

NOTES FROM SEA

Readers are invited to discuss either the extracts or the comments in the correspondence section of the Journal.

MARINE ENGINEERING

Comments by D. M. E.

Distilling Plant—H.M.S. 'Murray'

Difficulty was experienced in raising a vacuum in the distiller shell after cleaning and replacing the coils in the evaporator after interim docking.

All the usual reasons were investigated and no defects found. A taper was applied to the distiller shell and a leak found in the external sweating on the plain end plate. On removing the lagging it was found that the sweating had parted along 70 per cent of the entire circumference.

The distiller was removed by dockyard, stripped and re-sweated inside, reassembled and sweated externally, and has since functioned satisfactorily.

This shell is bolted to the ship's side and may be affected by vibration and working of the hull; a full-power trial had been completed immediately before docking.

It is suggested that the distiller should be fitted with sliding feet; it would be difficult to leave bolts slack for expansion purposes in a unit which is bolted to a vertical surface.

Distilling Plant—H.M.S. 'Duncan'

A loss of 7-9 inches of vacuum when the vapour valve was opened led to the distiller condenser being tested to 15 lb/sq in. The tests showed a bad leak at the soldering and rivets securing the condenser flange to the body. As operational requirements did not allow a permanent repair, the leak was treated successfully with Araldite and glass wool bandage.

Comment

The defects reported by *Murray* and *Duncan* are typical of a number received by this department on the same equipment.

The cause of the defect could be lack of provision for expansion on the feet of the condenser and ships would be well advised to check that the bolt holes are elongated.

In reply to an S.2022 from H.M.S. *Tiger* the manufacturer was unable to suggest any reason other than expansion for this defect.

In modern design, the end flanges and seams of the shells are welded and this should eliminate this defect. For ships fitted with the riveted shells the firms have been asked to produce proposals to modify the shells to avoid further failures of this type.

Main Boilers—H.M.S. 'Dundas'

As a result of contamination of the feed water from a punctured lubricating oil separator heater coil, H.M.S. *Dundas* had traces of oil in her superheater as well as a good deal of oil in the boiler. The boilers were cleaned by the Atlas Company, using Trichlorethylene (T.C.E.). The superheaters were cleaned by circulating Greesequilla mixture through them, via the running down valves and the dehumidifier. The deposit of Greesequilla powder inside the superheater tubes presented a problem. It was finally removed by shooting bullet-brushes

through each tube. The bullet-brush, borrowed from the A.F.E.S., Haslar, proved excellent value although the brushes had a nasty habit of bouncing back up the tubes or disappearing up steam pipes. A very rigorous control is required when using this gear and the explanation that 'it's probably in the bilge' can never be accepted. (Report dated 30th Sept. 1960)

Comment

Noted with interest. Contamination of boilers with lubricating oil is not so serious as contamination by F.F.O. which, even in small quantities, can cause failure of boiler tubes in a very short time. As it is usually difficult to differentiate between lubricating oil and F.F.O. which has been 'distilled' in the boiler, all oil contamination must be regarded as serious unless proved otherwise.

The use of T.C.E. is considered essential for degreasing large units such as a boiler, and the use of T.C.E. must at present be carried out by a commercial company.

The successful use of the new bullet-brush equipment for removing the powdery deposit is very satisfactory. The necessity for strict accounting of all brushes and also for the temporary plugging of steam pipes, etc., while cleaning is taking place, is strongly endorsed.

Steam Systems—H.M.S. 'Grafton'

The large number of steam joints which leaked after refit has emphasized the desirability of testing steam ranges with L.P. air before the lagging has been replaced. Dockyards should be pressed for this to be done. H.M.S. *Ark Royal* attributed an improvement of nearly 200 tons of feed water per day to rejoining as a result of an air pressure test. (Report dated 30 Sept. 1960)

Comment

Reference to the use of L.P. air to assist in the detection of leaks in steam systems is made in B.R. 3001, Art. 1106.

For new construction and modernizations, where spiral wound gaskets are fitted, system testing is to be limited to applying L.P. air at 80-120 lb/sq in. to check for omissions in initial gasket compression and other defects. Final testing to full working pressure is only to be carried out with the operating medium of the system.

Main machinery contractors and dockyards have been informed and G.R.M.(E) is being amended.

Main Engines—H.M.S. 'Grafton'

After completing a 6½-month refit, H.M.S. *Grafton* discovered a noise 'like a Diesel starting,' which appeared to come from the astern turbine whenever the turbine was put from ahead to astern. The turbine was lifted and the astern manoeuvring valve was refitted. As nothing was found which could account for the noise, the gearing was examined and it was discovered that the maker's marks on the spline couplings did not coincide.

The torquing-up of the gearing was measured by feelers and was pronounced incorrect by the Admiralty representatives conducting the test. It was found that all the teeth were not touching along the length.

It was decided to re-torque-up the gearing and this proved a very lengthy job, as much special gear had to be manufactured. On completion, the ship resumed her sea trials and the noise persisted, although greatly reduced. It is now believed to emanate from the astern manoeuvring valve, which is believed to rotate under certain conditions. (Report dated 30th Sept. 1960).

Comment

No similar reports have been received from other ships of the class. This appears to be an isolated case.

Main condensers—H.M.S. 'Teazer'

H.M.S. *Teazer* had both condensers repacked during her refit which ended in February, 1960. Previously, 'bird-nesting' of the outlet cranes packing had been frequent. The outlet packing was renewed with Branda, in accordance with A.F.O.2299/59. Heavy condenseritis was caused in July when one tube 'walked out' of the tube-plate. When the condenser was opened up it was found that many outlet packings were severely 'bird-nested'. The other condenser was found to be even worse, a total of about 500 packings being affected.

