

Recovery

Objective

To eliminate sever vibration and hammering caused by existing black liquor heater on gun loop to recovery boiler.

End User

Mead Paper in Kingsport, Tennessee

Design Conditions

Fluid:	67% Black Liquor
Flow Rates:	80 gpm [22m ³ /hr]
Inlet Temperature:	180°F [82°C]
Discharge Temperature:	250°F [121°C]
Fluid Supply Pressure:	65 psig [4.5 barg]
Steam Supply Pressure:	150 psig [10.3 barg]
Steam Superheat:	Yes, to 400°F [204°C]

Process Challenges

The previously installed direct contact steam heater was a one-of-a-kind, simple in-line sparging device. Because of inadequate condensing capabilities and external control of mass steam flow rate, unstable heating and rough operation caused damage to associated piping and fittings. This is not an uncommon problem when heating heavy black liquor with an improperly designed direct contact steam heater.

Solution

Hydro-Thermal engineers chose the K412AS Hydroheater®. Installed prior to the gun loop on the recovery boiler, the Hydroheater heats black liquor to the optimum temperature to maintain proper nozzle pattern and droplet size for maximum burn efficiency. The Hydroheater was designed for severe service liquor heating and eliminates the problems of hammering and fouling.

Results

Mead is experiencing smooth, quiet and stable operation. The severe vibration problem was eliminated. The temperature of the black liquor is precisely controlled at 250°F [121°C]. After the Hydroheater has been installed for more than six months, no downtime for maintenance or cleaning had been necessary.