Superheater Upgrades to Increase Power Generation
In recent years, many industry operators have been planning or have implemented projects to increase superheater electric power generation rates. In particular, projects are being identified to increase the steam output, pressure, and/or temperature of existing boilers. These units may have been “underperforming” from their original design or their performance and efficiency can be improved after making modifications.

Readers may be interested in a technical paper, titled “Boiler Upgrades to Increase In-House Power Generation,” presented by Janess at the TAPPF Engineering, Hajing & Environmental Conference.

The paper discusses the following topics:
- Strategies to Increase In-House Power Generation
- Boiler Steam Conditions to a New Steam Turbine Generator
- Boiler Steam Conditions to an Existing Steam Turbine Generator
- Maximizing Boiler Steam Production from Lower Cost Waste Fuels.

By Improving Efficiency:
- By Increasing Superheater Efficiency
- By Increasing Heating Efficiency with Additional Economizer Surfaces

The paper provides process technical data to help the reader make more informed decisions on whether to pursue a project in this area. The information in the paper is based on recent Janess superheater and economizer upgrade projects on biomass, chemical recovery, and energy-from-Waste (E-F-W) industry boilers. Particular case histories and descriptions are included on this page.

To receive a copy of the paper or specific inquiries, please contact Ann Verbeek at 425.952.2025, or John Laid at 425.952.2022 or e-mail at Janess@Catholicacres.com.

Boiler A. Biomass Boiler Superheater Replacement
In 2008, Janess supplied a recuperative superheater, high and natural gas fired boiler with the purpose to increase the boiler’s final steam temperature. The unit has a maximum continuous rated (MCR) steam generation capacity of 600,000 lb/hr at 700 psi. After an earlier upgrade, the maximum allowable working pressure (MAWP) of the unit had been “raised” to 900 psi. Currently the unit is being evaluated for additional capacity to increase their operating pressure up to its maximum permissible pressure in order to optimize in-house power generation from a new turbine generator.

Janes conducted a preliminary evaluation of the performance and capacity of a large recovery boiler with an upper heating value (UHV) of 800,000 Btu/hr at 670 psi. After an earlier upgrade, the maximum allowable working pressure (MAWP) of the unit had been “raised” to 900 psi. Currently the unit is being evaluated for additional capacity to increase their operating pressure up to its maximum permissible pressure in order to optimize in-house power generation from a new turbine generator.

Boiler B. Recovery Boiler Process Evaluation
Janes conducted a preliminary evaluation of the performance and capacity of a large recovery boiler with an upper heating value (UHV) of 800,000 Btu/hr at 670 psi. After an earlier upgrade, the maximum allowable working pressure (MAWP) of the unit had been “raised” to 900 psi. Currently the unit is being evaluated for additional capacity to increase their operating pressure up to its maximum permissible pressure in order to optimize in-house power generation from a new turbine generator.

Janes evaluated the liquid burning capacity and performance of the unit as well as the future design and performance of the boiler. Design concepts were developed to upgrade the unit’s capacity to carryover and meet significantly higher steam temperature and pressure from a replacement superheater. As part of the evaluation, Janess conducted a visual inspection of the superheater during a recent annual boiler outage (see photo above). The purpose of the inspection was to verify the arrangement and condition of the existing superheater, headers, and supports and make improvements to critical dimensions.

Boiler C and D. Coal and DCS Pulp Mill
Janes is conducting process engineering studies to make an assessment of the feasibility and capital cost to increase steam production from a 150 MW electric superheater and natural gas recovery boiler in a paper mill on the west coast. The mill is planning to install a turbine generator with electric power production capability that is significantly higher than the two boilers’ current capability.

Boiler MACT
How Combustion Improvements Help Meet Requirements
A new EPA rule came out April 29, 2010, and is to be finalized by the end of 2010. The rule’s purpose is to limit hazardous air pollutants from industrial, commercial, and institutional waste burners.

