



Department of Environmental Affairs and Development Planning

FIXING STEAM LEAKS

FACT SHEET

Steam leaks are routinely ignored by many manufacturing facilities and as a result are creating unnecessarily high operating cost. Steam leaks are inevitable as day-to-day wear and tear on pipes and valves (and various other equipment/parts) occur due to the pressures and temperature by which [steam](#) is distributed. These steam leaks form part of operating costs that are not easily visible, and they reduce the efficiency of steam distribution to the source equipment. Thus looking at ways to reduce steam leaks may be attractive to reduce operating costs, which in turn contribute to higher profits.

WHY implement?

A small leak may represent significant energy losses over a year making it very expensive to accommodate. Having steam leaks in your facility could lead to:

- Higher temperatures in the boiler room and surrounding distribution lines. This causes an increase in ambient temperature in the work place and may lead to an [uncomfortable working environment](#) and higher air conditioning costs.
- A drop in system pressure that can cause equipment to operate less efficiently by reducing the amount of heat delivered.
- An approximate 3 kg of carbon dioxide to be emitted to atmosphere for every 1kg of heavy fuel oil (HFO) burnt unnecessarily due to steam leaks.

Fixing steam leaks is an easy and low or no cost way of decreasing operational cost and increasing energy efficiency. Fixing steam leaks renders various advantages such as:

- A 3-5 % efficiency in steam systems improvement, which in turn means a reduction in operational costs.
- In general leaks repair has a short pay back of two months or less.
- Fixing steam leaks will preserve surrounding insulation on pipes and valves.
- Saving of up to 34% on steam energy cost.

HOW to implement?

First complete a thorough audit on the steam distribution system by searching for leaks, which mainly occur at valve stems, pressure regulators, and pipe joints. This can be done manually (by listening) or using a magnifying instrument such as an [ultrasonic acoustic measuring device](#). Leaks found should be made visible by tagging.

Secondly, fix leaks by replacing seals, tightening pipe joints or putting in place other necessary options.

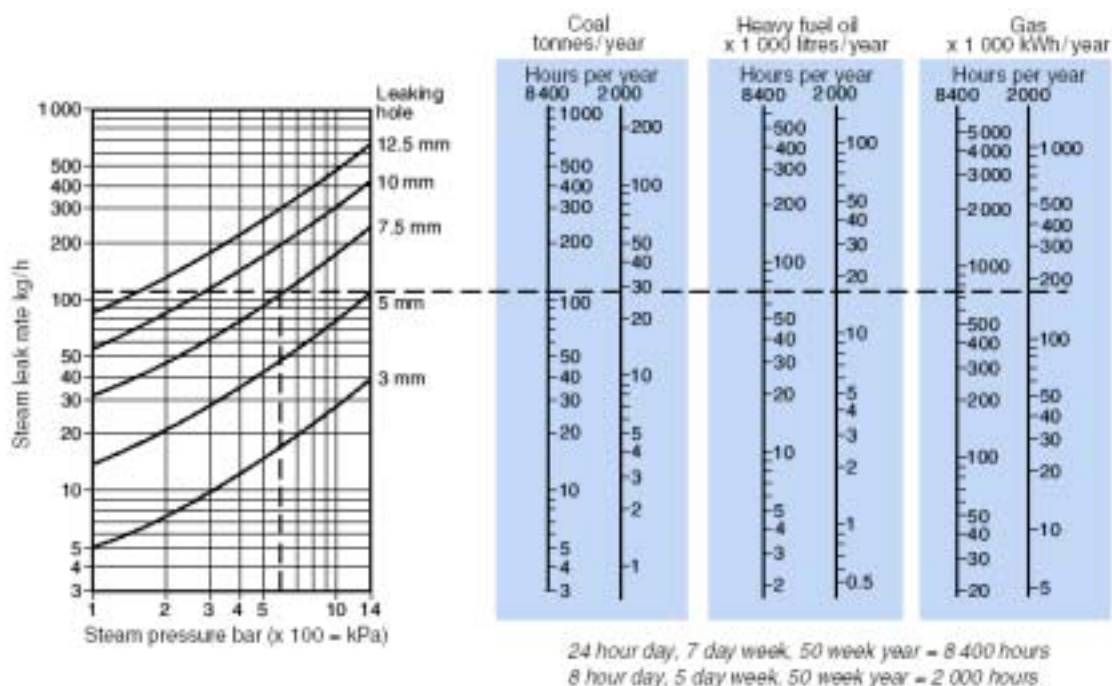
WHAT is required to implement?

Set up a monitoring plan to allow continuous auditing and monitoring of steam leaks. Assign staff (equipped to work with steam) that are well acquainted with the status and positioning of the steam distribution system, to do the audits and fix leaks.

Example

To determine a 7.5mm hole steam leak at 6 bar, read from the table below the pressure line at 6 bar upwards meeting the 7.5mm orifice line. Extending to the left will show that approximately 110kg of steam an hour will be discharged. Extending to the right will represent that for a year (of 8400 hr's), this shows a waste of 110 tonnes of coal, 70 000 litres of heavy fuel oil or 700 000kWh of gas.

A table representing steam loss through leaks.



Source: Spirax-Sarco

- Instituting a regular leaks testing program is good economic practice and contributes to a proactive rather than a reactive action in dealing with energy losses.
- For more information on how to calculate your emissions from boilers visit the <http://www.clever-brooks.com/emissions0.html> web page.

Sources and Useful Links:

- Thomas Net: http://news.thomasnet.com/IMT/archives/print/2000/12/scheduled_testi.html
- Tri State: <http://tristate.apogee.net/et/ehubslk.asp>
- Spirax Sarco (steam): <http://www.spiraxsarco.com/learn/pdf/block1module1.pdf>
- Semcosh (uncomfortable working conditions): <http://www.semcosh.org/heat.htm>
- Flow control network (ultrasonic acoustic measuring device): <http://www.flowcontrolnetwork.com/PastIssues/sep1999/2.asp>

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The entire range of fact sheets can be found by visiting the www.capegateway.gov.za web page.