

H.M.S. 'EXMOUTH' NEWSLETTER

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BY

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The commissioning of H.M.S. *Amazon* in May 1974 signified the end of *Exmouth's* previous pre-eminence in the COGOG world. A refit in the winter of 1974-5 discouraged thoughts of trials and, by the end of work up in April 1975, the ship felt it could be treated as an ordinary ship. Despite welcoming this reversion to normal status, *Exmouth* still retains great pride of purpose and, being the 'longest runner' in the all-gas-turbine field, respectfully submits to her successors the following items of historical and engineering interest.

Data Recording

The 14-channel tape recorder (*J.N.E.*, Vol. 21, No. 1) continues to rotate. However, experience in this ship has been that a well-calibrated u/v recorder is of more use than the tape recorder. Defects in the power/pitch control system do tend to repeat themselves to order and the monitoring system may therefore be patched to highlight the area which is under suspicion. Nevertheless, it is felt that there is a place for a sophisticated multi-channel reel-to-reel tape recorder, in the setting to work and trials phase on first commissioning the machinery, on building, or after refit. It is much easier to find a particular point on a tape and play it back for analysis than to sort through piles of old u/v recorder paper. However, the ability to record continuously, and hence play back as convenient, conning intercom (which is one of the voice channels) allowed us to relive the 'close marking' carried out during Operation DEWEY. The orders and responses come over well and it constitutes a much more accurate record than a list of hieroglyphics.

Olympus

The Olympus installed in March 1973 is still with us and achieved 3000 hours on 25 May 1976. This engine has an authorized extension to 4000 hours. Combustion cans were changed by Rolls-Royce in December 1974 and by ship's staff and FMG Portsmouth in March 1976. The smokeless

combustion equipment and pressurizing valve modifications continue to work well, much to our relief and to the envy of other COGOG ship engineer officers and operators. The reliability with which Olympus has provided power as and when required assisted us to fulfil our programme when Centrax was out of action. The maintenance effort traditionally devoted to main propulsion machinery could be safely diverted to a large extent to the auxiliary machinery and, in particular, to the two diesels and the Stones Vapor boiler.

Proteus

In the early part of 1975, attention was focussed on to the Proteus engines which, although having run only 1200 hours each, had been in the ship six years. The discussions were terminated when the starboard engine compressor bearing labyrinth seal failed in June, and a decision was taken to replace the engines with depot spares. There was little time to plan this exercise or to gather all the original special tools, and great credit is due to the dockyard officers and fitters whose enthusiasm and flexibility enabled the task to be accomplished in a normal leave period. The commissioning, setting to work and tuning of the engines to the satisfactory completion of a full-power trial was carried out almost exclusively by two teams of senior ratings. This task probably represents the most professionally satisfying job any has undertaken in the service utilizing, as it did, every facet of their training, including the ability to write a comprehensive report on completion of the exercise.

Controls

The loss of all servo air in a pneumatically-controlled steam plant for any length of time would very seriously affect that ship's ability to carry out its normal operations. A similar defect in *Exmouth* served to demonstrate yet another advantage of gas-turbine propulsion. The ship's single servo air compressor provides air for the power/pitch control system as well as a mass of transmitters feeding almost every gauge in the MCR. After four days of heavy weather off Portland in January, the mounting system and steadying bracket suffered complete failure, despite several unorthodox methods used to try to keep the machine in one place. The back-up emergency reduced HP air was known to be contaminated with oil at that time and therefore there was no alternative but to change to hand controls of propellor pitch and Olympus throttle. After the initial flurry, the EOOW and his team settled down to a prolonged period of 'coalface watchkeeping' and it was only necessary to close up additional watchkeepers for coming alongside.

Centrax

No newsletter from *Exmouth* would be complete without some comment on Centrax. A new unit was installed in the refit which, after some initial alignment problems, ran reliably until a sunny afternoon alongside at Bristol in October 1975, when it stopped with its customary abruptness after 1600 hours. This was extremely disappointing as, with various improvement to the cooling of the electronic governor, the ship's staff were beginning to feel that they had the measure of the beast. Another Centrax was fitted in the DED in March 1976. This machine is still running and, hopefully, there will be no footnote to say that it has stopped.

