H.M.S. EXMOUTH NEWSLETTER

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As H.M.S. *Exmouth* is currently undergoing her first refit since conversion it is an appropriate time to review the achievement to date as seen from the ship's point of view. Since initial sea trials started in June, 1968, she has 'gassed' over 50 000 miles.

H.M.S. *Exmouth* was converted at Chatham, as described in Vol. 16, No. 3, following a decision to use the Olympus engine in new construction ships of the Royal Navy. The principal aim was obviously to gain the earliest possible experience of the engine in a warship installation, albeit limited to 15 000 of its potential 23 000 shp.

Though an operator's nightmare for the first eighteen months' running, the ship has undoubtedly been a success. Firstly, conversion was completed within the projected time scale and cost. Since that time, the originally expected rate of accumulation of Olympus running hours has been achieved, despite protracted periods alongside sorting out the inevitable teething troubles. Two factors made this possible:

(*a*) Using the Olympus for operations originally envisaged for Proteus engines (accepting consequent poor fuel economy)

(*b*) Making the maximum use of night running.

It is understood that this Olympus running has been at least ten times greater than any other marine installation of the engine. (61 had been sold up to September, 1970).

Another encouraging fact is that the Olympus and Proteus engines themselves have been the least of the problems. When they have gone wrong, the engine has been quickly 'repaired by replacement' through its own air intake. The 'One Tide Navy' of Rolls-Royce advertising was almost a reality.

Analysis of the breakdowns shows the electrical generating plant to have been the worst offender. The Centrax 500 kVA gas turbo alternator was a second evaluation project in the same trials vehicle which unfortunately adversely interacted with the primary aim of Olympus because the Diesel generators also proved highly unreliable (principally cooling water problems).

It was for this reason that the ship failed to fulfil all her projected visits to exciting far-away places. However, visits have been made to Norway, West Germany, Holland, Belgium, France, Portugal, Italy and Greece. Demonstrations of the installation and the auto-pilot were given on most of these visits in support of potential sales. The ship has also been 'shown off' to hundreds of visitors at sea and in harbour while operating in home waters.

Few can fail to be impressed by the performance. Not only is the tremendous acceleration and deceleration likened to driving a sports car after any other ship, but engine change-overs taking 40 seconds from start of the oncoming engine to shut-down of the outgoing engine, with virtually no alteration in speed, need repetition several times for foreign visitors to attain belief. From stopped in the water to almost full speed in under a minute, and from full speed to stopped in the water in about two ship's lengths is impressive for a 1700-ton ship.

Extensive modification work done during the Docking and Essential Defects period was largely successful in curing the maladies. Indeed, availability and usage have more than matched the Type 14 average since DED completion in June, 1970. Running included a major Fleet exercise and with the Portland Squadron training classes.

Probably the greatest relief is to have apparently solved the problems with the controllable-pitch propeller. Premature departure from alongside, tug-assisted entrance into harbour, and an inability to predetermine whether 'stop' would be up to three knots ahead or astern, were unpopular with the Command. Since providing control of oil temperature and changing the philosophy to motor driven pumps normally unloading the shaft driven pump, the Stones Kamewa propeller has lived up to its high merchant marine reputation. One costly lesson which should have been learnt is to resist the temptation each time the C-P propeller hiccups to rush into dry dock and rip the hub to pieces. On every occasion the major problem has eventually been found inboard in the hydraulic system.

Perhaps the acid test of the merit of the installation is that the ships company like it. Every drafting preference card seems to be aimed at avoiding going back to steam.

Normal ME watchkeepers at sea have been reduced to one POMEM, one LMEM and two MEMs. MEAPs and mechanicians are nominated to watches as 'shift engineers', to be on call and to do rounds during the night watches, working on maintenance daywork under passage conditions. Thus the planned reductions in complement in future GT ships seem reasonable.

The quick time-scale involved in incidents becoming hazardous to machinery with this type of plant creates a need for positive warning indication and

reliance on operators carrying out 'reaction drills' to correct the situation in time to avoid damage. There is less scope for thought and interpretation than with steam. The MEAPs and mechanicians are therefore diagnosticians who need to be provided with post mortem playback facilities.

MEM ratings have responded well to the increased responsibility inherent with this reduced watchkeeping complement and the novel machinery. It is however apparent that copious log sheet recording as a means of monitoring machinery performance is inappropriate, and better instrumentation is required (the article in Vol. 18, No. 3, p. 423, is topical).

On fault-finding in control systems, the recent provision of an ultra-violet recorder, producing traces from some sixty transducers fitted permanently in the system, has proved a most valuable adjunct.

Having one rating responsible for the condition of oil and the collection of fuel and oil samples, millipore tests, etc., for despatch ashore has proved beneficial. Called the 'Oiler', he works opposite the normal ship's 'Tanky'.

These are but a few examples of the ideas formulating as experience of operating the new machinery is gained. Much of this is being passed to the future ships not only by visits of their MEOs and senior rates to H.M.S. *Exmouth*, but by drafting ships company to such ships and training billets. Clearly H.M.S. *Exmouth* will have an important role in the future as a training facility.

At the direction of Admiral Sir Horace Law, K.C.B., O.B.E., D.S.C., when Controller of the Navy, the introduction of this new era of marine engineering has been marked by the wearing of white overalls by all the ME Department personnel. It certainly stimulates interest in cleanliness of machinery spaces!

Perhaps the most serious criticism of the installation is the congestion of pipework, valves, pumps and coolers in the bilge areas, particularly in the after engine room. This has all but prevented bilge preservation in some areas. However, these are inevitable consequences of hasty conversion and inability to modularize system components. It is impressive that over 30 000 potential shp of gas turbine plant has been installed in the same space as 15 000 shp of steam plant, together with almost double the generating capacity and an extra 50-ton Dieso fuel service tank.

In conclusion, it must be noted that, though life on board has its frustrations, the ships company has had the consolation that most of the problems have occurred in time to influence future design. A number of alterations are being made during the refit with a view to further evaluation of components thought to be an improvement where previous arrangements have been inadequate. Thus, though no longer typical of future design, the ship has a continuing material function in the development of this type of plant. However, when H.M.S. *Exmouth* returns to sea she will be a fully operational unit of the Western Fleet, with the 'trials ship' tag behind her.