



OFF THE CHINA COAST

## NOTES FROM SEA

The following are extracts from letters received by the Engineer-in-Chief's Department from Engineer Officers of sea-going ships, together with comments, where appropriate.

The extracts from the letters and the replies sent to individual ships are not always in a form suitable for publication in the *Journal*. In some cases, therefore, the extracts have been slightly altered in form but not in substance, and the comments have been amended and amplified.

Readers are invited to comment in the correspondence columns of the *Journal* on the extracts and replies.

### **Recreation Space Air Conditioning Plant—H.M.S. 'Ocean'**

Trials carried out both in home waters and at Gibraltar have produced the interesting result that this space is cooled down to a lower temperature with direct ventilation than with recirculation. Under both conditions the plant was working at about 50 per cent of its full output due, it appears, to the cooler unit being of insufficient size. It is likely that, under tropical conditions, recirculation might prove better than direct ventilation.

**Comment**

The unit fitted is considered adequate to perform the duties for which it was designed ; there may be a fault in the operation of the plant. In order that an assessment may be made of the performance of the plant, the following details should be recorded at any future trial :--

- (a) Quantity of air circulating over by-pass and cooler.
- (b) Temperatures of ' air on ' and ' air off ' the cooler, both wet and dry bulb.
- (c) Temperature of sea valves.
- (d) Gauge temperatures of the compressor suction and discharge.

On receipt of this information we will get our experts to assess the faults, if any.

**Contamination of Lubricating Oil—H.M.S. ' Ocean '**

On passage, difficulty was experienced in separating water from the lubricating oil in both sets of main engines. After about an hour's running each of the two Hopkinson separators became choked with emulsion, necessitating a thorough cleaning. To speed up the cleaning process a cupful of teepol mixed with a bucket of boiling water was poured through the separator while it was running. After a further flush through with boiling water the separator was stopped, stripped down and found to be clean. Thereafter the separator was cleaned of emulsion by this method every few hours. In an effort to improve separation and avoid the emulsion, various sizes of gravity discs were tried, but no improvement was achieved.

**Comment**

The report of the formation of an unbreakable emulsion in a separator bowl with OM 100 is noted with interest, since similar effects have been reported in shore centrifuge trials but not previously from sea. It is possible that the trouble may be due to supplies of the oil from one source.

It is understood that samples of the oil were sent to the Admiralty Oil Laboratory for examination and that tests have shown the quality of the oil to be satisfactory. However, the whole problem of the demulsification properties of OM 100 is under active investigation.

**Turbo Generators—H.M.S. ' Ocean '**

Number 3 turbo generator suffered a bent rotor and other damage following a ' radial rub ' occurring between the diaphragm labyrinth packing and the rotor. The accident appears to have been caused by the end clearance of the bottom guide pins, locating the diaphragms to the turbine casing, becoming absorbed. The reduced clearances between the rotor and diaphragm labyrinth packing (which had been restored to makers' original figures during the refit) were a contributory factor. The machine was then repaired by ship's staff, with dockyard assistance with shop work, and was back in service in 6 weeks using a part worn rotor. A reconditioned rotor will be fitted in this machine as soon as one is available.

**Comment**

As a result of this defect, which occurred through the information for this particular type of machine not being available to dockyard officers, refitting instructions have been compiled and are being promulgated.

Turbine internal clearance diagrams have been issued as an interim measure.

**Boats—Silencers: H.M.S. ‘ Newcastle ’**

A 25-foot motor cutter (No. 441066) fitted with Dorman 2.D.S.M. engine was supplied while the ship was at Portsmouth. The hull had been well refitted and the engine was in good condition. The silencer perforated after a week's running and was internally in paper-thin condition. When a boat is refitted, the hull is beautifully repaired and the engine changed. The silencer and exhaust system tend to be overlooked. Steel silencers corrode rapidly owing to the effect of sea water on the welding and occasional overheating when the circulating pump loses suction.

