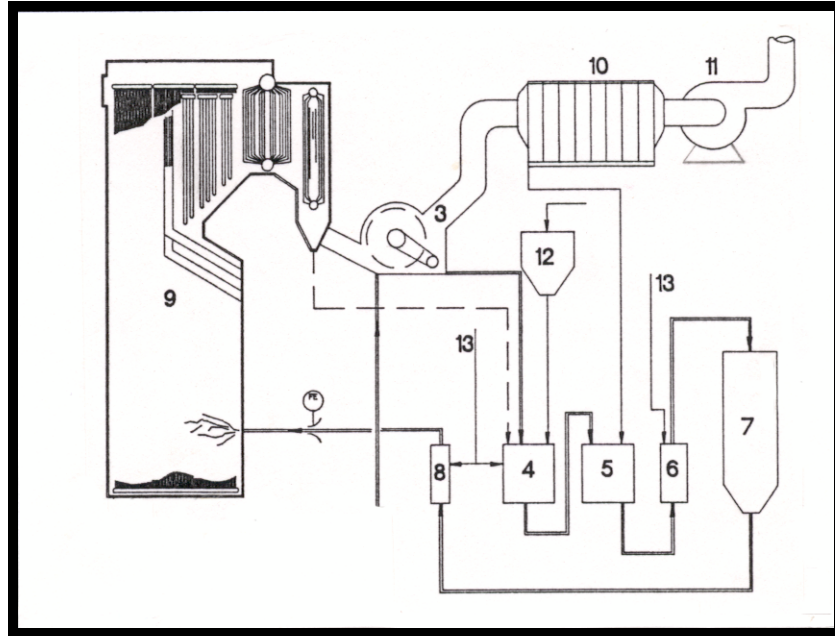


PROJECT CAPABILITIES

RECOVERY BOILER PERFORMANCE AND ENGINEERING EVALUATIONS



Purpose

All recovery boilers are designed individually and operated differently. In order to determine the feasibility of modernizing existing units for increased capacity, improved efficiency, extended service life, reduction in emissions of air pollutants, or other specific purposes, detailed knowledge is required about their specific arrangement and operational limitations. The performance evaluation, which includes a boiler field test, determines baseline conditions and provides a prediction of the expected results of an upgrade. JANSEN has carried out performance evaluations for more than 100 kraft recovery boilers, many of which have led to actual upgrades.

Scope of Services

The JANSEN performance and engineering evaluation is adapted to local conditions and the specific requirements of each assignment, and will normally include the following scope of services:

- Field test to collect current data and establish present performance and baseline conditions.
- Performance calculations under test conditions and projected future operation.
- Engineering evaluation of critical design and operating parameters affecting the proposed changes.
- Computational Fluid Dynamics (CFD) modeling and analysis (in-house).
- Steam/water circulation study.
- Determination of necessary boiler modifications to accomplish the desired objective.
- Budget cost and project time schedule estimates.

Selected References (see next page)

