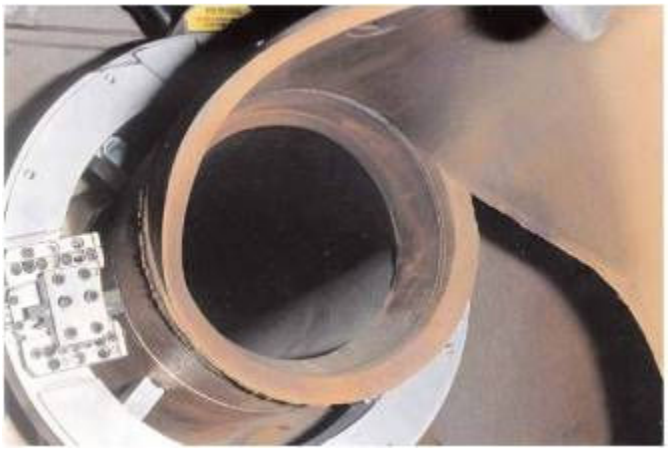
Flow-Accelerated Corrosion in Fossil Power Plants

Flow Accelerated Corrosion (FAC), is a fundamental problem for power generators that can result in lost availability and personnel injury. As the leading provider of FAC solutions, Altran Solutions has evaluated more than half of the nuclear plants and over 150 fossil plants in the United States. Altran Solutions offers cost effective FAC programs that can prevent plant downtime by ensuring timely detection of pipe wall thinning.



A rupture of a feedwater line at a coal-fired plant was caused by erosion/corrosion-induced wall thinning.

These highly publicized accidents and other less well-known incidents have attracted the attention of utilities, industry groups such as EPRI, as well as regulatory bodies. In 1996, OSHA issued a hazards bulletin discussing FAC in feedwater piping systems. In recent years, the insurance industry has become interested in the economic impact of FAC in terms of plant downtime, equipment loss, and personnel hazards.

Altran Solutions has been involved in addressing FAC since it was first identified as a major issue in the late '80s. Since that time, we have evaluated over one hundred fifty fossil plants for FAC. Altran Solutions offers a methodical approach, whose objectives are to minimize cost to the utility and to help ensure that worn components do not escape detection. Altran engineers understand how plants operate and work closely with plant personnel, soliciting input and valuable insights from system engineers, operations, maintenance and NDE personnel. Our approach and experience has enabled us to be successful in identifying locations of significant thinning.

FAC Capabilities

The mechanism of FAC involves the formation and removal of the protective oxide layer from the pipe inner wall. This process occurs in carbon or low alloy steel piping systems containing flowing, deoxygenated water at elevated temperature. The FAC process is influenced by the flow rate, pH, oxygen content, temperature and geometry of the piping system. There is a significant temperature and oxygen sensitivity. FAC is most severe at approximately 300°F—far below where many fossil plant piping programs investigate piping integrity.

To identify susceptible systems and components, Altran Solutions can use analytical modeling software such as EPRI's CHECWORKS™ or CHECUP™, our experienced-based evaluation methodology, or a combination of both. Within the framework of this approach, we offer the following services:

- Plant FAC system susceptibility screening
- EPRI CHECWORKS™ and successor code EPRI Steam/Feedwater Application SFA modeling and model updates
- EPRI CHECUP™ modeling and model updates
- Experienced based evaluations of susceptible piping systems
- Inspection location selection
- On-site outage support for FAC activities including Ultrasonic Testing data analysis, component structural qualification, and remaining life predictions
- Water chemistry studies/material upgrade engineering
- Self assessments/independent reviews of existing FAC Programs
- Development of Susceptible Non-Modeled (SNM) programs

For more information on this capability,
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