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DESIGN OF MARINE OIL TERMINAL AT TAKORADI PORT IN GHANA

Abstract: *The growth and prospects of Ghana's oil industry is significant producing 174,000 barrels of crude oil per day. The prospect made in the sector can only be well celebrated when oil storage deficit gap across the country is bridged. The aim of paper is to concentrate on designing a safer oil terminal to aid the oil storage system at the Takoradi port and to reduce dependence on expatriates for Ghana's design needs. Land reclamation techniques and the costs are also be considered.*

Key words: seaport, Ghana, oil terminal, design, safety, cost.

Master plan of Takoradi port development defines urgent construction of oil terminal but the design will be based on conceptual planning and investigation. Inadequate design of oil terminal structures is genetically hazardous to the life of the people using the facility and the industry it serves. The only option in reducing the risk is to design adequately. Adequate design of a terminal is one of the key most important means in the offshore oil projects to minimize hazards and its associated risks [1, p. 2].

Offshore oil terminals when constructed are expected to be exposed to all forms of loads such as environmental loads and degradation. Due to the risk and the cost associated with the construction of an oil terminal, the design of such facilities must meet all relevant requirements spelt out by local and/or international standards and regulations.

It is a known fact that oil terminals by usage will definitely pose some form of safety hazards and environmental risks which the designer has to consider to control and minimize during the design stage. In the British standard recommendations a fundamental prerequisite to designing maritime works is the understanding and assessment of the physical environment in which the works are situated and the naturally occurring conditions and events to which the works are exposed".

Ghana is one of the fastest developing countries in Africa which made a major oil discovery in the Jubilee fields in the western region of Ghana in the year 2007 and ever since then, Ghana has made it to the list of countries with oil minerals. The discovery has led to compilation and publication of many articles about the future prospect of the petroleum industry of Ghana and what the benefits and losses may be for the people of Ghana moving forward.

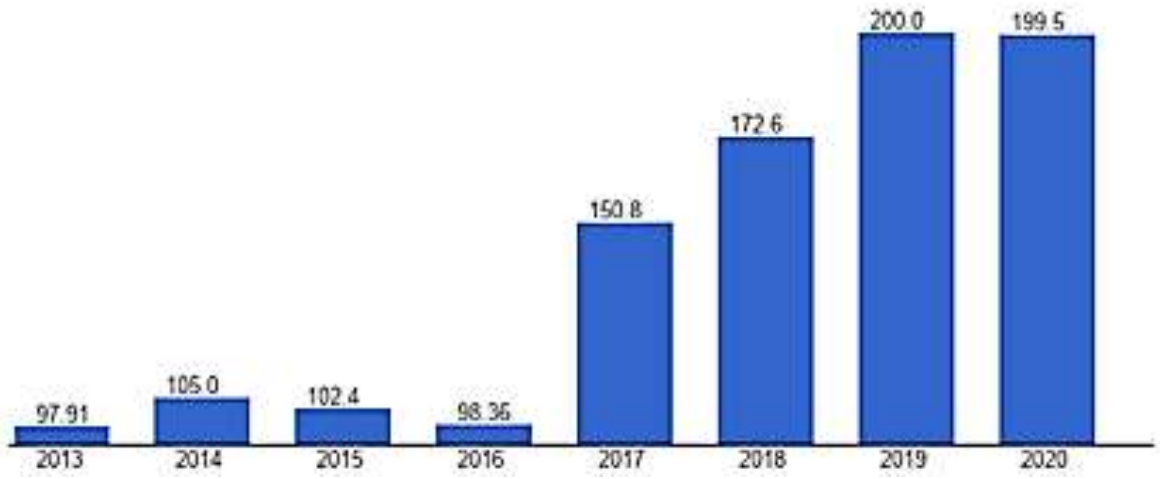

Figure 1. Ghana oil production, thous. barrels/day (TheGlobalEconomy.com)

Today, with a little over a decade ago and still counting, one can conclude that the oil sector of Ghana has experienced more growth. Despite this progress in the industry, there are not many Ghanaian offshore engineers to take up responsibility of designing maritime structures with others suggesting training for the Ghanaian engineers with a matching salary in that direction.

Ghana's oil and gas prospects after evaluation, is said to be significant after exploration activities led to discoveries that indicate that, oil and gas resources are dotted across the shoreline from Cape Three Points in the west to Keta in the east.

The progress made in the sector has compelled the Ghana National Petroleum Corporation (GNPC) to extend the country's continental shelf to increase the sector's scope and continuously maximize the prospects in the oil sector. This vision of GNPC coupled with government policies has led to the declaration by the president of Ghana in 2019 to make the Takoradi port an oil and gas hub. The Ghana Port and Harbors Authority (GPHA) has already made a move by capturing in its master plan an allocation for the construction of a new oil and gas hub.

This paper presents the safety problems for oil terminal to provide the necessary information and dimensions that aim at gathering data, analyzing them and designing modern offshore oil terminals to meet the requirements of codes of practice and expectation of GPHA. The author have considered the various methods and strategies including the use of analysis of bearing capacity (Plaxis 2D software) to determine the feasibility and the capability of the structure concept based on available data for design of marine oil terminal at the Takoradi port.

It is a non arguable fact that the progress Ghana is making in the oil industry is not well balanced as it lacks storage facilities across the country. The GNPC has the mandate to make sure the necessary steps are taken to bridge the gap between production, storage and distribution within the value chain management and it is this spirit among others that led the GNPC to collaborate with the GPHA to make the Takoradi port an oil and gas hub.

This decision however requires a project team to make a feasibility study of the allocated site prior to detailed design. Ghana always falls on expatriates for the design and most at times the construction which makes Ghana spend more when it comes to maritime works such as the proposed oil and gas hub. This paper has really come at the right time and when finished and gets accepted by the authorities of Ghana, it will reduce costs that will be associated with employee expatriates.

Reference:

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