

The Analysis of Plant Location Effectiveness the Study of Sarir Gas Turbine 855 Mw Project Site at General Electric Company of Libya

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Abstract: The study presents a report on Sarir Gas turbine industrial management especially for economical sustainable operation and proper element of plant management due to particularly design of an oil transportation system. It is found that the company is doing relative with some operational challenges and many people in Libya is rely on it and the influence of Government policies and programs on plant locations is quite helpful, particularly in planned economies area.

Keyword: Libya, Sarir Gas Turbine, Plant Location Effectiveness

I. Introduction

Libya, has initiated several programs that could promote industrials development and among this, is Sarir Gas turbine which also benefited with this scheme.

In this report we observed that, a company has make decisions based on the plant location, which refers to the selection of a particular site for setting up a business or factory. But before making such a choice, it has to go through the detailed locational analysis considering various factors, which influence his decision. It is a long-term strategic decision, which cannot be changed once taken.

1.1 Background

A. Sarir Field

The Sarir Field was discovered in southern Cyrenaica during 1961 and is considered to be the largest oil field in Libya, with estimated oil reserves of 12 Gbbl (1.9 km³). Sarir is operated by the Arabian Gulf Oil Company (AGOCO), a subsidiary of the state-owned National Oil Corporation (NOC). The Sarir field or, more specifically, Sarir C is on west edge of the Calanscio Sand Sea at the southeast margin of the Sirte Basin. Sarir C, which is part of a three-field complex, is 56 km long and 40 km wide covering 378 km². To its north is Sarir L, covering 15 sq mi (39 km²). Situated between the two is a much smaller Sarir North pool. Estimated ultimate oil recovery from Sarir L is 1.2 Gbbl (190,000,000 m³). The best, most sustainable, most efficient nations are going to have the best environmental Practices and sustainable power supply. Nations with a good reputation for sustainability have a competitive edge in sales. Conservation, efficiency, reduction of waste and sustainability buffer a nation against shocks. In Libya, a national, forward-looking environmental policy makes its exports more attractive. As it becomes more attractive for ecotourism.

B. power Supply in Libya

The power supply is a major challenge for it sustainability, thus various initiative were made to overcome this challenge is the establishment of the Sarir Gas Turbine 855 MW Project Site at General Electric Company of Libya. Although, Libya has 17 significant desalination plants (out of a total of 400 desalination plants according to So E 2002) with an installed capacity of more than 100 mcm/year, or 33,374 cum/day, The less oil is consumed domestically, the more oil is available for export, and the more foreign exchange becomes available for sustainable investments by Libya's Oil Reserve Fund. The actual production is only 18mcm/year (Porter and Yergin 2006), only one percent of annual national demand. Hence, technology plants are co-located at electrical generation facilities. Most desalination plants run only sporadically due to scaling, corrosion, and maintenance problems. Most desalination (60 percent) in Libya is by the thermal plus flash vaporization methods (multistage distillation). Reverse osmosis output is about 20 percent, as at the Tajura facility. Electric membrane separation plants produce about 10 percent. Three BOT desalination plants companies went bankrupt.

C. Gas Turbine 855 MW Project

Gas Turbine 855 MW Project power plant is vital for its long term efficiency and stable power supply to Libya and a lot many factors come into play when deciding where to install the plant. Although, it may not be possible to get everything desired at a single location, place but still it should contain an optimum mix of the

requirements for the settings to be feasible for long term economic justification. As the name implies the power plant is meant for generating power which obviously means that it will consume huge quantities of fuel. The exact quantity would depend on the size of the plant and its capacity but it is a general fact that ample quantities of fuel must be available either in the vicinity or it should be reasonably economical to transport the fuel till the power plant.

1.2 Objective of This Report.

In the industry management today, the major concern of public, user and clients is the plant location and its affective reliability in operation, availability of amenities based on this location, maintainability and safety. Therefore the objectives of this report are:

A. To describe design process of Sarir Gas Turbine 855 MW Project plant location.

B. To highlight the factors influence the effectiveness of plant location.

C. To explain some of the major factors contribute to plant location errors and explore solutions and understanding of plant location processes

II. Methods and Approach

The outline of research methodology for this report is presented in the form of a chart given in figure 1. The highly competitive environment, linked to the globalization phenomena, demands from companies more agility, better performance and the constant search for cost reduction. The present study focused on the analysis of plant location effectiveness on the study of Sarir Gas Turbine 855 MW Project Site at General Electric Company of Libya. The Materials are among many factors that contribute to improve a company's performance. The report is related in this work was performed in Sarir Gas Turbine 855 MW Project Site at General Electric Company of Libya. It was founded in the recent years and is classified as large-sized companies that provide electricity to Libya. The Sarir region contains a cluster of industries of metal-mechanic, automotive and metallurgical sectors that in its majority belong to production chains which demand a high internal performance level from their partners so the gas turbine is one them.



