Fouling prevention in Red Liquor Evaporators

Client: Pulp Mill
Location: South Africa

ISSUE

The customer has three effect evaporators in series. The evaporators use steam to evaporate water from red liquor to increase dry solid content over 50%. The steam circulates from the first effect to second and fourth, and finally in the condenser. The evaporators get fouled by the calcium-based fouling, and the issues occur mainly inside of the evaporators' tubes.

SOLUTION

The power ultrasound solution is externally attached to the hottest evaporators. The fouling prevention solution is based on focusing a high-power ultrasonic field to the black liquor flowing in the pipes of the evaporators and affecting the crystal structure of calcium-based fouling to avoid fouling attaching into the tubular structure of evaporators.

RESULTS

Ultrasonic treatment of red liquor has been shown to increase the period between washes by more than 60% and the energy efficiency improvement in evaporators by more than 50%. Additionally, the evaporation rate increased by more than 6%, and the operational time by 25%.