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BULLETIN NO. LR-15

OPERATION AND REPAIR of HEATING SYSTEMS

CARE OF BOILERS OUT OF SERVICE

one of a series of
OPERATIONS ENGINEERING BULLETINS

P H A LOW-RENT HOUSING
BULLETIN



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NOTE: Some bulletins will be issued in parts, of which one or more will be contained in the initial release of each bulletin; other parts will be issued subsequently from time to time as they are completed.

CARE OF BOILERS OUT OF SERVICE

1. INTRODUCTION

a. The purpose of this bulletin is to outline methods of caring for boilers that are removed from service. When operation is to be discontinued for an extended period, special precautions should be adopted to guard against corrosion and general deterioration. To minimize corrosion, boilers should be kept either absolutely dry or completely filled with water. This applies to all types of boilers, whether water-tube, fire-tube, or cast-iron-sectional.

b. The dry lay-up method normally is not used except for out-of-service periods of more than six months, or when the boiler may be subject to freezing temperatures when out of service. The wet lay-up should be used whenever the boiler is out of service for more than 30 days and less than six months. For periods of less than 30 days it is usually simpler to hold the boiler completely filled with water by filling it up after steaming is stopped.

2. LAY-UP PREPARATION

a. Fireside Cleaning. When a boiler is out of service in either a wet or dry condition, the furnace, exposed surface of plates, tubes, and stack outlet connection on boiler should be very carefully cleaned of all dirt, ashes and soot. When coal, oil, or gas is burned, the sulphur in all these fuels also burns and forms sulphur dioxide. There is some sulphur dioxide in every particle of soot and ash. When this form of sulphur comes in contact with any small amount of water, even the moisture in the air, it forms an acid which attacks the metal in the boiler, tubes, and stack connection. Therefore, it is just as important to remove all the soot and dirt from the furnace and fire tubes as it is to remove the scale and mud from the inside surfaces. When this is finished, tightly close all furnace doors, inspection doors, and both stack and forced draft dampers, and keep them closed as long as the boiler is not in use. If the weather is very damp or rainy, it may be advisable to light a small wood fire to dry out any moisture that manages to enter. Be sure that no water can drip into the insulation, furnace or brick work.

b. Water Side Cleaning. Clean the boiler thoroughly internally. Remove all traces of scale and mud from the interior surfaces, using mechanical tube cleaner if necessary. Examine for leaks and repair all defective tube ends and rivet joints.

3. DRY LAY-UP

a. To keep the boiler out of service in a dry condition, the inside of the boiler must be kept absolutely dry. Take every precaution to be sure that no water or steam can leak into the idle boiler through a feed water valve, drain valve, or steam valve.

b. After the boiler has been thoroughly flushed and drained, and all sludge and scale removed, wipe up carefully any puddles of water remaining in the boiler so that the entire inside surface is completely dry. Then place trays of quick lime or silica gel in the boiler. Carefully and tightly seal all openings, such as valves, manholes, and hand holes. Both quick lime and silica gel are chemicals which readily soak up moisture from the air, so they will absorb any moisture that might condense inside the boiler when the temperature changes. Inspect the trays of lime or silica gel about once every two months to be sure they are dry enough to continue absorbing moisture.

4. WET LAY-UP

a. For a period of less than one month, fill boiler completely with water after it has stopped steaming and pressure has returned to zero. Use boiler feed water if available; otherwise use regular water supply.

b. If the wet lay-up period exceeds one month, completely drain and carefully wash the internal surface of the boiler, removing all sludge and scale. Refill boiler with fresh water to normal water level, adding caustic soda, about one pound of soda for every 125 gallons of water. The caustic soda should be thoroughly dissolved in water and poured into the boiler. Also add sufficient tannin to give water a dark tea color. Start a slow fire and allow the water to boil under atmospheric pressure for several hours to thoroughly circulate the chemicals. Then completely fill boiler with water. When the boiler has cooled, close all vents tightly and seal the boiler from atmosphere. When returning the boiler to service, drain and refill it; otherwise the alkalinity of the water will be too high.

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