



# Flow Accelerated Corrosion Assessment

Flow-accelerated corrosion (FAC) is a well-known damage mechanism that affects carbon steel components carrying water or two-phase flow. Caused by the mechanically-assisted chemical dissolution of the protective oxide and base metal, it has led to failures or severe wall thinning in:

- Main Feedwater Piping
- LP and IP Drum Internals
- HRSG LP & IP Evaporator Tubes
- Feedwater Heaters
- HRSG Economizer Tube and Piping
- Blowdown Lines

Frequent startups and low load operation results in substantial transients in boiler water chemistry, therefore HRSGs in cycling operation can increase the risk for FAC.

The relative risk for FAC is affected by seven factors: pH, level of certain trace elements in the steel, fluid velocity, component geometry, single or two-phase conditions, dissolved oxygen and fluid temperature.

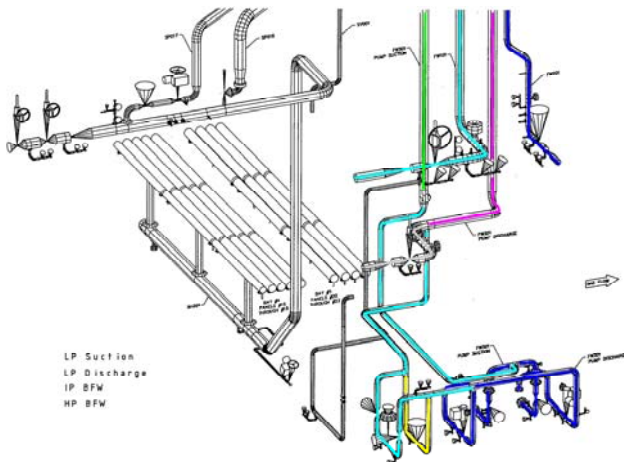
For over 10 years Tetra Engineering has used and continuously improved an in-house tool called *FACRisk* (based on modified versions of the Kastner models) to calculate FAC wear rates in piping and tubing. Inputs are obtained from plant design information as well as selected operating data. If necessary, additional inputs such as evaporator recirculation rates can be obtained with thermal performance simulations using an advanced boiler modelling code.



The results are tabulated to form a prioritized list of locations for a UT inspection.

Numerous HRSG inspections have demonstrated that high wear locations can be successfully identified with this method.

Tetra can perform the FAC inspection or provide the inspection plan to the client for inspection by a third-party.



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