

CHAPTER 5

ANALYSIS OF ALTERNATIVES

5.1 Introduction

This chapter discusses the alternative considerations that have been studied before finally proposing the present project.

The alternatives can be considered for the following major issues

- a) Requirement of the proposed project to meet the power demand
- b) Selection of the proposed site
- c) Selection of the project configurations and technology

The above issues are discussed below.

5.2 Power Requirement Alternatives

Tata Steel has proposed to establish 6 MTPA capacity steel plant in five phases at Kalinganagar Industrial Complex near Duburi village about 100 km from Talcher in Orissa State. This project will require a continuous and reliable source of power.

It is a well-known that India requires urgent development of power resources to meet both the industrial, agricultural and domestic demand. The tremendous increase in demand has prompted the Government of India (GOI) to encourage private participation in power generation, distribution and transmission sectors. The state of Orissa is going through a stage of massive industrialisation due to its immense natural resources. Sustaining this industrialisation requires supply of large amount of power. In line with GOI, the Government of Orissa seeks to promote power generation both by independent power producers (IPP) and captive power plants (CPP). The newly formed GRIDCO has been empowered to negotiate fair and equitable power purchase agreements with IPPs and with industries owning captive power plants supplying surplus power to the State Power Grid. It also provides for sales to industries on payment of wheeling charges.

In the above context, TPC finds that setting up a power plant in Orissa to meet the external power demand of Tata Steel's proposed Steel Plant at Kalinganagar is the

best alternative to ensure power supply to the steel plant. Also considering the requirement of the state, TPC has also signed MoU with GRIDCO to sell power to the extent of 250 MW from the same plant.

Considering the above, Tata Power Company proposes to set up a coal based thermal power plant of 1000 MW capacity which will meet all the power demand scenario.

5.3 Site Selection

The site selection was done on the basis a Report by Central Mine Planning and Development Institute (CMPDI), Ranchi, submitted to Central Electricity Authority (CEA) in March 2004 for locating the thermal power plants in the state of Orissa.

The first six sites listed in the above report were evaluated namely

1. Hindol
2. Banarpal
3. Tangi
4. Uspal
5. Sadar
6. Rengali

Out of six sites listed above, two were allotted to other IPP/PSUs participants and one was known to have religious significance. Because of which the selection was constrained to meagre three sites. In order to further expand the scope for selection, TCE Consulting Engineers were asked to evaluate the possibility of enlarging the site selection base. Accordingly TCE with the help of local consultants identified Fertiliser Corporation of India (FCI) site at Talcher and Naraj Marthapur near Cuttack as possible sites.

The final five sites which were evaluated further are as follows

From CMPDI Report

1. Hindol
2. Tangi
3. Rengali

Identified by TCE

4. FCI
5. Naraj Marthapur

The detailed evaluation of individual sites is discussed in following paragraphs;

1. Hindol – This site lies near Nuni, Balarampur & Bedapada villages near NH 42 in Hindol Tehsil, Dhenkanal District. The report ranks the site as number 1 considering various attributes like proximity to major cities, reserved forests, historical and defence installations, airport, type of land, R & R involved and water & coal availability at site and accessibility to site. Although having highest ranking, the site had few areas of concern as listed below

- a. Prime agricultural/forest land
- b. Extensive R & R
- c. Low water availability in the area
- d. Building of additional reservoir/dam/barrage

TPC took note of the fact that the source of water to this site is Brahmini River and many steel and power projects in the state of Orissa are proposed with source of water from river Brahmini. As a long-term strategy and to ensure reliable water supply for the thermal power plant it was decided not to site the proposed thermal power plant at Hindol.

2. Tangi – This site as proposed in the CMPDI report lies near Brahmapur village in Tangi tehsil in Cuttack district. The report ranks the site at number 3 and also lists following areas of concern against this site

- a. The site is within the radius of 10km from a defense installation
- b. Upto 20% of land is single crop agricultural land
- c. R & R issues
- d. Building of additional reservoir/dam/barrage

The proximity of the site to a defense and RAW installation was a major deterrent in selecting this site as it would have increased the interference from defence authorities in each and every aspect of project development &

implementation and would have remained on sustained basis. TPC tried to explore the possibility of establishing the power plant at the site but the effect it would have on the National security installations did not permit TPC to proceed.