The affected tubes were repacked during the ship's docking period in August. Because the outlet tube-plates are badly de-zincified around the tube holes and the outer threads have virtually disappeared, it was decided that the second turn of Branda packing should have half its metallic portion cut off. This allowed the fibre ring to end up opposite threads in better condition into which it could bite and, thereby, seal the packing.

In addition, activated zinc anodes were fitted to the outlet tube-plates to avert further de-zincification. Their wastage, after two weeks' steaming, is appreciable. (Report dated 30th Sept. 1960).

Comment

An A.F.O. will be promulgated in the near future stating the latest policy on the protection of the sea-water side of main condensers against corrosion.

For condensers fitted with R.N.B. tube-plates, zinc anodes are to be fitted at the outlet end. For new construction the tube-plates are of aluminium bronze which has superior corrosion resistant qualities and the fitting of zinc anodes is considered unnecessary. In all cases, the fitting of steel slabs is to be discontinued.

ORDNANCE ENGINEERING

D.P. 14 Compressor (G.A.S.U. Type 1 Mod. 2) Diaphragms

Many examples of discarded diaphragms have been examined and trials have been carried out to prove or disprove a theory that diaphragm failure probably arises, in many cases, from ineffectual clamping of the outer rim.

There is reason to believe that such ineffectual clamping occurs whenever it is necessary to pack the pump head off its flange on the crash case in order to avoid a collision between pump head and piston at top dead centre. (B.R.909, Chapter 6, page 57, paragraph 88.12 refers.)

The clamping of the outer rim of the diaphragm pack has been closely tolerated and if a soft packing (e.g. Klingerite) is introduced, or if any packing interferes with the raised head on the inside of the flange of the pump head, the diaphragm pack is not secured on its circumference and the reciprocating motion of the piston may cause severe racking on the stud holes and eventual tearing of the diaphragm material.

The paragraph in B.R.909 referred to above will be revised to read 'Turn the crankshaft several times to ensure that there is no fouling. Should fouling occur, fit a metal shim ring between the diaphragm pack and the crank case flange'.

Since the self-locking nuts will not stand repeated application, a contributory cause of ineffectual clamping may well have been from worn out or part-worn nuts which did not remain tight to the specified 3 lb ft torque. Nuts, Stiff, U.N.F. 2 B.P. Steel, 18T.P.1, *Rate Book* Section B.2.d, page 90, Joint Services Group/Class 5310, No. 941-3199 are suitable replacements and when 'A' Spare provision is exhausted it will not be replaced. B.R.226C will be amended in due course.

An A.F.O. giving full details of the adjustment to avoid a collision between piston and pump head will be issued.

Mk. 6M Directors—Training Load Resetter—H.M.S. 'Lynx'

Reports have been received stating that oil had penetrated the training load resetter in the AA/SH director Mk. 6M with a consequential fall off in performance.

Ships were requested to render reports stating if any leakage had been found and 50 per cent of reports stated 'yes'.

Action has now been taken for the manufacture of modified load resetter boxes and these should be available for retrospective fitting in the Fleet within the next year.

G.D.S. Mk. 2*—H.M.S. 'Torquay'

A report has been received stating that if the G.D.S. system is left switched on for more than a few hours under tropical conditions the elevation retransmission unit overheats and seizes mechanically.

Comment

No previous report of this nature has been received and any ship having experienced such troubles should render a report accordingly.

4.5 in. Mk. 6 Mounting Shell and Cartridge Hoists—H.M.S. 'Daring'

During the past 18 months shell and cartridge hoists have at various times developed unsatisfactory cut-offs.

Initially little was known of the modification state of the hoist valves and on investigation it was found that the combined control and cut-off valves were modified to take chevron packing in accordance with Mod. 17 part (1); the shuttles fitted were not modified in accordance with Mod. 17 part (4).

The following facts were also considered relevant :—

- (a) The cut off failure is always on the up stroke, at no time has there been any difficulty experienced in obtaining satisfactory cut-off on the down stroke
- (b) The effect cannot be rectified by adjustment
- (c) The four cut-off valves of more recent design have given no trouble
- (d) Shuttles show little if any signs of scoring
- (e) Usually replacement of seals is all that is required to ensure satisfactory operation.

Comment

It has now been arranged that a pool of up-to-date valves for shell and cartridge hoists in general is made available by the Superintendent, A.G.E. Depot, Openshaw. All ship valves will be refitted as time and opportunity permit and the control valves being refitted in this scheme will be suitable for any position i.e. of the latest universal type.

Regarding the remarks on differences in cut-off, it is important that the correct shuttle valves be fitted to the respective shell and cordite hoists.

A modification to strengthen the shuttle valve spindle is being progressed and will be promulgated in the near future.

C.R.B.F.D. Mk. 5—Tachometric Box Mk. 5 Mod. 1—H.M.S. 'Belfast'

Both 'A' and 'C' vertical rate dials were observed to be oscillating. Movement of the joystick stopped the 'A' dial oscillating but the 'C' dial continued to do so. Consequently the A2 unit was removed for inspection. The output roller of the vertical acceleration displacement unit was scored and the section was replaced by a new unit drawn from the G.E. store and the defect was no longer present.

Comment

D.G.W. (S) investigated this and confirmed the Ship's Officers' views that the defect was caused by localized wear of the roller due to break down of case hardening, but considers this to be an isolated case.