What is Boiler MACT?
One outcome of the 1990 Clean Air Act (CAA) was the formation of National Emissions Standards for Hazardous Air Pollutants (NESHAPs) to regulate pollutants that are not covered by the National Ambient Air Quality Standards (NAAQS). These are 188 hazardous Air Pollutants (HAPs) that are covered. The EPA is tasked with determining the Maximum Achievable Control Technology (MACT) and establishing MACT based on a process, engineering, and experience approach for hazardous air pollutants.

The EPA recently released the new MACT rules for the wood, metal, and institutional burners and process heaters that have the potential to emit more than 10 tons per year of any one HAP or 25 tons per year of any combination of HAPs. A heat input rating of over 100 MW, as well as being a new, small, or existing source, can be exempted.

In a study of the fuel type, MACT standards range from $6000 to $120,000 per pound of air pollution. For example, a large biomass boiler may be subject to the MACT requirements. For more information on the Study and work specific to potential boiler projects, please contact Jim Verbeek at 425.952.2025 or e-mail him at JimVerbeek@Catholicacres.com.

Boiler MACT – How These Controls Help Meet Requirements
- Monitoring and total mass emissions from Wood-Industries
- Such as incinerators, steam production systems
- Emission standards are set by adopting emission limits
- Setting total mass emissions and setting total mass emissions to the source

The table below shows the unit improvement standards and compliance dates for each of the technologies, as well as the corresponding emissions reductions.

R E C E I V E O U R N E W S L E T T E R E - M A I L
This Newsletter, No. 37, Spring 2010, is again being sent by e-mail to our contacts for whom we have an e-mail address. It will also be sent by regular postal service. We are continuing to expand the electronic distribution list for our bi-annual newsletter. To receive future newsletters, you are given the following choices:
- Prefer receipt by e-mail (no regular mail)
- Prefer receipt by regular mail (no e-mail)
- Prefer both mailings (e-mail and regular mail)

If we do not hear from you, we will assume the third choice.

To receive this and upcoming Newsletters electronically, please send your e-mail address to jessicaj@janess.com and you will be included on the list.

By the Leaders in Biomass Boiler Combustion System Upgrades

Witnessting a Revival in Energy-from-Waste Industry Municipal Solid Waste and Refuse Derived Fuel
The Confide-Waste (C-W) Industry consists of facilities that have accessed solid waste (MSW), refuse derived fuel (RDF), chemical deconstruction (CD), and sometimes biomass fuel in order to dispose of these waste materials. Typically, these facilities also convert MSW to energy, which is used to produce steam and/or electricity.

Recently, the Ef-W industry has experienced a surge in activities that is caused by both economic and political driving forces as well as popular trends, namely; (1) to reduce landfill targets, (2) to create power from renewable energy sources, (3) to offset the high cost of fuel oils, and (4) to achieve more stringent s standards.

Improvements in the economic disposal of these waste fuels in combustion furnaces is addressed in projects such as:
- Expanding the waste fuel burning capacity in existing furnaces.
- Developing new and innovative systems for fuel and gasification processes.
- Reducing metal corrosion rates and improving effective life span of the equipmen.
- Increasing furnace firing rates through improved combustion and/or application of emis.

In recent years, Janess has participated in the revival of the Ef-W industry by carrying out the following projects:
- “Superheater corrosion analysis and design.
- Furnace life studies in tubes and convection from prior to MAFWR0.
- Review of process/combustion design factors, pressure part evaporation, and circula.
- Computational Fluid Dynamics (CFD) modeling of combustion performance and heat transfer in burners.
- AAEM Boiler and Pressure Vessel Code (15) pressure part design and supply.
- Efficient convection and gas delivery systems, i.e., overfire air (OFA) upgr.
- For further information on this month’s topic and specific inquiries about potential boiler projects, please contact Jim Verbeek at 425.952.2025 or e-mail him at JimVerbeek@Catholicacres.com.

