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Factors affecting the crack-initiation of pipeline infrastructure in the oil and gas

An essential step in materials degradation is the determination of the failure mechanism. To understand better the mechanism of the crack initiation process, key metallurgical and environmental elements that can affect the cracking phenomena were investigated and are reviewed. The complexity of both cracking phenomena results from the dependence of SCC and HIC on multiple metallurgical, mechanical, and environmental parameters that may all influence both crack initiation and propagation; e.g., composition, microstructure and non-metallic inclusions in the steel, applied stress, water chemistry in the field, and ionic concentrations in the groundwater near the pipe surface to name a few for SCC. In addition, for HIC phenomena, one can add the concentration of H_2S in the fluids transported in the pipe as well as concentration of CO_2 , pH, etc.

Cracking of line pipe steels is analyzed critically, with attention to the crack initiation process.

Biography

Mimoun Elboujdaini is a Research Scientist with over 30 years in material R&D and management and coordinator of projects on engineering materials, their properties and performance in various service environments. The projects covered oil & gas, pipeline, aluminum base alloys, stainless steels, mining industry, and aerospace materials, etc. He is an Active member of several international professional societies as chairman and/or as member of Board of Directors. He is also Chaired several national and international conferences. He reviewed numerous papers for scientific journals, and acted as editor books, PhD thesis examiner and reviewer of graduate programs at the universities and Adjunct professorship at the University of Alberta. He has won several National & International awards and recognitions.

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