Renewal of silencers should be a standard routine whenever a boat is in dockyard hands. It is also desirable that S.P.D.Cs. should hold replacements for the types most commonly in use.

**Comment**

Financially, it is not possible to renew silencers whenever a boat goes into dockyard for refit ; but new E.M. Article 348A refers. Silencers should soon be available on demand through the S.P.D.C. organization and stocks will be held for standard engines on the stations.

**Main Feed Pumps—H.M.S. ‘ Birmingham ’**

The tail end glands continue to give a considerable amount of trouble, particularly after heavy manœuvring. Best results have been achieved by re-packing completely with Flexmet, and thoughts go back to the far more satisfactory Allen's packing now no longer available. It is believed that the 'necks' of the stuffing boxes have too large a clearance, which will be remedied as soon as possible.

**Comment**

It is not stated what packing was fitted that gave unsatisfactory results. It is noted that Flexmet packing conforms with the specification of Admiralty recommended packing, 'Metal Foil Lubricated Plaited Core' which is issued in the following sizes :—

$\frac{3}{4}$	inch square	Admiralty Patt. 7608
$\frac{1}{4}$	inch square	Admiralty Patt. 7609
$\frac{5}{16}$	inch square	Admiralty Patt. 7610
$\frac{3}{8}$	inch square	Admiralty Patt. 7611
$\frac{1}{2}$	inch square	Admiralty Patt. 7612
$\frac{3}{8}$	inch square	Admiralty Patt. 7613

The neck clearances should be a minimum of 0.015 inches and renewal clearance of 0.035 inches.

That feed pump packing may have an uncertain life and depends greatly on care and initial fitting, and in 'following up', is fully realized. Details of a former to assist initial fitting will shortly be promulgated.

Trials with mechanical seals, as a possible alternative are under way.

**Evaporators—H.M.S. ‘ Birmingham ’**

Three coils have perforated about 10 inches from the outlet end and now have Cu Ni Fe lengths inserted. Particular care has since been taken over the coil drain valve settings and no further failures have occurred. It is intended to get all coils so treated during the refit.

The casing of the Drysdale pump for the 50 tons/day plant is badly eroded, and temporarily repaired with tin.

L.P. air is satisfactorily used for blowing down. It saves time and is not so fatiguing for the watchkeepers in hot climates.

#### **Comment**

Trials are being held on a number of selected ships to treat eroded surfaces with a patent compound called Peratol, and it will be generally issued for this purpose, if trials prove satisfactory.

#### **Chadburn Turbometers - H.M.S. ' Birmingham '**

Despite having all six refitted by the makers or Chatham Dockyard, it was not long before 3 became unreliable. A ' Cirscale ' electric meter, removed from H.Q.2 to the engine room, has given good and reliable, though not fully accurate service, since a Chadburn bevel wheel drive broke a little later. These instruments seem far simpler and give a dead-beat reading. Slight inaccuracy is thought to be due either to belt slip or inaccurate original calibration.

#### **Comment**

The limitations of the old type Chadburns are well known. A new design of the dead-beat type has been produced, proving very accurate and consisting of very few moving parts, which will eventually replace the existing type. Spares for the 9-inch Chadburns are held at S.P.D.C., also a limited stock of 12-inch size complete, which could be fitted in place of the 9 inch size, the latter size no longer being manufactured. Demands for spares should be made in accordance with A.F.O. 1888/54.

#### **Bridge Air Conditioner—H.M.S. ' Birmingham '**

Some trouble has been experienced with the ' gumming up ' of the strainer. This has now stopped, but its cause is not known. The substance was very similar to that experienced in *Sheffield* about 4 years ago.

#### **Comment**

This gumming up is unusual in freon plants compared with methyl-chloride, but is undoubtedly due to the effect of moisture in the circuit at some period of operation.