Biomass, Chemical Recovery & Energy-from-Waste

Biomass, Chemical Recovery & Energy-from-Waste

Biomass, Chemical Recovery & Energy-from-Waste
Biomass Boiler Combustion System Upgrades

Customized

The ability was experience. Other prospective impacts have also been proposed. There are in addition to existing biomass limitations that may exist for PMa, PMb, sulfur dioxide (SO2), nitrogen oxides (NOX), (SO2), NOX, and lead (Pb).

What Pollutant Emission Limits Were Proposed?

The EPA has established a database to determine the top 12% emission levels for each pollutant. The major critical pollutant that may have been limited is PMa, which has been shown to contribute to 20% of the PM emissions in biomass boilers.

Intense mixing of fuel and combustion air as well as control of fuel-to-air ratios and air distribution can drastically reduce PM emissions. An increase in the PMa emissions control is primarily driven by the ratio of the total PM10 emissions to the total PM10 emissions in the mill's DEP system.

Evaluation of Water Flow in Tubes of Recovery Boilers with a Decarbonizing Hearth: by Allan Walsh, Marcel Borz, and Steve Campbell, Enerfab Ltd.

The paper presents results from the application of Allan's ultrasonic flow monitors to measure the water flow in tubes of eight different recovery boilers with decarbonizing hearths. The nature of the process means that there are limits to the amount of water that can be added to the south wall (so-called corner tubes) which would result in lower circulating water flow. This could potentially have a detrimental impact on water/lime circulation conditions. The paper provides a discussion and assessment of these potential detrimental effects.

Investigation of Dissolved Gases in Soot: by Allan Walsh.

Soot is a complex mixture of carbonaceous material and gas-phase and solid-phase components. Soot deposition on the walls of recovery boilers is a relatively small change in viscosity. In studies, dissolved gases are known to be present in liquid and solid phases. Measurements of the smokes from new recovery boiler indicated that it contained about 10% of entrained air. The results are of an experimental combination of various techniques in the paper makes an initial exploration of this soot material that may help to identify the key to understanding the mechanism of poor boiler performance.

Jansen Presence at International Chemical Recovery Conference (ICRC) in Buffalo,

Jansen’s Booth at the International Chemical Recovery Conference & Expo. June 4-6, 2010 in Buffalo, New York. Jim, Mark, and Tom are looking forward to catching up with all of our customers and new friends there. Please stop by Booth #1080 to say hello and learn about the new equipment available from CanadianBIOMASS.

New Biomass Recovery Boiler System Advances

Jansen Projects in Canada. In Canada, the department of Natural Resources is putting the Pulp and Paper Green Transformation Program that was first announced early in 2009. Based on production of black liquor in Canada, the total costs of 50% will be invested in these mills for capital projects that have a positive impact on the environment, energy efficiency, and related opportunities.

Recently, Jansen has been awarded several projects that are supported by the Green Transportation Program and many more are currently under consideration.

UPDATE ON Biomass Boiler Combustion System Upgrades

Since the late 1990s, Jansen has designed and supplied combustion system upgrades on over 55 biomass boilers. Currently, projects are under contract for four additional units, with planned installations between July and November this year.

Typically, a combustion system upgrade includes modifications to the biomass feed and/or air delivery systems, particularly the fuel delivery systems and online/democratic (O/A) systems as depicted in the sketch to the right.

Further detailed information of the Jansen approach and experience in upgrading combustion systems in biomass boiler-fed, including O/A upgrades, can be found on our website (www.jansenbiomass.com) in the Biomass Boiler Upgrades, Upgraded Protocols, and Upgraded Protocols descriptions and related publications.

Readers may wish to attend one of our upcoming seminars, including the Biomass Boiler Upgrades Webinars. As a tradition has continued for ten years, again with a new biomass boiler workshop for the similarly two locations. New Orleans (June 10-11) and Minneapolis (September 16-17). For more information on Jansen’s many other information about these workshops and locations, see the available resources on page 6.

