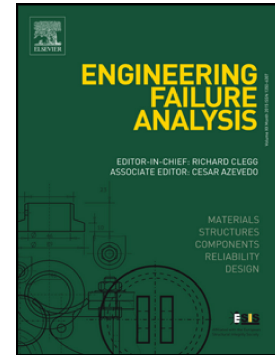


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Correlation between defect depth and defect length through a reliability index when evaluating of the remaining life of steel pipeline under corrosion and crack defects

Djamel Zelmati¹ .Oualid Ghalloudj^{1,2} .Abdelaziz Amirat¹

¹ LRTAPM: Research Laboratory of Advanced Technology in Mechanical Production, Department of Mechanical Engineering, Faculty of Engineering Science, Badji Mokhtar University Annaba, BP 12, 23000 Annaba, Algeria

²Research Center in Industrial Technologies (CRTI), P.O.Box 64, Cheraga16014 Algérie, Algeria

Abstract

Despite the various engineering models existing for lifetime investigation of hydrocarbon steel pipelines under localized corrosion and crack defects there is still a lack of information about the correlation between the two main parameters characterizing the geometrical defect model, depth and length. So the aim of the present work is a contribution in evaluating the remaining life of the pipeline using reliability analysis in order to correlate the two parameters through one common parameter, the reliability index. As a first step, the investigation is carried out on four standard and well established engineering models; Irwin, SINTAP, ASME B31G and Modified ASME B31G methods, aiming to coordinate results given by each of the four models. The potential defect depth and length correlation through a reliability index can be used as a decision-making tool to give realistic answers for replacing and/or repairing a tube subjected to internal pressure and on which flaws of different depths and lengths have been detected from inspection of a pipeline after few years of service.

Keywords: Corrosion; Defect; Reliability; Correlation; Sensitivity

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