

Are High Oil, Gas Prices Hurting Your Bottom Line?

Would you like to burn more wood-waste to reduce burning of expensive purchased fuels but your boiler cannot handle it? You are not alone!

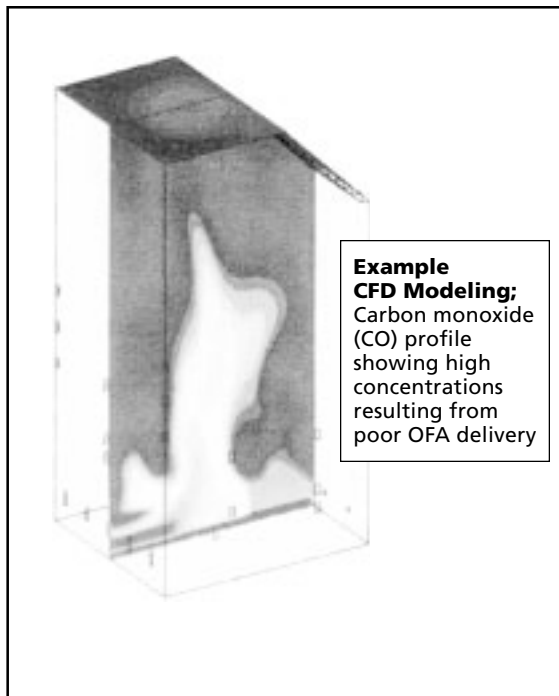
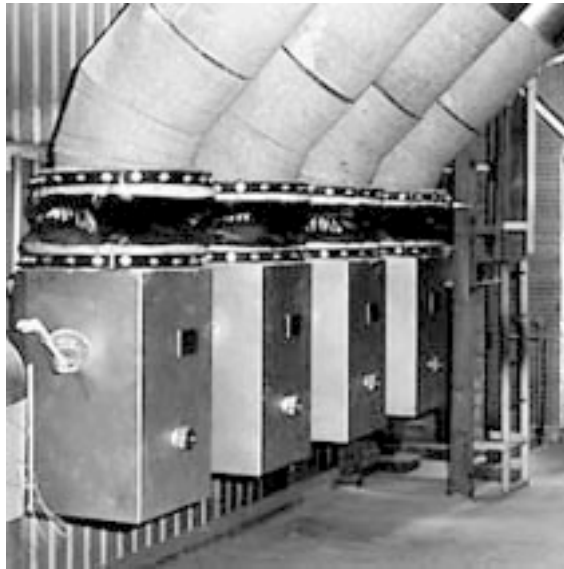
As our survey indicated last year, many *Solid Fuel Grate Fired* boilers experience operating challenges that often require continuous co-firing of oil or natural gas for proper combustion or are limited in the amount of wood-waste they can burn. Needless to say, the mill's bottom line is increasingly affected in a detrimental way, with the rapidly rising cost of these fuels.

Poor combustion typically leads to the following operating problems:

- High emissions of CO and VOC
- High ash carryover from the furnace
- High unburned carbon content in the fly ash
- Piling of unburned fuel on the grate
- Combustion stability problems, furnace puffing
- Delayed combustion into superheater, high gas temperatures and steam temperature excursions
- Need for high excess air usage
- Tube erosion from carryover
- High stack opacity, if gas clean-up system is marginally adequate

These problems are often symptoms of poor combustion that is caused by inefficient overfire air (OFA) delivery. With inadequate OFA delivery, poor combustion can be partially remedied by high auxiliary fuel firing rates while limiting the burning rate of biomass fuel (wood-waste, sludge).

In some boilers, poor OFA system design is characterized by numerous small air ports that are located at different elevations on the boiler's front and rear walls. Small air jets do not penetrate deep into the furnace nor do they provide uniform cross-sectional coverage of combustion air. In other boilers, tangential or cyclonic OFA is delivered, resulting in insufficient mixing of air with combustibles prior to the furnace outlet. Please see the accompanying (right) CFD modeling image, showing high carbon monoxide (CO) concentrations resulting from poor OFA delivery. *(continued on page 2)*



Bark Boiler Workshop in Florida

Jansen is scheduling a *Bark Boiler Workshop* to take place in Jacksonville, Florida, on February 22 and 23. See details on inside back cover.

