(IV) Proposed Terms of Reference for EIA Study

Project: Paguthan Thermal Project - 2x1000 MW Imported Coal-based Power Plant

Category: A [1(d) Thermal Power Plant ≥ 500 MW]

Project Proponent: CLP India Private Limited

Location: Village- Paguthan, District- Bharuch, State- Gujarat

I. Introduction

CLP India intends to expand their Paguthan Power Project by adding two coal fired (high end supercritical or ultra-supercritical technology based) 1000MW units ("Paguthan Thermal Project"). The project will be located within the existing premises of PCCPP.

The project is a Category A [S. no. 1(d) Thermal Power Plant ≥ 500 MW] project according to the notification SO 1533 (E) dated 14th September 2006, which requires preparation of EIA Report and environmental clearance from the Ministry of Environment, Forests & Climate Change, Govt. of India.

II. EIA Methodology

The EIA Report will address all the terms of reference and will be prepared in accordance to the Environment Protection Act 1986 and EIA Notification published by Ministry of Environment, Forests and Climate Change, Govt. of India on 14th September 2006.

It will form part of the application to the Statutory Authority. The scope of the EIA Report for the proposed Power Plant will include identifying relevant environmental concerns and focus on potential impacts that may have changed due to the setting up of the plant. The report will also provide an Environment Management Plan and Disaster Management Plan.

III. Site, Study Area & General Environment

The geographical location of the site lies at latitude 21° 46' 48.56" North and longitude 72° 58' 41.74" East. The project site is located at a distance of about 9 km from Bharuch Railway Station on Mumbai - Ahmedabad Broad Gauge section and is accessible by the road connecting NH-8. The nearest Airport is Vadodara, which is about 70 km from the site. Nearest seaport Dahej is at a distance of about 50 km from the site.

The Project will be located adjacent to the existing 655 MW Combined Cycle Power Plant in the Paguthan village of Bharuch District of Gujarat and in the same premise.

IV. Project Description

1. Project Rationale

This section will highlight the goals and objectives of the proposed project. It will also include discussion on the significance of the project in terms of the need for the project in the local as well as the national level. It should also highlight if the proposed project is in line with existing development plans of the State and Central government and in accordance with the existing or envisioned land use plans. Finally, it should also be mentioned if the proposed project is according to the priorities of the local government.

2. Project Location & Site Alternative

This section will discuss the geographic location of the project, the location of the project in relation to clearly defined geographical features (e.g. watersheds, coastal areas, national parks / protected areas, military reservations, etc.) and the general access to the project site (e.g. presence of existing road networks, feeder roads, etc.).

As the project is an expansion and land is available within the present plant, no alternate sites will be examined.

3. Project Information / Process Information

This portion should include the following:

- Statement of the Official name of the project and name/s of proponents (including address, telephone nos., etc.) responsible / liable;
- Vicinity plan, processes involved, site layout, water balance diagram
- Project cost and area
- Resource / Manpower requirements
- Time frame for project implementation

4. Process Description

The technology to be used for the project and the process components of the project focusing on the materials input to, and outputs from the process components including products, fuels, feedstock and utility requirements (gas, electricity, steam and cooling water will be provided. Material balances (also energy balance), flow diagrams and descriptions of the process to be used will also be provided. The process emissions including air, liquid, and associated wastes, and any pollution abatement equipment will be discussed.

5. Project Phases

Construction

This section shall discuss / describe the various components of the projects. This section shall also discuss the major activities to be undertaken during the construction phase, which shall include but not be limited to:

- Site mobilization
- Road construction / improvement
- Camp construction
- Site clearing
- Construction of the major facilities / project components
- Construction of support services e.g. water & power supply, telecommunications, etc.

Operation

This section shall discuss the activities to be undertaken during the operation, which shall include but not limited to:

- Major maintenance activities
- Manpower requirements
- Fuel Requirement
- Energy requirements

V. Baseline Environmental Scenario

Description of the existing environment, assessment of historical trends of environmental data specific to the proposed site and description of the socio-economic setting in the area will provide an overall picture of the proposed site before any development activities are undertaken. Thus, equipped with the knowledge of the existing environment and aware of the specifications of the proposed project as described in the preceding sections, one can identify areas of critical importance and impacts of the project can be reliably predicted. Finally, methodologies used in the data collection (primary data) will be briefly discussed with the corresponding interpretation of the data obtained. Likewise, all sources of information (secondary data) will be identified and appropriately acknowledged.

