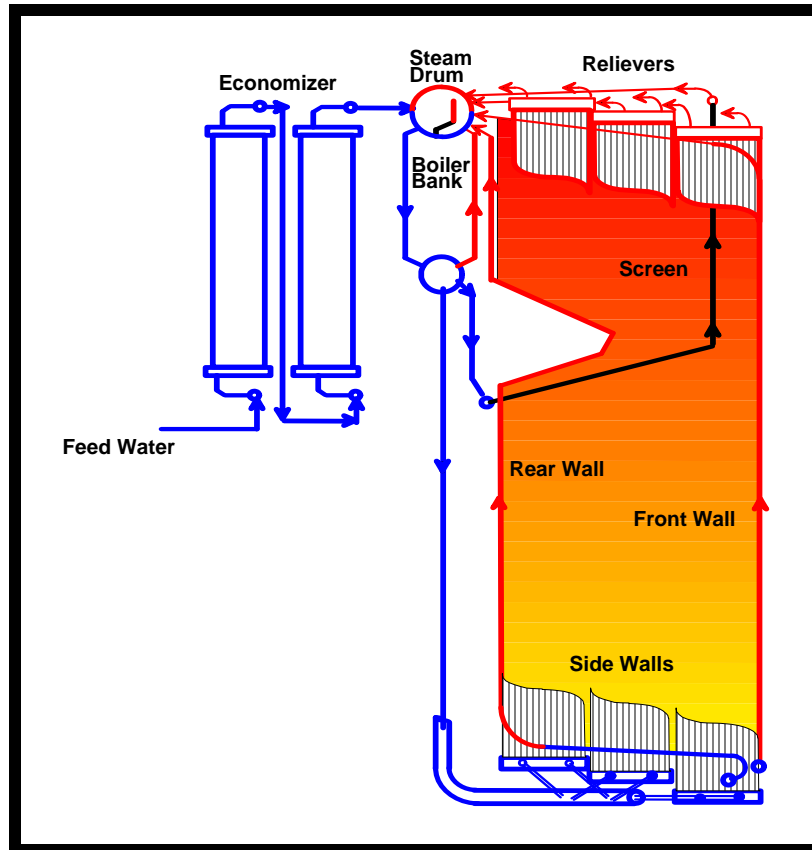


CAPABILITIES

BOILER CIRCULATION STUDIES



Boiler Circulation

Circulation of water through boiler tubes is necessary to prevent tube overheating and potential failure. The need to conduct a circulation study on a boiler is typically dictated because of any one, or combination of, the following reasons:

- To establish the maximum steaming rate at which circulation remains adequate.
- To determine pressure part modifications needed to support a significant increase in fuel burning rate.
- To evaluate the effect of changing boiler operating conditions (such as type of fuel or operating pressure) on circulation.
- To evaluate the effect of changing heating surfaces on circulation.
- To uncover factors causing repeat pressure part failures and/or tube overheating.
- To investigate the cause of excessive scale depositions inside tubing.

A valuable technique used by JANSEN during its analyses of circulation conditions is the application of Ultrasonic Flow Monitoring (UFM).

Selected References (see next page)