For further information and seminars, please contact Jansen Biotech at 453-925-3632 or New Atlas at 453-925-2827 by e-mail at Kevan.Jansen@jansenbiomass.com in Jansen International Biomass Conference & Expo. Jansen’s booth at the International Biomass Conference & Expo. Held May 4-6, 2010 in Minnesota, attracted many visitors expressing their interest in attending to see some of their important new products and services that are available at Jansen.

For more information on the type of work, please contact Jansen at 453-925-2827 by e-mail at Kevan.Jansen@jansenbiomass.com.

Revolutionizing high-pressure boilers with superior furnace systems

“Combustion Troubleshooting” Article Published in CanadianBIOMASS Magazine

A Jansen authored article was published in the January/February issue of CanadianBIOMASS Magazine, titled “Combustion Troubleshooting.” The article discusses the combustion of biomass fuels, boiler operational problems, symptoms of poor combustion and their root causes, and upgrading combustion systems to remedy combustion problems. The article is based on the Jansen combustion troubleshooting seminars for the study and design of operation of over 300 industrial biomass boilers, worldwide, and supplying combustion system upgrades on 55 solid biomass-fired boilers. A direct link to the magazine website is available at www.canadianbiomassmagazine.ca.

If you have any questions or would like to see a electronic copy of this paper or any specific information, please contact Arv Verel at 453-925-3632 or by e-mail to Arv.Verel@jansenbiomass.com.
Jansen Presence at International Chemical Recovery Conference (IC7RC) 2023

Jansen’s representatives at the recent International Chemical Recovery Boiler Conference (IC7RC) held in May 4–6, 2023 in Minneapolis, Minnesota, attracted many visitors expressing their interest for our biocatalysts, biomass and new technologies after our capabilities and experience.

For further information on this topic, please contact Arlin Veruel at 452.952.2625 or by e-mail at Arlin.Veruel@jansenboiler.com. Additional information and specific project references can be found on our website at www.jansenboiler.com.

Jansen Presented at the 13th International Biomass Conference & Expo (IBCE 2020)

Jansen’s booth at the international Biomass Conference & Expo, held May 4–6, 2020 in Minneapolis, Minnesota, attracted many visitors expressing their interest for our biocatalysts, biomass and new technologies after our capabilities and experience.

For further information on this topic, please contact Arlin Veruel at 452.952.2625 or by e-mail at Arlin.Veruel@jansenboiler.com. Additional information and specific project references can be found on our website at www.jansenboiler.com.

Biomass Boiler Combustion System Upgrades

Biomass boiler combustion systems are complicated and require frequent maintenance and modernization. To meet recent environmental requirements, it is necessary to improve the performance of biomass boilers. This is why Jansen Boiler has developed several improvements to enhance the performance of biomass boilers.

Engineered

Dr. Waathne and his team in Oslo, Norway, have developed a new technology to improve the performance of biomass boilers. This technology allows for better control of the combustion process, leading to higher efficiency and less emissions. The team has also developed new materials and components to improve the durability and longevity of the boilers.

www.jansenboiler.com

UPDATE ON Biomass Boiler Combustion System Upgrades

Since the late 1990s, Jansen has designed and supplied combustion system upgrades on over 55 biomass boilers. Currently, projects are under contract for four additional installations in Montana, with deliveries expected by the end of this year.

Typically, a combustion system upgrade includes modifications to the biomass fuel and/or air delivery systems, as well as the fuel delivery and storage systems. The project scope varies depending on the specific requirements and constraints.

For further information and specific project references, please contact Arlin Veruel at 452.952.2625 or by e-mail at Arlin.Veruel@jansenboiler.com. Additional information can be found on our website at www.jansenboiler.com.

