THAI KRAFT PAPER INDUSTRY COMPANY LIMITED

Repair or Replacement of Leaking Steam traps

SUMMARY OF THE OPTION

Thai Kraft Paper Industry Company Limited (TKIC) was founded in 1991, is located in Kanchanaburi in Thailand and produces more than 550,000 ton of paper per year.

During the energy assessment in August 2003, the Team conducted a steam traps survey in the utility area with boilers and a network of piping systems that support the steam requirements in the production process. The team found that several steam traps were either blowing or leaking which required immediate repair or even replacement.

During the follow up visit (December 04) records showed that most steam traps were already overhauled or replaced. However, about 20 steam traps were still malfunctioning. Based on the assumption that these have been repaired or replaced in the next maintenance period, investment costs were US$ 8900, annual savings US$ 13217 and the payback period was 8 months. Each year, 14121 coal and lignite is saved, which equals to a reduction of 977 tons CO2 emissions.

KEY WORDS

Pulp and paper, Thailand, Steam distribution and utilization, Steam traps

OBSERVATIONS

Steam traps are used throughout the Boiler Plant and in steam distribution piping (site reticulation) in all four waste paper plants and paper machines. The site's steam trap supplier conducts routine steam trap surveys. The most recent survey shows that 30 out of the 85 steam traps surveyed are either blowing or leaking and hence require repair or replacement.

Most of the steam traps that service the 105 barg, 505°C steam system are TLV HR150A thermodynamic type steam traps. Many of the traps have not been replaced since the plant was built. The plant engineers do not have any TLV product manuals or maintenance guidelines and as a result the majority of these traps were not maintained. It was found that several traps were malfunctioning.

Most of the steam traps that service the seven bargs, 185°C steam system are TLV A3N or P46 thermodynamic type steam traps. Some Spirax Sarco TD42 or fixed orifice traps are also used. Many of these traps were observed to be shut down (isolated) as they were leaking heavily. Several TLV A3N traps looked quite new, indicating some sort of replacement program. Steam trap surveys are limited to the Boiler Plant and Reticulation piping. Steam traps inside the other plants are not surveyed and hence are not maintained.

OPTIONS

During the maintenance period following the August 2003 energy assessment, the company conducted the steam traps survey once again and repaired or replaced the faulty ones. As a result, leaks decreased substantially. Nevertheless, records reviewed during the follow up visit in December 2004 indicated that 20 steam traps are yet to be maintained. Four of them are high pressure types while approximately 16 are low pressure types. The energy losses could be

reduced when these steam traps would be replaced or repaired. This would be included in the next maintenance period comes.

RESULTS

The table below shows the financial and environmental results based on the assumption that all the identified steam traps would be replaced or repaired during the maintenance period after the last plant visit.

Calculations are based on the following assumptions:

- High pressure steam traps that are malfunctioning: 0.5 mm leaks (assumed).
- Low pressure steam traps that were leaking or malfunctioning: 3 mm leaks (assumed).

Financial Benefits:

- Investment: US$ 8900, calculated as follows:
  - 4 steam traps, 105 bar, (assumed as 0.5 mm leaking): US$ 6,500
  - 16 steam traps, 7 bar. (assumed as 3 mm leaking): US$ 2,400
- Annual operating costs: incorporated in maintenance costs
- Annual cost savings: US$ 13217, calculated as follows:
  - 4 steam traps 105 bar: US$ 9612
  - 16 steam traps 7 bar: US$ 3605
- Payback period: 8 months
  - Steam traps 105 bar: 8 months
  - Steam traps 7 bar: 8 months

Environmental Benefits

- Annual coal and lignite savings: 14,121 tons
  - 4 steam traps 105 bar: 13,976
  - 16 steam traps 7 bar: 145 tons
- Annual GHG emission reductions: 978 tons CO_2, calculated as follows:
  - 4 steam traps 105 bar: 711 tons CO_2
  - 16 steam traps 7 bar: 267 tons CO_2

FOR MORE INFORMATION

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