**AIMS2 Research Project in Manufacturing Systems Engineering and Management**

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| **Research Duration:**  | Fall 2018 – Spring 2019 |
| **Faculty:**   | Prof. L. Reiner and Prof. B. Bavarian |
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| **Contact No:****Title of Project:**  | JD1130, 818-677-7746**Application of New Biobased Vapor Phase Corrosion Inhibitors for the Contaminated Environments** |

**Goals and Objectives of the Project, Expectations and Outcomes**

With a shortage of fresh water resources, seawater may be used in recirculating cooling water systems and hydrostatic pressure tests of pipeline and storage tanks. Seawater as industrial circulating cooling water can relieve the constraint of a clean water shortage and rapid development of industries. But seawater is an electrolyte solution with multiple salts, mainly 3.0%~5.0% sodium chloride, pH value about 8, and a higher percentage of oxygen. Due to its chemistry, seawater easily corrode steel structure, valves and pipelines. So the key of seawater utilization is to solve piping and equipment corrosion problems in the seawater environment by modifying its chemistry with the addition of corrosion inhibitors.

The main objective of this research program is to study corrosion behavior of steel samples to demonstrate effective corrosion protection of different Bio-based vapor phase corrosion inhibitors against aggressive attack from high chloride environment. The program include: Study DC and EIS electrochemical corrosion behavior of carbon steel in aggressive chloride solution and addition of inhibitors. Monitoring corrosion rate (mpy) of steel pipe samples and ER probes for ninety days using stagnant solution condition using with and without inhibitor addition. Post-test evaluation of surface condition of exposed samples using Light microscopy, scanning electron microscopy (SEM/EDAX) and XPS analysis.