NEW BRIEFS

Since our last newsletter (Nov 2023), Jansen has conducted the following process design and engineering projects in the Forest Products, Indonesian Pulp Producers, Energy-from-Waste, and other industries (several are in progress):

- Combustion system upgrades for biomass boilers.
- Biomass and RDF boilers' engineering evaluations.
- Chemical recovery performance evaluations and capital studies.
- Recovery and biomass boilers evaluations to meet power generation upgrades.
- Design of injection modules for DINGE disposal in biomass.
- Boiler circulation studies and UFM data collection.
- Capitalizing of biomass, chemical recovery MHD, and RDF-fueled boilers.
- Biomass boiler fine-tuning and optimization.
- Biomass boiler performance review and operator training.

This work was conducted, or is currently in progress for the following companies:

- Aalborg입니다
- Carlsberg
- Carlsberg Pulp & Paper Company
- Chalmeria Limited Partnership
- Chelsea Wood Products, LLC
- CleanWord Paper
- Dremler Inc.
- Fortis Biomass Group
- Georgia-Pacific LLC
- Georgia-Pacific International Paper Company
- Kimberly-Clark
- MeadWestvaco
- Millwork
- NewPage Corporation
- Paterson Specialty Cardboard

For further information on this topic, please contact Arin Veruel at 452.952.2625 or by e-mail at Arlin.Veruel@jansenboiler.com. Additional information and specific project references can be found on our website at www.jansenboiler.com.

Jansen Projects in Canada.

In Canada, the department of National Resources is working with the pulp and paper green transformation program that was first announced early in 2009. Based on the production of black liquor. Cupro-nickel, in Canada, we are working with three mills that we have identified as a potential impact on the environment, energy recovery, and equipment.

Recently, Jansen has been awarded several projects that are supported by the Green Transformation Program and many more are currently under consideration.

Biomass Boilers - How Can Combustion Improvements Help Meet Requirements?

Jansen will be exhibiting a biomass boiler at the Biomass Boilers - How Can Combustion Improvements Help Meet Requirements. The demonstration will feature a new biomass boiler and a demonstration of the latest technology for biomass boiler improvements.

More specifically, the demonstration will feature:

- Enhanced Combustion Efficiency
- Improved Emissions Control
- Reduced Fuel Costs
- Enhanced Boiler Life Expectancy

The demonstration will provide an opportunity for attendees to learn more about the latest technology in biomass boiler improvements and how they can be applied to their specific needs.

For more information on this demonstration, please contact Arlin Veruel at 452.952.2625 or by e-mail at Arlin.Veruel@jansenboiler.com.
Jansen Presence at International Chemical Recovery Conference (ICR-C) in Las Vegas

Jansen’s representatives at the recent International Chemical Recovery Boiler Conference (ICR-C), held the week of March 29 in Washington, Virginia, included Dr Allen Walsh, Technology Development Manager; Lee Kingma; Joel Young; Uday Bhagwat of Visy Pulp & Paper, Tumut, New South Wales, Australia. Several alternative technical solutions were evaluated to remedy the problem. The boiler manufacturer, a supercritical superheater was found to be upgrading the superheater tube material as well as implementing a plan to reduce the amount of steam in the mill’s liquor system.

Evaluation of Water Flow in Tube Flows of Recovery Boilers with a Decanting Hearth: by Allan Walsh, Marc Berz, and Steve Campbell, Dallas, TX

The paper presents results from the application of Jansen’s ultrasonic flow measurement technology to a number of large tube flows of eight different recovery boilers with decanting hearths. The nature of the boiler and the location of the stories in the parallel tube flows, located on the side walls (or corner tubes) will generally lose less heat than other wall tubes, thereby resulting in lower circulating water flow. This could potentially have a detrimental impact on water/steam circulation conditions. The paper provides a discussion and assessment of these potential detrimental effects.


