

SARASWATI UDYOG INDIA LTD

*S.F. Nos. 220, 221& 222,
Kabilarmalai Village,
Paramathi Velur Taluk,
Namakkal District
Tamil Nadu.*

Proposed Unit

Management Summary for the Proposed Power Plant of capacity 5 MW

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1.0 PROJECT DESCRIPTION

1.1 Introduction

M/s. Saraswathi Udyog India Limited is an existing duplex board paper manufacturing unit located at S.F. Nos. 220, 221& 222, Kabilarmalai Village, Paramathi Velur Taluk, Namakkal District, which is located 10 km away from Paramathi velur.

The unit is manufacturing 3500 T/M of duplex board papers to fulfill the requirements in Tamilnadu and other parts of India. As a backward integration in the process of modernization of boiler the unit plans to install a power plant to get quality steam and required power. The steam produced is used in the process of drying the paper and also to generate power.

To help bridge the gap between demand and supply of power and to meet out their own power requirements **M/s. Saraswathi Udyog India Limited.** has decided to replace the existing less efficient 2 x 8 TPH boiler with a higher efficient 40 TPH boiler to generate power utilizing coal and biomass as fuel. The power generated will be exported to its paper plant after captive consumption. The co-generation plant will be located adjacent to the paper mill.

1.2 Plant Location

Saraswathi Udyog India Limited unit located at S.F. Nos. 220, 221& 222, Kabilarmalai Village, Paramathi Velur Taluk, Namakkal District, which is located 10 km away from Paramathi velur.

1.3 Products Manufactured

The Production Capacity of power Plant will be as follows.

Power - 5 MW

1.4 Raw Materials

| S.No | Raw Material | Quantity T/D |
|------|--------------|--------------|
| 1. | Biomass | 80 |
| 2. | Coal | 50 |

1.5 Manufacturing Process

Cogeneration is broadly defined as the coincidental generation of useful thermal energy and Electrical power from the same input fuel. Thus Cogeneration can allow the energy consumers to lower their energy costs, through use of the energy normally wasted in conventional systems. The useful thermal energy could be in the form of hot gases, hot liquids or steam, generally used for meeting the process requirements.

The proposed new installation of boiler and TG aims at significantly improving the energy efficiency of the Paper Factory, enabling the plant to generate surplus power from the Biomass and Coal. This surplus power will be captively consumed in their own Paper Plant. Energy efficiency and power production to their own purpose is made feasible by the employment of high pressure and high temperature steam cycles and by the utilization of the biomass and coal to produce more steam and hence more electricity.

Boiler system

Boiler

Selection of Pressure and Temperature

As per Rankine Cycle, which is the basis for design, more the steam temperature and pressure, higher is the cycle efficiency. Hence it is decided to go for high pressure boiler with suitable higher temperature

Electro Static Precipitator

The boiler will be equipped with an Electro Static Precipitator, which will remove the suspended particles and ash particles from the flue gas. The efficiency of the precipitator will be 99.9% and the dust concentration at the outlet of the ESP will be less than 150 mg/Nm³.

Chimney

A chimney of 45 m height will be constructed to exhaust the flue gas to the atmosphere and this height has been considered taking Sulphur content in the fossil fuel into account.

Fuel Handling and Feeding System

The design of fuel handling system, involving biomass and Coal fuels is based on the estimated quantities of annual fuel requirements.

Fuels will be received at site by road. Adequate road facilities will be provided to handle the road – bound vehicles on a daily peak basis.

The fuels arriving at site by different types of vehicles such as trucks, tractor trailers etc. will be weighed on a pitless type electronic road weighbridge provided in the plant premises.

The fuels will be unloaded manually/hydraulically. Separate open storage areas will be identified for different fuels for maintaining necessary plant stock of two (2) months. The fuels will be stock piled to a height of about 4 meters.

One (1) separate storage shed of mild steel structural construction of adequate size for the biomass and coal fuels is envisaged near the feeding zone to accommodate two (2) days' storage of fuels.

Fuel Requirement

It is proposed to operate Co-generation Plant for 300 days.

