

**Boiler room routines (part 1)**  
**by Harry de Jong**

## **BOILER ROOM LOG**

During operation, there are certain procedures that should be performed by the operating personnel. The best way to keep track of procedures and to help to remind the operator to perform certain functions is to keep a boiler room log.

For a log to be effective, it must provide a continuous record of boiler operation and maintenance and record any unusual observations.

The number and frequency of the checks to be performed depend on the type of boiler room installation. The Hartford Steam Boiler Inspection and Insurance Company, in their Engineering Bulletin No. 70 "Boiler Log Program", explains why a log is desirable, and also points out the various tests to be performed on the equipment and apparatus. Bulletin No. 70 recommend the various tests to be performed and the frequency of log entries as follows:

- *Low Pressure Steam and Hot Water Boiler Logs - Weekly Readings.*
- *High Pressure Power Boiler Log, for relatively small plants that do not have constant attendance - Twice daily readings with more frequent checking while in operation.*
- *High Pressure Power Boilers Log, larger units in large plants - Hourly readings, the preferred frequency for all high-pressure boilers.*

In the interest of accident prevention and safe operation and maintenance practices, the Hartford Steam Boiler Inspection and Insurance Company and Cleaver-Brooks Division of Aqua-Chem. Inc. offer without cost or obligation, copies of their boiler room log. Consult your Cleaver-Brooks rep. or write to The Hartford Steam Boiler Inspection and Insurance Company, One State Street, Hartford, Connecticut 06102-5024.

## **LOW WATER CUTOFF**

Statistics show that by far the largest number of preventable accidents involve the overheating of a boiler. Most of the occurrences are due to low water conditions.

The most recommended method when the boiler is operating is to shut off the supply of feed water to the boiler.

If the boiler is equipped with its own individual feed pump, the pump can be shut off. If more than one boiler is supplied from the same pump, then a valve in the feed water line to the boiler can be closed. With the supply of water to the boiler shut off, the water level will slowly drop until it falls to the point where the low water cutoff mechanism should actuate and shut the burner down. The low water cutoff should activate before the water disappears completely from the gauge glass.

When blowing down the gauge glass and the water column, the operator should carefully observe the action of the water in the glass. When the drain valve is closed, the water level should recover promptly. If the water level is slow or sluggish in retuning to its normal level, it is an indication that there is some obstruction partially blocking the flow of water into the control chamber. If the apparent obstruction cannot be cleared by blowing down, then the boiler should be shut down and cooled off so the water

column float (or probe) chamber can be opened and inspected. If there are any mud, scale or sediment deposits, they should be removed completely. The float and linkage should be examined to make sure that everything is in good working order. All the connecting piping should be inspected and, if necessary, rodded out to remove any obstructions.

On a steam boiler, the head mechanism off the low water cutoff device(s) should be removed from the bowl at regular intervals to check and clean the float ball, the internal moving parts and the bowl or water column.

In addition, and at the same time, remove the pipe plugs from the tees or crosses to make certain the cross-connecting piping is clean and free of obstructions. Controls must be mounted in a plumb position for proper performance. Determine that piping is vertically aligned after shipment and installation and throughout the life of the equipment.

A scheduled blowdown of the water controls on a steam boiler should be maintained.

On a hot water boiler, it is impractical to blow down the low water cutoff devices since the entire water content off the system would become involved. In addition, since many hot water systems are fully closed, any loss of water will require make-up and additional feed water treatment that might not otherwise be necessary. Since the boiler and system arrangement usually makes it impractical to perform daily and monthly maintenance of the low water cutoff devices, it is essential to remove the operating mechanism from the bowl annually or more frequently if possible to check and clean the float ball, internal moving parts, and the bowl housing. Also check any cross-connecting piping to make certain it is clean and free of obstruction.

## **FEED WATER PUMPS**

One of the most important times in the life of the pump is when it is installed. Proper installation at this time will do more to pump longevity than any other item.

The pump should be very carefully levelled, grouted and aligned before it is piped. Then to make sure the piping has not distorted the pump housing or pulled it out of alignment, the pump should be checked again and realigned if necessary.

During periods of operation, there is very little that can be done except to check it periodically to make sure that everything is functioning properly. Bearing temperatures should be checked. At the same time vibration can be observed. Packing gland adjustment can be done and depending on types of lubrication methods employed, lubrication of the bearings can be done.

Just like other pieces of equipment in a boiler room, the pump should be taken out of service for a preplanned schedule for monthly, semi-annual and annual inspections. At that time bearings should be opened up, checked for wear and alignment, washed out thoroughly and reassembled with new lubricant.

During the same inspection, the pump seals can be inspected and, if necessary, replaced. If the pump is equipped with mechanical seals and they are working alright, then probably the best advice is to leave them alone.

If the pumps are equipped with a packing type seal, they should be inspected and repacked if necessary.

Any suction and discharge strainers should be inspected, opened and cleaned. Suction and discharge piping should be checked for proper support, leaks, etc. If the boiler room log entries indicate that the pump performance has fallen off appreciably, perhaps overhaul of the pump is advisable. Rotor wear and increased clearances will affect pump capacity and discharge pressure. If a major overhaul of the pump is indicated, the pump manufacturer should be contacted for instructions and recommendations.

Above article is part of the Cleaver-Brooks Boiler Room Guide and was submitted by Harry de Jong of Canadian Boiler Industries Ltd. For further information, Harry can be reached at 403-255-0186

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