

# THE ENGINEER IN THE MERCHANT NAVY

BY

STEWART HOGG, O.B.E.

(*Chief Examiner of Engineers, Ministry of Transport, 1950-60*)

In 1951, I contributed an article under the above title to the '*Journal of Naval Engineering*'. That article covered the period 1862-1950. It dealt with the century old practice of joining the Merchant Navy as a junior engineer after completing a five years apprenticeship with a suitable firm, usually of marine engine builders. This further article covers the ten years to the end of 1960, when I was closely associated with problems of training and examinations, and gives my recollections of the outstanding changes during these years.

Until about 1950, as I explained in my previous article, the shipowners had depended for the best part of a century on a supply of trained young men, mainly from the shipbuilders' engine works and repair yards. These days were over, never to return, for many reasons.

### *Workshop Training.*

Apart from the slow reduction of the supply of entrants from the traditional sources, made up to a limited extent by entrants from the light engineering industries, the quality of these entrants had been on the decline for some time, due to full employment ashore offering more congenial employment to the better qualified ex-apprentices. Even the accepted standard of basic skills appeared to be on the decline. The reader will rightly ask what was wrong with the craft training of many of the traditional entrants into the Merchant Navy from Industry. One must first appreciate that the natural evolution of processes in a engine builder's shop has been slowly but constantly changing; machine tools have in many processes superseded the hands of the fitter who has now been limited to erecting or assembling the finished parts. This change has been overlooked by many of the heavy engineering and marine engine building firms, though in the lighter engineering and aircraft industries it was recognized much earlier, and many firms had set up their own apprentice schools where the boys received basic instructions in the use of hand tools and the operation of small machine tools before being employed on production work, thus ensuring that the unusual job could be efficiently performed and that the individual would be adaptable to changing circumstances.

In the early 'fifties the marine engineering firms generally lagged behind the leading mechanical and electrical engineering firms in provision for training their apprentices, but many of them have now set up training schools. Apprentices are no longer regarded widely as 'cheap labour', but as an investment for the future survival of their establishments. This need for basic training is now fully recognized and proposals now at national level may be widely implemented during the 1960's.

Future entrants from industry should therefore prove more satisfactory to the ship-owners. At this point I would like to mention that ex-E.R.A.s are welcomed by many Companies because of their excellent practical training. It was noted annually that a few serving E.R.A.s sat the Ministry Examinations and passed for Certificates of Competency.

### *Turnover*

During the 'fifties the annual turnover of engineers in the Merchant Navy averaged round about 3,000/3,500 out of a total of 26,000/27,000 engineers afloat at any one time ; of that total 7,000/8,000 engineers were certificated. This large turnover, I suggest, resulted to a considerable extent from the operation of the National Service Acts. Service in the Merchant Navy was an attractive well-paid option to service in the armed forces.

It must be emphasized that despite the efforts of all interested parties the drift from the sea of certificated Engineer Officers was the most alarming feature of the period. Some apparent progress was made in the early 'fifties when the numbers of certificated officers afloat did increase from about 7,000 to 8,000 but by the end of the period that number had fallen to round about 7,000 and would have been less but for the early entries from the Alternative Training Scheme qualifying for both Second and First Class Certificates. The inauguration and operation of this training scheme will be referred to later.

With the ending of National Service in 1960 the position rapidly worsened, particularly the supply of suitably trained junior engineers to fill the numerous vacancies, and a number of ships had in the early weeks of 1961 to put to sea shorthanded.

What did the shipowners do during the 'fifties to provide against the ending of the National Service Act ? They provided excellent conditions afloat with high wages and liberal annual leave in the hope that this would offset the attraction of shore employment, but this was not enough. A number of Companies, however, did anticipate the ending of National Service and associated themselves with special schemes for training seagoing engineers.

The foregoing is a brief review of the general pattern of conditions in the Merchant Navy in the 'fifties. Some details follow of outstanding changes in these years.

### **Ministry of Transport Examinations for Certificates of Competency**

After a lapse of twenty years it was decided in 1957 by all interested parties that the Examination Regulations and syllabuses should be revised and brought into line with present practice where necessary. The Ministry adopted the recommended changes and the revised Regulations were implemented in January 1959. The changes were few in number and did not materially affect men already in the pipeline. They included a relaxation from two years to one year in the requirement specifying the portion of the necessary four years' workshop service which must be spent on fitting suitable for the training of a marine engineer. This modification widened the potential recruiting field. The qualifying period of sea service for admission to the 2nd and 1st Class examinations was increased from 18 to 21 months. This increase was considered necessary to allow candidates time to gain experience in the operation and maintenance of the more complex machinery under present day conditions. The actual standards of the examinations were not raised but some rearrangement of the syllabuses was considered necessary, in particular the practical questions dealing with ship construction and electrical appliances were hived off from the Engineering Knowledge syllabuses and incorporated in the Electrotechnology and Naval Architecture syllabuses and the papers on these subjects extended to include a section covering these questions. One overdue change which drew many comments from those interested was the introduction of a question paper in Elementary Mathematics for the 2nd Class candidates only. The scope of the syllabus for the subject was limited to cover the mathematics necessary to deal with the problems met with in the theoretical questions in other papers.

