

FIG. 1—MARINE ENGINEERING FACILITY AT RNEC MANADON

No. 3 Hangar—left foreground, Steam Test Shop—right foreground. Workshops Block and Mess in background.

## CHANGES TO THE MARINE ENGINEERING APPLICATION COURSE

BY

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The Marine Engineering Application Course (MEAC) has for some years comprised three terms' instruction at the Royal Naval Engineering College, Manadon, (FIG. 1) immediately post-Degree or Diploma. Numbers on course average 46 and, besides officers from the RN and RNES, in recent years have included representatives of the Australian, Canadian, New Zealand, Malayan, Ceylon, Netherlands, Indian and Argentine Navies.

The principal aim of the course has been, and remains, to complete the basic professional technical training of the General List officer of the ME and M(SM) sub-specializations by giving him a sound knowledge of the principles and practice of operating and maintaining naval marine engineering systems and equipments.

The first Murray Scheme entered officers reached the application course phase of training in August, 1965. The 1967-68 Course included the last COST entered officers who already held a MEOWKC, Part A. Experience with Murray Scheme entered officers on these courses showed the following problems:

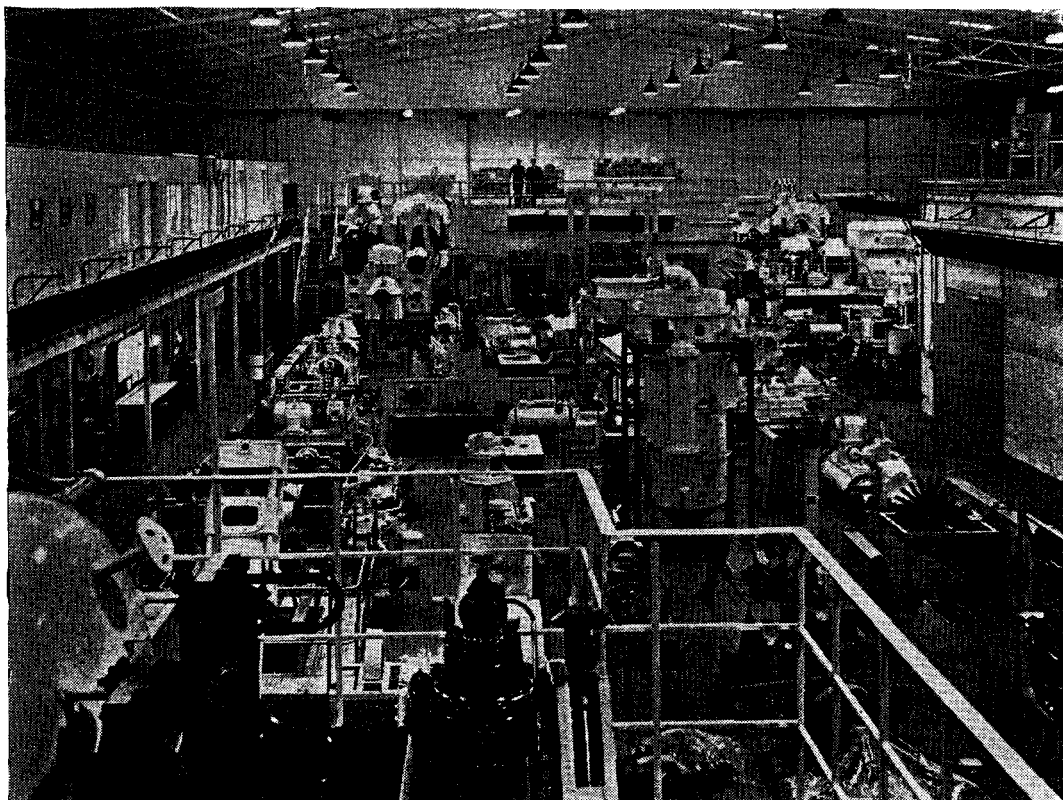


FIG. 3—No. 3 HANGAR

Left—Classrooms and Offices. Right and at rear—Diesel and Gas Turbine Test Cells. Centre—Static Machinery Display

*(a) Inadequacy of Prior Acquaintance with Marine Engineering at Sea*

In order to correct the lack of background knowledge of the problems and work of the ME Department in a ship, and the inability to picture the environment in which machinery operates, the following steps were taken as an introduction to the MEAC:

- (i) The 1965–6 and 1966–7 Courses spent a week at sea in H.M.S. *Hermes* and H.M.S. *Ark Royal* respectively.
- (ii) The 1967–8 Course spent three weeks at H.M.S. *Sultan* (including time in the harbour training ship H.M.S. *Crossbow*) and three weeks on an Auxiliary Machinery Course at the RNEC.
- (iii) H.M.S. *Sultan* being unable to accept the 1968–9 Course they only received a three-week AMC at the RNEC (including two days in H.M.S. *Urania* for systems tracing).

