TECHANICAL ANALYSIS

OF THE

RAPID ENVIRONMENTAL IMPACT ASSESSMENT REPORT PREPARED FOR

Kutch Power Generation Limited

5x660MW (Super-critical) Thermal Power Project

At village Bhadreswar Taluka- Mundra, District- Kutch, Gujarat

The **Kutch Power Generation Limited**. is planning to set up a thermal power plant at village Bhadreswar Taluka- Mundra, District- Kutch, Gujarat. This report is a technical evaluation of the Environment Impact Assessment (EIA) document submitted by **Kutch Power Generation Limited** as part of the clearance process for 5X660 MW Coal Based Thermal Power Plant. The EIA has been conducted by the Ghaziabad -based consultant, **GIS Enabled Environment and Neographic Centre (GreenC)**. The study area for the EIA study is 10-km radius.

According to the EIA report, the nearby area of the project site is under development by the Mundra Port and Special Economic Zone (MPSEZ) along with Port and other upcoming Industries. The EIA report failed to provide information on types of other upcoming projects, size, their characteristic and distance from the project site. This is important to assess industrial stress and their subsequent impact on the local environment.

Resource requirement - According to the EIA, project will require 315 Ha of land, consume 13.98 MTPA of coal and require 5,25,000 m3/hr of water. The proposed plant will sourced water from the sea.

EIA report has provided information on number of household and population of 10 km radius but failed to provide the human settlements close to the plant. This is important because proposed project will handle 13.98 MTPA of coal and 4.17 million tonnes of flyash per year. Therefore potential of fugitive dust and consequent impact of air pollution on adjoining areas are anticipated to be significant. The potential of fugitive emissions could be a big threat to surrounding area because project site experiences high wind throughout year and proposed project proposed to store coal in open. Being a significant issue, EIA failed to capture this issue nor suggested adequate mitigation plan for it. For example, the village Mamiramora is just 500 meter away from the project site. But EIA report is completely failed to mentions this.

The project will likely to cause significant impact on marine ecology because daily power plant will release around 12 million m3 (496945 m3/hr) of hot cooling water in the sea. The EIA report completely overlooked this impact. The EIA failed to assess the impact of hot water on dissolved oxygen, which is a lifeline of marine biodiversity. Considering the fact that proposed project is one of the largest projects. However, the report failed to account discharge of 12 million m^3/ day of hot water in sea and offloaded this significant issue on National Institute of Oceanography (NIO) and states “cooling *water will be disposed to sea as per the recommendation of National Institute of Oceanography*” Moreover, entire EIA report is silent on impacts on coastal ecology and marine biology. Therefore, considering the magnitude of hot water discharge in the sea, it important for this project to undertake detailed assessment of impact on marine ecology.

The EIA report also failed to assess the impact of project on fishing community, as the project site and adjoining areas is the main livelihood of the fishing community and their livelihood depends on fishing. The discharge of 12 million m^3/ day hot water in sea would certainly impact the marine ecology and coasatal mangroves and associated livelihood.

As we know that wind direction and speed plays an important role to determine the impact areas of air pollution. However, there is a discrepancy in the information on wind direction. According to the EIA report the predominant wind direction is from NE, NNE and NW (pp 3-2, table 3.1 also see page 3-3). But in another report ***(Report on mathematical/hydraulic modelling studies on hot water recirculation and sediment transport for CW intake and outfall discharge system)*** of the same project revel that most probable wind direction is SW.

Month	**Wind direction**
March to May	SWW
June through August	SW
End of September to January	NE
February	wind direction is southerly

Source: Report on mathematical / hydraulic modelling studies on hot water recirculation and sediment transport for CW intake and outfall discharge system, prepared by Environ Software (P) Ltd, Bangalore

Further, considering the capacity of the plant, ideally proposed project should have generated the site specific data for mixing height, which is important for dilution and dispersion of air pollutant. Instead of generating the site specific data, consultant has referred mixing heights of CPCB publication. However, they had not mentioned anywhere, whether used mixing height information are applicable for the coastal area, because in coastal areas, metrological parameters are influenced by land and sea breeze and plays an important role in dispersion and dilution of pollutants.

