Study on Buckling Strength at Deck Leg of Fixed Offshore Platform

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ABSTRACT

A deck of fixed offshore platform is location where all activities are performed, i.e. deck must be supported by leg with adequately strength under vertical or horizontal loading. The present study is focused on the buckling strength taking the deck leg of fixed jacket offshore platform into account. The axial compressive load is applied to the deck leg of the structure. Because dimension front view and side view of the deck structure is completely different, so that the analysis is conducted by two stages. To investigate the critical buckling load and critical buckling stress including its deformation, the plane-frame (2D) analysis is considered. The Non-linear Finite Element Method so-called Structural Analysis Program (SAP) is adopted for the investigation of the structural behaviors. The critical buckling load and stress ratio obtained by Finite Element Analysis (FEA) is compared with the simple formula. As a result, it can be concluded that the stress ratio of the combination between axial compression and bending is less than 1.0 which indicates that the structure is safe.

Keywords: fixed offshore platform, deck leg, finite element method, critical buckling load, stress ratio