Georgia Tech College of Engineering-Structural Mechanics Seminar Series

Fracture Mechanics Assessment of Crack Growth During Offshore Pipeline Installation

Hugo Alejandro Ernst
Tenaris- Siderca R&D Center, Campana, Argentina

Friday, March 27 at 11AM
MRDC Bldg., Room 4211
(Host: Stephen Antolovich, MSE)
http://www.me.gatech.edu/SMSS

Abstract

The reeling process is one of the most important methods for offshore installations of pipe lines. Pipe segments are welded onshore and subsequently reeled onto a drum in a laying vessel. Later, the welded pipes are unreeled and installed off-shore. The problem is to determine the maximum initial weld defect that can be sustained during the severe deformation cycles suffered by the pipes.

In this work, the effects of the strain history on the driving force and crack growth resistance were studied in a fracture mechanics framework. A theoretical model was developed to describe the crack driving force evolution through the applied strain cycles. A criterion was proposed to represent material fracture resistance.

Experimental work and finite element analysis were performed to validate the assumptions of the models.

Bio-Sketch

Dr. Hugo Ernst obtained the degree of Master in Physics from the University of Buenos Aires, and a Ph.D. in Mechanical Engineering from Washington University, St Louis, Missouri. He has more than 35 years of experience in the areas of deformation and fracture of engineering materials, structural integrity and design. He has been: Senior Scientist, Westinghouse R&D Center Pittsburgh, PA, USA; Director of Research Fracture Proof Design Corporation, St. Louis; and tenured professor at the Georgia Institute of Technology, Atlanta, Georgia. He has published more than 60 refereed articles in international journals, and he has lectured extensively around the World. He was also the Chairman, Organizer and Editor of the National Conference on Fracture Mechanics, Atlanta, GA, 1990. For the last fifteen years, he has been working at the Tenaris-Siderca R&D Center, Campana, Argentina. He is now the Head of the Structural Integrity Department.

If you have any questions regarding the seminar you can contact Marlene White at marlene.white@mse.gatech.edu or Cecelia Jones at cecelia.jones@me.gatech.edu