#### **Spare Gear—H.M.S. ' Birmingham '**

It has been proved beyond doubt that more spare gear can be stowed far more effectively by using pigeon-hole racking than by the ' plate ' method. In addition this latter method is outmoded by ' P.I.P. ' -ing and the box method is even more inferior. It is suggested that general approval should be given by A.F.O. to enable all ships to draw the Naval Stores racking for use in their own stores. The fixed type racking, so often fitted in spare gear and ready use stores, is nothing less than a pain in the neck. We have now ' acquired ' and assembled nearly enough pigeon-hole racking to meet our needs, and it is becoming possible to have a place for everything and everything in its proper place. Once we can persuade someone to clean and preserve all of the older items in accordance with modern practice, the maintenance and stocking of spare gear will be far more efficient and take far less time.

A proportion of spare gear received is not correctly marked, and has to be opened to identify it.

**Comment**

The various methods of stowing spare gear have recently been fully investigated and their relative merits assessed. A new system of fixed and mobile racking has been evolved which can be used in both store rooms and machinery spaces.

A standard range of multiple size lightweight boxes for this racking will shortly be developed.

**Main Condensers - H.M.S. 'Daring'**

Examination of the areas near the exhaust baffles, through condensate sump doors of each main condenser, shows that arrangements are exactly the same in each, and that steam issuing downwards from the baffles is being deflected off the thick strengthening plate across the top of each sump, deeply pitting it in the process, and then carrying on upwards at reduced velocity to produce as light roughening and brightening on about one-half of the bottom row of tubes. Exactly what is going on higher up than this cannot easily be seen, but it is likely that the end tube (nearest the baffle) of the second, third, fourth and fifth rows from the bottom, are suffering. A selection of tubes in each main condenser will be plugged in accordance with A.L.D. 14695/54 of 3.9.54, and a report will be rendered on completion.

**Comment**

Original reports of this trouble indicated that a cure could be effected by extending the lower edge of the baffle, but it now appears that it is acting as a divergent nozzle rather than a baffle. This problem is being investigated and more reports from sea will be of value.

**Water Washing Boilers--H.M.S. 'Daring'**

Both boilers have been externally cleaned very successfully by water washing. The appropriate reserve feed tank was heated to 170° F. in about three hours by keeping at least 20 lb per square inch of exhaust steam on the feed heater. Most of the sludge, which was quite unpumpable, ended in the bilges, and it is intended in future to drain the generator bank (via a steel trough) and each furnace (via hoses attached to stumps of pipes to be welded to access panels into a 40-gallon drum between frames in the bilges. This would seem to tie up well with the implications of A.F.O. 1924/54. The brickwork was coated with liquid bitumastic as well as possible, but it must all have got well soaked, and examination indicated that it had suffered nothing by this treatment. Each boiler was banked to working pressure immediately after replacing the casings after cleaning.

**Comment**

The damage to brickwork is caused, not so much by the water, unless it is trapped under the bricks, but by the dissolved salts it has absorbed from the soot and ash. These salts in time will slag the brickwork and reduce its life.

**Soot Blowers--H.M.S. 'Daring'**

The trouble with three of the soot blowers noted as 'very stiff' in the defect list has been found to be caused by warping and bowing of the long tube elements in their brackets. The reason for this is considered attributable to the small cooling air pipes connecting the blower heads with the outer boiler casings, which have not been cleaned out and examined frequently enough in

the past. The three elements involved have had to be cut off just short of their blower heads due to complete seizure of the threads, and therefore will have to be reassembled about  $1\frac{1}{2}$  inches short of their original length. It is intended to block the steam jet hole nearest the blower head of each, to obviate any tendency to impinge on the front brickwork.

#### **Comment**

The action taken is agreed with, but these soot blowers should be restored to their original dimensions at the first opportunity. The need for frequent examination and cleaning of soot blower air cooling pipes should be impressed on the staffs of B. and W. boilered ships.

#### **Remetalling Stern Tube—H.M.S. 'Daring'**

The starboard stern tube has been extracted for remetalling, a clearance of some 115 thousandths having been measured. This is peculiar since last docking shows the starboard stern tube .040/.017 and the previous docking .015/.028.