Process Steam Requirement

Total steam requirement for Paper Plant shall be 63% at 40 TPH

Fuel Balance

It is proposed to go for one 40 Tones high pressure, with feed water inlet of 115⁰C for De-aerator, steam to biomass and coal ratio would be 1.6:1.0

Power Generation

Entire quantity of process steam at Paper required for Paper plant operations have to be met by the steam generation from the proposed High Pressure Boiler after expanding the same in the proposed TG.

The power generation will be 5 MW. At the proposed production capacity, the average power demand will be about for Paper plant 3750 KW and for power plant 600 KW per hour.

Grid Inter connection for Export

Power Generation from the proposed TG is planned at 5MW at Generator Terminals. Exportable Power has to be stepped up to 5MW on generator Transformers to be located in the switchyard with in co-generation complex and then to be synchronized with the grid. The grid interconnection will have to be done at 5 MW.

For operating Paper Plant and Co-generation Plant, a Portion of power is stepped down to 3750 / 600 KW wherever required and for these suitable transformers have to be installed at various convenient locations at Cogen and Paper Plant area.

Steam Turbine:

The proposed biomass Coal based power plant, will one no. 5.0 MW turbo generator. The turbine will be a reaction type, extraction cum condensing type and running at a high speed. The generator speed will be 3000 or 1500 rpm. Hence will be coupled with the generator through a reduction gear unit.

Steam is admitted into the turbine through an emergency stop valve actuated by hydraulic cylinders. The turbine speed controlled by an electronic covering system. The extraction pressures are arrived at based on the process requirements. The turbine exhaust pressure will be 0.18 ata.

The turbine shaft will be given fool sealing with steam. The steam coming out of the staff sealing system will be condensed in the gland steam condenser.

The lubrication system for the turbo generator will consist of main oil pump, auxiliary oil pump and emergency oil pump. The pumps will be equipped with suction and discharges filters, oil coolers etc. An oil tank of adequate capacity will be provided.

The turbine will be provided with devices to safeguard to turbine against, over speed, low stem inlet pressure, high axial movement of the shaft, low lube oil pressure, high condenser vacuum, excessive vibration etc.

Ash Handling and Disposal system

The ash from the furnace will be handled by water impounded submerged belt conveyor and fed on to the main belt conveyors to ash silo.

The other ash collection points are Air Pre heater hopper and ESP hopper. This will be handled through pneumatic conveying system and stored in Ash silos. The Pneumatic ash handling system will avoid the fugitive emissions.

The ash from the ash Silos will be disposed regularly through special trucks for direct consumption as brick and cement manufacturers or to farm land as soil conditioner.

1.6 Power and Fuels

The total power generation of 5 MW from the turbo generator, the plant auxiliaries will consume 600 KW.

1.7 Raw Water

The total requirement of raw water for this unit will be 200 KLD, which will be met from existing approved quantity from bore well.

1.8 Land

The total area of plant and machinery is 2.5 acres. The area required for Biomass and coal storage is 0.7 acre. The unit has identified 1.5 acres for its greenbelt development. Then the total area including the greenbelt development is around 5 acres with vacant area of 0.3 acres.

1.9 Manpower

The plant will have about 95 employees per day for its normal working.

1.10 Organization Structure

The Senior General Manager is responsible for the factory operations. There are several executives for various sections such as Production, Human Resource, Purchase, Store, Accounts, Environmental & Safety, Maintenance, and Quality Control etc.

2.0 DESCRIPTION OF THE ENVIRONMENT

2.1 Climate

The climate is generally arid with temperatures varying from 38.8°C to 28.8°C. The rainfall is maximum in the NE monsoon period and minimum in SW monsoon period.

2.2 Ecology

There is no endangered species of flora and fauna noticed in this area. The area does not shelter any specific wildlife.

2.3 Hydrological Conditions

2.3.1 Surface Water

The run-off during monsoon period contributes to the surface water. These villages get water due to rain in rainy season.

2.3.2 Ground water

Since ground water drawn from hand pumps, open wells and water supply systems at selected towns are the main sources for domestic use,

2.4 Water Quality

Water samples were collected from different locations, and the following parameters will be monitored for pH, Colour (Visual), Odour, Turbidity (NTU), Electrical Conductivity, Total Suspended Solids, Total Dissolved Solids, Chlorides (as Cl), Sulphates (asSO₄), Calcium (as Ca), Magnesium (as Mg), Total Hardness(as CaCO₃), Phenolphthalein Alkalinity(as CaCO₃), Total Alkalinity (as CaCO₃), Iron (as Fe).