Figure 1 outline of research methodology

As its name is known, seeks to provide descriptive and accurate description of the phenomenon notes based on the data that has been collected. The goal of the data collection is to describe the basic accuracy of the information as a result, this academic research attempts to describe the current cement company conditions and the performance. The data collection is based on an empirical through quantitative. Anyone considering an empirical project should consider first whether to use primary or secondary data. However, for this report I am solely used going to secondary because there is a substantial cost advantage to doing secondary analysis. Others have borne the cost of collecting the data, and although some costs may be incurred to tabulate the data, these costs will be considerably lower than original data collection. These existing data bases are often far superior in their extent, both geographic and historical, to anything that a single investigator could achieve. Most are in the public domain and many are easily accessible in a machine-readable format. Moreover, the study also relies on company report to find out route company production process this will tremendously help to give clear picture on overall company operation. The secondary data sources are the books, employees of the institution and previous reports any source through various units of the institution, Local reports, data can be access online through net. But there are problems are not available resources help in great extent such as published papers and reports, online data, and websites.

Sarir Gas Turbine 855 Mw Project Site At General Electric Company: - Primary data was collected through interview from some employees in the department of the situation. Since the report will be based secondary data so the analysis that can be done is meta-analysis. Meta-analysis is re-analysis of a number of published research studies to draw a conclusion. Since there is good number of studies on the report interest, these studies are sufficiently comparable, so we can use a meta-analysis to generalize a larger conclusion. Meta-analysis is by now a fairly sophisticated technique of its own, but it shares with other secondary techniques the advantage of being relatively inexpensive. Meta-analysis can also make a substantial contribution to the

understanding and various conclusions for decision making which it should be very important tool for this report and the increasing complexity of construction projects creates the need for design professionals trained in all phases of the project's life-cycle and develop an appreciation of the building as an advanced technological system requiring close integration of many sub-systems and their individual components, including sustainability. Building engineering is an emerging discipline that attempts to meet this new challenge.

The results and discussion start with the analysis of plant location effectiveness is strategic. Organizations take the location decision considering various factors related to customers, supply of capital, raw material, power supply, business climate, manpower availability, government policies etc. There are mainly two methodologies to decide the plant location viz. Factor Rating and Centroid method. The type of product or services and the type of production system basically affects the plant layout. There are different plant layouts for these different types of production systems viz. Job Shop, Batch production and Mass production. In mass production, equipment's are expensive and used for a solitary purpose (Watanapa et al, 2011). A very small variety of goods are produced in this type of layout. In Job shop type of layout machineries are general and all-purpose machinery.

III. Results and Discussion

A. Sarir Gas Turbine 855 MW Project designed the plant location

Various designs of products may be manufactures in such facilities. Batch production falls between mass production and jobbing. One batch of products must be completed before work on the next one may begin. Similar products are produced on a batch basis, in large quantities Wilsten (2007). The plant layout must ensure the optimum usage of resources by minimizing the movements of the resources within the plant. A good location of a production or service facility will give cost advantage to production or services and may also reduce the raw material and distribution costs. The location aspect is particularly advantageous to small business enterprises and service units. Location adds to competitive advantages and improved profits. Usually location question arises when (1) a new plant or service facility is planned (2) there is addition to the existing business or added capacities in the other regions (3) existing facilities are to be relocated or modified to remove drawback (4) to get advantage of better infrastructure or incentives from the government sources. Location of organization plant or service facilities is a permanent fixture and has considerable expenditure. The selection has to be done considering all relevant aspects. If there is any mistake or wrong choice of location, all the expenditure in the form of site development, factory construction, installation of machinery and other infrastructure development will go waste



