# THE SHIP DEPARTMENT REORGANIZATION

BY

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For two and a half years, in various capacities, including my present one, I have been closely concerned with the preparation and realization of the reorganization of Ship Department; and in writing about it now I am expressing my own opinions and interpretations rather than any 'official line'.

People still ask if reorganization was necessary. I am one of those who are convinced that, since its foundation ten years ago, the Ship Department has achieved an enormous output with an efficiency and economy which few outside it understand. That so much of this output in the design of warships and their systems never got to the building berth was not the fault of Ship Department. Nevertheless, and perhaps inevitably, time and experience began to show up weaknesses in the operation of the department, particularly in the ability of the three main professional divisions to achieve harmonious relationships.

A Committee was set up; the Admiralty Board studied its recommendations and accepted some of them and in DCI (RN)1071/67 announced the decision to reorganize with four objectives:-

(*i*) Improved forward thinking and design for the future.

(*ii*) Better planning of work and resources.

(*iii*) Further development of project management.

(*iv*) The creation of a strong Board of Management.

The Board of Management, charged with the duty of implementing these instructions was to be constituted as follows:-

Director-General Ships
Deputy Director-General Ships
Director of Warship Design
Director of Engineering (Ships)
Director of Naval Ship Production
Director of Resources and Programmes (Ships)
Director of Naval Equipment
Scientific Adviser

The Director of Warship Design is a Constructor and the Director of Engineering either a Mechanical or Electrical Engineer. The Director of Resources and Programmes is an Assistant Secretary, the Director of Naval Equipment a Seaman Officer, and the Scientific Adviser a member of the Royal Naval Scientific Service. The first five posts listed are selected from the Royal Corps of Naval Constructors, the Royal Naval Engineering Service and the Engineering Branch of the Navy. They must be so appointed that there is always one naval engineering officer, and that among the membership of the Board shall be the heads of the three professions—Naval Constructors, Mechanical Engineers and Electrical Engineers. The appointment of members of such a Board is going to present many an administrative headache in the future; nevertheless I am sure it is a sound arrangement.

The new structure of the Board of Management implies the break-up of the old strong professional divisions DNC, DME and DNEE, and some fear that there will follow a weakening of professional standards. I do not believe this for a moment. We must demand of every officer the highest possible loyalty to and attainment in his own profession. Particularly in his younger years in junior posts each officer should have the opportunity of really deep technical engagement in his appointed tasks so that he knows the kind of technical issues to be faced and overome. But, as his career develops, he should increasingly gain experience of 'inter-professional' service and management so that he comes to the highest posts in due time with any professional blinkers he might have had completely removed. The primary loyalty of all Ship Department officers must, therefore, be to that Department and to the Royal Navy; professional and other loyalties must come second.

The Director of Warship Design is responsible for the design of all warships. For this purpose he has professional groups of constructors, mechanical and electrical engineers, allocated to the various ship projects. It has not been possible to set up a large number of completely integrated project groups, as was at one time hoped, but the method of staffing the Directorate of Warship Design does ensure that project control principles can be applied.

Within the Directorate of Warship Design is the Forward Design Group which represents a new philosophy rather than a new part of the structure. This is a strong team whose function is to handle all forward design work, particularly for ships, at the earliest stages before Staff Requirements have become established. It is the hope, not only that this group will crystallize the ideas of the Admiralty Board into design studies for ships, but that through this group the Ship Department will take the initiative in offering to the Board and the Naval Staff ship concepts in which the recent advances in technology are applied to the solution of naval problems.

The Director of Resources and Programmes has taken over some of the functions previously held by Mat. 1 Branch and RDF(N) of the Secretariat