#### **Comment**

Several reports of the use of incorrect whitemetal have been received and that may be the explanation in this case. Samples should be analysed if any further trouble with excessive wear is experienced.

#### **Fuel Tanks—H.M.S. 'Daring'**

Water pressure testing of F.F.O. tanks has shown that many of the leaks, chiefly out of No. 9 F.F.O. tank, are due to cracking of the deeply penetrated welding securing various small brackets in the magazines and stern gland compartment. One gets the impression that more care, or a different technique, is required during execution of such work on thin bulkheads.

#### **Comment**

The following is an extract from D.N.C.'s comments :—

'Every effort is made to ensure that welding is carried out in an efficient manner and X-ray examinations are made to ascertain that the welds are satisfactory. 100 per cent radiographic examination is, however, impracticable. Advances have been made since *Daring* was under construction and more modern techniques are now employed, from which improved welds will no doubt result.'

#### **O.M. 100—H.M.S. 'Defender'**

The oil in 'A' unit although renewed in September, 1954, is persistently cloudy in spite of running the lub. oil separator at least 10 hours a day. 'B' unit (oil renewed in November, 1953) is in excellent condition. A leak is suspected in 'A' lub. oil cooler. Although the maximum salinity of the water discharged by the separator has not exceeded 5 grains per gall, flushing with distilled water in accordance with E.M. Article 59 has been carried out.

#### **Comment**

It is known that a separator may not remove all the water from O.M. 100, but may discharge oil which, although cloudy, will contain only insignificant quantities of water. This will not impair its lubricating properties.

Investigations are in hand to develop an apparatus for supply to ships to enable the water content of oils to be determined.

### Swirler Plates—H.M.S. 'Defender'

These have been fitted in both boilers, but the formation of carbon in 'B' saturated furnace has not been reduced. The original type of tip plate has been fitted to the 12-inch registers of 'B' boiler to see if an improvement is effected with the larger diameter centre tube.

#### Comment

Previous reports indicated that this modification (the fitting of swirler plates in lieu of tip plates in the half-sized registers) worked very well and largely solved the carbon formation difficulty. Further details are requested, giving intervals at which cleaning is necessary, and where the carbon build up occurs.

### Pilot Burners H.M.S. 'Defender'

These have been fitted to the superheated furnaces but are not entirely successful, since they cannot be lit until a big sprayer has been flashed, because there is no means of getting a torch to the pilot burner. When manoeuvring, the pilot burner has on occasions to be shut off and its value is again lost. A size 'O' sprayer cap is fitted in accordance with instructions, but it is intended to try a size '00' when available.

#### Comment

There is no objection to using the size '00' cap. It has so far proved impracticable to arrange any ignition device in the pilot register.

### Steam Systems H.M.S. 'Defender'

(a) During the refit the following steam joints were remade on the main superheated range :—

- (i) 'B' Engine Room ahead nozzle box joint to guarding valve.
- (ii) 'B' Boiler Room superheated outlet elbow piece to main stop, vertical joint above boiler.
- (iii) 'A' Boiler Room main steam bulkhead valve casting joint on boiler side of valve.
- (iv) 'A' Boiler Room safety valve 'Y' piece joint to superheater header.

(b) The process of connecting boilers cannot be carried out in the nonchalant manner associated with earlier machinery designs, unless one is prepared to pay for it in making good blown joints. The present practice is to connect at a speed of between 15 and 16 knots, and not increase power for some 30 minutes afterwards. This is likely to be a severe handicap in war time, which can only be overcome by steaming in units when the notice for full power is 30 minutes or less.

(c) The four-bolt valve cover joints on the saturated range continue to be the biggest source of annoyance. The type of valve fitted depends on steam pressure to keep the valve lid on the seat when shut, and it is neither possible to take steam off the cover in the shut position nor to arrange for the valve spindle to be vertical in the majority of cases.

