

## **ABSTRACT**

The Khartoum Oil Refinery (K.O.R) has been built in Algaili area (70 km north of Khartoum) as a joint venture between the Sudanese Government (S.G) & The Chinese National Petroleum Corporation (C.N.P.C). It started to operate in June of 2000.

The constructions of eighteen petroleum terminals near (K.O.R) had been finished, and they were commissioned, but many of them exceeded the proposed time for construction.

This study is carried out in the petroleum terminals at Algaili area to discuss the causes of delay which occurred in their construction processes, and to recommend possible solutions.

Some of these petroleum terminals are selected as case study of this thesis:

- ❑ Nepta Petroleum Terminal.
- ❑ The National Petroleum Terminal.
- ❑ Mobil Oil Petroleum Terminal.

Sites visits, office interviews, a questionnaire are used for the data collection, and the SPSS program was used for analysis of the questionnaire data; the presentation of both in tabulated and graphical forms.

A full detailed report is done for Nepta Petroleum Terminal, a less detailed one is carried out for the National Petroleum Terminal, and a brief description presented Mobil Oil Petroleum Terminal.

In this study many important parameters have been examined such as:

1. The type of contracts used for the construction of the Terminals.

The petroleum terminal is considered as an industrial project; each part of it consists of mechanical, electrical equipments, and pipelines so a suitable type of contract must take place for the construction process.

2. The No. of contractors assigned for the construction stage.

From the layout it is found that the project is large enough to be divided into many parts and consists of different constructional work (civil, mechanical, and electrical work), therefore it will be better to appoint many contractors for the project to accomplish the work in a shorter time.

3. The designs of the project at the beginning of the construction stage.

The petroleum terminal needs complete detailed designs for each part, also it needs a detailed analysis not only in the individual phase of the total construction process but also of the interaction between those phases. This leads to an accurate commercial and technical evaluation.

4. The timing of preparing the finance and bank letters of credit for importing the equipments.

Mechanical, electrical, and fire fighting system works depend on equipments and materials that must be imported, so more consideration must be taken in the timing of equipments and materials procurement.

5. Changes of the designs and specifications during construction.

During construction stage, any change in the designs or specifications of the mechanical, electrical and fire-fighting system needs rearrangements in the finance, and bank letters of credit to import the equipments that will definitely delay the project. For the civil works most of the construction materials and equipments are available in the local market, so any change in the design, specification, or quantity can be covered.

6. The work programme of the project.

The work programme of the project should be prepared properly; that analysis-identification of tasks, task sequence or task concurrence, and task time requirements must be considered.

## 7. Payments.

The payments must be approved and paid within a certain time; any delay in the payment will affect the performance of the contractor and the execution of the work then delay of the project.

A Proposal for the stages or phases for the construction of petroleum terminal in case of using a traditional contract has been suggested:

### Phase 1

Complete preparation of designs, drawings, quantities, specifications that will lead to an accurate project commercial and technical evaluation then the finance and letters of credit will be prepared in a suitable time.

### Phase 2

Dividing the petroleum terminal into three or four parts to appoint a contractor for each part.

### Phase 3

Materials and equipments procurements.

### Phase 4

Tendering .

The contractors should be chosen through a Tendering procedure either by inviting competent contractors or advertising in newspaper.

### Phase 5

Construction of the petroleum terminal.

The careful consideration of above suggested parameters and proposal for the procurement, design, construction techniques and management approach should make implementation easier, quicker and cheaper.