Inspect and Repair Steam Traps

In steam systems that have not been maintained for 3 to 5 years, between 15% to 30% of the installed steam traps may have failed—thus allowing live steam to escape into the condensate return system. In systems with a regularly scheduled maintenance program, leaking traps should account for less than 5% of the trap population. If your steam distribution system includes more than 500 traps, a steam trap survey will probably reveal significant steam losses.

Example

In a plant where the value of steam is $4.50 per thousand pounds ($/1,000 lbs), an inspection program indicates that a trap on a 150 psig steam line is stuck open. The trap orifice is 1/8 inch in diameter. The table shows the estimated steam loss as 75.8 lbs/hr. By repairing the failed trap, annual savings are:

\[
\text{Savings} = 75.8 \text{ lbs/hr} \times 8,760 \text{ hrs/yr} \times \$4.50/1,000 \text{ lbs} = \$2,988/\text{yr}
\]

### Leaking Steam Trap Discharge Rate

<table>
<thead>
<tr>
<th>Trap Orifice Diameter (inches)</th>
<th>Steam Pressure (psig)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15</td>
</tr>
<tr>
<td>1/32</td>
<td>0.85</td>
</tr>
<tr>
<td>1/16</td>
<td>3.4</td>
</tr>
<tr>
<td>1/8</td>
<td>13.7</td>
</tr>
<tr>
<td>3/16</td>
<td>30.7</td>
</tr>
<tr>
<td>1/4</td>
<td>54.7</td>
</tr>
<tr>
<td>3/8</td>
<td>123</td>
</tr>
</tbody>
</table>

From the Boiler Efficiency Institute. Steam is discharging to atmospheric pressure.

### Steam Trap Testing Facts

Steam traps are tested to determine if they are functioning properly and not cold plugging or failing in an open position and allowing live steam to escape into the condensate return system. There are four basic ways to test steam traps: temperature, sound, visual, and electronic.

### Suggested Actions

Steam traps are tested primarily to determine whether they are functioning properly and not allowing live steam to blow through. Establish a program for the regular systematic inspection, testing, and repair of steam traps. Include a reporting mechanism to ensure thoroughness and to provide a means of documenting energy and dollar savings.
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