Smelt gases such as carbon dioxide and temperature have been used when attempting to calculate changes in smelt viscosity and a relatively small change in viscosity is observed to be of relative significance. In studies, dissolved gases are known to be present in the smelt. In Jansen’s smelt laboratory, the smelt from one recovery boiler indicated that it contained about 80% of dissolved gases in the form of carbon dioxide. A study conducted on paper mill sludge, construction and demolition (C&D) wood, tire-derived fuels (TDF), old contaminated container (ODC) rejects, etc., could be classified as solid waste incinerators and be required to meet different set of air pollut-

Jansen Projects in Canada.

In Canada, the department of Energy, Mines and Resources has made a commitment to reduce primary fuel consumption, and is working on improving its assessment techniques. In the West, the Jansen teams have a number of ongoing projects.

UPDATE ON Biomass Boiler Combustion System Uplifts

Since the late 1990s, Jansen has designed and supplied combustion system uplifts on over 55 biomass boilers. Currently, projects are under contract for four additional units, with planned installations between July and November this year. Typically, a combustion system uplift includes modifications to the biomass feed and/or to the delivery systems, particularly the fuel delivery system and/or onerous (API) supply, as depicted in the sketch at the top of this page. Further detailed information of the Jansen approach and experience in upgrading combustion systems has been put forward in a number of publications and papers presented at conferences and workshops. Typically, a combustion system uplift includes modifications to the biomass feed and/or to the delivery systems, particularly the fuel delivery system and/or onerous (API) supply, as depicted in the sketch at the top of this page. Further detailed information of the Jansen approach and experience in upgrading combustion systems has been put forward in a number of publications and papers presented at conferences and workshops. Further detailed information of the Jansen approach and experience in upgrading combustion systems has been put forward in a number of publications and papers presented at conferences and workshops. Further detailed information of the Jansen approach and experience in upgrading combustion systems has been put forward in a number of publications and papers presented at conferences and workshops.

NEWs Briefs

Jansen at International Boiler Conference & Expo

Jansen’s booth at the International Boiler Conference & Expo, held May 4-6, 2010 in Minneapolis, attracted many visitors expressing their interest for both the numerous educational seminars and our capabilities as we executed a successful booth. For further information on the type of work, please contact Alex Veratel at 403.592.8825 or by e-mail at info@jansenboiler.com.

Biomass Boiler Combustion System Uplifts

Biomass boiler uptakes are a significant business line for Jansen. Jansen is focused on the combustion systems uplifts for biomass boilers and continues to collaborate with leading manufacturers of biomass boilers, including Smith Biomass, to bring about efficient and effective solutions. Jansen is proud to be a part of this exciting business line and is committed to providing state-of-the-art solutions.

Jansen Boiler Combustion System Uplifts

“Combustion Troubleshooting” Article Published in CanadianBIOMASS Magazine

A Jansen authored article was published in the January/February issue of CanadianBIOMASS Magazine, titled “Combustion Troubleshooting”. This article discusses the combustion of biomass fuels, boiler operator (opera-
tional, goals of process control and their root cause(s)), and upgrading combustion systems to remedy combustion problems. The article is based on our long standing experience with a multitude of over 300 industrial biomass boilers, worldwide, and supplying combustion system upgrades on 55 solid biomass-fired boilers. A direct link to the magazine can be found at www.canadianbiomassmagazine.ca.

If you have any interest in receiving an electronic copy of this paper or have a specific inquiry, please contact Alex Veratel at 403.592.8825 or by e-mail at info@jansenboiler.com.
By the Leaders in Biomass Boiler Combustion System Upgrades

R E C E I V E O U R S e t t l e m e n t e r y b y E - m a i l

This Newsletter, No. 37, Spring 2010, is again being sent by e-mail to our contacts for whom we have a name and address. It will also be sent via postal mail service. We are continuously expanding the electronic distribution list for our bi-annual newsletter. To receive future newsletters, you are given the following choices:
- Prefer receive by e-mail (no regular mail)
- Prefer receive by regular mail (no e-mail)
- Prefer both mailings (e-mail and regular mail)
- If we do not hear from you, we will assume the third choice.

