

Evaluation of Fatigue Crack Growth Rate in Weldments

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Abstract : The fatigue crack growth rate evaluation is a basic experimental characteristic when assessment of the remaining lifetime is needed. Within the repair welding technology project, the crack growth rate at cyclic loading was measured in base and weld metals and in the situation when cracks were initiated in base metal and grew into the weld metal through heat-affected zone and back to the base metal. Two welding technologies were applied and specimens in as-welded state and after heat treatment were tested. Fatigue crack growth rate measurement was performed on CrMoV pressure vessel steel and the tests were performed at room temperature. The crack growth rate was measured on CCT test specimens (see figure) for both the base and weld metals and also in the case of crack subsequent transition through all the weld zones. A 500 kN MTS controlled electro-hydraulic testing machine and Model 632.13C-20 MTS extensometer were used to perform the tests.

Keywords : cracks, fatigue, steels, weldments

Conference Title : ICMSE 2015 : International Conference on Materials Science and Engineering

Conference Location : Amsterdam, Netherlands

Conference Dates : May 14-15, 2015