Selected References

Alberta-Pacific Forest Industries, Inc. - Boyle, AB
 APRIL Group - Rizhao, China
 AssiDomän Sepap - Steti, Czech Republic
 Australian Paper - Morwell, Australia
 Blue Ridge Paper Company - Canton, NC
 Boise Cascade Corp. - DeRidder, LA
 Boise Cascade Corp. - International Falls, MN (2 units)
 Boise Cascade Corp. - Jackson, AL
 Boise Cascade Corp. - Rumford, ME
 Boise Cascade Corp. - Wallula, WA (2 units)
 Bowater Incorporated - Catawba, SC
 Bukoza - Hencovce, Slovakia
 Cariboo Pulp & Paper Co. - Quesnel, BC
 Carter Holt Harvey Pulp & Paper Ltd. - Tokoroa, NZ
 Champion International Corp. - Quinnesec, MI
 Champion International Corp. - Roanoke Rapids, NC
 Champion Papel e Celulose Ltda. - Mogi Guaçu, Brazil
 Covanta Energy - Hartford, CT
 Domtar Papers - Cornwall, ON
 Domtar Inc. - Bennettsville, SC
 Domtar Inc. - Kingsport, TN
 Domtar Inc. - Lebel-sur-Quevillon, PQ
 Donohue Forest Products Inc. - St. Félicien, PQ
 E.B. Eddy Forest Products Ltd. - Espanola, ON
 Federal Paper Board Company, Inc. - Riegelwood, NC
 Fletcher Challenge Canada - Mackenzie, BC
 Fort James Corporation - Clatskanie, OR
 Fraser Papers Inc. - Edmundston, NB
 Fraser Papers Inc. - Park Falls, WI
 Georgia-Pacific Corporation - Big Island, VA
 Georgia-Pacific Corporation - Camas, WA
 Georgia-Pacific Corporation - Cedar Springs, GA
 Georgia-Pacific Corporation - New Augusta, MS
 Georgia-Pacific Corporation - Palatka, FL
 Georgia-Pacific Corporation - Wauna, OR
 Graphic Packaging - Macon, GA
 Harmac Pacific Inc. - Nanaimo, BC
 Hercules Pinova - Brunswick, GA
 Howe Sound Pulp & Paper - Port Mellon, BC
 Inland Paperboard & Packaging, Inc. - Orange, TX
 International Paper Company - Mansfield, LA (2 units)
 International Paper Company - Pine Bluff, AR
 International Paper Company - Pine Hill, AL (2 units)
 International Paper Company - Pineville, LA
 International Paper Company - Riegelwood, NC
 International Paper Company - Svetogorsk, Russia (2 units)
 Interstate Paper Company - Riceboro, GA
 Irving Pulp & Paper, Limited - Saint John, NB
 KapStone Paper - Roanoke Rapids, NC
 Kimberly-Clark Corporation - Coosa Pines, AL
 Kimberly-Clark Forest Products Inc. - Terrace Bay, ON
 Kimberly-Clark Nova Scotia Inc. - New Glasgow, NS
 MacMillan Bloedel Limited - Port Alberni, BC
 Mead Corporation - Chillicothe, OH
 Mead Corporation - Escanaba, MI (2 units)
 Mead Corporation - Kingsport, TN
 MeadWestvaco - Phenix City, AL (2 units)
 Minnesota Power - Grand Rapids, MN
 Montenay Onyx - Burnaby, BC
 New Ulm Public Utilities - New Ulm, MN
 Northwood Pulp & Timber, Inc. - Prince George, BC
 Packaging Corporation of America - Counce, TN
 Packaging Corporation of America - Valdosta, GA
 Plainwell Paper Company - Anderson, CA
 Pope & Talbot, Inc. - Halsey, OR
 Rayonier, Inc. - Jesup, GA
 Repap British Columbia Inc. - Prince Rupert, BC
 Repap Manitoba - The Pas, Manitoba
 Riverwood International Corporation - West Monroe, LA
 SAPPi Fine Papers North America - Muskegon, MI
 SAPPi Fine Papers North America - Skowhegan, ME
 SCP - Ruzomberok, Slovakia
 Simpson Paper Co. - Eureka, CA
 Simpson Tacoma Kraft - Tacoma, WA
 Smurfit Cartón de Colombia - Cali, Colombia (2 units)
 Smurfit Mocarpe - San Felipe, Venezuela
 SP Newsprint - Newberg, OR
 Stone-Consolidated Corp. - Fort Frances, ON
 Stone-Consolidated Corp. - Portage du Fort, PQ
 Stora Enso North America - Wisconsin Rapids, WI
 Tasman Pulp and Paper Company Ltd. - Kawerau, NZ
 Western Pulp Limited Partnership - Squamish, BC
 Westvaco Corporation - Covington, VA
 Westvaco Corporation - Wickliffe, KY
 Weyerhaeuser Canada Ltd. - Kamloops, BC
 Weyerhaeuser Paper Company - Longview, WA
 Weyerhaeuser Paper Company - New Bern, NC
 Weyerhaeuser Paper Company - Oglethorpe, GA
 Weyerhaeuser Paper Company - Springfield, OR (3 units)