

From: Greg Retzlaff [mailto:retzlaff@sterling.net]
Sent: Saturday, May 19, 2007 5:34 AM
To: Matsumura, April Mido
Cc: 'Don Bryan'; John_Lague@URSCorp.com; 'Bo Thibaut'; Karen_Beattie@URSCorp.com
Subject: Questions - Fuel Oil Consumption and Max Boiler Input

April

Thank you for your questions about fuel oil consumption because your suggestion about limiting the number of gallons is right on point. I have attached a letter responding to three of your emails and our telephone conversation. Also attached is a letter from the boiler supplier, Factory Sales and Engineering, responding to my inquiry about the maximum heat input to the boiler.

Please don't hesitate to call with any questions.

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Regards,

Greg Retzlaff

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May 19, 2007

Ms. April Matsumura
Environmental Engineer
Clean Air Branch
Hawaii State Department of Health
919 Ala Moana Blvd., Suite 203
Honolulu, Hawaii 96814

Subject: Fuel Oil Limitation & Maximum Heat Input

Dear Ms. Matsumura,

You recently sent emails asking for clarification on certain subjects related to Tradewinds' air permit application. You requested this clarification in your recent emails dated as follows:

- May 10, 2007 regarding maximum boiler heat input
- May 11, 2007 regarding the proposed fuel oil consumption limitation
- May 11, 2007 regarding questions about Tradewinds' proposed operation regarding use of fuel oil and how we will operate should we run out of biomass fuel. This letter responds to all of these questions.

Maximum Heat Input

The maximum heat input of the boiler is 132.4 MMBtu/hr as listed in Factory Sales and Engineering's proposal shown on page 9 of Appendix B of Tradewinds' air permit application. An explanation of why this value is the limit for this boiler can be found in the attached letter from Factory Sales and Engineering dated May 17, 2007 responding to my inquiry.

Questions about Boiler Operation

Below is a listing of the questions you asked in your May 11, 2007 email followed by Tradewinds' corresponding answers to each question.

Per our phone conversation this morning, you may be changing the proposed hourly diesel limit to a fuel usage limit.

April, you and I had a brief conversation about whether Tradewinds really wanted an hourly limitation for fuel oil or a gallon consumption limitation for fuel oil. That was a very valid question because Tradewinds would like a gallon consumption limitation. As described below in greater detail, the boiler will often be co-firing fuel oil with biomass. As a result, the boiler will not be relying solely on fuel oil and will not be consuming fuel oil at the maximum rate. So the hours of operation on fuel oil become somewhat meaning

less or unimportant as I believe you were inferring in your telephone conversation with me. I believe what is important to both Tradewinds and the Dept of Health is the amount of fuel oil fired. Therefore, Tradewinds would like to have a fuel oil consumption limitation of 208,906 gallons per year in the air permit, as calculated below.

110,783,408 Btu/hr (from page 13 of Appendix B of the application) / 140,000 Btu/gallon for fuel oil (from footnote 2 for Table 3-10 on page 3-17 of the permit application) x 264 hours per year = 208,906 gallons of fuel oil per year.

I was wondering what happens if there is not enough wood fuel to burn.

Tradewinds has executed contracts for the necessary feed stock for the veneer mill. A large portion of the fuel for the boiler will be generated by trimmings, bark and cuttings of the veneer mill. There will also be significant fuel generated by the logging operation. We have completed due diligence on the amount of other biomass available on the island and have found that there are adequate quantities that can be cost effectively obtained. The additional fuel source is primarily comprised of tree trimming and tree removal.

Tradewinds will always have a few days' supply of fuel on site to handle short term loss of fuel supply from weather or holidays etc. Because of these provisions, Tradewinds does not anticipate running out of fuel for the boiler. The need for distillate is primarily for:

1. To help ignite the biomass fuel during startup.
2. To co-fire with biomass should the biomass fuel be very poor quality or contain excess quantities of moisture.
3. To "bridge" short periods when a fuel handling conveyor plugs or there is a mechanical failure of the fuel handling equipment. This will allow the boiler (and in turn the veneer mill) to continue operating through these short term equipment failures.

Further, in the unlikely event that Tradewinds for some reason did run out of biomass fuel, they would like the flexibility to consume distillate as an alternative fuel for short periods of time up to the limits stated above. This mode of operation is expected to be very limited and if we have properly planned our fuel supply, firing fuel oil because we have run out of fuel will seldom be required.

1. Does the 264 hours account for scenarios where you may not have an adequate supply of wood fuel?

These hours account for any and all time periods that we are unable to meet our steam and electrical demands of the veneer mill because of the biomass supply, feed system or biomass quality. The need to fire on distillate is mostly for the scenarios mentioned above but Tradewinds would like the flexibility to fire on distillate for any reason up to the limits proposed. Tradewinds will avoid this as much as possible because it is not nearly as cost effective as firing on biomass. Yes, the 264 hours account for all periods we might not have adequate biomass fuel.

