عنوان مقاله:

A Comparison of the Dynamic Response of a Product Transfer System in CALM and SALM Oil Terminals in Operational and Non-Operational Modes in the Persian Gulf region

نویسندگان:

Esmaeil Hasanvand - *Offshore Structure Engineering Department, Petroleum University of Technology, Abadan*

Pedram Edalat - *Mechanical Engineering Department, Petroleum University of Technology, Abadan*

خلاصه مقاله:

Offshore oil terminals are a cheaper and safer solution than conventional shore terminals for unloading and loading tankers. There are several types of offshore terminals, including Catenary Anchor Leg Mooring (CALM) and Single Anchor Leg Mooring (SALM). Product transfer systems, including floating and underwater pipes, are the most important components of these terminals. The present study aims to compare the dynamic response of a product transfer system in these two models of offshore oil terminals. To obtain structural responses, including forces created in floating and underwater pipes, a simulation in Orcaflex software is used considering wind, current, and wave forces in different sea states. The curvature and tension in the pipes are considered a criterion for evaluating the failure modes. The results show that under operating conditions, the curvature and effective tension of the pipes in the SALM terminal are ۵% and ۹۳% lower than those in similar operating and environmental conditions in the CALM terminal, respectively. As the environmental conditions increase up to Sea State ۸, when the tanker is not connected to the terminal, the SALM terminal pipes will have more structural stability and usability, while the CALM terminal pipes will only have stability up to Sea State ۶. The tensions generated in the pipeline end manifold (PLEM) of the SALM terminal are also lower than those in the CALM terminal. It is also observed that the critical point for the CALM terminal pipes is the connection point to the terminal buoy, while it is the connection point to the seabed for SALM terminal pipes, which should be considered in designing a product transfer system for this type of terminals.

کلمات کلیدی:

Offshore oil terminal, CALM, SALM, Dynamic analysis, Flexible pipeline

لینک ثابت مقاله در پایگاه سیویلیکا:

https://civilica.com/doc/1727418