

Symposium on Predictive Capabilities in Environmentally Assisted Cracking  
ASME Winter Annual Meeting  
Miami, Florida  
November 17-20, 1985

## **Influence of Small-Amplitude Cyclic Loading on Stress-Corrosion Cracking of High-Strength Steels in Salt Water**

**J. A. Hauser II and T. W. Crooker**

Material Science and Technology Division  
Naval Research Laboratory  
Washington, DC 20375-5000

One of the primary characterization parameters for stress-corrosion cracking (SCC) of structural alloys is the threshold stress or stress-intensity below which SCC is not observed within a specified testing period. In fracture mechanics terminology, the SCC threshold parameter is termed  $K_{I,SCC}$ . Threshold parameters are commonly measured under static loading conditions and are often regarded as a material/environment characteristic which can have general applicability for materials selection and structural design criteria. However, in recent years several investigators have shown that small-amplitude cyclic loading can significantly reduce the apparent SCC threshold in a variety of material/environment systems. The present investigation was undertaken to investigate this phenomenon using fracture mechanics test methods on two high-strength steels, 4340 and 5Ni-Cr-Mo-V, in 3.5 percent NaCl aqueous solution at ambient temperature and pressure.