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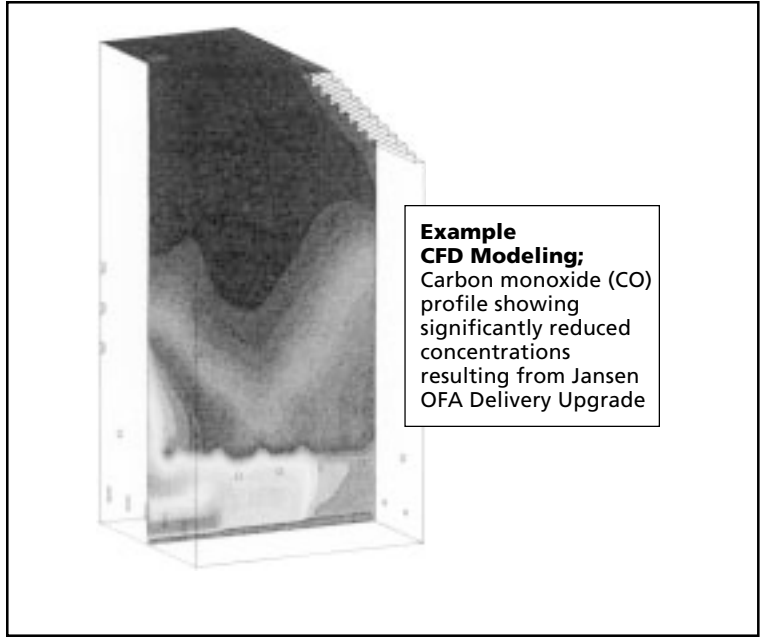
(continued from page 1)

Solution:

Key to resolving these operating problems is to upgrade the boiler's OFA delivery. Jansen's OFA upgrades have shown to significantly reduce or altogether eliminate combustion problems, therefore eliminating the need for high auxiliary oil or gas co-firing rates. Please see the CFD modeling image to the right, showing very low carbon monoxide (CO) concentrations resulting from the Jansen OFA delivery upgrade.

A sampling of benefits seen on recent Jansen boiler OFA projects:

- Reduction in CO stack emissions from 1500 ppm to below 250 ppm
- Reduction in VOC/hydrocarbons stack emissions from 500 ppm to below 25 ppm
- Elimination of ash re-injection system due to low carbon content in the ash
- Reduction by 75% or more in fuel oil consumption
- Increase in bark firing rate by 50%
- Follow load swings on bark alone (no gas/oil) in steaming range of 50,000 to 300,000 lb/hr
- Elimination of puffing and combustion instabilities
- Elimination of delayed combustion and steam temperature excursions
- Project payback time within six months
- Rapid and complete incineration of HVLC NCG (without causing odor problems in the boiler house)



Jansen has successfully upgraded OFA delivery systems of many biomass boilers of different design, vintage, and manufacturer, and is currently working on several upgrades to be installed later in 2001. Times have never been better to seize the opportunities that are available to improve your boiler's performance and reduce your monthly fuel bill at the same time!

For further information please contact Arie Verloop (ext. 111) or Ned Dye (ext. 125) at 425.825.0500. Additional information and specific project references can also be found on our website at: www.jansenboiler.com

A Brief History

The month of January 2001 marks the 25th anniversary of Jansen Combustion and Boiler Technologies, Inc. For you history buffs, to be exact: Johan H. Jansen founded the company on January 16, 1976, which also happened to be his 39th birthday! And yes, as with many high-tech companies, he started out in (a spare room above) the garage at home. The company was incorporated in April of 1981.

