

عنوان مقاله:

parametric study of outer-brace SCFs at saddle and crown positions of right-angle two-planar tubular DKT-joints of offshore jacket structures

محل انتشار:

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خلاصه مقاله:

In the present paper, a set of parametric FE stress analyses is carried out for two-planar welded tubular DKT-joints under two different axial load cases. The analysis results are used to present general remarks on the effect of geometrical parameters on the stress concentration factors (SCFs) at the inner saddle, outer saddle, crown toe, and crown heel positions on the main (outer) brace. Based on the results of finite element analyses which are verified against the experimental data, a complete set of SCF database is constructed. Then a new set of SCF parametric equations is developed through nonlinear regression analysis for the fatigue design of two-planar DKT-joints under axial loads. An assessment study of these equations is conducted against the experimental data and the satisfaction of the criteria regarding the acceptance of parametric equations is checked. The hot-spot stress method for fatigue design of offshore structures relies on the accurate prediction of SCFs. Significant effort has been devoted by researchers to the study of SCFs in various uni-planar tubular connections. Nevertheless, for multi-planar joints covering the majority of practical applications, very few investigations have been reported due to the complexity and high cost involved. Despite the frequent use of two-planar DKT-joints in the offshore jacket structures, this is the first research proposing design formulae for the SCF calculation in such tubular joints

کلمات کلیدی:

Offshore jacket structure, Multi-planar tubular joint, KT-joint, Fatigue, Stress concentration factor (SCF), Parametric equation

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