In addition, all officers undertake a one-week EXPED at the end of the second year of the three-year Degree Course, living in a ship in Reserve (currently H.M.S. *Urania*) and bringing the machinery into use.

It is felt that the value of more experience of operating machinery during the year at sea as a Midshipman, would be minimal to the MEAC after the three (or four) years taken over the Degree. Thus the modifications to the Midshipman's Syllabus proposed by RNEC and accepted in detail into the Midshipman's Task Book, were aimed at giving a more comprehensive appreciation of the vital part of the engineering departments in the functioning of a ship. In the 16 working days allocated to marine engineering the only mandatory watchkeeping included is experience on the throttles (DCI 591/68 refers).

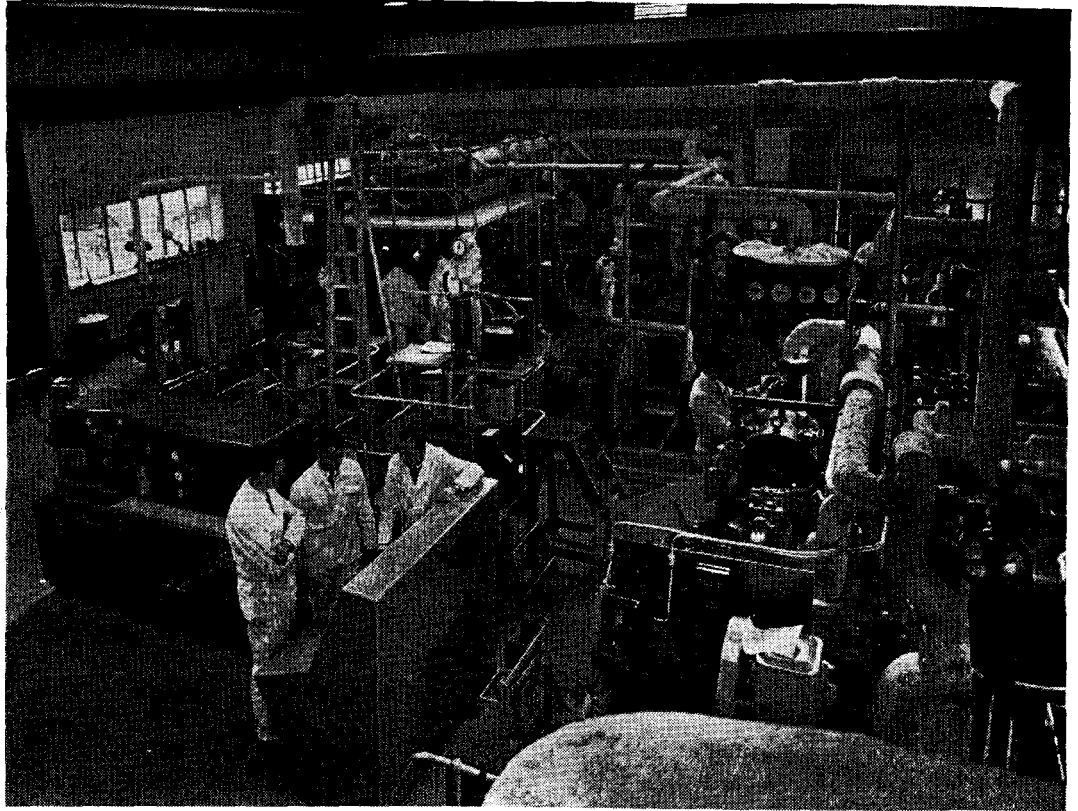


FIG. 4—STEAM TEST SHOP

Machinery includes a Turbo Generator, examples of Flash, Boiling Shell and Vapour Compression Evaporators, turbo and reciprocating pumps and thermodynamic experimental rigs.

