

Interoffice Memo

8/25/2004

To Bruce Cartmel
From Jared Rogers
Cc
Subject Orifice Trap Evaluation

Per your request, I've evaluated the LaGrande Sawmill dry kiln steam usage data from 2000 through July, 2004 to determine what, if any, impact the recently installed orifice traps have made on drying efficiency so a decision can be made as to whether or not to install these devices at Elgin. Based on the following findings it appears the new traps have indeed lived up to their expectations and have already paid for themselves several times over in reduced gas costs at the boilers.

While the economic impact of reduced boiler fuel usage at Elgin will obviously be much less than at LaGrande, there are other potential benefits that must be evaluated at this location before a final determination on their use can be made. I've scheduled a meeting with the Elgin team to facilitate this evaluation and ultimate usage determination.

To evaluate the historical LaGrande steam usage data I felt it appropriate to look at the amount of steam required to dry a board foot of lumber before and after the installation of the new traps. Since these devices were installed in the first half of March 2004, I calculated the March through July "# steam/BF" ratio for each of 2000 through 2004.

With the new traps installed, the LaGrande mill has experienced the lowest steam use per board foot of lumber dried for any of the years evaluated and has required 0.49 #/BF less than the **average** use of 2000 through 2003. This 0.49 #/BF savings, compared to average, has led to

18,536 M# less steam used in the kilns. At 12 therms/M# and \$0.50/therm, this results in an **\$111,216 reduction** in required natural gas over this time. This is approximately **4 times the cost of the orifice traps installed in the kilns.**

To assure these results were truly attributable to the traps and not merely to ongoing drying efficiency improvements I looked at January & February data for 2004 versus prior years. While steam data wasn't readily available I was able to compare "therms/MBF" ratios found in the Region energy report. Interestingly, this ratio for 2004 was higher in each month prior to trap installation than it was for the average of the four prior years, but lower following their installation.

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This would seem to confirm that the observed energy savings were indeed attributable to the new traps and that the magnitude of the savings is greater than the March through July data used above might indicate.

It should be mentioned that a complicating factor for this analysis is the non-consistent white fir drying which has occurred over the study period. Since the "# steam/BF" ratio for drying white fir is significantly lower than it is for pine, an attempt was made to remove this bias from the data rather than to just "dilute" it by using averages as in the above analysis. When monthly data containing white fir drying was tossed out, including the July 2004 data, the savings attributable to the new traps were even higher! It was discovered that the highest white fir production occurred in 2002 and was the only reason that year's steam use ratio was close to the 2004 value.

All things considered, **it appears conservative to claim that the new traps have led to a reduction of well over 10% in the amount of steam required to dry lumber in the kilns and have therefore paid for themselves many times over since their installation 5 months ago.**