

## Steam System

- ◆ Fix steam leaks and condensate leaks
- ◆ (A 3 mm diameter hole on a pipe line carrying 7 kg/cm<sup>2</sup> steam would waste 33 kilo litres of fuel oil per year).
- ◆ Accumulate work orders for repair of steam leaks that can't be fixed during the heating season due to system shutdown requirements. Tag each such leak with a durable tag with a good description.
- ◆ Use back pressure steam turbines to produce lower steam pressures.
- ◆ Use more-efficient steam desuperheating methods.
- ◆ Ensure process temperatures are correctly controlled.
- ◆ Maintain lowest acceptable process steam pressures.
- ◆ Reduce hot water wastage to drain.
- ◆ Remove or blank off all redundant steam piping.
- ◆ Ensure condensate is returned or re-used in the process
- ◆ (6 °C raise in feed water temperature by economiser/condensate recovery corresponds to a 1% saving in fuel consumption, in boiler).
- ◆ Preheat boiler feed-water.
- ◆ Recover boiler blowdown.
- ◆ Check operation of steam traps.
- ◆ Remove air from indirect steam using equipment (0.25 mm thick air film offers the same resistance to heat transfer as a 330 mm thick copper wall.)
- ◆ Inspect steam traps regularly and repair malfunctioning traps promptly.
- ◆ Consider recovery of vent steam (e.g. -- on large flash tanks).
- ◆ Use waste steam for water heating.
- ◆ Use an absorption chiller to condense exhaust steam before returning the condensate to the boiler.
- ◆ Use electric pumps instead of steam ejectors when cost benefits permit
- ◆ Establish a steam efficiency-maintenance program. Start with an energy audit and follow-up, then make a steam efficiency-maintenance program a part of your continuous energy management program.