

Trove International, LLC

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High-level definition of Flow Assisted Corrosion (FAC) in HRSGs.

"FAC is the localized dissolution of feedwater piping in areas of flow impingement. It occurs where metal dissolution dominates over protective oxide scale formation." ¹

Formation of magnetite (Fe₃O₄) on the metal surface provides a protective coating that reduces oxidation and corrosion reaction rates. Instances of FAC can occur when local flow velocities increase to a range that scours the protective coating off the metal surfaces. This almost always occurs in conjunction with other variables such as boiler water chemistry excursions from normal. Chemistry upsets do occur in the normal operation of a boiler and thus transient losses of metal can occur. However, vigilant monitoring of water quality in the boiler and quick responses to upsets can and do prevent boiler damage. FAC development is mostly affected by temperature, Ph level, and local velocity of the fluid, Cavitation, O₂ concentration, alloy of construction, geometry and water quality². Even low concentrations of Chromium in low carbon steels (i.e. SA-178 & SA 210) can impede FAC. Higher alloys can provide even greater margins of protection.³

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¹ From Babcock & Wilcox, Steam Edition 41 pg 42-15

² From NACE Publication on boiler corrosion

³ From Ashland Water Technologies "Boiler Tube Failures" 2006/