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Streszczenie rozprawy doktorskiej

Temat pracy: **„Metoda zabezpieczenia rurociągu przemysłowego przed niekontrolowanym wypływem substancji niebezpiecznych”**

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Dyscyplina: budowa i eksploatacja maszyn

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Abstract:

This thesis presents the wide application of industrial installations containing pipes in their construction. The issue of safety during the operation of industrial piping systems, in particular installations for the extraction and transport of hydrocarbons, has been discussed. Two examples of catastrophes caused by a failure of the installation are described, focusing on their causes and effects. An analysis of the factors affecting the risk of failure has been conducted identifying safety key processes occurring during its design, construction, commissioning, operation and disassembly. Author described processes that are used to minimize the risk of failure as well as to limit its effects when it occurs. In assessing the consequences of the failure and the analysis of the procedures, it was found that one of the key factors that determines the magnitude of the problem is the time between the occurrence of the failure and the effective response. A review of available piping repair methods has been made, founding that there is no effective way to quickly and effectively prevent uncontrolled outflow if the installation is completely disrupted for use in areas difficult to access for the crew.

The purpose of the research is to find an effective solution that applied in a fast way enables to limit or block the leakage from the damaged pipe or first of all to connect damaged subsea well.

The thesis of the work is the possibility of using a labyrinth-type seal used, among others in the construction of energy turbines, as an effective and efficient solution that allows to quickly reduce or completely stop leakage from a damaged installation by blocking the outlet, or, above all, connecting a damaged offshore well.

Based on conducted numerical and experimental studies, the author's solution of the protection of the industrial pipeline against the uncontrolled outflow of hazardous substances was developed and verified. These studies may provide the basis for further development of the proposed solution to develop optimal configurations for individual