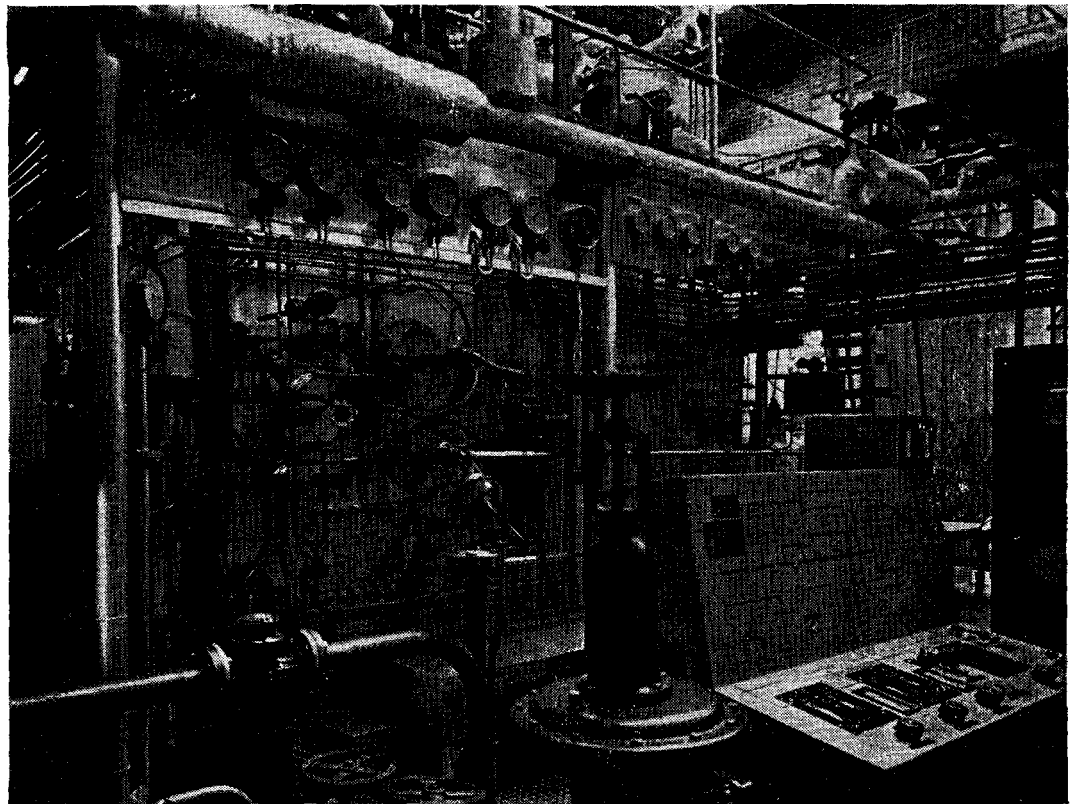


FIG. 5—STEAM TEST SHOP—Y.20 Boiler

The boiler, besides having full automatic pneumatic controls from the console shown, is also linked for data processing to the College IBM 1130 computer. A contract has been placed to provide computer control of the boiler as an instructional aid to ME and WE training.

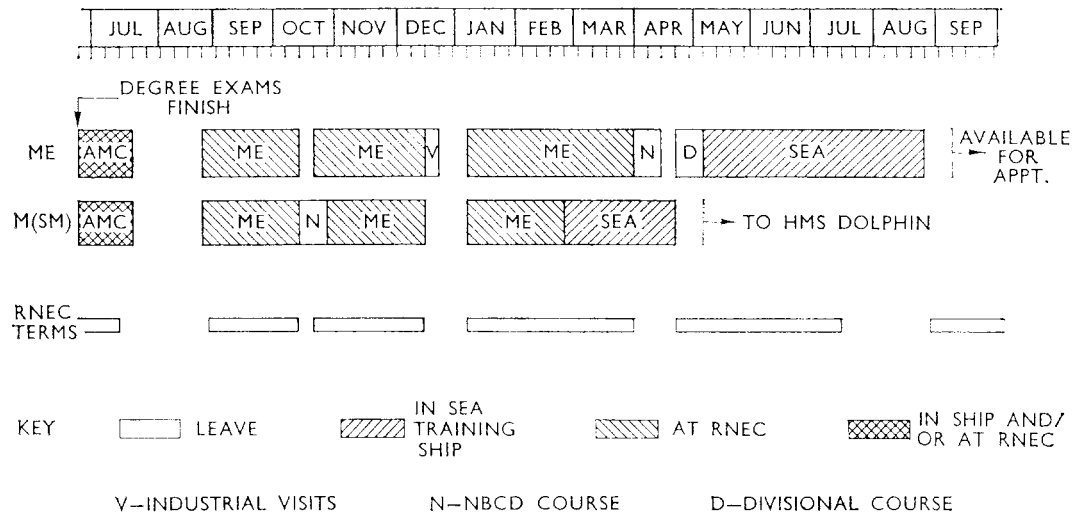


FIG. 6—PROGRAMMES FOR REVISED MEAC

*(b) Failure to Stimulate Interest in Marine Engineering during the MEAC*

The following factors are felt to have influenced the Officer Under Instruction (OUI)'s attitude towards the course:

