

Title: Closing the Loop: Integrating Metallurgical Failure Analysis into Flow Acceleration Corrosion Program Management

Abstract: Flow-accelerated corrosion (FAC) remains a leading cause of carbon steel piping failures in fossil and combined-cycle power plants, where unexpected wall thinning can lead to forced outages and serious safety hazards. Using case studies from a utility generation fleet, it examines how characteristic damage features, such as scalloped surfaces, wall-loss patterns, and material chemistry, reveal the true drivers of degradation, including flow geometry, water chemistry, and low-chromium content. It then shows how these root-cause findings were translated into program improvements: refined inspection locations, updated susceptibility rankings, chemistry adjustments, and targeted material upgrades. The approach turns each failure into actionable data, strengthening fleet-wide FAC management and reducing the risk of recurrence.

Biography: Han Tsan is a Metallurgical Engineer at Salt River Project (SRP), supporting the reliability and integrity of SRP's generation fleet, which includes nine fossil-fueled units and five hydroelectric units. Her primary focus is the failure analysis of power plant components, integrating field observations, operating history, and laboratory evidence to determine root causes such as corrosion, erosion, fatigue, creep, and welding-related damage. Han translates technical findings into practical recommendations that help operations and maintenance teams prevent recurring failures and improve long-term equipment reliability. She also performs Fitness-For-Service (FFS) assessments to determine whether degraded components can remain in operation, require repair, or need replacement. Her work includes integrity evaluations of high-energy piping systems, combining dimensional, stress, and metallurgical analyses to assess component condition and remaining life. In addition, Han supports repair and fabrication activities through the application of welding codes and standards and contributes to fleet-wide damage management programs, including flow-accelerated corrosion mitigation and inspection planning.