Figure 3.1 showing pipe line design

The report has acknowledged the challenge face by Sarir Gas Turbine 855 MW Project and how the company has invested huge amount of money into gas but yet, there is problem of gas transportation due plant location problem such as gas and geographic expansion should provide access to a fresh market and to additional resources as shown in figure 3.1. But companies that take a strategic view also realize that the new territory should increase a firm's competitive advantage by complementing and adding value to its current business. After all, the strategic value of a new location depends on three things: the strength of available resources, such as nearby supporting industries; the company's ability to seek and retrieve knowledge in this setting; and its capability to do something better than competitors. The following problems have been identified



Figure 3.2 showing new pipe line construction site

Sarir project have team to design a new site through professional service of creating and developing concepts and specifications that optimize the function, value and appearance of products and systems for the mutual benefit of both user and manufacturer. In designing the location, Sarir determine suitable plant location for interrupted operation and maintaining pipelines and safety fig 3.2. Factors influence the effectiveness of the plantlocation are near to oil field, employee, material handling, strategic objectives, and socio economic factors. The effective plant location factors will achieve various objectives like efficient utilization of available land space, minimizes cost, allows flexibility of operation, provides for employees convenience, improves productivity etc. The entrepreneurs must possess the expertise to lay down a proper layout for new or existing plants. It differs from one plant to another. But basic principles to be followed are more or less same. Although, this report is mainly conducted with Sirir Gas turbine in main but it is applicable to all types of industries or plants.

Some problem error related to this design on the plant location of the Sarir is related with gas and geographic expansion should provide access to a fresh market and to additional resources. An optimum location can reduce the cost of production and distribution to a great extent. Thus great care and appropriate planning is required to select the most appropriate location. The efficiency of production depends on how well the various machines; production facilities and amenities are located in a plant. An ideal plant location should provide the optimum relationship among the output, floor area and manufacturing process. At the end, the location and management should be conducive to economic operation, health and safety of employees. It should ensure free and efficient flow of men and materials. Future expansion and diversification may also be considered while planning factory location.

B. The factors influence the effectiveness of the plant location

There are many factors effluence the effectiveness of the plant location and among them is good professional team and the team have proposed a new site and design through professional service of creating and developing concepts and specifications that optimize the function, value and appearance of products and systems for the mutual benefit of both user and manufacturer. Industrial designers develop these concepts and specifications through collection, analysis and synthesis of data guided by the special requirements of the client or manufacturer. They are trained to prepare clear and concise recommendations through drawings, models and verbal descriptions. Industrial design services are often provided within the context of cooperative working relationships with other members of a development group.

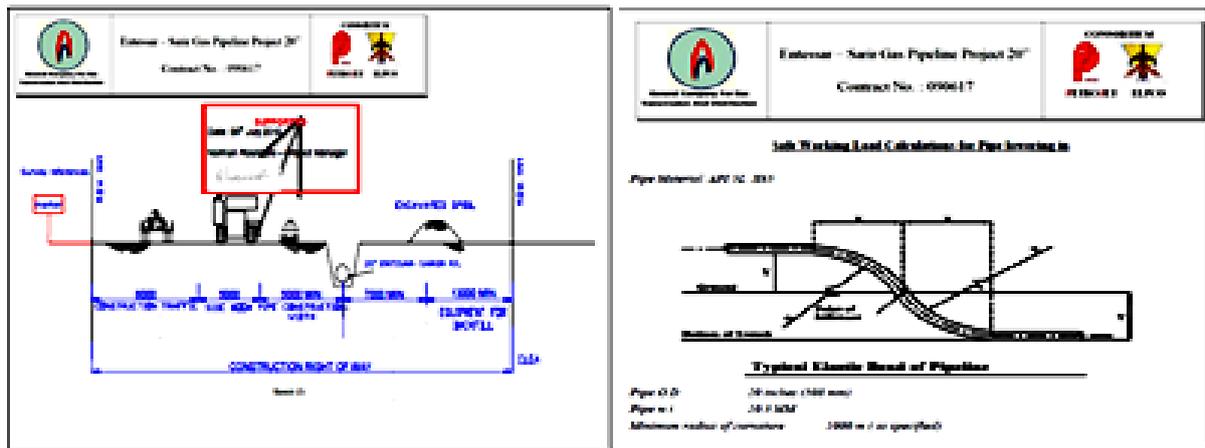


Figure 3.3 showing professional site design.

