

ANTI-SUBMARINE WARFARE

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BY

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This year's symposium took Anti-Submarine Warfare as its theme. Over recent years, the Royal Institution of Naval Architects (RINA) has held a number of symposia, covering many aspects of naval vessel design; and a reputation for attracting wide-ranging, informative and interesting papers, has led to the symposia being well attended by international audiences. This symposium was no exception with over 170 delegates from 14 countries. The international flavour was also found among those presenting papers, with 7 countries (from 4 continents) providing authors.

The papers were predominantly of a technical nature. Areas of anti-submarine warfare that were presented covered various aspects of the design of ASW vessels, ASW sensing devices, the environment in which the ASW battle is fought and details on some ASW weapon systems. The one exception to this technical bias was a paper dealing with the ASW strategies and capabilities of the U.S. and Soviet navies by the well-known naval commentator, Mr Anthony Preston.

The opening two papers presented two sides of the ASW battle. Mr R. W. S. Easton of Yarrow Shipbuilders Ltd. gave a paper on the latest R.N. ASW Frigate design, the Type 23 DUKE Class. He described the way the design had evolved from the concept first discussed in the early 1980s. He emphasized the increased and earlier involvement of industry in the design process compared with previous warship designs. Success of a vessel can be

measured in many ways and the endeavours to export the Type 23 and the consequential advantages to the U.K. in general were discussed, as well as the more specific technical details of the ship. This paper was followed by one by Herr Petersen of Deutsche Werft AG on the design of conventional submarines, their sensors, their weapons, their weaknesses and strengths, and the measures that can be taken to maximize their advantages over ASW units.

In these papers, and indeed in many other papers over the 3-day symposium, the subject of underwater noise was discussed. Submarines can possibly be detected by a number of methods, depending on the design, environment and mode of operation, but the proposed method currently, and the method that is likely to continue to be important in the foreseeable future, is the underwater noise signature. Much detail on this subject is classified and so the papers had to concentrate on the laws of physics and more generalized discussions on how sensors could, especially in the future, be able to discriminate between a ship's signature and unwanted background noise to a far greater extent. There was also some discussion on the nature of noise sources and how analysis of the noise source could lead to either a reduction of the source level or more effective noise reduction measures being taken to attenuate the noise before it becomes a useful signature in the open ocean. A very interesting paper on oceanography, as it affects ASW, was presented by Dr G. J. Kirby of ARE Portland. The complexity of the environment in which the underwater noise sensors operate was discussed and how, by understanding this environment, the advantage in an ASW encounter could be swayed to either the hunter or hunted.

Other signatures can complement the use of underwater noise and there were two papers, both by foreign authors, on the use of magnetic anomaly detectors. These added to the understanding of how this sensor type can be of use in localizing a submarine.

Foreign authors predominated in the papers on ASW weapons. Three Swedish authors described the annoyance felt in their country over the violation of their territorial water by foreign submarines and how this had led to the development of a shallow water ASW weapon. Some delegates queried whether such a weapon would be used in peace time, bearing in mind the fatalities and international consequences that could follow seriously damaging a submarine. The authors replied that the weapon was definitely not just a warning device and hostile submarines should know it!

On the last day of the symposium there were four papers by RCNC authors that covered aspects of ASW vessel design. Modesty prevents me reporting the paper on propulsion of ASW vessels*. Papers that developed themes on naval architecture have, over the years, been produced by Mr D. K. Brown and Dr D. J. Andrews. Both contributed papers to this symposium, the former covering layout of frigates and the latter aspects of the early design stage. The final paper was by the Professor of Naval Architecture at University College London and some former students of the college. It reported a study undertaken during the M.Sc. courses in naval architecture and marine engineering into an ASW SWATH vessel.

Most papers, and these latter papers in particular, generated considerable discussion and helped to leave the audience feeling that, although the subject of ASW had been aired, a further conference in the not too distant future was necessary. If this comes about or indeed when other R.I.N.A. conferences on warship matters are organized, I commend *Journal* readers to attend, if the opportunity arises.

*See this issue, pp. 465-479.