

If you use steam, you can save steam



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Steam and energy conservation

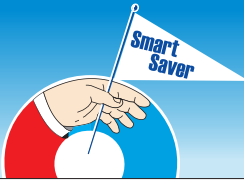
While money is as good a reason as it gets to save energy, other equally attractive reasons make this effort imperative in the long term. Some of these are related to core issues like global warming, depletion of the earth's resources, pollution, etc., that arise from extensive consumption of fossil fuels and directly affect the lives of all of us.

Steam accounts for the major source of industrial energy in many industries. In process heating, more than 60% of thermal energy used is in the form of steam. Because of the ever increasing costs of energy, and because conservation of energy in all forms is imperative, we must seek to understand better and improve the process by which we generate and use steam.

Fuel saving/steam saving opportunities can be significant because companies can identify and implement multiple system improvements, which could collectively yield savings of 10 to 15% in many cases, with a general project payback period of less than 2 years.

Steps in energy conservation:

1. Identify steam system costs - cost of fuel, quantity of steam generated, cost of producing steam for the facility, cost of steam per unit of production.
2. Identify properties of the steam system - temperature, pressure, saturation, other properties.
3. Evaluate boiler efficiency-blowdown rate and heat recovery opportunities, feedwater condition, flue gas composition and temperature.
4. Investigate energy losses in the steam distribution system steam leaks, trap losses, condensate losses, insulation losses, flash steam losses.
5. Assess opportunities for reducing distribution losses stop all leaks, introduce a trap management system, install condensate return systems, invest in better insulation, recover and use flash steam..



Steam traps should be inspected to determine whether they are functioning properly or allowing live steam to blow through. Generate a program for periodic inspection and maintenance of traps. Ensure correct reporting and evaluate monetary savings.

Typically, high pressure traps should be inspected at least twice a month, medium pressure traps once in two months, and low pressure traps once in six months.

Plants where traps haven't been inspected or maintained for 3 years or more, could have upto 30% of their traps blowing steam. This could be brought down to less than 5% with a well designed and executed maintenance program.

Consider that one leaking DN 15 steam trap on a 10 kg/cm² (g) distribution line can lose upto 25 kg of steam per hour. For a plant that operates 365 days a year, 24 hours a day, with a steam cost of Rs. 1.30 per kg, this translates to a loss of Rs.2,84,700.00

Extrapolate this to a plant with 300 traps installed with 10% traps leaking and this becomes Rs. 85,41,000.00 for the year.

Steps in Steam Trap Management:

- A. Train Personnel
- B. Locate and identify (tag) every trap
- C. Assess the operating conditions of every trap
 - Trap operation
 - Trap selection
 - Trap installation
 - Condensate return
- D. Rectify faults found during trap assessment
 - Replace leaking traps
 - Replace wrongly selected traps
 - Replace leaking valves
 - Ensure effective condensate return
- E. Develop a trap database and establish frequent checking
 - High pressure - check monthly
 - Medium pressure - check quarterly
 - Low pressure - check every six months



Losses ... Per hour ... Per Trap ...
from leaking traps
(Indicative figures at varying pressures)

| Working pressure (kg/cm ²) | | 3.5 | 7 | 10 | 14 | 17.5 | 20 |
|--|----------------------------|-------|-------|-------|-------|-------|-------|
| Steam loss (kg/hr) | | 10.5 | 18.5 | 25 | 35 | 45 | 50 |
| L O S S P E R H O U R | Coal fired boiler (Rs.) | 4.70 | 8.35 | 11.25 | 15.75 | 20.25 | 22.50 |
| | Oil fired boiler (Rs.) | 13.65 | 24.00 | 32.50 | 45.50 | 58.50 | 65.00 |
| | Baggase fired boiler (Rs.) | 3.70 | 6.50 | 8.75 | 12.25 | 15.75 | 17.50 |



Disclaimer: The information given in this booklet, is intended for guidance only. Actual values will vary depending on user conditions.