2. Would you run on just on diesel to keep the boiler running?

Yes, as discussed above and only to the extent we don't exceed the quantity of fuel oil consumption allowed by the air permit.

3. If you were to just run on diesel, & if you propose a fuel usage limit, what is the boiler's maximum fuel feed rate?

The maximum firing rate on distillate is 791.31 gallons per hour calculated as follows:
110,783,408 Btu/hr (from page 13 of Appendix B of the application) / 140,000 Btu/gallon
for fuel oil (from footnote 2 for Table 3-10 on page 3-17 of the permit application) =
791.31 gallons per hour.

It is anticipated that distillate will nearly always be co-fired with biomass, resulting in reduced firing levels on distillate at nearly all times that it is being used as a fuel. And as outlined in the attached Factory Sales and Engineering letter the boiler has a finite firing rate on fuel oil. For these reasons, it seems as if the addition of an *hourly* firing rate limit in addition to an annual limit may unnecessarily complicate the reporting and the equipment required to measure and record this variable.

I trust this provides the answers to your questions but please call with any further questions or to discuss details.

Sincerely,



Greg Retzlaff
Project Engineer
Tradewinds Forest Products LLC



FACTORY SALES & ENGINEERING
ncorporated

P.O. Box 240
COVINGTON, LOUISIANA 70434

May 17, 2007

Tradewinds Forest Products
Century House
2574 Northwest Thurman Street
Portland, Oregon 97210-2524

Attention: Mr. Greg Retzlaff

Reference: 82,000 PPH Wood Waste Fired Boiler System
Maximum Heat Input and Steam Production

Dear Mr. Retzlaff,

I am in receipt of your email asking us to determine what the maximum heat input and steam production of the boiler system we are providing your company. We have reviewed our design records and the system is designed to produce 82,000 pph of steam with 45% moisture fuel with a total heat input into the furnace of 132.4 mmbtu. This is the maximum steam that the boiler is designed to produce based on flue gas velocities and pressure drop. The boiler also has a ratio of heating surface to produce steam in comparison to water circulation. The boiler has specific limitations in two areas; those being steam production and heat input into the furnace. The boiler can be fired with dryer fuels which would make someone assume that the boiler could gain efficiency and fire at higher steaming rates. The operators would have issues increasing the steam production due to limitations of water circulation, feedwater pumps and velocities in the steam line. There would be additional problems of over firing the boiler system due to variations in the final steam temperature which could potentially damage the turbine generator if the attemperator could not keep the temperature down. Drier fuels will allow the boiler to be more efficient in producing 82,000 pph of steam which would result in a lower heat input into the furnace. Fuels with higher moisture content will not be able to fire the full 82,000 pph because of the limits of the maximum heat input to the boiler and heat release issues from the furnace and grate.

Trying to over fire the boiler can and will damage the grates in the boiler because of the resulting grate heat release rates. Trying to over fire a natural circulation boiler could cause damage because higher than design steam production rates may cause poor water circulation because of inadequate available water flow capacity. Please note that attempting to over firing the boiler would void the warranty.

I would also like to remind you that this boiler is custom designed to produce 82,000 pph of steam with the specific fuel as listed in our proposal; this boiler is *not* an off the shelf unit with large margins in the design parameters to accommodate a wide variety of fuels that might offer an excess steam production capacity or additional heat input capacity.

An example of burning a drier fuel would be the burner firing number 2 oil. The boiler in that case would be limited to 82,000 pph of steam. The oil is a much more efficient way of firing the boiler and therefore could theoretically increase the heat input into the boiler. In actuality, the burner is limited by the capacity of the fan on the burner and the control valve. The control valve is designed only to allow the required amount of oil into the burner to generate 82,000 pph of steam. If someone were to replace the valve, a second limitation is in place on the burner fan to limit the air flow to prevent increased firing rates. The fan would not have the designed air flow capacity to allow the burner to be operated at higher levels. The burner maximum heat input to the furnace on an hourly basis is 110.78 mmbtu/hr at 82.7% efficiency and generating 82,000 pph of steam.

In summary the boiler has two limiting design points which are the heat input and steam production. You will be restricted by the heat input limitation when burning wetter fuels and you will be limited by the steam production when burning drier fuels. Please let me know if you have any further questions. Please note that going outside of the parameters as defined in our proposal will void all warranties implied or stated on the equipment.

Respectfully,
Factory Sales & Engineering, Inc.

James D. Thibaut II
Vice-President