

Fatigue Assessment of Tubular Specimens with Dents

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Abstract.

The paper reports initial results from an investigation program launched with the objective of monitoring of fatigue initiation and propagation in the actual specimens used nondestructive infrared inspection techniques based on TSA. Thermoelasticity stress analysis (TSA) and three-dimensional digital image correlation (3D-DIC) were used to determine fatigue hot spots locations as well as strain concentrations. Full field TSA and fiber optic Bragg strain gages (FBSG) were used to determine the overall strain field (TSA) as well hot spot strain evolution (FBSG) along the loading cycles. Strain fields determined from the experimental measurements and from finite element analysis (FEA) were combined with the fatigue Coffin-Manson strain-life equation and the Miner's fatigue damage rule to predict fatigue life (N_c).