(d) Trials have been conducted to establish the effectiveness of portable fans and salt water sprays in increasing the endurance of engine-room personnel under 'closed-down' conditions. 'A' Engine Room was used for the trials and undoubtedly these 'air conditioning aids' are effective.

**Comment**

(a) The following additional information of the steam joints remade would be of value :—

- (i) Material of original joint and type of flange preparation.
- (ii) If joints were S.W.G., whether of ' V ' or ' W ' formation.
- (iii) State of joints and flanges on removal.
- (iv) Remarks on any previous trouble experienced with these joints.

(b) This point has also been raised by *Duchess*. The method of connecting the second boiler in *Duchess* appears to dispense with the need for a speed limitation after connecting. Further comment is requested. It is anticipated that wartime steaming will be in units, so the question of delay will not arise.

(c) Details of the type and make of valve are not available in E.-in-C.'s Department. The majority of cases of cover joint leakage have, however, been cured by reversing the valves so that steam was off the cover with the valve shut.

(d) Noted with interest.

**Main Circulating Pumps—H.M.S. ' Defender '**

During the second refit at Hong Kong a new impeller was cast and fitted to ' B ' unit pump, previously damaged by zines. Examination of the impeller shafts showed signs of de-zincification in way of metallic gland packing, particularly where the shaft passes through the cone shaped fairing plate surrounding the ' Raileo ' bearing.

**Comment**

Present practice is to use aluminium bronze instead of H.T. brass for these shafts and the material should be changed accordingly if replacement becomes necessary.

**Drain Cooler Tube Leak—H.M.S. ' Chaplet '**

A large hole, approximately  $\frac{1}{8}$  inch long by  $\frac{1}{16}$  inch wide occurred in one of the tubes of the drain cooler. It is not intended to go into detail, but it is of interest to note that, even using a low rate of forcing, priming was sufficiently severe to ' stick up ' the governor gears of the turbo auxiliaries. It even salted up one F.L. pump rotor so much that it could not be turned by hand. Even in emergency, therefore, it is not possible to steam for long on badly contaminated boilers.

**Comment**

The concentration of solids in the orthodox naval type boiler has been the subject of research recently, and extensive experiments have been conducted in *Illustrious*. The truth of the matter is that the age-old 20 grains per gall is a very dangerous limit to use, and it has been found that 10 grains per gall is a more realistic figure at which ' carry over ' (still not entirely solid water) was making a high percentage. The Engineering Manual will be amended.

**Running on 5 Cylinders—H.M.S. ' St. Kitts '**

No. 3 O.D.G. developed a badly scored crankshaft due to lack of a split pin on a large-end bearing cap. It is proposed to try to run this machine on 5 cylinders until opportunity occurs, and dockyard assistance is available, to change the crankshaft.



**Comment**

The proposal to run the machine on five cylinders is agreed and the engine output should be de-rated to 60 per cent.

**Instruction on Spare Gear Procedure—Mediterranean Flotilla**

A vast amount of paper work is involved in keeping spare gear issues and demands up to date and it is suggested that Engineer Officers' writers would benefit from more comprehensive instruction during their course.

Problems are also arising from the supply of packaged spare gear. Proper rack stowage for well made boxes is an increasing requirement and dockyard assistance during refits is essential.

The following remark was made by S.E.O. (F) Med. : ' During recent inspections by F.O.F. Mediterranean, the inadequacy of the stowage arrangements was noted.'

**Comment**

The suggestion to increase instruction on spare gear procedure is receiving attention in the Department.

Several improved methods of stowing spare gear are being tried in both large and small ships.

**Boiler Performance—Mediterranean Flotillas**

Boiler performance at full power is disappointing in all four ships. *Wakeful* is the worst offender but to a lesser degree similar difficulties in achieving full output are experienced in *Wrangler*, *Whirlwind* and *Roebuck*.