The schools preparing candidates for these examinations rapidly amended their courses and the changes were soon operating smoothly.

## **Training Courses**

### *The Alternative Training Scheme*

The problem of the supply of well trained junior engineers, mentioned above and in my previous article, gradually built up from the end of World War II, and became quite serious. The 'fifties opened with much talk of full-time training at sea for apprentice cadets straight from day school who were to become the engineer officers of the future. Out of these discussions a scheme, known as the Alternative Training Scheme, took shape, and it reflected the thoughts in part of each of the interested parties. It functioned throughout the period more or less as originally agreed. The training period lasted about  $4\frac{1}{2}$  years, commencing age was not less than 16 years of age, on or before the 30th of September in the year the apprentice started in the scheme. The entry qualifications into the scheme were in practice the possession of at least two passes, mathematics and a suitable science subject, in the G.C.E. examinations. Equivalent qualifications were accepted. The scheme was divided into three phases, Phase I covering the first two years spent in a Technical College studying a course leading to the Ordinary National Diploma. The normal Ordinary National Diploma course was adapted to meet, as far as possible, the special requirements of a marine engineer and to include more than the usual amount of workshop practice and technology while Heat and Heat Engines received particular attention, being regarded as possibly the most important of the technical subjects for a marine engineer. Phase II, lasting 18 months, was spent as an apprentice or cadet afloat and Phase III was spent on work suitable for the training of a marine engineer in an approved engine works.

The long vacation periods in Phase I were also to be spent on suitable work in approved engine works or repair works. Practical difficulties of finding suitable workshops for vacation training led in many cases to these periods of training being carried out in the college workshops, on a pre-arranged agreed programme of tasks. Towards the end of the 'fifties the current thought was that all the periods of workshop training should be done in suitably equipped college workshops. This will be dealt with more fully below under the heading 'Technical Colleges'.

In addition to the O.N.D. course, the apprentices followed a correspondence course in Phase II. This course was designed in preparation for the part-time endorsement course in Phase III, covering Electrotechnology, Naval Architecture and the Operation and Maintenance of Marine Machinery.

The cost per apprentice over the training period,  $4\frac{1}{2}$  years, which was then in the region of £1,300, appeared frightening. The number of shipowners therefore taking part in the scheme did not increase at the rate anticipated and the number of apprentices did not exceed about 350 per annum until 1961. The scheme, as might be expected, suffered much criticism in the early years, particularly from the senior engineers in some of the ships in which these apprentices served and from some uninformed outsiders. In particular the trainee's practical knowledge was weak relative to the time-served traditional entry from the marine engine works or repair yards, with five years' experience as apprentice fitters behind them. Such shortcomings will disappear as they gain experience, particularly as their knowledge of workshop technology is good. On the other hand the theoretical training those apprentices have received is superior to that of the average junior engineer from the traditional source of supply. They should qualify more quickly for promotion and be competent to take charge of the most modern machinery installations. I think that the

Superintendent Engineers best able to comment on these matters will agree with the foregoing.

It might be appropriate here to mention that this scheme may run into shoal water in the 1960's as a sequence to the 'Crowther Report'.\* Following that report the Ministry of Education and the Institution of Mechanical Engineers have prescribed definite entry standards for admission to National Certificate and Diploma Courses. These new standards are rather more exacting and this revision may severely limit the number of school leavers available at the age of 16 years to enter the scheme.

#### *The 'Southampton' Scheme*

Another scheme was on the stocks by the end of 1960, to be launched in September 1961, at Southampton Technical College. Early in 1960 it was appreciated that recruiting into the main Alternative Training scheme would become more difficult. As already stated, the intake into that scheme had been about 350 per annum over its first eight years. To expand, it was considered necessary to seek an untapped source of possible recruits and this, some parties believed would be found among Grammar School and Modern School boys who had not passed the necessary G.C.E. subjects but who would be eligible for admission to the G2 year of the new General Course at Technical Colleges for persons seeking admission to the Ordinary National Certificate or Diploma courses. The Phase I of this scheme was planned so that at the end of two years in the college these apprentices would reach an educational standard which would allow them to complete a part-time Ordinary National Certificate course during Phase III. Apart from the academic side in the colleges the scheme would follow the details of the main Alternative Training Scheme, except for the correspondence course in Phase II and the endorsement course in Phase III; an appropriate correspondence course, however, was to be arranged for this course. As this scheme grows it is hoped the college workshops will be expanded and become suitably equipped to offer the full workshop training required in Phase III for all apprentices under these schemes.

#### *Ratings Course*

In August 1960, a course was started at Leith to train selected ratings to become engineer officers. It had been pointed out that whereas on deck it was possible to 'come up the hawse pipe' and in due course become a Master, no such openings existed for engine room ratings to become a Chief Engineer.

