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Stress Corrosion in Magnetite

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Message from the Guest Editors

Magnetite sludge depositing inside steam generators is the major root cause of loss of heat transfer, impurity accumulation, and materials corrosion and degradation. So far, stress corrosion cracking of steam generator tubes has mainly focused on water chemistry in the crevices, such as chemical impurity concentrations, pH values, and temperature. However, it should be considered that the actual stress corrosion cracking occurs on the surface of a steam generator tube covered with magnetite deposits under operating condition of nuclear power plants. Magnetite is an oxide, but it shows almost metallic behavior with respect to its electrical properties. Hence, numerous microgalvanic cells can be formed on the surface of steam generator tubes within the porous magnetite and can be affected by corrosion phenomena.

We invite investigators to submit papers that discuss the various corrosion phenomena in magnetite, including stress corrosion cracking, general corrosion, flow-accelerated corrosion, pitting corrosion, intergranular attack, etc. Furthermore, mitigation technologies for magnetite deposition on steam generator tubing based on coating and surface property control are welcomed.

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Message from the Editor-in-Chief

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