STUDY MODULES	SCOPE AND COVERAGE	METHODOLOGY (TYPE AND SOURCE)	MAPS/TABLES/ FIGURES REQUIRED
A. PHYSICAL ENVIRONMENT			
Inland Topography	Landform Pattern	Slope and elevation	Topographic map
Soils	Soil physical and chemical characteristics / analysis	Soil survey	Soil Sampling Locations
Land Use	Present Land use /Land Pattern based on the satellite Imagery	• Satellite Imagery • GIS mapping	Land Use Map (10 km radius from the site)
Hydrology	• Surface water characteristics, river systems • Groundwater characteristics • Drainage systems	• Ground & surface water analysis • Characterization of inland surface water	Water supply and demand with water balance
Meteorology/ climatology	• Rainfall pattern • Frequency distribution of wind direction • Temperature • Associated atmospheric pressure	• Secondary data from IMD • Site Specific Meteorological data other than monsoon	• Wind rose diagrams
Air Quality	Ambient air quality for PM10 & 2.5, NOx, SO_2, O_3 and Hg	• Air quality measurements • Identification of air pollution sources	• Sampling station map • Result of air quality measurements • Ambient Air Quality will be monitored on 10 location including site.
Water Quality	Physico-chemical characteristics of surface waters and ground water (pH, TSS, DO, BOD, temperature, nitrates, phosphates, and metallic components etc.) • Bacteriological characteristics (total coliform)	Sampling and analysis	• Sampling station map • Results of laboratory analysis • Will be monitored in 8 locations (4 Surface Water and 4 Ground Water) including site.
Noise Level	Ambient noise levels at the project sites and nearby community	Noise quality measurements	• Results of noise level measurements • Sampling stations map • Will be monitored on 10 location including site.
B. BIOLOGICAL ENVIRONMENT			
Flora	Summary of vegetative cover	Survey / inventory of terrestrial and freshwater flora	Flora species inventory
Fauna	• Terrestrial fauna including endangered and threatened fauna species	Survey / inventory of terrestrial fauna	Fauna species inventory

	• Fauna species inventory survey		
Aquatic Fresh	• Plankton/ benthic life form • List of fish species	Survey of aquatic fauna	Aquatic Fauna inventory
C. SOCIO-ECONOMIC & CULTURAL ENVIRONMENT			
Demography	• Population size • Population density, household size • Population by gender • Literacy rate • Occupation and employment status	Principal data from Census	Primary Census Abstract
Other Social Services	• School facilities • Telecommunications, water and power facilities • Health Facilities	Inventory of social services in the project site	Village Infrastructure directory
Transportation	Network and mode of transportation	Identification of main and access road, mode of transport	Road access map

VI. Assessment of Environmental Impacts

There will be an assessment on feasibility and cost-effective measures to prevent or reduce significant negative environmental impacts identified, to an acceptable level. In this section, the following aspects will be assessed:

- The project component and development activities that result in discharges to the environment and the effect of these on the environment
- Existing conditions in the site area, including existing land-use, resources and other activities, which in combination with the project activity have potential to affect the environment.
- Anticipated environmental effects

This chapter will include appropriate tables and figures to illustrate and summarize the key information that is relevant in understanding the environmental and socio-economic environment. The environmental and socio-economic impact of the proposed project having regard for regional and cumulative effects will be presented. Wherever possible, the impacts will be quantified. Include measures to address emergency response requirements for accidental events. Also estimate costs of those measures and of the institutional training requirements to implement them. Identify residual or unavoidable impacts.

The existing air quality of the region and the impact of the proposed project on regional air quality will be discussed. The component of the project, which will affect air quality, will be taken care to keep it within acceptable limits. All emissions as a result of the proposed projects and their effects on the environment will be discussed. Also the ways and means of reducing the air emissions impact will be discussed.

The project activities that will have minimum affect on surface water and ground water and will be taken care of. In this section, the water intake requirements during construction, operation and emergency situations will be estimated and the sources will be identified also. Any water minimization considerations will be included. The method of plant cooling and the design parameters and criteria for any incremental water management works and storage facilities will be provided.

The quantity and source of wastewater will be presented including a summary of water quality effects and possibility of recycling. Project activities during construction and operation phases that will affect

noise levels and the potential for increased noise resulting from this project will be presented. The effect on noise levels during the construction and operation phase will be ascertained.

Future waste management projections, storage and disposal plans and locations will be discussed. The quantity and composition of any waste streams, including solid and hazardous wastes produced will be estimated and classified.

Land-use and Socio-economic change due to project will also be provided. The impact on the resources and the present population will be highlighted. This will include the effects on employment, livelihood, economy and infrastructure.

RESOURCE/ ENVIRONMENT	CONSTRUCTION PHASE	OPERATION / MAINTENANCE PHASE
	Impact	Impact
1. Land	• Modification of land forms	• Change in present form
2. Water	• Change in quality of surface and groundwater	• Change in quality of water bodies due to discharge of domestic effluent
3. Air Quality	• Dust generation • Change in concentration of pollutant gases	• Change in level of gaseous pollutants i.e. SO_2 and NO_X etc.
4. Noise	• Change in noise level	• Change in noise level from various sources
5. Wastewater / Solid waste management	• Wastewater / Solid waste management	• Solid waste management • Wastewater management

VII. Environmental Management Plan

1. Monitoring Program

The EIA shall contain an extensive monitoring program for parameters included in the baseline studies. An Environmental Monitoring Plan containing the following information could serve as a guide in the monitoring activities**.**

1.1 Measurement methodologies
1.2 Frequency of monitoring
1.3 Location of the monitoring
1.4 Data Analyses Procedure
1.5 Reporting Schedule
1.6 Emergency Procedures
1.7 Detailed Budget
1.8 Procurement Schedule

2. Information, Education and Communication (IEC) Plan

Plans for informing, educating and communicating with the State Government and the community regarding the project and its implementation of the EMP will be presented.

VIII. Contingency / Emergency Response Plan

Procedures on how to cope with emergencies/accidents shall be outlined in a comprehensive contingency/emergency response plan. The institutional responsibilities should be made clear and the flow of communication in cases of emergencies should be included.