- 3. Rengali** – The site as proposed in the CMPDI report lies near Bajrakot village near Rengali-Angul road in Rengali tehsil in Angul district. The report ranks the site at number 6 and also lists following areas of concern against this site
- a. R & R Issues
 - b. Low water availability in the area
 - c. Absence of rail network

The site depended on Brahmini river for meeting its water requirement and with number of steel & power projects in the vicinity of this river, TPC decided not to consider this site for their proposed power plant.

- 4. Fertiliser Corporation of India (FCI)** – The site is 10 kms away from NH 42 and is 12kms from Talcher Railway station. The site is an abandoned plant of FCI and has plant, office and colony structures in place. The FCI has committed water drawal from river Brahmini to the tune of 2160 m³ / hr. The FCI is spread over 860 acres of land out of which 600 acres are used for main plant and rest covers colony, roads, plantation etc. The plant was closed down under the direction of BIFR.

TPC noted serious concerns on this proposed site as follows

- a. Limited space of 600 acres only
- b. Expansion of the plant at future date might not be possible
- c. Disposal of ash could cause serious issue
- d. Additional expenditure for demolishing the existing structures
- e. Power evacuation from the site since three existing generating stations in the vicinity
- f. Water source as river Brhamini
- g. Talk of reviving the fertiliser plant

Due to the reasons cited above it was decided not to consider this site for proposed thermal power project.

5. Naraj Marthapur - The site is identified and has a potential to accommodate 2,000MW thermal power plant. The site encompasses four villages namely Naraj Marthapur, Talagad, Mundali and Nuagaon of Cuttack Sadar tahasil in Cuttack district. It is 12Kms from Cuttack city and about 30Kms from Bhubaneswar city. The Naraj Marthapur railway station is very close to the site and river Mahanadi is also only 3kms away. The site is in two parts with Puri irrigation canal flowing through the middle.

Primarily land consists of some waste land and some rain fed agricultural land (single crop) type. Most of the terrain is flat except for one hillock and the part of the land is used for brick manufacturing. The R & R issues involved is insignificant as most of the land is inhabited.

There are reserved forests on the south and west side of the site but by restraining the plant away from the forests the effect of emissions can be minimised.

The site at Naraj Marthapur offered significant advantages over all the other sites as listed below

- a. Plain and unhabited land stretching to 1200 acres of land
- b. Abundant land available for expanding the capacity at a future date
- c. Very close to railway station
- d. Negligible R & R issues
- e. Only 3 kms from a perennial source of water like river Mahanadi
- f. No defense installation/air strip / archeologically sensitive areas in the vicinity

TPC acknowledges the fact that the chosen site is within 10Kms of radius from reserved forests and is close to a irrigation canal but is of the opinion that the constraints are manageable and would like to state that

- a. The plant layout will be finalised in such a way that the point of emission will remain away from the forests
- b. The stacks will also be located taking into consideration the wind direction
- c. Adequate care will be taken not to pollute the irrigation water by discharging effluents into the water nor the water from the canal will be used as input to the thermal plant.

In view of the advantages offered by the site at Naraj Marthapur over all the other short listed sites, TPC has selected site at Naraj Marthapur as their site for siting 1,000MW thermal power plant in Orissa

5.4 Selection of Project Configurations and Technology

This power plant has been proposed to meet the power demand of three basic sectors;

- a) Power demand of Tatar’s steel plant at Kalinganagar
- b) Meeting GRIDCO Commitment
- c) TPC’s own sales

As the demand for the steel plant will depend on its commissioning of different units and also the sale of electricity by TPC will depend on the increase in demand in the area, the techno-economic best alternative is to build the power generating units in several modules. This will provide the best scenario of developing the power generating units along with the increase in demand for power.

With that idea a combination of 125 MW and 250 MW units are contemplated to generate the total power. 125 MW and 250 MW units are well established in the country and therefore provide to have best technology for these units.

Considering all these factors best alternative for the unit sizes for the proposed power plant have been selected as 2 X 125 MW + 2 X 125 MW + 2X250 MW = 1000 MW.

-----00000-----