

From: John Yntema
To: Jenkins, Susan
Date: 3/29/2005 1:13:49 PM
Subject: Phillip Towels and Jim Teaford called yesterday and we discussed SNCR as possible BACT

Susan,

Jim Teaford, as you probably know, is president of the Teaford Company. Jim worked for Wellons for a number of years and now has his own company, designing systems that compete with Wellons. Teaford is bidding on the Norbord contract.

Here is the gist of the discussion we had:

SNCR requires temperatures above 1600F (that needs to be verified), but wood-fired furnaces must be maintained at a lower temperature than that. The reason that lower temperatures are required in a furnace is to assure that the ash (with a high sodium content) does not melt into slag. They indicated, for example, that the Wellons already on site is not allowed to get over 1500F. They noted that temperatures need to be controlled differently in a furnace, as compared to a boiler. In a boiler, a lot of heat is removed through the water/steam tubes in the walls; in a furnace, the walls are refractory lined to hold and reflect heat.]

Therefore, it appears that SNCR is not feasible.

It is possible to boost the heat of the gas exhausting from the furnace up to 1600+F, perhaps with a duct burner. However, this would cause additional air pollution (products of combustion) and would require a redesign of the system to accommodate the extra heat. [I am not sure I am totally convinced by that 2nd argument; sometimes it is hard to tell when one has crossed the line from feasibility to economics.]

They added that the wet ESP used for PM pre-RTO control is very alkaline (due to sodium bicarbonate, which must be added to the water to keep it clear, and due to the alkalinity of ash). This means that, very likely, NOx emissions will be lower out the stack than predicted. Therefore, any reductions by SNCR would be lower than predicted (with higher cost per ton).

We discussed the possibility that maintaining the alkalinity of the WESP lowers NOx emissions, even though they do it for other purpose. They contacted me the next day (today) and said that the mill now uses Caustic Potash, Liquid 45%. As for the amount, it varies. However, last year they used 1,277,612 lbs, which is 3500 lbs/day. Phillip added: "Caustic Potash is the same thing as potassium hydroxide I believe. Sodium Bicarbonate, sodium hydroxide and so forth are other chemicals that can be used as well."

Additional info:

20% of the hot air from the furnace goes thru the thermal oil heater and is then returned to be part of the dryer air. Therefore less than 20% of the heat goes to the thermal oil heater.

The furnace fed by 4 cells, each a little over 50 MMBtu/hour input heat capacity. Each of the cells is a furnace built in the shape of a vertical 8 foot tall coke bottle, all feeding into a central chamber. Each cell has its own grate for bottom ash. [a crush and roll grate?]

Susan, with regard to the comparison with Langboard, one difference is that Langboard is using a fluidized bed thermal heating unit. I don't know what difference that makes, in the applicability of the limit of 1500F, but it is different than what is proposed by Norbord.

- John