In the early 1980s, the company was called J.H. Jansen Company, Inc. In those days, with an engineering staff of three people, for the most part, our jobs were relatively small consulting jobs, process engineering and feasibility studies, as well as conceptual design projects. Often, these early projects were related to energy conservation to help mills make more efficient use of free fuels such as spent pulping liquors and wood-waste. Oddly, with today's high costs for oil, natural gas, and purchased power, we have come full circle in 25 years!

A major achievement from the early years was the development of the Recovery Boiler Reference Manuals, Volumes I, II, and III; they were produced by Jansen under the auspice of the American Paper Institute (API), now called American Forest & Paper Association (AF&PA). This set of blue manuals has found its way to most mills in North America.

In the mid 1980s, our capabilities were expanded to include full design engineering and the size of our projects increased. We acquired the ASME Boiler and Pressure Vessel Code "S" stamp and NBIC "R" stamp that certifies us to design pressure part modifications and issue construction drawings. With it, the company grew and had to move twice in the 1980s to accommodate the number of employees.

With capabilities, the scope of



our projects grew as well, as customers asked us to take on projects with Engineer-Procure-Construct (EPC) responsibility. On several recovery boilers, complete lower furnaces (floor, walls, combustion system) were replaced as turnkey projects. Low odor conversions were undertaken as well. Looking back, in the past 15 years, Jansen has upgraded dozens of power and recovery boilers for increased fuel burning capacity, availability, efficiency, improved emissions performance, and/or reliability.

In the meantime, Jansen has also expanded its process engineering analytical capabilities and troubleshooting expertise. Many mills still seek out Jansen to evaluate their boiler in solving difficult problems, such as with steam/water circulation (using Ultrasonic Flow Monitoring), persistent emissions of air pollutants, repeat tube failures,

and to reduce co-firing of costly auxiliary fuels. Our Computational Fluid Dynamics (CFD) modeling capability was developed in-house and is second to none. Our CFD modeling has been used successfully for numerous projects, large and small, to evaluate the impact of different design alternatives for boiler modifications on operational performance factors.

In 1993 our name was changed to Jansen Combustion and Boiler Technologies, Inc. to better reflect the type of work we do. In all, after 25 years, we have carried out hundreds of projects covering most of the pulp mills in North America. Our territory was expanded worldwide, as we performed projects in Australia, New Zealand, Brazil, Venezuela, Colombia, Mexico, France, Slovakia, the Czech Republic, Russia, and South Africa.

Historically, our staff has been international as well. Whereas the company is American owned, past and current employees have had passports from the US, Canada, The Netherlands, Finland, Sweden, Switzerland, and India.

The past 25 years have gone by incredibly fast. Our work has been rewarding and enjoyable. We can't wait for the next 25 years!

Newsbriefs: Recovery Boiler Studies

In the past year, evaluations of recovery boiler performance and/or reliability/safety issues were conducted for the following mills:

- Blue Ridge Paper Company - Canton, North Carolina
- Donohue, Inc. (now Abitibi-Consolidated) - St-Félicien, Québec
- Eurocan Pulp and Paper - Kitimat, British Columbia
- Fort James Corporation (now Georgia-Pacific) - Old Town, Maine
- Fort James Corporation (now Georgia-Pacific) - Wauna, Oregon
- Mead Paper - Escanaba, Michigan
- Plainwell Paper - Anderson, California
- Pope and Talbot, Inc. - Halsey, Oregon
- Simpson Tacoma Kraft - Tacoma, Washington
- Smurfit-Stone Container Corporation - Brewton, Alabama
- Weldwood - Hinton, Alberta
- Western Pulp - Port Alice, British Columbia
- Westvaco Corporation - Wickliffe, Kentucky

The goal of the work was to resolve problems such as:

- Reduce boiler plugging and frequency of cleaning
- Reduce TRS emissions and be able to burn more black liquor
- Investigate equipment failures
- Quantify increased dry solids burning capacity

- Help solve issues with boiler water/steam circulation
- Assist with recurring operational problems
- Conduct an operational safety review (audit)
- Carry out emissions performance CFD modeling

Please contact Arie Verloop, phone: 425.825.0500 ext. 111, or e-mail:

Arie.Verloop@jansenboiler.com for further information on how Jansen can help solve issues with recovery boiler performance, such as solids burning or steaming capacities, availability, emissions, efficiency, and/or reliability.

