



A Framework to Select the Best Strategy for Iran's Entry into the Repair and Maintenance Market of Oil Drilling Rigs

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Abstract

The oil and gas service industry revenue is projected to rise to \$350 billion in 2020, and a major part of such services belong to repair and maintenance (R&M) of the drilling rigs. Therefore, with regard to the number of jack-up rigs in Iran and the Persian Gulf, the R&M and improvement of these types of rigs become particularly important, especially due to the high lifespan of these rigs, which increases the time frequency of basic repairs. Nevertheless, Iran is suffering from lack of management and knowledge in the field of project resource management in this industry. Therefore, knowing the strategies and effective criteria for this industry is essential. In this paper, 15 criteria affecting the selection of R&M strategy were determined through interviews with experts, and the effect of each criterion on each alternative (seven strategies) was studied, and the most appropriate R&M strategy was then selected through analytic hierarchy process (AHP). The results show that the best strategy for Iran's entry into the R&M market is to perform all basic repairs of the rig, followed by license and joint venture. Finally, the best strategy was applied at R&M of Sina1 rig, comparing the results with those for Iranian rigs such as Modarres and Rajaei, the repairs of which were carried out in foreign yards, indicates the low cost of domestic repairs and the economic justification.

Keywords: Strategy; Repair And Maintenance; Drilling Rig; AHP; Effective Criteria.

1. Introduction

Based on Figure 1, the number of jack-up rigs more than 40 years old has rapidly increased, and it can thus be concluded that the fleet of jack-ups in the world is getting old with a need for repair and maintenance. In other words, the R&M market will be better by the day due to the increased time frequency of basic repairs [1].

Figure 2 indicates three peaks of frequency of jack-up rigs construction in 1982, 2009 and 2015. Also, Figure 2 shows that with cyclical behavior, improvement in the business of basic repairs is expected in certain years [1]. Due to the large part of the operations in the land workshop, the rig repairs often require a large workspace and guiding rails. The provision of the required infrastructure in the land is costly; so, it is suggested to use low-volume equipment and lower energy consumption [2].

Drilling rigs are one of the most important pieces of drilling industry equipment. Drilling equipment regularly needs R&M and system upgrade. Each rig usually requires R&M between five and 10 years after getting started which increases efficiency of drilling operations and the life span of drilling equipment. Neglecting oil rig repairs can lead to irrecoverable incidents. The incidents happened in Mexico bay, causing complete destruction of the rig, the loss of platform forces and irreparable environmental damage, and Asalouye can be exemplified [3]. Considering several years of foreign sanctions and multiplying the cost of importing drilling equipment and machinery, R&M of drilling rigs is of

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