2.5 Ambient Air Quality and Noise Levels

The ambient air quality was studied for various locations. It is found that the Suspended Particulate Matter (SPM) is found to vary from 56 µg/m³ to a maximum of 139 µg/m³. The concentration of NO_x and SO₂ are found to be

very low. The noise levels recorded at various locations indicate that it is mostly less than 70 dB (A).

2.6 Land Use Pattern

This Site is classified as unclassified area recognized by the Tamilnadu Government.

3.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

3.1 Air Emissions and Control Measures

| S. No. | Description | Air Pollution Control Measures |
|--------|-----------------|---|
| 1. | Boiler (40 TPH) | 45 m height and 1.5 m dia of stack with Electro Static Precipitator will be provided. |

3.2 Wastewater Generation and Method of Treatment

| S. No. | Particulars | Water requirement m ³ /day | Method of Treatment |
|--------|-------------------------|---------------------------------------|------------------------------------|
| 1. | Sewage | 4.0 | Septic tank with Dispersion trench |
| 2. | Boiler blow down | 4.0 | Neutralization tank |
| 3. | Cooling tower bleed off | 11.8 | |
| 4. | DM Reject | 23.0 | |

3.3 Solid Waste generation and method of disposal

The solid waste will be generated from this unit is as follows.

| S. No. | Solid Wastes | Quantity (T/DAY) | Method of Disposal |
|--------|--------------|------------------|---|
| 1. | Boiler ash | 8.0 | Sold out to brick, hollow block manufacturing industry and local farmers for use in land as soil conditioner. |

3.4 Hazardous Waste

There will be no hazardous waste generated from this unit.

3.5 Noise Level

The noise level in the inside & outside the factory will be maintained at low level.

4.0 ENVIRONMENTAL MONITORING PROGRAMME

4.1 Environmental Monitoring

The environment, safety and health monitoring programme in the factory are as follows:

| Particulars | Parameter | Frequency |
|--------------------------------|---|-----------|
| Stack Emissions | SPM, SO ₂ , NO _x | Monthly |
| Ambient Air Quality | SPM, RPM, SO ₂ , NO _x | Monthly |
| Noise monitoring | Noise Levels | Monthly |
| Safety and Occupational Health | -- | Yearly |

4.2 Budgetary Allocation for Environmental Management

| S.No | DESCRIPTION | CAPITAL COST (Lakhs) |
|------|---------------------------------------|----------------------|
| 1 | Air Pollution Management | 150 |
| 2 | Water and Wastewater Management | 100 |
| 3 | Solid Waste Management | 50 |
| 4 | Greenbelt | 3.0 |
| 5 | Environmental Monitoring and Training | 5.0 |
| | Total | 308 |

5.0 ADDITIONAL STUDIES

5.1 Socio-economic Conditions

There is no habitation or settlement in the industrial area. The nearest village of Kabilarkurichi is having a population of 3160 with 1583 males and 1577 females as per 2001 census data. The major source of income of the local population is from these types of industries only.

6.0 PROJECT BENEFITS

6.1 Socio-economic benefit

This project on implementation will generate 95 - potential jobs directly, and will also generate many indirect job opportunities.

Due to the project, indirect employment to the extent of 200 will be generated. The Government revenue from the project will increase by way of direct and indirect taxes, duties, etc. The infrastructure development will get an impetus with this industrial growth. Communications, transport, schools, hospitals, trade and commerce will indirectly get an impetus.

7.0 ENVIRONMENTAL MANAGEMENT PLAN

7.1 Land Degradation

Since, the small quantity of wastewater will be generated from domestic usages, the chances of contamination of soil will be nil. The vacant area in the industry will be used for tree plantation to improve the surrounding environment of the industry.

7.2 Greenbelt Plan

Greenbelt is developed inside the factory premises covering a total area of about 1.5 Acres The unit will also develop the nearby area around the industry for greenbelt. The inter-spaces are laid with shrubs. The inter-space between trees planted is about 5m. It is proposed to double the tree density in future.

For Saraswathi Udyog India Ltd.

B.Anandan
(Executive Director)