Newsbriefs: Bark Boiler Performance Studies

With the rising cost for purchased fuels and power, and more strict environmental regulations, many mills are facing performance issues with their bark boiler. In the past year, Jansen has conducted wood-waste boiler evaluations for 12 mills. The work typically involves performance testing, analyses of boiler performance parameters, and root cause determination of specific problems. Conceptual modifications are provided (either operational or hardware related) and a path forward is formulated. Sophisticated Computational Fluid Dynamics (CFD) modeling has also been used to evaluate hardware changes prior to implementation.

Please contact John La Fond, phone: 425.825.0500 ext. 110, or e-mail:

John.LaFond@jansenboiler.com for further information on how Jansen can help solve your wood-waste boiler operating problems.

OUR MISSION

Our Company provides combustion and boiler technology, products, and services.

We are dedicated to working with our clients to achieve their production, reliability, efficiency, safety, and environmental goals.

We accomplish this by:

- Listening and understanding.
- Providing a flexible approach to problem solving.
- Developing creative and innovative solutions.
- Working with clients to implement these solutions.

Our team of talented and experienced individuals is committed to the highest standards of professional ethics.

We commit ourselves to creating a challenging and supportive work environment that fosters opportunity for professional growth, fulfillment, and rewards.

Bark Boiler Workshop in Florida

Jansen is scheduling a *Bark Boiler Workshop* to take place in Jacksonville, Florida, on February 22 and 23.

The two-day workshop consists of presentations about new technological developments and cost effective solutions to improve the operating performance of bark fired boilers.

With the increase in oil and natural gas prices, improving the performance of biomass boilers makes good economic sense. Also, environmental regulations are requiring tighter standards for emissions. Enhancing the combustion performance of hog boilers is the most cost effective way to meet regulator requirements.

The workshop is co-sponsored by:

- Jansen Combustion and Boiler Technologies, Inc.

- Orion CEM, Inc.
- T.R. Miles, Technical Consultants, Inc.
- MillPro, Inc.

The experience and reputation of these companies is well regarded in our industry.

Preliminary topics are:

- Characteristics of bark boiler combustion
- Comparison of overfire air systems
- Computational Fluid Dynamics (CFD) modeling, an update
- Combustion control systems and instrumentation/energy management
- Preparation and handling systems for waste wood combustion

- Fuel properties, fuel distributors and urban fuels in bark boilers
- Air pollution control for wood-waste boilers, 20 year operational history and performance related topics
- Troubleshooting and problem discussion

Participation in the workshop is free of charge. Registration is on a first come first serve basis and seating is limited. Jansen reserves the right without advance notice to cancel or postpone the workshop at any time without obligation or liability.

For additional workshop information and sign-up, please call Cathy Thomas at 425.825.0500 ext. 108, or e-mail: Cathy.Thomas@jansenboiler.com



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www.jansenboiler.com

We've updated our website. The new website contains much more information than before, including:

- Project Capabilities
- Project Descriptions
- Newsletters, Brochures, and Flyers
- Technical Reference Papers
- And...Boiler House Cartoons

Do visit! For you long term readers of our newsletter: the site contains a compilation of all

boiler house cartoons from past newsletters. These cartoons, by Gord Stevens, depict people and situations in the boiler house in a humorous way. We hope you enjoy his cartoons as much as we do. Best of all: from the website, you can retrieve prints of each of the cartoons, as well as all other posted materials.

Our Newsletter; another 25th celebration

The Companies' 25th anniversary coincides with this 25th issue of our newsletter. Jansen first published the semi annual newsletter in the fall of 1988.

For a peak at past newsletters, please visit our updated website at:
www.jansenboiler.com.



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Recovery
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