- (i) The wrong impression of marine engineering formed as a Midshipman due to having been made to keep dreary watches below without, in many cases, adequate interest being taken to give instruction.
- (ii) The impatience of the OUI to get to the first responsible job in his life after a minimum of  $6\frac{1}{2}$  years in the Navy. With the Degree behind him, as a climax to at least three very intensive years of academic work, the OUI saw the MEOWKC as the last hurdle to qualification. For this he imagined he required little but the experience of operating machinery. He did not take kindly to being confined in a classroom for a further year for on average 25 out of 35 periods per week. Study of at least six academic subjects, of only indirect association with the principal aim (almost half the time allocation), simply labelled the course as 'more school' to the OUI.
- (iii) Apart from the provisional selections for Dagger courses, made at the end, the MEAC lacked a carrot. Equally there was no stick.

Practical work included in the MEAC has proved popular, and been steadily increased over recent years as the best means of stimulating interest in marine engineering. This has necessitated a major effort to improve the facilities for practical training (FIGS. 3, 4 and 5). Provision of a ship is the ultimate practical training aid for certain marine engineering instruction.

The provision of more modern machinery at Manadon has been beneficial in another way. It has helped to improve the image of marine engineering among officers on the Degree Course. It is encouraging for the future that, for the first time with Murray entered officers, the latest selection of sub-specialization has produced all first choice volunteers for those to become MEs.

**The Revised MEAC**

For ME officers the revised MEAC consists of only two terms at the RNEC, followed by one term in the sea training ship (see FIG. 6). M(SM) officers

omit the uniquely surface-ship content, e.g., gas turbines, and complete in a shorter period.

The ME officers on the 1968–9 MEAC were the guinea pigs of this programme and the detailed syllabus for the revised MEAC is being written based on the experience gained with this course.

The RNES(M) and Foreign and Commonwealth Navies have been advised that their officers (who at present form 30 per cent of those on the MEAC) can only be offered the two terms of instruction at Manadon from August, 1969.

M(SM) officers will go to H.M.S. *Manxman* for a shorter period of training than the ME officers, starting with the 1969–70 MEAC. They will be appointed to H.M.S. *Dolphin* in May instead of in July as previously.

#### *Time at Manadon*

The following factors have made possible the reduction of the Manadon content of the MEAC:

- (a) Inclusion of much of the former academic content of the MEAC in the Degree; e.g., Computation, Control Theory, some Materials Technology and Economics.
- (b) Reduction of the Nuclear Engineering content from 86 periods to an 'acquaint' level of 18 periods.
- (c) Reduction of the time allocated to the 'Design and Make' project.
- (d) Deferring the detailed study of Management Techniques until a costed 15-week Mid-Career Course, to be taken by all General List Engineering Specialist Lieutenants between four and seven years' seniority. The first such course will start in August, 1972. Sufficient 'Management' will be retained in the MEAC under 'ME Administration' for an officer's needs in his first one or two appointments post-MEAC.
- (e) Deleting 'Flight Deck Machinery'.

#### *H.M.S. Manxman*

Approximately sixteen weeks are spent in the sea-going training ship. The aim of this period is to give each officer opportunity to achieve enough confidence and competence in the operation of machinery, to be given the sole responsibility as MEOOW in the training ship. A staff officer from the RNEC accompanies the Course to the ship to act as Training Officer.

The trainee works progressively through all the machinery watchkeeping responsibilities in the ship, initially double-banking an experienced rating, and then, when considered competent, fulfilling the responsibility on his own. Officers also gain valuable experience as OOD.

#### **Qualification**

Successful completion of all phases of the MEAC results in the award of the Marine Engineering Surface Ship Qualification (MEQ) which replaces the MEOWKC for ME officers. (DCI 928/69 refers.) Award of the MEQ is not applicable to M(SM) officers.

#### **Employment in the Fleet—Post-Revised MEAC**

Previously a Lieutenant completing the one-year MEAC was unable to fill a 'complement' billet until he had obtained his MEOWKC. This took four to six months in a ship, provided there had been sufficient time under way.

It is expected that after one year on the revised MEAC, an officer will be competent for appointment as AMEO of a small ship or to a big ship as a

complement junior marine engineer officer (accepting the need for a short period of familiarization with the ship's installation before watchkeeping).

His time in the Fleet will broaden his marine engineering experience and it is hoped demonstrate his need of management techniques for success in a Charge appointment. The imparting of this knowledge will be given in the Mid-Career Course previously mentioned.

### **Conclusion**

Introduction of the Revised MEAC shortens by approximately four months the training of General List ME officers before they reach their first position of real responsibility. In combination with the Mid-Career Course it means that their training will be better matched to the future pattern of their appointments.

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