EIA is poor not in terms of evaluating impacts but also poor in suggesting mitigation measures for example (in page number 4-6 , 4.4.1 Impact on Air) it is mentioned "*the fugitive emission is likely to be controlled to a great extent through proposed control measure like dust suppression system and highly efficient Electrostatic Precipitators."* However, the EIA consultant failed to justify **what are proposed control measures**. The consultant either does not have knowledge of pollution control equipments or have copied from elsewhere for instance, consultants has proposed ESP for fugitive emission control, which is completely wrong because ESP is never being used for controlling point source emission (i.e. emissions from stack or chimney). This clearly shows the level of expertise involved in EIA preparation.

EIA is also silent on mercury emission from the power plant, assessment of mercury emission is crucial because entire coast is rich in mangroves and support fragile biodiversity. The mercury has potential to bio magnify once it's enter in food chain. Exposure to mercury causes neural and renal damage, and cardiovascular disease. Organo-mercury compounds bio-accumulate, particularly in fish. In India there are strong cultural pattern of fish consumption among coastal people (East, West and Southern coast of India). In some coastal areas due to industrial development and indiscriminate discharge of pollutant had increased the mercury content in fish and other sea food (consumed in certain costal areas) in range of 0.03-10.82 µg/g compared to the permissible limit of 0.5 µg/g (http://www.ibcmt.com/2009-02-02-GuidanceAwareness-Materials_Under_UNEP_MercuryPrograms.pdf).

The coal based power plant is one of main culpurit for mercury contamination. In the EIA report, the level of mercury considered in the coal (imported and Indian coal) was less than 0.02 mg/kg. The consultant has intentionally given low figure of mercury in coal.
Indian coal contains mercury in trace amounts ranging from 0.04 to 0.7 mg/kg. The proposed project will use blended Coal (Imported / Indian in the ratio of 70:30). The coal will be imported from the countries like Indonesia, China and Australia. Below given table depict the level of mercury in imported coal.

Range	**Indian coal**	**Chinese coal**	**Australian coal**	**Indonesian coal**
Low	0.04 mg/kg	0.01 mg/kg	0.005 mg/kg	0.01 mg/kg
High	0.75 mg/kg	0.19 mg/kg	0.08 mg/kg	0.18 mg/kg
Average	0.35 mg/kg	0.065 mg/kg	0.021 mg/kg	0.05 mg/kg

http://www.acarp.com.au/Downloads/ACARPTraceElementsinCoalNewsletterOct06.pdf

According to our estimation, if the proposed project would use only India coal, then, it would release 4 tonnes of mercury every year. If the proposed would use only Chinese, Indonesian and Australian coal, the mercury emission from the proposed project would be **2.66** tonnes (considering 0.19 mg/kg mercury in coal) , **2.52** tonnes (considering 0.18 mg/kg) and **1.1** tonnes (considering 0.08 mg/kg) respectively.

EIA is also poor in portraying the impact on biodiversity. As the project is proposed near the fragile ecology and proposed to discharge 12 million m3 of hot cooling water in the sea. Hence, importance of biodiversity assessment is more critical but it has been poorly articulated, instead of assessing the biodiversity of coastal area and species abundance of coast and consequently impacts of discharge of hot cooling water on marine ecology, the consultant has provided the list of animals **present in the Kutch district (see table 3.20), which seems**

quite irrelevant and illogical because 40 to 50 percent of the study area constitute of coast, which is rich is marine ecology.

According to the EIA report, Ash pond will be provided with 40 mil HDPE liner to prevent groundwater contamination however even though the report mentions about HDPE liner, but no details about the budget allocation, dimensions, etc are mentioned. There is discrepancy in data provided on land requirement for ash pond, *in table 2.2, Land details of plant area* depict 90 Ha of the land required for ash pond but in page 9-10, area earmarked for ash pond is 64 Ha. Further, EIA report also fails to provide percentage of ash to be handled in dry and in slurry form.

