ULTIMATE STRENGTH ANALYSIS OF FIXED PLATFORM DUE TO SUBSIDENCE

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ABSTRACT

The purpose of the final project is to evaluate the impact of wave force on a steel platform and the slamming force on the deck beam after subsidence. The wave force is calculated based on the 100 years return period of extreme wave condition. The jacket member stress is analysed due to the increment of the lateral wave force. The water depth is modelled to be increased by the depth of subsidence until wave crest is reached the sub cellar deck floor. Using SACS it is found that jacket stress member is three times higher due to 5 ft subsidence in which UC (unity check) is found of 0.33 before subsidence to be 1.07 after 5 ft subsidence. The member stress is found to be increased constantly after 5 ft subsidence until reached sub cellar deck floor. Due to 3D-Flow modelling it is found that the pressure on the sub cellar deck beam is also increased by 1.1 due to increasing subsidence from 5 ft to 10 ft. The of the beam is found that it could be reached a plastic deformation due to slamming pressure. The deck beam stress due to slamming is increased from 309 MPa to 470 MPa. It could be concluded that the deck beam could be failure in a plastic deformation condition due to slamming force which is caused by the subsidence.

Key word: jacket structure, deck analysis, stress analysis, subsidence, slamming, UC (Unity check), ultimate strength, deformasi plastis.