Unmanned Machinery Spaces

The importance of rounds and the proper reaction to warning lights, particularly in relation to unmanned machinery spaces, was brought home to us forcibly on one occasion in July 1975. During normal operations at sea,

whilst running on Olympus, a Minerva fire-detection head was activated in the forward engine room. The MEM detailed to make a search reported nothing untoward except that it was unusually hot in the vicinity of the Olympus uptake. Further investigations in difficult conditions revealed that there was a hole, approximately twelve inches by eight inches, in the previously gas-tight asbestos bellows, just above the Olympus module. This allowed Olympus exhaust at 300°C and 100 ft/s to pass directly into the FER. Furthermore, the asbestos was smouldering and the hole was getting bigger every minute. A change was quickly made to Proteus and the ship continued her programme.

The uptake was cooled by dry-cycling the engine several times and, on return to harbour after the day's serials, the access plate above the bellows was removed. Inspection revealed that a 4 foot by 1 foot section of the Twiflex bellows steel internal protection plate had disappeared, allowing Olympus exhaust to impinge directly onto the Twiflex bellows, and subsequently onto the wire reinforced external asbestos bellows.

At the top of the uptake, there is an open square steel frame-work used to carry thermocouple leads, the mesh size of which is more than adequate to allow passage of the steel plate; fortunately however it had struck at the wrong angle and had fallen down into the air entrainment section of the uptake from where it was later recovered.

The same night, ship's staff rewelded the missing plate into position after it had been hammered reasonably straight and, with the aid of Portland FMG, temporarily patched the external asbestos bellows with fibre-glass cloth.

The repair proved satisfactory and the ship continued her normal day running programme until the next programmed AMP a fortnight later. It is noteworthy that an uptake inspection 250 running hours earlier had shown the steel protection plate to be quite secure with no sign of impending weld failure.

On this occasion, the quick reactions of the watchkeepers kept the damage to a broken glass lampshade and some blackened paintwork, but the consequences, had the defect been allowed to develop, might well have led to evacuation of the MCR which is located alongside the Olympus.

Operation DEWEY

At the time of writing (May 1976), the ship is engaged in Operation DEWEY, well known to many as the Iceland Patrol. No great claim is made as to the ship's ability to manoeuvre rapidly in relation to steam frigates, but the significant points are that, with bridge control and gas turbines, the strain on the watchkeepers is minimal compared to their steam counterparts, the response rate is constant and no machinery operating limits need to be exceeded. Also, bearing in mind that on occasions our funnel was nearer to the bridge of the Icelandic ship than it was to ours, the noise from an un-silenced Olympus uptake at high power would be quite off-putting. However, perhaps the most impressive feature of this ship's machinery, so far as the OTC is concerned, is our ability to 'loiter' on a single Proteus in fixed pitch for prolonged periods without the need to RAS. Fuel consumption, including auxiliary load, is considerably less than 1 ton/h at normal patrol speeds.

Finale

Although it has been mentioned previously in *Exmouth* newsletters, it ought to be repeated that the greatest single factor in the various successes enjoyed by this ship has been the response of the men who have sailed in her. A Type 14 frigate is certainly not a palace, particularly at sea in the

winter and the kudos attached to serving in the only COGOG ship in the Royal Navy has gone. What is left though is the considerable job satisfaction derived from operating a gas turbine propulsion system and it was with great pleasure that we heard at the last Engineer Officers' Conference the MEOs of other COGOG ships emphasize the favourable reaction of the men in their departments to all aspects of their work. The future of the Navy as a whole and the Marine Engineering Branch in particular looks bright.

Footnote:

Olympus has now (September 1976) run more than 3600 hours. It is hoped that 4000 hours will be achieved before the ship stops running at the end of the year.