To receive this and any previous newsletters electronically, please send your name and address to nabnewsletter@jansencenter.com and you will be included on the list.

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B i o l e r M A C T N o w H o w C o m b u t i o n I m p r o v e m e n t s H e l p M e e t P r e d i c t e d R e q u i r e m e n t s

A new ruling came out April 20, 2010 and is to be finalized by the end of 2010. The ruling affects industrial, commercial, and institutional boilers and heaters with heat input of more than 10 MMBtu/h.

W h a t i s B o i l e r M A C T ?

One outcome of the 1990 Clean Air Act (CAA) was the formation of National Emissions Standards for Hazardous Air Pollutants (NESHAPs) to regulate pollutants not covered by the National Ambient Air Quality Standards (NAAQS). There are 188 hazardous air pollutants (HAPs) that are covered. The EPA is tasked with determining the Maximum Achievable Control Technology (MACT) and establishing permit limits for HAPs control for each source category (e.g., Kilns, Dry Cleaning Units, etc.). Boiler MACT refines the existing National Emissions Standards, industrial and institutional boilers and heaters that have the potential to emit HAPs. Units that are considered “Major” sources have a default rating of 10 MMBtu/hr and can burn solid, liquid, or gaseous fuels. The EPA promulgated the initial Boiler MACT rule in 2004 with a 3 year phase-in.

W i t n e s s i n g a R e v i t a l i z a t i o n f r o m W a s h i n g t o n D e s P r e s e d R e f u s e D e r i v e d S o l i d S t e a m

The Capital Region’s (Wash.) industrial complex of facilities that have been major steam users (new refuse derived solid steam (RDS), refuse derived fuel (RDF), combustion designs, and some biomass fuel) in order to dispose of these waste materials. Typically, these facilities also convert natural gas to heat energy and steam.

Recently, the E-I-W industry has experienced a surge in activities that is caused by both economic and political drivers, such as regulation, fuel, and environmental policies. The surge in activities has driven sales of the technologies, which is expected to accelerate in the coming years. In addition, the economic constraints of the new refuse derived solid steam (RDS) technology have driven the adoption of new refuse derived fuels (RDF) technologies.

Recent years, Jansen has participated in the revival of the E-I-W industry by carrying out the following projects:
- Superheater corrosion analysis and design.
- Plant fuel use was a major factor in the LP-MVR (low pressure-melting-vacuum-reflux) process.
- MAINE Boiler and Pressure Vapor Code: ‘1’ pressure part design and supply.
- Efficient combustion delivery systems, i.e. overfire (OFU) upgrades.

For further information on this work and specific queries to potential boiler projects, please contact Boilen News at 425-825-0500 or by e-mail at editor@boilennews.com.
Superheater Upgrades to Increase Power Generation

In recent years, many industrial boiler owners have implemented projects to increase overall electrical generation rates. In particular, projects are being identified to increase the steam output, pressure, and/or temperature of existing boilers. These units may have been “underperforming” from their original design or their performance and efficiency can be improved after making modifications.

Readers may be interested in a technical paper, titled: Boiler Upgrades to Increase In-House Power Generation, presented by Jensen at the TAEP 2007 Engineering, Heating & Environmental Conference.

The paper discusses the following topics:

- Strategies to Increase In-House Power Generation
- Boiler Steam Conditions to a New Steam Turbine Generator
- Boiler Steam Conditions to an Existing Steam Turbine Generator
- Maximizing Boiler Steam Production from Low Cost Waste Fuels

By Improving Efficiency:
- By Increasing Efficiency
- By Increasing Thermal Efficiency with Additional Economizer Surfaces

The paper provides process technical data to help the reader make more informed decisions on whether to pursue a project of this nature. The information in the paper is based on recent Jensen superheater upgrade projects on biomass, chemical recovery, and Energy-from-Waste (E-f-W) industries. Particular case history descriptions are included on this page.

