

# **The Impact of SRB on the Corrosion of Monel Alloy in Sea Water**

**Jiunn-shyong Luo**

Material and Chemical Research Lab.  
Industrial Technology Research Institute  
Hsinchiu, Taiwan

## **Abstract**

A nickel-copper alloy Monel alloy 400 Flow Element (FE) had experienced significant corrosive deterioration after approximately three years of service at the Power Plant in Taiwan. The component was mounted and welded to a 16" superaustenitic stainless steel AL-6XN pipe within the piping system. Due to maintenance issues, it is approximated that the component was in stagnant (non-flowing) seawater conditions for 33% of the time since it was introduced into its service environment. It was reported that intergranular corrosion was found on cavitated Monel alloy in periodical flowing seawater with the presence of sulfate-reducing bacteria (SRB). To confirm this phenomenon, the exposure of Monel alloy and stainless steel to an enriched SRB culture medium was studied.

It was found that SRB growth on Monel 400 did not promote microbiologically influenced corrosion (MIC) unless cavitated areas were present. Even though air was permitted, intergranular corrosion induced by SRB could be still active at the cavitated areas of Monel 400. In order to avoid intergranular corrosion occurred at cavitated areas, SS AL-6XN can be considered to substitute for Monel 400 with the presence of SRB.