All ships make too much black smoke at high powers. This results from air starvation of the wing sprayers. Stokehold air pressure and boiler-room fan speeds are high and superheat temperatures are low. Increase of air pressure to reduce smoke produces a further lowering of superheat temperature, and in the necessary compromise conditions it is difficult, and occasionally impossible, to achieve the required H.P. receiver pressure.

*Wakeful's* last full power trial was particularly disappointing, in that no improvement was shown on previous performance, in spite of great efforts in recent months to check air leakage in the boiler rooms.

**Comment**

It is considered that more attention should be paid to air casing leakage for exclusion of black smoke and reduction of fan speeds. If the leaks are in the way of the superheaters, this will be a factor resulting in low superheat temperatures, but this matter has been dealt with more fully elsewhere.

**Water Washing Boilers—Sixth Destroyer Squadron**

The boilers have been satisfactory in operation, although all three ships have had to concentrate a lot of effort on maintenance of brickwork. *Crossbow*, *Scorpion* and *Battleaxe* have washed boilers and it was found, in *Scorpion*, that a pressure of 250-300 lb/sq in produced results more quickly and efficiently than the 150 lb/sq in recommended in A.F.O. 1662/54.

Baling out the last few inches of water in the furnace is a messy and laborious business. The latest Blue Funnel ships have a permanent sump fitted in their boilers which is normally stopped up with fire clay. This seems a good idea and worth bearing in mind for our own new designs.

**Comment**

In new construction, with sloped floor brickwork, permanent suction pipes are being fitted for removal of water. The floor bricks in way of the suction pipes being made removable to form a sump in which a strainer is fitted during water washing. The question of a similar fitting for ships in service is being discussed, but suggestions from sea for the position and size of the fitting to produce the best arrangement will be welcomed.

**Engineers Special Stores - Eighth Destroyer Squadron**

When engineers special stores are ordered, the Home Storing Dockyard require sketches of the articles ordered. Since the Engineers Special Stores list is fully itemized by article and page, and this book is held by both refitting and store yards as well as the ship, it is considered that this sketch duplication nullifies the itemizing in D.122, and causes unnecessary paper work.

**Comment**

It is laid down in B.R.4 Article 14 paragraph 4, that demands for special stores should be accompanied by dimensional sketches. It is agreed that this system appears unnecessary, but the storing yards only carry one copy of the Special Stores List, and unless sketches are supplied by the ship the N.S. copy of sketches has to be sent into the dockyard or out to the supplier for the item to be obtained. As the sketches are not always returned to D. of S. or as they may be damaged on return, the storing yard understandably prefers to use drawings supplied by the ship.

It is now intended to do away with special stores and replace them either by patternizing, manufacture from R.B. material, or by replacement as spare gear. New construction (*Darings* and later) have no engineers special stores. So far as ships with special stores are concerned, every effort is being made to reduce these items by making them Rate Book articles, spare gear, or manufacture from service material. Special Stores Lists are amended accordingly whenever they are received in the Department from Director of Stores, this occurs at modernizations or conversions and sometimes when ships propose alterations to their Special Stores Lists. It is unlikely that this action will, however, result in complete abolition of special stores in ships prior to *Darings*.

**Turbometers --H.M.S. 'Consort'**

Both turbometers failed recently soon after refit and there are no spare units available. Dockyard opinion is that the failure was simply due to fair wear and tear. It is dockyard opinion also that 'repair by replacement' is the only satisfactory answer as, after a certain life, there will be a sequence of failures of various parts. This is so consistently borne out by past experience that yet further representations concerning the provision of further spare units appear justified.

**Comment**

Limited stocks of complete turbometers are available in the S.P.D.C. organization and can be demanded in accordance with A.F.O. 1888/54, the defective units being returned. Spare parts are also available for supply to ships and repair authorities. The 9-inch Chadburns are no longer available from the manufacturers but the working parts for this size are the same as from the 12-inch.

