

Maintenance of Steam Traps and Wet-Bulb Water Supply

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Maintenance of steam traps can be divided into two parts: (1) preventive and (2) corrective. Preventive maintenance is much the easier. It begins in the boiler room and follows an orderly path through the entire steam system and more or less ends on the repair bench.

The first step of preventive maintenance on steam traps is the proper conditioning of the steam supply. Boiler feed water, unless treated, may contain a number of alien elements that are harmful to the entire steam system. At one large battery of kilns that tried to operate without proper treatment of boiler water, two repair men worked six days a week with added hours of overtime just doing necessary repairs on the steam lines. These repairs included everything from new valves and pipe fittings to new and more traps. For a period of six months these two repair men worked in conjunction with the regular maintenance man who spent most of his time making up lists of required repair parts.

The cost of these extensive repairs was prohibitive. As a corrective measure an injection system was installed in the powerhouse to pump corrosion-preventive chemicals directly into the steam main to the kilns. This system was further improved upon. The chemicals are now injected into the boiler feed water, adding protection to the steam system in the entire plant as well as reducing the cost of operation for the dry kilns.

The second step of preventive steam-trap maintenance is less direct, but there is a connection. Each kiln has several valves for controlling the steam supply. The automatic valves must have the packing glands repacked or tightened at regular intervals to prevent their leaking excessively or failing to function properly. Improper functioning of these valves may throw an excess of steam against the traps, or the valves may not open and leave the trap idle. On top of the packing gland nut there is usually a shallow depression. We have found that a drop or two of heavy oil applied to the valve stem at this point will afford sufficient lubrication of the stem and packing gland to keep the valve in good working order.

Up to now the steam trap has been mentioned as only a part of a complex system of valves and pipes, yet the trap is a very important part of the entire heating system.

Regardless of the make or type of trap used, its one purpose is to pass condensate and retain live steam. Whether the parts be complex or simple makes little difference so long as they function properly. Each piece has a specific size and shape, that must be maintained to keep the trap in good working order.

To keep each trap in perfect condition, a system of routine checks is helpful. The interval of these routine checks may be one month, two months, or three months, depending upon local conditions. At first, a trial period may be set up and increased or decreased according to the condition of the trap at the end of the period. Having kept a record of each inspection, it is easy to tell how long the interval between checks should be. How does one check the operation of the trap?

If you can see the trap and can drain the exhaust outlet to the atmosphere, put a valve on the exhaust side of the trap and open it when you want to check the trap. A little experience will tell whether the trap is opening or closing properly.

If the trap is in a position where you can reach it but cannot exhaust to the atmosphere, listen to how the trap is working. Hold a stick of wood, a screwdriver, or a similar sounding device against the trap housing and against the ear to listen to what is going on inside the trap. The inside workings of some traps can be heard without such aids.

The second method of steam trap maintenance is corrective. It involves work right from the beginning. By corrective it means you wait until something goes wrong on your kiln control. To cite one instance, the temperature pen on the kiln chart drops below setting, and you start checking the air lines, diaphragms, and so on until you come to the trap. You may find the trap is not working and needs repairs. It takes time to dismantle and repair a trap. An extra trap or a complete set of traps costs very little compared to an hour lost on a kiln charge of lumber. Therefore, I keep a spare trap in readiness and can install the good trap and start the kiln again without delay. I can then repair the worn trap as I have time - not in the back end of a dark kiln but under a light on a repair bench.

The second part of this talk on wet-bulb water supply is brief but may be very valuable to some operators. It ties in directly with trap maintenance and repair, for we have found that condensate from the trap is the best readily available water for the wet-bulb wick. We have a storage tank on top of the kilns for holding a supply of condensate. We pass this condensate through a commercial filter before piping it to the wet-bulb drip wells. We also inject condensate into our steam spray system for conditioning the lumber to remove drying stresses. All excess condensate is returned to the power house for re-use in the heating system.

These measures have helped us at the Ralph L. Smith Lumber Co. to operate our kilns with less down time and less repairs than formerly. We hope you will find some of them helpful in reducing drying costs at your respective plants, also.