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NUMERICAL MODELING OF THE OIL RIG EXPLOSION

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The explosion of the Deepwater Horizon oil platform was one of the most serious accidents, leading to the loss of 5 million barrels (pollution of the Gulf of Mexico) and the disappearance of 11 people. That is why the description of a simulation model of an explosion on a marine platform makes the prevention activity useful, in the context of the increasing importance of the exploitation of the Black Sea. Through this material we simulated a possible explosion on a Romanian oil structure, in order to obtain the minimum data necessary to be quantified so that an incident does not occur. Indeed, from 2004 to 2024, fatalities in the offshore oil and gas industry were significantly higher (more than four times) per person-hour worked in US waters than in European waters, even though the companies operating in these waters are frequently the same.

In Romania, incidents of Offshore platforms it is at low level, because the strategy of working to Romanian Offshore Platforms is approve to the Life and Safety Management Authority Standards.

This striking discrepancy reinforces the view that the problem is not so much about the business itself but rather is determined by the specific cultures and regulatory systems in which the industry's many members operate. Past accidents in offshore oil and gas operations must be analyzed to establish new work procedures. This should be considered when estimating overall risk and in the risk -based decision-making process. The entire process of risk management and the ALARP (As low as reasonably practicable) principle is based on a prerequisite of discernment. The principle assumes that most risks can be controlled, while only a tiny percentage of "remaining risk" needs to be tolerated - and should be managed cost-effectively.

This means that a significant amount of risk remains uncontrolled.



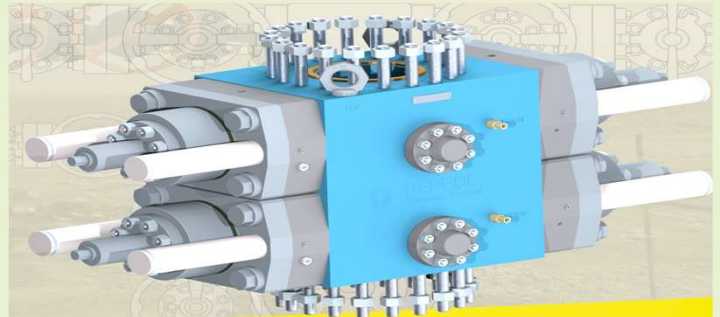
Deepwater Horizont explosion



Deepwater Horizont accident pollution



Rigs protection by BOP vertical



Rigs protection by BOP orisontal

I this paper we described the test requirements for putting the eruption preventers into operation as well as the acceptance criteria. Next, we carried out a study on the effects of pressure tests on employees.

We analyzed the effects of the test pressure on the environment in case of rupture or leakage of the test equipment (blowout preventer). For testing I took water with oil (fuming sulfuric acid) $\gamma\text{SO}_3\cdot\text{H}_2\text{O}$ with a concentration of 1%.