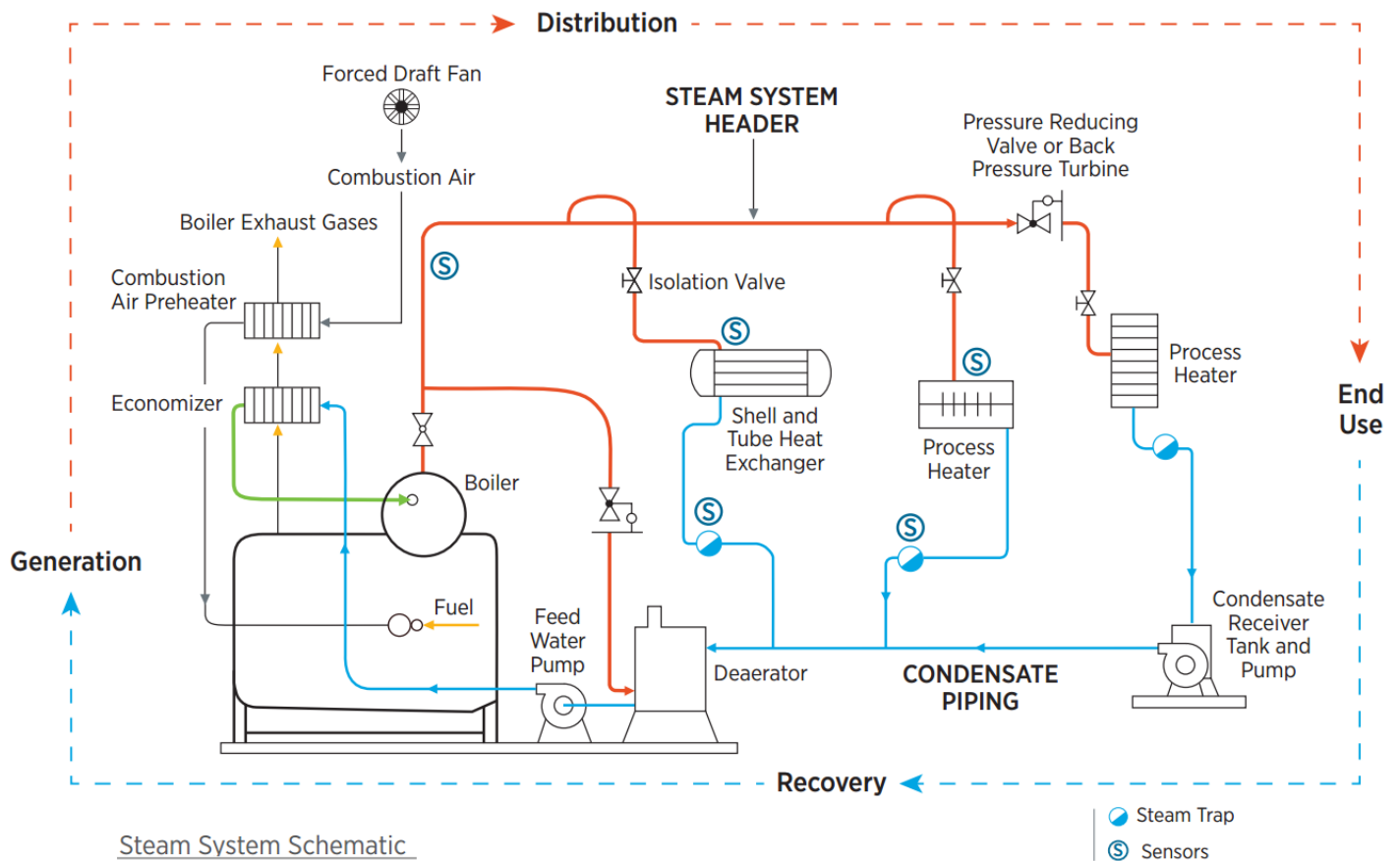


Best Practices

- 1.) Reduce Steam demand and pressure
- 2.) Optimize Fuel/Air Ratio
- 3.) Fix Steam Traps
- 4.) Insulate Pipes and Tanks
- 5.) Recover condensate/ flash steam and capture water & heat
- 6.) Preheat boiler feed water
- 7.) Install automated blowdown controls
- 8.) Optimize deaerator vent rate
- 9.) Adjust steam system based on production
- 10) Identify and close off dead legs (unused to sections of steam header)



System	Things to Check	Comments
Individual Boilers	<ul style="list-style-type: none"> • Opportunity with Boiler efficiency • Opportunity with Blowdown • Opportunity with scheduling 	<ul style="list-style-type: none"> • Are the boilers operating efficiently? When was the last time boiler tune-up was done? (boiler tune up should include minimizing excess air, cleaning boiler heat transfer surfaces, and improving fuel/air ratio control) • Automated blowdown results in lesser water wastage • Improving feed water treatment can also avoid excessive blowdown • Is heat recovery from boiler blowdown possible? • Can boiler be turned off on weekends? • Can we reset pressure back during weekends/non production?
Boiler System	<ul style="list-style-type: none"> • Opportunities with system optimization • Automated stack dampers • Combustion air temperature • Feed water temperature 	<ul style="list-style-type: none"> • Can we sequence the boilers so that the boiler operates in higher load? Boilers on high fire operate more efficiently • Stack dampers reduce losses • Hotter the combustion air, lesser work on boiler Possible to direct warmest air to combustion intake? • Hotter the feed water, lesser the work on boiler • Can the feed water be pre-heated from blowdown or exhaust?
Distribution System	<ul style="list-style-type: none"> • Opportunity with header pressure • Opportunity with dead legs • Recover steam for low-pressure applications • Steam leaks • Un-insulated lines/ Tanks • Steam Trap Failure 	<ul style="list-style-type: none"> • Can boiler header pressure be reduced? • Closing off dead legs can reduce the amount of steam needed • Install back-pressure turbines instead of Pressure reducing valves (PRVs) • Steam Leaks, un-insulated steam lines / condensate lines/ flash tanks; all result in energy being lost. • Failed open traps have significant energy losses.