STUDY OF BUOYANCY TANK FOR STABILITY FIXED OFFSHORE STRUCTURE TYPE TRIPOD PLATFORM WHEN CONDITION OF PILE FOUNDATION DECLINED

Name : Herdanto Praja Utama
Reg. : 4308 100 053

Majoring : Ocean Engineering Department, FTK-ITS
Supervisors : Ir. Wisnu Wardhana, SE., M.Sc., Ph.D
Dr. Eng. Rudi Walujo Prastianto, ST., MT

ABSTRACT

Pile foundation has a very vital function in the operation of a fixed offshore structure. The pile foundation has to support the overall load for keeping the structure stable. When in operating condition of platform structure has given the addition of load and reduction in the amount of foundation load capacity, then it is possible that the structure will be oblique. Therefore it is necessary to provide buoyancy tank for the platform leg structure. This study reviewed the pile axial load, safety factor and unity check of pile. Value of unity check at the pile before the addition of buoyancy tank for each PL 1, PL 2 and PL 3 are 0.74; 0.78 and 0.89. From the obtained pile structure value of PL 3 which will be given Buoyancy Tank. It is because the value of unity check on PL 3 that comes most closest to a value of 1. Given two models, namely the installation of buoyancy tank vertically and horizontally. From the analysis it can be concluded that the model of a vertical installation is more effective when compared to the horizontal models. This is because the model is more focus on providing vertical lift for one leg on the platform. However horizontal model obtained the effect of distributed lift force for each leg on platform. Placement and size of the buoyancy tank at an optimum of some models is a model of buoyancy tanks which installed vertically on a model with a diameter of 120 6-inch, 0.7 inch thick and is installed at a depth of 98 feet. Reduction value of pile axial load on the model 6 obtained 15.57% and the value of unity check and safety factor is 0.75 and 2.65. The total costs required for installation and manufacture of model 6 is Rp 400,000,000.00.

Keyword: Buoyancy Tank, pile axial load, safety factor dan unity check.