

CONDITIONING MONITORING AND FURNACE OPERATION AND DESIGN

(619) - THE EFFECT OF COLD-END SULFURIC ACID INDUCED CORROSION ON WEATHERING STEEL CORROSIVE RESISTANCE UNDER BOILER CONDITIONS

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Draft Paper

The power generation sector in Saudi Arabia uses sulfur-containing heavy fuels to operate power plants using steam boilers. When this sulfur-containing fuel, such as Heavy Fuel Oil, HFO, or Arabian Extra Light, AXL, is burned, a significant amount of SO₂ is created in the combustion process which turns to SO₃ in the presence of oxygen, then forms sulfuric acid vapor when exposed to water vapor. At low temperatures, the condensation of sulfuric acid, commonly known as cold corrosion, can be highly corrosive for materials. The experimental work done at KAUST, King Abdullah University of Science and Technology, further expands the understanding of the effect of cold corrosion on Corten steel. Partially submerged specimens were exposed to varying dilute sulfuric acid concentrations in a high-pressure, high-temperature rig. This work was done to facilitate and further the understanding of the corrosive behavior exposure to fully liquid, gaseous, or the liquid-vapor interface the electrolyte has on material integrity for industrial use.

Palavras-chave : Cold corrosion, Steam boilers, Sulfur in fuel oil, Weathering steel