## DIRECTORATE OF ENGINEERING

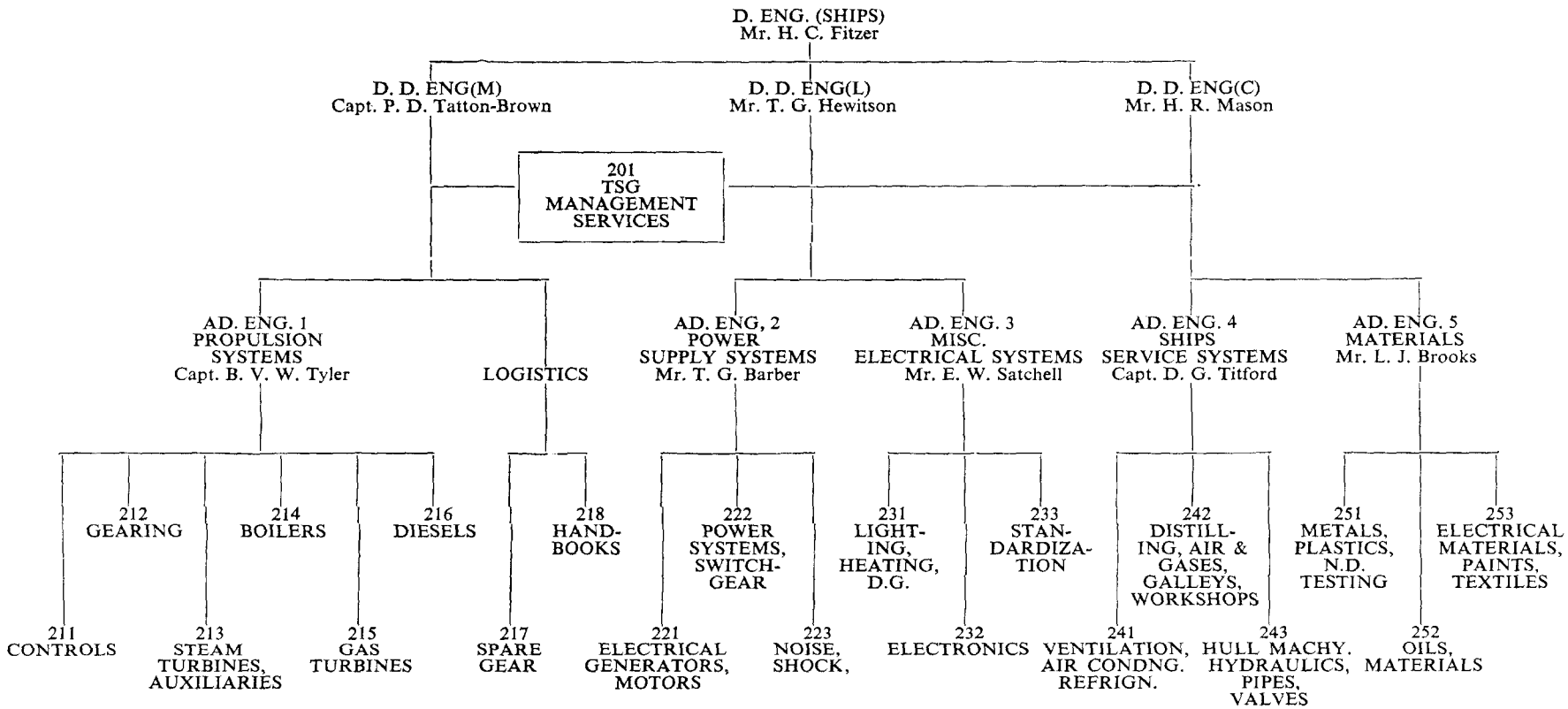


FIG. 1

and represents a new departure aimed broadly at providing the Department with a management service. Its task is to survey and reconcile the three broad fields of Work, Staff and Money, and it will therefore handle the departmental work programme, personnel matters and budgetary finance.

The tasks and functions of DNSP, DNE and SA have not been significantly changed from what they were before, although certain programming functions previously undertaken by DNSP have now been transferred to DRP(S).

The foregoing is a very brief summary of the new constitution of the Ship Department apart from the Directorate of Engineering, because as its Director I intend to devote the rest of this paper to the organization and tasks of that Directorate. In some respects the Directorate of Engineering is the most revolutionary part of the Ship Department reorganization. Not only is it composed of all three professions engaged in the Ship Department, but it is intended so to integrate the members of these professions and their drawing office colleagues that all the work of the Directorate will be controlled and managed according to the principles of 'System Engineering'.

