

## STEPS TOWARD MAKING A STEAM SYSTEM EFFICIENT

The combination of escalating fuel costs and rising equipment costs make steam system neglect a horribly wasteful proposition. A steam energy efficient steam system that has been properly designed and maintained will produce and use only the amount of steam needed to get the job done. The neglected one will have:

- **oversized steam traps**, blowing, leaking and plugged because of dirt
- **control valves wiredrawn**, unable to shut as a result of wet steam
- **high back pressure in condensate lines** due to blowing traps
- undersized steam and condensate lines with no provision for utilizing *flash steam*
- **low steam temperatures** because traps are discharging into flooded condensate lines
- **uninsulated** sections of steam system piping
- **low percentages of condensate return** that increase boiler fuel, chemicals, water and sewerage costs.

**The list goes on and on...**

The reasons for maintaining an efficient steam system are apparent ... wasted energy is wasted money.

### **Goals For Making A Steam System Energy Efficient**

Here's a list of the crucial steps to follow:

- Check your steam traps at least once a year.
- Be certain that the traps are properly sized, correctly applied and constructed of the highest quality materials.
- Protect all traps, regulators, vacuum breakers, pumps, and all other vulnerable equipment and components with upstream strainers. Install blow-down valves on them blow free of dirt,

un-dissolved boiler treatment chemicals and pipe scale.  
Perform this procedure at three times a year, religiously.

- ➔ Strive to eliminate system problems such as waterhammer. Re-design systems to reduce potentially dangerous situations.
- ➔ Keep the steam quality high. Control valves will wiredraw if drip legs are not adequate or if steam traps are not draining the condensate.
- ➔ Size both steam and condensate lines correctly. Over the years, many systems see unregulated contractor alterations, and equipment additions through expansions that never take into account *the very limitations of the system*.
- ➔ Return as much condensate as possible. It contains valuable energy in Btu's that can save up to 26% on boiler fuel costs.
- ➔ Insulate the system as thoroughly as possible. Insulation generally has a six- to nine-month payback on the initial investment.
- ➔ Condensate pumps should be used to return condensate to overhead lines where adequate lift pressures do not exist.
- ➔ Size control valves correctly. Oversized valves will wiredraw since they are working too closely to their seats. If undersized, they starve a system of proper energy. When sized correctly and fed dry steam, they will last almost twice as long.
- ➔ Do not allow condensate to stay in one place. It only needs one more component- air, to turn it into corrosive carbonic acid, which will slowly eat away at the pipes, internals of steam traps, destroy coils, heat exchangers, unit heaters, etc.
- ➔ Use air vents and vacuum breakers. Air inhibits good steam transfer and prolongs start-ups. Vacuum Breakers do their job at the high point of a piece of thermostatically controlled equipment, equipment that is periodically shut-off and on steam mains. Vacuum is broken and condensate is allowed to flow. **Note: for condensate to flow away from equipment the piping must be pitched properly, proper dip legs must exist and gravity drainage must occur.**

- ➔ Recover flash steam in the condensate. Since it was paid for once -- *why not use it twice?* Study the roofs of most plants that produce steam. Most likely, there are vent pipes spewing valuable energy dollars into the atmosphere.

## **Maintaining A Steam System**

- ➔ Assign individual(s) to blow-down system strainers at least once a month.
- ➔ Install a union connection between the strainer, trap and check valve. If service is required, all three components are checked before reinstallation.
- ➔ Form an energy team in each plant that will be made aware of any recurrent problems with steam system components. Any system changes should require energy team and engineering department approval.
- ➔ Establish standard specifications. A hodgepodge of components makes the system vulnerable to problems and requires maintaining a burdensome inventory of parts.
- ➔ Install pressure gages in the steam and condensate system to head off big problems by catching them when they're small ones.
- ➔ Make sure insulation that is removed for servicing is always re-installed.
- ➔ Use steam trap software for record keeping, loss computations, and for scheduling periodic steam trap audits. It is difficult to gauge progress without good record keeping.

***Good energy management is like creating an excellent product ... and insures an edge over the competition. LIVE THE OLD ADDAGE: Waste not, want not. Author, Bruce Gorelick, VP Conserv-it Software, Inc. <http://www.conserv-it.com>***