To receive a copy of the paper or specific inquiries, please contact Arne Verze at 425.952.2620 or by e-mail at Arne.Verze@jensen.com.

Boiler A. Biomass Boiler Superheater Replacement

In 2006, Jensen supplied a custom designed superheater for a low and natural gas fired boiler with the purpose to increase the boiler’s final steam temperature. The unit has a maximum continuous rating of (MCR) steam capacity of 600 lb/hr at 900°F. Prior to the superheater replacement, the goal was to increase final steam temperature to 925°F (769°F) typical over a wide range of steam flows when firing a combination of hog fuel, cotton seed, cotton, and natural gas, or on natural gas alone. With the new superheater, these performance goals have successfully been met. After 18 months of operation, the unit was taken down for a maintenance call this past April.

An inspection of the overall mechanical condition of the superheater was found to be in very good condition, other than a few minor items that are commonly found and repaired during inspection outage.

Boiler B. Recovery Boiler Process Evaluation

Jensen conducted a preliminary evaluation of the performance and capacity of a large recovery boiler with an upper burning capacity of about 800,000 lb/hr at 670 psig. After an earlier upgrade, the maximum allowable working pressure (MAWP) of the unit had been “raised” to 900 psig. Currently, the unit is evaluating technical solutions to increase both the pressure and output up to its maximum pressure capability in order to optimize in-house power generation from a new turbine generator.

Jensen evaluated the lashing burning capacity and performance of the unit with several superheater design features and performance design concepts were developed to upgrade the reactor and meet significantly higher steam temperature and pressure from a replacement superheater. As part of the evaluation, Jensen conducted a visual inspection of the superheater during a recent annual boiler outage (see photo above). The purpose of this inspection was to verify the arrangement of the condition of the existing superheater, headers, and supports and make modifications of critical dimensions.

Boiler A. and B. Combustion System Upgrades

In recent years, Jensen is conducting process engineering studies to make an assessment of the feasibility and capital cost to increase the steam production from existing boiler and superheater recovery in a modified paper mill on the west coast. The mill is planning to install a turbine generator with electric power production capability that is significantly higher than the two boiler’s current capabilities.

Welcome to the January: 2010 Biomass Boiler Workshops

Biomass, Chemical Recovery & Energy-from-Waste

Nebraska, Lincoln: January 13-14, 2010

New Orleans, Louisiana: June 10-11, 2010

Minneapolis, Minnesota: September 16-17, 2010

Since 2000, these workshops have been attended by more than 5000 participants from numerous industries operating in the pulp/paper and biomass industries. These workshops are designed to help participants learn about the latest developments in technical issues, new developments in technologies and developments in new policy actions. The workshops offer a variety of practical and technical sessions designed to help visitors learn about the latest developments in technology and applications. Participants take notes during a past Biomass Boiler Workshop.

By the Leaders in Biomass Boiler

Combustion System Upgrades

By the Leaders in Biomass Boiler

Combustion System Upgrades

R E C E I V E O U R N e w s l e t t e r by E - m a i l

This Newsletter. No. 37, Spring 2010, is again being sent by e-mail to our contacts for whom we have an e-mail address. It will also be sent via postal service. We are continuously expanding the electronic distribution list for our bi-annual newsletter. To receive future newsletters, you are given the following choices:

- “Subscribe” by e-mail (no password needed)
- “Subscribe” by postal mail (see below)
- “Unsubscribe” by e-mail (any email)
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Through our many years of experience we have developed the necessary capabilities to help you optimize your biomass and energy-from-waste system. From the beginning we have been a leader in the field, and we continue to be at the forefront.

Biomass, Chemical Recovery & Energy-from-Waste

For more information on our services, please contact us at 425.952.2041 or by e-mail at editor@jensen.com.

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