### **Damage Control—H.M.S. 'Cossack'**

Trials on closing down the engine room completely and steaming without ventilation have been conducted. Results have shown that with an upper deck temperature of 79 W/84 D. exhaustion is reached in about 22 minutes, when the engine-room temperature was 114 W/126 D. In more normal upper deck temperatures of 54 W/63 D. and 63 W/73 D., the full 30 minutes can be attained without a 'couldn't care less' feeling coming over the watch below, temperatures reached being 106 W/112 D. (X) and 107 W/115 D. (Y). In trials (X) and (Y) above, at 19 and 14 knots respectively, the boiler was left to steam itself, with only a safety watch below. No difficulties were experienced; safety valves worked satisfactorily by keeping steam pressure well up on the manoeuvring valves, to a gauge which was reading low. Smoke was barely discernible, its cause being too low a heater temperature--this control is the hardest to set.

Some relief for the engine-room watch is best achieved by salt water showers in the bilge. A spell between the condensers (10-15" less) also helps. D.B. fans sucking from the lowest point of the engine room were not a success.

The conclusion reached is that actual humidity percentage has no definite bearing upon endurance--(the gear room under trial gave higher humidity figures, but the temperature was less, and ratings did not suffer). The human body will apparently last a long time provided the wet temperature is below 110° F. Confirmation that some men can last longer would spur others to greater heights of endurance.

### **Comment**

Information on the endurance of men in high wet and dry bulb temperatures under zero air movement conditions is, unfortunately, very sparse. Considerable investigation is now being carried out and information of this kind is very valuable.

From such limited records as are available the following effect of wet bulb is of interest. At dry bulb temperature of 120° a group of men were given simple watchkeeping tasks.

- (1) At wet bulb of 89° -- all men completed a 4-hour watch.
- (2) At wet bulb of 91° -- all men collapsed within 4 hours.
- (3) At wet bulb of 104° -- men may expect to watchkeep for about 30 mins.
- (4) At wet bulb of 110° -- men may expect to watchkeep for about 20 mins.

Figures at (3) and (4) are only estimates based upon (1) and (2), but may be taken as a guide.

The wet bulb reading has a very great bearing upon the endurance of men under stress conditions.

### **Capstan Engine Drains Sixth Frigate Squadron**

Steam leakage from pipe unions and asbestos packed drains cocks is a continual nuisance. Damage has been caused to cordage, canvas, paintwork and wine stocks in the vicinity of these leaks. The cocks and pipe unions have frequently been refitted both by ship's staff and dockyard, but have leaked again very shortly afterwards. They do not seem robust enough for the job. It is suggested that flanged pipes and Klinger type drain valves would be more satisfactory.

The following remark was added by S.E.O. Flag Officer Flotillas, Home Fleet, in his covering letter :—

‘These have long been a source of trouble and annoyance especially on the forward upper mess deck of destroyers. Any leakage causes sweating of the deck head and a general mess in the vicinity. Under arctic conditions, when it is necessary to keep the capstan engine warmed through continually, any leak developing cannot be made good, as shutting steam off in very low temperatures entails risk of the engine freezing up.’

#### **Comment**

A different arrangement of capstan draining and heating is being tried. If it is satisfactory, an A. and A. will be proposed which will include replacement of unions by flanges, and cocks by screw-down valves.

#### **Cleanliness of Engine Room and Bilges—Sixth Frigate Squadron**

Special efforts to keep the engine room and bilges clean and free of waste and other debris were only partly successful, and it is suggested that the following might assist in this important matter.

- (a) Bilges to be covered in, as far as possible, with rigid steel mesh.
- (b) Lighting in lower parts of the engine room and bilges to be improved.
- (c) Filters to be fitted in engine-room air intake trunks to prevent dirt being blown in by the ventilation supply fans.

#### **Comment**

E.-in-C. is collecting, and taking steps to implement, proposals for the reduction of the menial task and improvement of machinery spaces. Suggestions on this subject are most welcome.

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