

- ✓ Preheat combustion air with waste heat. (22 0C reduction in flue gas temperature increases boiler efficiency by 1%).
- ✓ Use variable speed drives on large boiler combustion air fans with variable flows.
- ✓ Burn wastes if permitted.
- ✓ Insulate exposed heated oil tanks.
- ✓ Clean burners, nozzles, strainers, etc.
- ✓ Inspect oil heaters for proper oil temperature.
- ✓ Close burner air and/or stack dampers when the burner is off to minimize heat loss up the stack.
- ✓ Improve oxygen trim control (e.g. -- limit excess air to less than 10% on clean fuels). (5% reduction in excess air increases boiler efficiency by 1% or: 1% reduction of residual oxygen in stack gas increases boiler efficiency by 1%.)
- ✓ Automate/optimize boiler blow down. Recover boiler blow down heat.
- ✓ Use boiler blow down to help warm the back-up boiler.
- ✓ Optimize deaerator venting.
- ✓ Inspect door gaskets.
- ✓ Inspect for scale and sediment on the water side (A 1 mm thick scale (deposit) on the water side could increase fuel consumption by 5 to 8%).
- ✓ Inspect for soot, fly ash, and slag on the fire side (A 3 mm thick soot deposition on the heat transfer surface can cause an increase in fuel consumption to the tune of 2.5%).
- ✓ Optimize boiler water treatment.
- ✓ Add an economizer to preheat boiler feed water using exhaust heat.
- ✓ Recycle steam condensate.
- ✓ Study part-load characteristics and cycling costs to determine the most-efficient mode for operating multiple boilers.
- ✓ Consider multiple or modular boiler units instead of one or two large boilers.
- ✓ Establish a boiler efficiency-maintenance program. Start with an energy audit and follow-up, then make a boiler efficiency-maintenance program a part of your continuous energy management program.