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Fatigue Life Estimation of Tubular Joints - A Comparative Study

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Abstract : In fatigue analysis, the structural detail of tubular joint has taken great attention among engineers. The DNV-RP-C203 is covering this topic quite well for simple and clear joint cases. For complex joint and geometry, where joint classification isn't available and limitation on validity range of non-dimensional geometric parameters, the challenges become a fact among engineers. The classification of joint is important to carry out through the fatigue analysis. These joint configurations are identified by the connectivity and the load distribution of tubular joints. To overcome these problems to some extent, this paper compare the fatigue life of tubular joints in offshore jacket according to the stress concentration factors (SCF) in DNV-RP-C203 and finite element method employed Abaqus/CAE. The paper presents the geometric details, material properties and considered load history of the jacket structure. Describe the global structural analysis and identification of critical tubular joints for fatigue life estimation. Hence fatigue life is determined based on the guidelines provided by design codes. Fatigue analysis of tubular joints is conducted using finite element employed Abaqus/CAE [4] as next major step. Finally, obtained SCFs and fatigue lives are compared and their significances are discussed.

Keywords : fatigue life, stress-concentration factor, finite element analysis, offshore jacket structure
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