'System Engineering' tends to mean whatever people think it might, but in the Directorate of Engineering it means that emphasis will be placed in future on the behaviour of components and machinery as parts of engineering systems and the concentration of all the necessary talents to deal with system design into appropriate groupings. This is not so easy to achieve at the beginning because of the way people are already working and thinking, and because the relative numbers in the various disciplines are not necessarily suitable for deployment according to the new principle. Moreover, the relationships of 'Component Design Groups' to 'System Design Groups' requires much careful discussion before they can be expressed in an organization chart. So the Directorate of Engineering is in some ways an experiment by which the present sub-divisions of staff and work strictly according to profession will gradually change into the new sub-divisions.

The structure at present still therefore shows recognizable signs of the old professional sub-divisions. Under the Director are three Deputy Directors, each one of whom is responsible for an area in which the major activity is of his own profession, although various degrees of mixing have already taken place, as may be seen from FIG. 1.

The three Deputy Directors, together with the Director himself, form the Board of Management for the Directorate, and each Deputy therefore wears three hats:-

(*i*) He is a member of the Board of Management

(*ii*) He is responsible for the administration of the staff groups under him

(*iii*) He is the head of his profession within the Directorate of Engineering.

Some people would prefer to have seen a much more radical change from the beginning, but, apart from the general problems already mentioned, there have been more tangible difficulties:-

(*a*) There have been prohibitions on increasing the numbers or upgrading staffs.

(*b*) So that there was no dislocation of the work of the Directorate, it was thought wiser to leave the main grade working groups undisturbed as far as possible at the beginning.

(*c*) The best possible spread of senior staff had to be made to ensure a balance of work and responsibility.

(*d*) Sub-division of work, staff and responsibility between the Directorates of Warship Design and Engineering must receive first attention.

Much of the attention of the senior officers of the Directorate in the early months will be devoted to curing the resulting awkward spots in administration and dealing with the programme of impending office moves.

But the greater interest lies in the long term development of the Directorate of Engineering towards System Engineering. The question has to be asked 'What is an Engineering System?'; and how is the answer to be expressed in organization? For instance, what we usually call a pump is a system consisting of pump, motor, starter, valve box, seating and connections to ship systems. It is not possible, with the people we have, to get all the talents required into one group for one pump. Moreover, the pump may be part of the propulsion system, the air conditioning or the electric power system. Also, because the propulsion system exercises a determining influence on the design and performance of the whole ship, the propulsion system engineers are in the Directorate of Warship Design. It seems unlikely that D. Eng. can be fully organized upon some general principles of System Engineering but that (as in most aspects of engineering) theory will often be overridden by practical considerations.

The term 'System Engineering' however, has a more extensive meaning in the sense of applying systematic thought to engineering problems—a meaning which leads us into wide concepts such as 'Systems Analysis' and 'Information Systems'. The Management must explore this field because in it might be the key to the future of the Directorate, not only within its own organization but in its relationships with the Navy, Industry and Engineering Research and Development.

But this is not all in the future. A more old-fashioned way of describing some aspects of 'System' is to talk about the formulation of Policy—in our case 'Technical Policy'. Here small beginnings have already been made. Standardization people are grouped together and already getting to grips with metric conversion. We are establishing the nucleus of an Engineering Upkeep Section which will in time handle all those questions of ship availability and reliability which bring ships' officers to frustration and designers to despair. We are considering policy co-ordination to rationalize all aspects of SYMES.

In the meantime our basic task goes on, providing the Warship Designers, Weapon Authorities, Dockyards and everybody else who needs it, with the engineering service we have to give. We must procure equipment designs to meet naval requirements and provide system designs which often nobody else can do for us. We must be ready with advice on performance, reliability, installation and repair. For this we have to improve our specifications which are often uncoordinated and uncertain in their aim. We should be preparing and issuing for ships and other designers codes of practice on equipment utilization, system installation, testing, commissioning, maintenance and repair, and a host of other things. We have a varied development programme which must be continually aligned with the requirements of the new Fleet.

There is much to be done and the big gains are to be expected from the enthusiastic dedication of mixed professional teams bringing their combined talents and experience to the solution of the engineering problems of the Navy. The success of our work will be judged in time by the Navy and the Dockyards which have to operate, maintain and repair what we provide. The aim of the Directorate of Engineering must therefore be a simple one: to provide the Royal Navy with an Engineering Design and Consultancy Service which will make the maximum contribution to the effectiveness of the ships and the efficiency of their crews.