Utilization of on-line corrosion monitoring in the flue gas cleaning system

The power plant unit 1 at Amager, Denmark is a 350 MWth multifuel suspension-fired plant commissioned in 2009 which uses biomass. Increasing corrosion problems in the flue gas cleaning system have been observed since 2011 in both the gas-gas preheater and the booster fan and booster fan duct. A root cause analysis concluded that corrosion occurred due to corrosion products/deposit formed during operation; however it was unclear whether the majority of corrosion occurred during operation or downtime. In both cases the chlorine content in the flue gas results in the presence of chlorine species such as HCl, KCl or chlorine containing corrosion products. Without knowing when corrosion occurs, it is difficult to take reasonable measures to reduce corrosion. In order to gain an improved understanding of the corrosion problem, an on-line corrosion measurement system was established before the booster fan. The corrosion rates measured with respect to time were correlated to plant data such as load, temperature, gas composition, water content as well as change in the fuel used. From these results it is clear that many shutdowns/start-ups influence corrosion and therefore cause decreased lifetime of components and increased maintenance. A fuel change from a mix of straw and wood pellets to only wood pellets has also decreased corrosion.