With professional team company can excel and typical groups include management, marketing, engineering and manufacturing specialists. The industrial designer expresses concepts that embody all relevant design criteria determined by the group figure3.3

The pipeline is cleaned, primed and coated with a hot, tar-like material to prevent corrosion and wrapped in an outer layer of heavy paper, mineral wool or plastic. If the pipe is to be buried, the bottom of the trench is prepared with a sand or gravel bed. The pipe may be weighed down by short, concrete sleeves to prevent its lifting out of the trench from groundwater pressure. After the underground pipeline is placed in the trench, the trench is backfilled and the surface of the ground returned to normal appearance. After coating and wrapping, aboveground piping is lifted up onto prepared stanchions or casements, which may have various design features such as anti-earthquake shock absorption. Pipelines may be insulated or have heat trace capabilities

C. Problem error related to this design on the plant location and solution these problems



Figure3.4 (a) Current fuel transportation system (b) long term plan for alternative fuel supply

The company is located in desert and the suppliers' side, truck is the most used mode whenever the shipped quantities do not justify the huge truck especially for their gas supply. However, the company demand to the supplier gas is higher and validates the use of truck. Related to the customers for those cases, airfreight is the most convenient choice, though not the least expensive. Facility location problems are unavoidable decisions for many organizations trying to compete on land. It is totally mistake to locate a company in abnormal area



Figure 3.5 Showing the desert area of the company

This type of problem ranges from a simple facility location problem where the only decision made is where to establish a new plant, to more complex problems that decide on several aspects at the same time figure 3.5, such as inventory, demand allocation, reliability, routes and others. The company transportation factors have been considered as inputs to several types of models serving as a multiplying weight; however, these factors have not been considered as decisions. Some of the factors related to the complex concept of transportation are: availability and reliability of diverse transportation modes and infrastructure; existing capacity in links, nodes and transportation modes; reduction of transit times for each transportation mode; maximization of transportation resources utilization; improvement of routing and scheduling performance; climate; community culture; regulations and quality standards; and others, along with the more traditional factors of distance, demand, and cost. The regular monthly fuel consumption is high and to keep this smooth is very difficult and this is provided in the summary.

Due to low pressure head due location issues and poor road network due location issues, the company suffers a great set back in supply adequate distribution due to location issue. Basically, this has led Libya not getting a stable power supply for its development and gas turbine which operates at Sarir Gas Turbine 855 MW Project Site at General Electric Company of Libya is one of the main power supply in Libya and in most cases problems associated with such project the material handling or error in material handling due to above mentioned problems and if not properly maintained with result in lower turbine performance which will generally affect the whole system and also will result in and decrease efficiency. Lower efficiency of gas turbine means the lower power output is produced. To increase the performance of gas turbines and maintain stable supply there have several things to be done, so therefore the study want examine following problem and suggest solution in Sarir Gas Turbine 855 MW Project.

IV. Conclusion

In conclusion, the study presents a report on Sirir Gas turbine industrial management especially on plant location.

A. Sarir project have team to design a new site through professional service of creating and developing concepts and specifications that optimize the function, value, appearance of products and systems for the mutual benefit of both user and manufacturer. In designing the location, Sarir determine suitable plant location for interrupted operation and maintaining pipelines and safety.

B. The influence factors of plant location are near to oil field, employee, material handling, strategic objectives, and socio economic factors. The effectiveness of plant location factors will achieve various objectives like efficient utilization of available land space, minimizes cost, allows flexibility of operation, provides for employees convenience, improves productivity etc. The entrepreneurs must possess the expertise to lay down a proper layout for new or existing plants. It differs from one plant to another. But basic principles to be followed are more or less same. Although, this report is mainly conducted with Sirir Gas turbine in main but it is applicable to all types of industries or plants.

C. Some problem error related to this design on the plant location of the Sarir are Poor Road Network due location issues, The company suffers a great set back in supply adequate distribution due to location issue and Plant location designed error for gas flow through geographic expansion should provide access to a fresh market of enhance additional resources. In an optimum location can reduce the cost of production for distribution to a

great extent. Thus great care and appropriate planning is required to select the most appropriate location. The efficiency of production depends on how well the various machines; production facilities and amenities are located in a plant. An ideal plant location should provide the optimum relationship among the output, floor area and manufacturing process. Finely, the management atmosphereshould be conducive to economic operation, health and safety of employees. It should ensure free and efficient flow of men and materials. Future expansion and diversification may also be considered while planning factory location.

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