

TRAINING FOR TYPE 21 FRIGATES AND TYPE 42 DESTROYERS

BY

LIEUTENANT T. BLAKELEY, R.N., B.SC., C.ENG., M.I.MAR.E.

The following article, entitled 'Pre-Commissioning Courses for Engine Room Ratings', appeared in the *Journal of Naval Engineering*, Volume 4, No. 4, the January 1951 issue:

'Of recent years, the design of the main propulsion machinery, and to a lesser extent the auxiliary machinery, of new construction ships, has not differed radically from previous practice, and operational techniques and maintenance problems were generally similar.

With the introduction of machinery using steam at high pressures and temperatures the situation has changed and it was realised that the personnel required to operate the machinery should be given instruction in the whys, hows and wherefores of these advanced steam conditions.

With this end in view, short Pre-commissioning courses for the C.P.O., P.O. and Leading rates in the Engine Room Department of the *Daring* Class Destroyers are being started in the M.T. and R.E. Portsmouth.

Although this new material will gradually be incorporated into the normal syllabi of Training Establishments, such instruction will always tend to lag behind the latest developments, and the requirement for some form of 'Modern Machinery' Course is likely to be permanent.'

With the introduction of an all gas turbine main propulsion system and new types of machinery in the Type 21 frigate and Type 42 destroyer, the requirement again exists for a 'Modern Machinery' course for the personnel of the marine engineering department appointed to these ships.

The *Daring* Class PCT and subsequent Type courses were not introduced until after the first ships of the class had been to sea. The design of the Type 21/42 courses, however, started approximately two years before the completion of the first of each class. The aim was to provide pre-commissioning training for those officers and ratings who would be required to operate the first of these ships.

Scope

This article is intended to give an indication of the scope of the marine engineering training associated with the Type 21 and Type 42 ships. The decision to introduce training for these ships at such an early stage has meant that it will now be possible to make full use of the experience gained from the very outset of operation of the equipment.

Senior Rates' Pre-joining Training

It was first necessary to make certain assumptions about the employment of the MEA and POMEM, and about the operation of machinery. While recognizing that they would probably require modification in the light of experience, these assumptions allowed training objectives for the course to be formulated. To meet these objectives, a course of eight weeks' duration for MEAs and six weeks' duration for POMEMs was designed.

An attempt was also made to anticipate the training requirements of OEAs, who would be required to work in conjunction with MEAs, in the diagnosis and repair of faults in the electronic control system associated with the main propulsion system. It was expected that the MEAs would provide a knowledge of the operation of the main propulsion system, while the OEAs would provide the electrical expertise required. It was very apparent, however, that a division of responsibility on a mechanical/electrical basis could not be defined. It was considered that the OEAs would not only require a general appreciation of the operation of the main propulsion system but would also need to understand the operation and interdependency of the individual components of the propulsion system, e.g. gas turbines, clutches, etc. Similarly, the MEAs would require a limited amount of basic electrical training in order to appreciate the operation of the main propulsion control system and the implications and effects of its failure. The senior rates PJT is a combined course for MEAs, OEAs, and POMEMs, although varying in length and content for each; wherever possible throughout however, the course is fully integrated for all three categories. In addition to a greater utilization of training resources, it has been found that the combination of electrical ratings and mechanical

ratings in the same classrooms effectively encourages the 'systems engineering' approach, which is a feature of the Type 21/42 courses.

Joint Training at H.M.S. 'Sultan' and H.M.S. 'Collingwood'

Instruction on the main propulsion system is carried out at H.M.S. *Sultan* and H.M.S. *Collingwood*. The requirements of the control system and the operation of the main propulsion system are taught at H.M.S. *Sultan*, using the Type 21/42 machinery control console simulator. The implementation of these requirements by the Hawker Siddeley Dynamics System, together with practical fault diagnosis and repair of the control system, is then taught using the maintenance training unit at H.M.S. *Collingwood*. Instruction to MEAs and POMEMs on basic electrical theory, power and distribution and electrical systems associated with auxiliary equipments, is also carried out at H.M.S. *Collingwood*.

Two pilot courses for the senior rates' PJT were run, attended by officers and ratings standing by the first of the two classes, H.M.S. *Amazon* and H.M.S. *Sheffield*. The assistance of these officers and ratings was invaluable in preparing the teaching documentations and course structure. The first full course was run in June/July 1972. Nine senior rates' courses are now run each year.

Leading Rates' Pre-joining Training

Ideally, sufficient instruction should be included in career courses to enable a LMEM to serve in any ship of the fleet without special pre-joining training. The present mechanical training course, however, is primarily geared to the Y100 and later frigate steam plants. It was therefore decided that there existed a similar requirement to give a PJT course to LMEMs drafted to Type 21/42 ships.

Again assumptions were made on the expected employment of LMEMs in these ships, and appropriate training objectives were produced. The areas where the equipments and systems to be used differed from those covered during career training were identified and a two week course designed. The first of these courses was run in April 1972.

Officers' Course

A 4-week course is run for ME officers. Although designed primarily for MEOs appointed to these ships, the first courses were also attended by officers from the MTU and the SMA. Personnel from the MTU, the MCTT, the SMA and the FMG have also attended the senior rates' course.

Dockyard Courses

A series of 2-day acquaintance courses have been run for the benefit of senior dockyard officers involved with advance planning of dockyard work associated with the Type 21 and Type 42 ships. In 1974, a number of six-week courses, based on the senior rates' PJT, will be available for dockyard personnel at PTO 2 to 4 levels.

Training of Foreign Navies

Officers and ratings of the Argentinian Navy standing by the first of their Type 42 destroyers being built at Vickers, together with members of their base support group, have attended a number of 10-week courses at H.M.S. *Sultan*.

Technical Information

The problem of gathering technical information on the new types of machinery to be fitted was solved by keeping a close liaison with the crews standing by the first ships; the more specialized and detailed information was obtained by a series of courses and visits to a wide range of manufacturers, mainly by senior rating instructors. Valuable assistance was also provided by the ship and specialist sections of the Ship Department.
