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Moss Lumber Industries, Inc.

Gurley (Madison County)

The wood-fired boiler system installed at Moss Lumber Co. in 1995 burned green sawdust of either oak or poplar and provided steam to operate two lumber dry kilns.

The kilns at Moss Lumber Industries, Inc. had been supplied by a propane gas-fired package boiler which was left in place to serve as a backup. Green sawdust from the fuel shed adjacent to the boiler room is reclaimed by a reclaimer and placed into a fuel feed system which feeds the green sawdust to the boiler furnace. A fan and a distributor distribute the fuel across the furnace floor which is fitted with partial grates. Venturi feed fuel tangentially into the furnace needed for good combustion efficiency, thereby increasing furnace retention time and providing turbulence needed for good combustion efficiency. The tangential furnace is a modified Dutch oven so that the bottom of the boiler can receive radiant heat from the furnace. Hot gases leave the furnace, pass under the HRT boiler, and then pass through the tubes to an outlet damper. The exhaust then passes to a mechanical collector for flash removal and then to an induced draft fan and stack. The mechanical collector has an air lock rotary valve to serve as an air seal when dumping collected fly ash into barrels.

The boiler control system operates off boiler pressure, cycling the variable speed, fuel-feed system to maintain desired steam pressure. The outlet of the stack is fitted with a temperature sensor, which provides signals to a control system that limits the temperature of the flue gases (A flue is a duct, pipe, or chimney for conveying exhaust gases from a fireplace, furnace, water heater, boiler, or generator to the outdoors) by interrupting fuel feed when a limit temperature is reached. This safety feature is designed to warn operators if the tubes are dirty or if the system is being over fired. The system also has a smoke detector to sense stack-gas opacity. If the opacity exceeds the set point, the system will shut down the fuel feed for a predetermined amount of time.

In 1995, this system consumed 2,900 tons of residue fuel and produced 708 ktons of steam. The energy savings are estimated to be 24,408 MMBtus/year at a value of \$174,362.