

Erosion, Cavitation and Corrosion In WC-Co-Cr Coating



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Research Abstract

In this research study, the WC-10Co-4 Cr coating by high-velocity oxy-fuel thermal spray process (HVOF) has been investigated. Coating process, spray parameters, microstructure and coating performance in erosion-corrosion and cavitation corrosion environments will be studied. These materials are used in the energy sector for power generation. The coating has been sprayed on two different types of substrate materials. The first one was the carbon steel type EN8 while the second material was the austenitic stainless type UNS S316L. Laboratory experiments will be conducted utilizing a flow loop designed to serve the objectives of this study. The deterioration and damage mechanisms of the coating layers serve in Erosion-Corrosion and Cavitation-Corrosion environments will be thoroughly investigated. The influence of the coated specimens microstructure and the synergy effect of erosion-corrosion and cavitation-corrosion will be studied in two different environments. The first one is two phases environment constitutes from seawater with 3.5% NaCl and CO₂ gas while the second environment is three phases impingement constitutes from seawater with 3.5% NaCl, CO₂ gas with loads of sand particles. Test results and observations shall be collected and further analyzed.

Supervisors

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Publications

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