

Successful Implementation – Energy Conservation Measure

Measure
Reduction in distribution losses in steam distribution lines by revamping the insulation
Equipment
Steam system
Industry / Sector
Pharmaceuticals
Year of Implementation
1999
Cost Benefit Analysis
o Type of Measure: Short term measure
o Annual Energy Savings: 97 kL of furnace oil
o Actual cost savings: Rs. 12.70 lakh
o Actual investment : Rs.3.00 lakh
o Payback: 3 months
Implementation Highlights
<ul style="list-style-type: none"> ☞ Simple and short term measure can be implemented on all steam lines ☞ The measure can be duplicated in all types of hot surfaces ☞ Wide variety of insulation materials are available to choose based up on the temperature, application, etc ☞ Insulation has other benefits such as reduction in safety hazards ☞ Reduces the heat losses from steam lines thereby maintains the dryness fraction in the steam

Summary

Installation reduced the surface heat losses and reduces the energy consumption

Background

A leading pharmaceutical company has one 4 tph boiler to meet the steam requirement of the plant. The boiler uses furnace oil and consumes about 900 kL of furnace oil per year, which accounts for about Rs. 60 Lakh.

The steam generation pressure at the common header varied from 7-9 kg/cm²-g. Steam is supplied to various sections of the plant. Detailed survey indicated that the insulation of the steam lines was completely damaged. The surface temperatures measured in the range of 68-80 °C, which were on higher side. The steam insulation was damaged from the top and it was also observed that the water was entrapped in the insulation and causing huge steam losses.

Estimated surface heat losses indicated that about 16-17 lph of furnace oil was consumed to compensate the losses.

Plant has taken immediate measure to replace the entire insulation and replaced with 2-3" of insulation

Principle

Transmission losses in steam lines mean that energy lost in the pipe lines has to be compensated by providing more energy at the boiler. Considerable fuel savings result by proper insulation of steam lines. It also ensures that the desired quality of steam reaches the user end.

Details of techno-economics:**Insulation details before and after implementation**

Particulars	Value	Units
Surface temperature before replacing the insulation	68-80	°C
Surface temperature after replacing the insulation	35-37	°C
Estimated FO oil loss – before modification	16.7	lph
Estimated FO loss after the insulation	2.8	lph
FO savings	13.9	lph
	100	KL/year
Cost savings	12.7	Rs. Lakh/year
Investment	3.0	Rs. Lakh
Payback period	3	Months

Results after implementation:**Implementation issues**

 Required stoppage of the boiler for considerable time