% respectively. The predominant wind direction recorded was from NE followed by E as the second predominant.

Ambient Air Quality: The maximum P₉₈ value for SPM and PM10 was found at Dumpara (176.2 µg/m³ and 74.1 µg/m³ respectively). The PM 2.5 value was also recorded highest at Dumpara (18.4 µg/m³). SO₂, NO_x and Ozone levels were much below the permissible limit. The concentration of Mercury (Hg) was found below detectable limit i.e. 5 ppb (detectable limit of the method). It was observed that the recorded values of air pollutants are well within the allowable limit of National Ambient Air Quality Standards (NAAQS) for the Rural Areas.

Ambient Noise Level: The ambient noise levels monitored at ten different locations indicate that they were within the standards. The L_{eq} were recorded at 40.8 to 47.8 dB (A) during daytime and 33.0 to 38.6 dB (A) during nighttime.

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Water: The study area is mainly drained by Brahmaputra, Digaru and Kalang rivers. River Brahmaputra flows towards west in the North, Digaru flows towards south in the south-east and Kalang flows towards south in the east of the project site. These rivers constitute the general drainage system of the area. First and second order seasonal streams join the Brahmaputra or Digaru or Kalang rivers within the study area.

Surface Water: Water samples have been collected from 8 stations (4 for surface water and 4 for groundwater). Surface water analysis showed that all parameters are within the norms. The surface water quality falls within the desirable limits for drinking water. The pH and TDS (mg/l) of the surface water samples were found normal in the range from 6.8 to 7.1 and 71 to 99 respectively. The values of hardness, calcium and magnesium, chloride, sulphate, nitrate values are also found well within the limits of drinking water standard prescribed by BIS (IS 10,500: 1991). Heavy metals such as Arsenic, Cadmium, Chromium, Copper, Lead and Mercury are all found below detection limits. Although low concentrations of iron and zinc are found, they are within drinking water standards.

Ground Water: The pH of the groundwater was found in the range from 6.2 to 7.1. The TDS values were found in the range from 107 to 325 mg/l. The hardness values were in the range from 59.7 to 163.9 mg/l and the calcium and magnesium were in the range from 14 to 31.0 mg/l and 6 to 21 mg/l respectively. The heavy metals such as Cadmium, Copper, Lead, Boron, and Zinc are all found within drinking water standards. In general, the groundwater quality indicates that the groundwater bodies are not polluted and can be used for drinking purpose after necessary disinfection.

Ecology: There are no ecologically sensitive receptors or endangered species within the 10 kms study area. The nearest Forest is Amchang RF and Raja Mayang RF at a distance of 1 km from site. Besides some patches of forest such as Malibagan, Govardhan and Kamrupur Pahar are also existed as open mixed jungle Non forest land which is under govt. ownership is barren while there are agriculture lands under private ownership in the study area. Cultivated plants provide valuable resources to mankind like cereals, millets, vegetables, pulses, fruits, fodder, timber and wood for agricultural implements. Diverse types of fauna ranging from mammals Macaca (*Rhesus macaque*), Golden langur (*Trachypithecus geei*), Bay bamboo rat (*Connomys badius*), Spotted Deer (*Curvus axis*), avian species such as rock pigeon (*Columba livia*), house crow (*Corvus splendens*), cattle egret (*Bubulcus ibis*), House sparrow, Myna etc and reptiles such as snakes, lizards etc were recorded during study period.

Socio-economic: The number of households of villages within the 10 km radius is 9,708 with average family size of 5.35 persons. This indicates the family size is not very big in the area and there is a predominance of nuclear families. The literacy rate in the study area is 60.43%, whereas the female literacy rate is only 53.23%. The area has 11.21% of Scheduled Caste and 5.61% of Scheduled Tribe population.

PREDICTION OF IMPACTS

Based on the impact analysis, it is predicted that there will be negligible impact on environment during construction phase. During construction the likely impacts include dust due to construction, movement of vehicles, gases from engine exhaust, noise from movement of material personnel, etc.

The maximum resultant GLC's of the study area (which includes the sum of monitored and incremental) are likely to be 17.4µg/m³ for SO₂ and 176.5µg/m³ for SPM. It was found that the GLC for SO₂ and NO_x were well within the prescribed norms of CPCB.

Operation of the TPP will not have any long-term impact on water quality as it is proposed to have a minimum discharge plant. The water system of the proposed project has been

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developed with maximum recycle and reuse of water, so as to minimize the water requirement for the project as well as to reduce the quantity of effluents generated from the plant to minimum discharge.

