

عنوان مقاله:

Numerical analysis of residual stresses and crack propagation in welded tubular X-joint subject to OPB loading

محل انتشار:

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نویسندگان:

,Nabard Habibi - Assistant professor, Mechanical Engineering Department, University of Kurdistan, Sanandaj, Iran

Homayoon Kalantari-Moghadam - Master Science, Mechanical Engineering Department, University of Kurdistan, Sanandaj, Iran

خلاصه مقاله:

Welded joints are widely used in the construction of offshore platforms. The large residual stress is generally caused by welding process in welded components. In this research, the finite element 3D modeling of welded tubular X-joint with 3-passes, made of St52, is done by ABAQUS software and welding residual stresses produced in the welding surrounding area have been estimated. In the modeling was performed for tubular X-joint and electrodes, the mechanical and thermal properties as a function of temperature as input is considered, and with respect to the electrode voltage and speed, heat flux at boiling temperature until the ambient temperature is calculated and ultimate remaining stress in the body at the end of the process of heat exchange with the environment, are residual stresses. The modeling results were good agreement with experimental results and using of this software can be a good estimate of the results achieved. Based on 3D modeling, the residual stresses in the longitudinal, transverse and shear residual stresses than acceptable results with experimental data show. Also, the results of numerical simulation and results of laboratory measurements for crack propagation have been compared together and good compatibility has been achieved.

کلمات کلیدی:

Crack Propagation, Tubular X-Joint, ABAQUS, Welding, Residual Stresses

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