Selected References

Recovery Boiler Performance and Engineering Evaluations

APRIL Group - Rizhao, China (2 units)
 Alabama River & Pine Pulp Companies - Perdue Hill, AL
 AssiDomän Sepap, Štetí - Czech Republic
 Bahia Specialty Cellulose S.A. - Camaçari, BA, Brazil
 Blue Ridge Paper - Canton, NC
 Boise Cascade Canada Ltd. - Fort Frances, ON
 Boise Cascade Corporation - DeRidder, LA
 Boise Cascade Corporation - International Falls, MN
 Boise Cascade Corporation - Jackson, AL
 Boise Cascade Corporation - Rumford, ME
 Boise Cascade Corporation - Wallula, WA
 Boise Paper - St. Helens, OR (2 units)
 Bowater Carolina - Catawba, SC
 Bukocel - Hencovce, Slovakia
 Cariboo Pulp & Paper - Quesnel, BC
 Carter Holt Harvey Pulp & Paper Ltd. - Tokoroa, NZ
 Cascade Pacific Pulp - Halsey, OR
 Catalyst Paper - Crofton, BC
 Champion International Corporation - Quinnesec, MI
 Champion International Corporation - Roanoke Rapids, NC
 Champion Papel e Celulose Ltda. - Mogi Guaçu, S.P., Brazil
 Clearwater Paper - McGehee, AR
 Domtar Inc. - Lebel-sur-Quevillon, PQ
 Domtar Inc. - Nekoosa, WI
 Domtar Papers - Cornwall, ON
 E.B. Eddy Forest Products Ltd. - Espanola, ON
 Eurocan Pulp & Paper Company - Kitimat, BC
 Federal Paper Board Company, Inc. - Riegelwood, NC
 Fletcher Challenge Canada Ltd. - Mackenzie, BC
 Georgia-Pacific Cellulose - Crossett, AR
 Georgia-Pacific Cellulose - New Augusta, MS
 Georgia-Pacific Corporation - Ashdown, AR
 Georgia-Pacific Corporation - Big Island, VA
 Georgia-Pacific Corporation - Brunswick, GA
 Georgia-Pacific Corporation - Camas, WA (2 units)
 Georgia-Pacific Corporation - Cedar Springs, GA
 Georgia-Pacific Corporation - Clatskanie, OR
 Georgia-Pacific Corporation - Monticello, MS
 Georgia-Pacific Corporation - Palatka, FL
 Georgia-Pacific Corporation - Zachary, LA (2 units)
 Graphic Packaging Inc. - West Monroe, LA
 Gulf States Paper Corporation - Demopolis, AL
 Howe Sound Pulp - Port Mellon, BC
 Inland Paperboard and Packaging - Orange, TX
 International Paper Company - Mansfield, LA (2 units)
 International Paper Company - Pine Hill, AL
 International Paper Company - Riegelwood, NC
 International Paper Company - Svetogorsk, Russia (2 units)
 Irving Pulp & Paper, Limited - Saint John, NB
 Kimberly-Clark Corporation - Coosa Pines, AL
 Kimberly-Clark Corporation - Terrace Bay, ON
 Koch Cellulose - Brunswick, GA
 Kruger Wayagamack Inc. - Trois Rivières, PQ
 Longview Fibre - Longview, WA
 Mackenzie Pulp - Mackenzie, BC
 MacMillan Bloedel Limited - Port Alberni, BC
 Mead Corporation - Chillicothe, OH
 Mead Corporation - Escanaba, MI
 Mead Corporation - Kingsport, TN
 MeadWestvaco - Covington, VA (2 units)
 NewPage Corporation - Rumford, ME
 NewPage Corporation - Wickliffe, KY
 NewPage Corporation - Wisconsin Rapids, WI
 Northern Pulp - New Glasgow, NS
 Northwood Pulp & Timber Ltd. - Prince George, BC
 Packaging Corporation of America - Counce, TN
 Packaging Corporation of America - Valdosta, GA
 Port Townsend Paper - Port Townsend, WA
 Rayonier, Inc. - Jesup, GA (2 units)
 Repap Manitoba - The Pas, MB
 Riverwood International - West Monroe, LA
 RockTenn - Demopolis, AL
 RockTenn - Fernandina Beach, FL (2 units)
 RockTenn - Panama City, FL (2 units)
 SAPPi Fine Paper North America - Cloquet, MN
 SAPPi Fine Paper North America - Muskegon, MI
 SAPPi Fine Paper North America - Skowhegan, ME
 Scott Maritimes Limited - New Glasgow, NS
 SCP - Ružomberok, Slovakia
 Simpson Paper Company - Eureka, CA
 Simpson Paper Company - Pasadena, TX
 Skeena Cellulose, Inc. - Prince Rupert, BC
 Skookumchuck Pulp - Cranbrook, BC
 Smurfit-Stone Container Corporation - Brewton, AL
 Stone-Consolidated Inc. - Portage du Fort, PQ
 Stone Container (Canada) Inc. - New Richmond, PQ
 Tasman Pulp and Paper Co. Ltd - Kawerau, NZ
 Union Camp Corporation - Eastover, SC
 Visy Pulp and Paper - Tumut, Australia
 Western Pulp Limited Partnership - Squamish, BC
 Western Pulp Limited Partnership - Port Alice, BC
 Westvaco Corporation - Wickliffe, KY
 Weyerhaeuser Paper Company - Kamloops, BC
 Weyerhaeuser Paper Company - New Bern, NC
 Weyerhaeuser Paper Company - Valliant, OK
 Woodland Pulp - Baileyville, ME