

EXTERNAL BOILER CLEANING IN DRY DOCK

BY

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It recently became necessary to clean externally H.M.S. *Lion's* boilers while in dry dock. She was supplied with dockyard steam at about 40 lb/sq in. in the ship's range, and shore electrical supply.

The forward boiler room was so far dismantled for dockyard work that it would have been impossible to flash the boilers for drying out; and so, as the external deposits appeared to consist entirely of dry soft soot without any nesting or hard deposits, it was decided to accept a dry sweep down for these boilers. It has been the practice to sweep loose soot out of the boilers before water washing, and it was thus only necessary to blow through the economizers, generator and superheater tubes with L.P. air to complete the job. The result certainly looked very clean. The soot was blown as far as possible into the furnaces and then removed in disposable paper sacks.

Water washing is not, of course, mandatory for the external cleaning of boilers. However, it does seem to have become widely viewed as the only effective method. It appears, in fact, that under certain conditions it may be less desirable; an admixture of soot and water in difficult-to-clean, slow-to-dry-out corners is an unpleasant combination in an idle boiler. It must be admitted that the dry clean took longer than a water wash and it is less amenable to being carried out as an evolution, but it can be steadily progressed without prejudice to refitting work going on in the boiler room. It is also, surprisingly, less messy than the water wash. Therefore there seem to be reasons for the Engineer Officer to inspect his boilers before deciding which method of cleaning to employ. Some scope also exists for the perfection of some simple elements of pneumatic cleaning gear.

The after boiler room was more or less intact from the degradations of the dockyard, and it was decided to water wash its boilers, although they were in no worse condition than the forward boilers. The situation was unusual in that the ship's boilers had always previously been washed by a T.C.V. or with steam raised in the other unit.

A one-inch copper pipe in lieu of a suitable hose was run from a convenient valve on the saturated range to the feed heater drain connection on the star-board reserve feed tank. With the restricted steam flow, a back pressure of some five pounds per square inch and an ambient temperature of 30 to 40 degrees F., it took about five days to raise the temperature of 30 tons of feed water to 120 degrees F., a result that confounded our rather 'Harry Tate' thermodynamic prophesy of 24 hours! About 10,000 lb of steam was condensed in the tank.

The auxiliary feed pump is normally used to pressurize the water for washing but, although we had recently received the steam injector on board for trial and it had proved itself with ship's steam pressure, it could not be used with the steam pressure available from the dockyard. We fell back on an electric

Worthington Simpson 75 tons/hour fire and bilge pump situated in the boiler room. A suction was taken from its suction chest through a suction hose to the harbour service feed pump reserve feed tank suction valve. A canvas hose led the pump discharge to the water washing manifold. A 'Y' piece was fitted at the pump discharge and a second hose led back to the reserve feed tank filling funnel. This acted invaluablely as a leak-off, allowing the discharge pressure to be controlled; before this was fitted, everyone got rather wet as the constant-speed pump was delivering about 160 lb/sq in., and canvas hoses were parting company with instantaneous connections.

As it was felt that overheating of the fire and bilge pump might occur due to the temperature of the working fluid, the air pump and motor air bell, normally cooled by a bleed from the pump discharge, were cooled instead from an adjacent cold fresh water connection in the boiler room, the cooling discharge being allowed to run to bilge, and normal connections blanked.

The furnaces and bilges were suctioned with an electrical portable 35 tons/hour pump, discharging down a conveniently dismantled sea valve.

The wash went quickly and well, and there was no problem about flashing up on Dieso using the electric lighting-up pump and fan.

Apart from the apparently inevitable fact that several adaptors 'known to be in the ship' could not be located until new ones had been made, this method seemed simple and effective. It could be used if the ship were self-supporting on Diesel power provided the disadvantage of cold water is accepted.
