

Superheater Corrosion Mitigation and Prevention

Fireside corrosion in superheaters can result from various parameters. These are:

- The existing tube metallurgy not being adequate for the corrosive components of the flue gas being generated in the furnace.
- Inability to control the final steam temperature leading to steam temperature excursions that result in the tube material becoming more susceptible to corrosion attack.

These parameters make a superheater susceptible to accelerated corrosive metal loss and premature component failure.

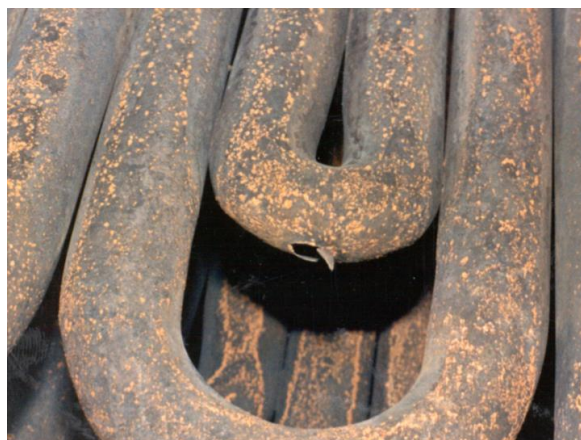
Jansen has an engineering analysis approach that helps to predict where corrosion problems may occur and provides the insight necessary to design a solution to overcome them. This analysis includes:

- Collection of historical boiler operating data.
- Doing temperature traverses of the flue gas entering and leaving the superheater.
- Confirmation of the steam temperatures entering and leaving the superheater.
- Collection of fuel samples for chemical analysis and determining the resulting flue gas components.
- Reviewing superheater geometry, metallurgy, and tube thickness, and a comprehensive heat transfer analysis.

This analysis has proven useful for boilers that fire black liquor, woody biomass, municipal solid waste (MSW) and refuse derived waste (RDF), and tire-derived fuel (TDF).

Scope of Service

- Identification of process parameters to maintain tube metal temperatures at safe levels. These include final steam temperature and pressure, attemperator water flow rates, firing capacity, flue gas conditions, deposit characteristics, etc.
- Prediction of tube metal temperatures to identify areas most vulnerable to corrosive attack.
- Redesign of the superheater tube layout to avoid exposure of tube metal to excessive temperatures and heat fluxes, and the use of varied and upgraded metallurgies where needed.



C-14 – 2023-04