



Marine Environment's Risk Analysis of Offshore Oil and Gas Activities

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1- Introduction

Throughout the world, estimated proved reserves of petroleum have been reported to be about 1.29 trillion barrels of oil and about 6,110 trillion cubic feet of natural gas. More than 90 percent of these reserves were based on land or near shore. [1]

The estimated deepwater oil reserves by considering the recent discoveries in deepwater areas will reach 200 billion barrels. Therefore, as the other oil reserves are declining rapidly, the deepwater oil reserves can be expected to play an important role in the future of the world oil and gas energy.

So, intensive activities for exploration and exploitation of the oceans, especially the growing demand for hydrocarbons, led to the development of the offshore oil and gas industry during the last decades. [2]

2- The Risk of Offshore Activities

The Piper Alpha disaster demonstrated that even when a facility is built to good design standards, catastrophic events can still occur. This incident prompted the recognition that exceptional safety performance requires the implementation of a comprehensive safety management system. Safety management systems provide a holistic approach to safety, addressing not only technical safety requirements, but also organizational and human performance issues such as management, training, documentation, operational procedures, etc. Regulatory trends have been moving away from enforcement of prescriptive requirements and toward performance-based systems. As operators are required to demonstrate the effectiveness of their safety management measures, the use of risk assessment tools has increased throughout the industry.

On 20th April 2010, an explosion rocked Transocean's Deepwater Horizon drilling rig in what has escalated into one of the United States' deadliest offshore drilling incidents of the past half-century. After the initial blowout occurred, the leaking wellhead continued to feed the fire onboard the semi-submersible until the rig ultimately collapsed beneath the deep waters of the U.S. Gulf of Mexico on 22nd 2010. [3]

Since 2001, there have been 69 offshore deaths, 1,349 injuries and 858 fires and explosions in the Gulf of Mexico, according to the federal Minerals Management Service. [4]

The main consequence of the Deepwater Horizon sinking is that oil and gas offshore drillings look more risky than before especially from the marine environment pollution point of view.