Also there is a discrepancy on total quantity of ash to be generated from power plant, in **Ash disposal plan (see pp 9-10), EIA states 4.474 million tonnes of ash to be generated from the power plant. In page 2-4, EIA states that** fuel used for Thermal Power Plant will be Blended Coal (Imported / Indian in the ratio of 70:30) and ash in Indian and imported coal will be less than 34 % and 25% respectively. Considering (13,98 MTPA annual coal requirement, 34% and 25% ash content in coal, and ratio of 70:30 Blended Coal) coal requirement, total quantity of ash to be generated from power plant will be around 3.87 million tonnes. But, in **Ash disposal plan (see pp 9-10), the EIA states, from forth years, there will be no fly ash sent to ash pond and** total quantity of ash to be disposed in Ash pond is 4.027 million tonnes. However, EIA fails to justify, why 90 Ha of land is required for construction of ash pond, **if they will not use ash pond after fourth years.**

Particulate emissions

According to the EIA report, the concentration of outlet dust after ESP will be at 50 mg/$Nm^{3.}$ In table 4.1, the particulate emission rate as mentioned in the EIA report is 68.3 gram/sec, but there is no explanation how the consultant has arrived to this figure. Considering the same emission rate as mentioned in the EIA report, the particulate emission will be 1948 tonnes/ annum from each stack. It means proposed project will emits 3895 tonnes of dust from both the stacks.

EIA also state that high efficiency (>99.9%) electrostatic precipitators are proposed to be installed to limit the particulate matter (dust) emissions below 50 mg/Nm3. However, EIA report fails to provide techanical specifiaction of ESP such as number of fields, area of collecting electrodes etc. These are some critical specifiction to assess the efficiency of ESP. It is just pointless to give emission limit (50 mg/Nm3) without substantiating techanical specification, in absence of techanical specification. It is doubtful that ESP will achieve the standard of less than 50 mg/Nm3

SO_2 and NO_x emissions

Sulphur dioxide (SO2) emission rate as mentioned in the EIA report is 722.4 gram/sec, but there is no explanation, how the consultant has arrived to this figure. Moreover, there is discrepancy in total Sulphur dioxide emission from the plant, if we assume emission rate (722.4 gram/sec) as mentioned in the EIA report, then annual Sulphur dioxide emission from both stacks would be around 41194 tonnes (assumed 330 days working day for estimation).

If we calculate sulphur dioxide load on coal consumption (*13.98 MTPA), percentage of sulphur in coal (0.5%) and working days (330 days*), annual emsission of Sulphur dioxide from the proposed project is around 139800 tonne per year. Thus, there is a difference of 98 thousand tonnes. This clearly shows that proposed project has mentioned low emission rate for sulphur dioxide emissions. Considering this as a significant amount, the EIA report has not provided sufficient mitigation measures. SO_2 emissions even at low concentrations can be detrimental to some kinds of plants. They can cause decreased yields, chlorophyll loss and greater leaf fall.

Similarly, for emission of Oxides of Nitrogen (NOx), no explanation has been provided how consultant has arrived the figure of 748.2 gm/sec. If we consider the same emission rates and 330 working days, the NOx load from both stacks will be around 42665 tonnes per year. But no adequate mitigation measures are suggested.

Fugitive emission is a big concern in coal based power plant, both coal and flyash dust are generated during storage, transportation and handling. Being a significant issue, EIA report has not made any estimation of fugitive emissions. Only superficial mitigation measures such as 'water spraying' has been recommended. Best practices in the reduction of fugitive emissions would be closed storage areas, closed conveyor transportation with transfer point fitted with bagfiler, mechanical material handling systems etc. The EIA report has not elaborated any of these points. Moreover, EIA is completely silent on coal storage, handling and area required for coal storage. According to estimate, around 0.4kg/ha/hr of fugitive emission is generated from open coal storage areas. As the EIA report has not mentioned the areas to be use for coal storage, hence, it is not possible to calculate the fugitive dust from coal storage area. Assuming that if 40 Ha of land to be use for coal storage, the potential of fugitive dust annually from storage area would be around 140 tonnes.