The qualifications required for acceptance into the course were at least four years' sea service, three of which must have been as a senior rating since attaining the age of 18. The results from this course will not be evident for several years.

A further course along somewhat similar lines but designed for boys straight from school who wish to become seagoing engineers, but who have not started any form of apprenticeship, was being sponsored by certain shipowners. The history of the 'sixties, when it is written will tell whether or not this scheme will be implemented, but such a scheme to me savours of Hobson's choice.

#### **M.V. 'Otaio'**

One must include a word about the above training ship of the New Zealand Shipping Company which provided for the training of both navigating and engineering cadets. This new cargo liner was fitted out with workshops and class rooms to train thirty engineer cadets in groups of 15 per annum. At the end of two years in *Otaio*, where the cadets also receive theoretical training leading to Part I of the Engineering Institutions' Examinations, they are trans-

\* Report of the Central Advisory Council for Education—England (H.M.S.O.).

ferred to other ships in the Company's fleet to obtain a further 18 months' practical training and will later complete their 4½ years apprenticeship with 12 months workshop training in one of the large Clydeside ship builder's engine shops. The ship has been in service since late 1957. The scheme has had its setbacks ; there were difficulties in securing the continuing services of instructors of suitable quality with the ability and experience necessary to bring the apprentices to the required theoretical standard. However, the owners' motive in introducing the scheme is to be commended, namely to bring up these cadets in the same atmosphere as the navigation cadets, hoping they will all develop the same common officer-like qualities and prove themselves a credit to their Company as engineer officers in future years.

### **Technical Colleges**

In my first article I showed how a number of the Technical Colleges in the ports provided departments for instructing sea-going engineers studying for the Ministry of Transport examinations for Certificates of Competency. At the beginning of the 'fifties these colleges, so far as the marine engineering departments were concerned, functioned as individual units ; there was no liaison between the colleges, and, in fact these departments were, in most cases, isolated from the Mechanical Engineering Departments in their own colleges. One or two heads of departments in these establishments did from time to time put their problems to the Ministry's Chief Examiner of Engineers. In 1953 the marine departments in these colleges got together and formed an Association; this was a move in the right direction. This Association has developed and its considered deliberations merit attention.

During the 'fifties some pressure was brought by the Ministry to bear on the Principals in a number of the colleges to see that all the facilities such as the Heat Engines and Mechanics laboratories were made available to the Marine departments, who were also encouraged to organize progressive courses of study and to forget the old cram methods.

In these years, the new South Shields Marine and Technology College merits special attention. The college was originally authorized to be built to meet the demand for National Certificate and City and Guilds of London courses, but long before its completion the emphasis was changed to meet the demands for courses for marine engineers, both pre-sea courses for apprentices from local engineering firms, courses for the O.N.D. (Marine) of the Alternative Training Scheme, and post-sea courses leading to M.O.T. examinations for Certificates of Competency. The college laboratories and workshops are excellently equipped for the instruction of marine engineers. Its outstanding efforts to provide suitable workshop courses for the Alternative Scheme Apprentices doing their first vacation training in Phase I added conviction to the growing belief that Phase III workshop Training could be provided in suitably equipped college workshops. There never was any doubt about the ability of the colleges to provide craft training, but hitherto colleges have maintained that their function was the instruction of the technologies with the workshops as laboratories for demonstrations, and the acquisition of craft skill and standards were left to be acquired in industry. Most of the interested parties gradually came round to the belief that simulated exercises on suitable machinery parts might provide sufficient training for these apprentices for at least six months of the twelve months Phase III training.

These ideas became practicable for a few in 1958 when the British Petroleum Tanker Company, Limited, presented the machinery in an old tanker to the South Shields College and subsequently presented in June 1960 a cheque for £20,000 as a contribution to the cost of the necessary workshop for this vocational craft training. Pilot courses of six months duration commenced in

1959, and these reduced the Phase III industrial workshop training for apprentices in the course to six months. This radical departure from the usual industrial workshop training received much publicity and, as I have already mentioned, there was soon talk of more colleges following in the wake of South Shields.

Many problems, however, mainly financial, have yet to be solved.

### **Conclusion**

The decade of the 1950's thus ended with the shipowners heavily indebted to National Service for the supply of junior engineers from industry, and fully aware they must make a larger contribution to training apprentices to meet the demand for the junior engineers they will require, realizing that they cannot expect as in the past to recruit entirely from the men trained by industry. I feel, however, that industrially trained men will be required in fairly large numbers for some considerable time because the training schemes cannot hope to meet the demand in the foreseeable future.

Shipowners are in business to make profits and no one can blame them for trying as long as they could to obtain a plentiful supply of trained engineers at no cost to themselves. A further article towards the end of the 1960's will, I am sure, be most interesting in recalling whether the present efforts were successful in filling the gap between the supply and demand for suitable junior engineers and the retention of certificated engineers. This decade may see the advent both of the nuclear ship and of the fully automated ship, either of which will require a new breed of engineer, with further new supply problems to be solved.