Solid waste in the form of ash will be generated in a coal based thermal power plant. The total ash generated in the plant will be 77,901 TPA. Other than ash, gypsum of 16,874 TPA will also be generated as waste. The ash generated from the power plant will be utilized in cement plants and the remaining ash will be disposed in ash pond for which an area of 8 acres have been kept. Full ash will be utilized from the 4th year onwards.

Noise modeling indicates the noise during daytime will be within the permissible limit about 0.5 Km from the plant site. At boundary it will be less than this value due to green belt proposed all around the plant site.

No significant impact on terrestrial ecology is anticipated due to proper dispersion of pollutants through a chimney of 90 meters.

MONITORING PLAN

A structured and certified environment management system is suggested at the industry level for ensuring that all the activities, products and services conform to the environmental requirement.

The Environment Management Cell will be responsible for managing following activities related to environment function of proposed Power Plant:

- Coordinate and manage the EMP implementation during pre-construction, construction and operation phase
- Appoint dedicated environment staff to manage environmental monitoring responsibilities
- Manage and coordinate environmental monitoring and control
- Coordination with other sections of the plant and government agencies in relation to environmental management activities
- Implement and monitor greenbelt development and plantation activities
- Safety specialist will ensure safe working practices in all the sections of the plant

A well-defined environmental monitoring program would be emphasized with trained and qualified staff that would monitor the ambient air as well as stack emission quality to ensure that the pollutants level is maintained always within the permissible levels.

The one-time cost for installing pollution control equipments, development of green belt and setting up of laboratory for sample testing will be approximately Rs.18.71 crores. In addition to the above, annual recurring cost of Rs 29 lacs will be incurred for operation and maintenance of the machines. The manpower cost for E M Cell is not included in the estimate.

RISK ASSESSMENT

Risks likely to pose a risk to man, environment or property associated with various activities are addressed in this report. Such activities include transport, storage; handling and usage of fuels (Coal & LDO) and hydrogen, Precautionary measures to be taken for preventing any hazards due to these materials are proposed in the report.

All equipment vulnerable to explosion or fire would be designed to relevant IS codes and statutory regulations.

Specific precautions shall be taken with respect to hazardous chemicals and regular mock drills shall be carried out to enact accident scenarios with reports sent to the top management.

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Suitable fire protection system comprising hydrants and spray systems are provided for fire protection. Fire extinguishers shall be tested periodically and always be kept in operational mode.

Surrounding population shall be made aware of safety precautions to be taken incase of any mishap in plant.

On-site disaster management and off-site emergency plans, commands communication and controls will be established and maintained.

Adequate provisions like emergency response, response organization, response plan, material safety data sheet, command and control, capabilities, transportation, medical facilities, mitigation measures, training, education, public awareness emergency plan review etc. to control any disaster situation will be made available.

ENVIRONMENT MANAGEMENT PLAN

During the construction process, the impact will be minimal and temporary in nature. So the scope of EMP during the construction phase will be limited to dust suppression and noise attenuation. Care has to be taken to reduce the SPM level of the project area.

During the operation stage the main air pollutants will be from the Coal Handling Plants, coal crusher units and the flue gases. Furnaces and boilers would be operated with minimum excess air so that fuel consumption is reduced and gaseous emissions are minimized. Lime-dosing of coal will be made to reduce SO₂ emission. The fugitive emissions of coal dust from storage facilities, from crushers and at coal transfer points shall be reduced by adopting appropriate measures like cyclones /bag filters/water sprinklers/fog system.

Demineralization plant will be sized to meet the internal requirement of fresh water in the proposed power plant. Water storage tank will be provided for distribution of potable water to various consumer points. Provisions for rainwater harvesting will be made and the water will be re-circulated in the plant.

All equipment that are major noise generating devices/machines like steam turbine generator, compressors and other rotating equipment will have material to absorb/ reduce the noise i.e. using noise absorbing material for enclosures or using appropriate design technology for fabricating/assembling machines. Proper noise barriers/ shields etc. shall be provided in the equipment whenever it required. Noisy equipment shall be adequately attenuated, by providing soundproof enclosure and insulation.

CLEAN DEVELOPMENT MECHANISM

India has high potential for CDM projects, particularly in the Power Sector. The Baseline Carbon Dioxide Emissions from power sector have been worked out by CEA based on detailed authenticated information obtained from all the operating power stations in the country. The Baseline would benefit all prospective CDM project developers to estimate the amount of Certified Emission Reduction (CERs) from any CDM project activity.

The carbon reduction estimated for the plant is 185405400 tons/year. However as the plant is using the conventional sub-critical technology it will not be eligible for carbon credits.