THE INCREASING IMPORTANCE OF MARITIME PATROL AIRCRAFT

‘In a dispersed battlespace that would be the norm in a maritime environment, the ability to identify the adversaries’ centres of gravity is a critical advantage.’

Sanu Kainikara, Australian Air Power in a Maritime Strategy, CAF Occasional Paper No 4, p.40

All maritime nations are aware of the diverse spectrum of threats against both their maritime territorial and economic interests. This has contributed to an expansion in undersea warfare capabilities of navies who appreciate the advantages that even a modest submarine force offers. For example, even the potential presence of an adversary submarine can create significant sea-denial and anti-access effects that could hinder unrestricted maritime movement. Neutralising such a threat, whether real or not, will require expending a considerable amount of resources to find, track and prosecute it. Long-range and high-endurance diesel-electric submarines have proliferated in recent years, particularly in the Asia-Pacific. The submarine threat seems to be also increasing in the Middle East, and Central and South America. This trend is likely to continue.

The growth of submarine fleets has reinforced the argument for maritime patrol aircraft (MPA) that are capable of performing anti-submarine warfare (ASW) and anti-surface warfare (ASuW) as the need for countermeasures able to secure territorial and economic interests becomes apparent to maritime nations. MPAs are multi-role platforms that are capable of performing a wide spectrum of missions ranging from maritime surveillance to high-end naval combat operations. In recent times, the term maritime surveillance aircraft has been used to denote unarmed airborne platforms that are used only for surveillance and reconnaissance. The subtle difference between the two terms is that the surveillance platform does not have the ability to carry weapons and therefore cannot by itself prosecute a target.

While the role of the MPA is not new, ASW operations against sophisticated state-of-the-art submarines, especially when they are operating in littoral waters, present a unique set of increasingly complex challenges. The complexity of littoral waters and increased shipping activity close to the shore makes it necessary to have technologically advanced sensors on board an MPA to achieve sufficient discrimination to detect and localise submarines. The latest diesel-electric submarines have the ability to shut down the diesel generators and run on electric batteries for fairly long periods, which makes detecting them when they are close to the shore extremely difficult.

MPAs need to have the characteristics of: long endurance, great range at relatively low altitudes, and the ability to carry sufficient numbers and variety of weaponry such as anti-ship missiles, depth charges, mines and torpedoes. They also need sufficient internal space, and electrical power generation capacity to support a large number of mission systems and operator consoles. These requirements translate to the MPAs being large platforms. Newer MPAs, such as Boeing’s twin-turbofan P-8 Poseidon MPA, have between 30 and 50 percent excess internal space margins to cater for increased load carrying requirements. This also improves the multi-role capabilities of the aircraft.

As is usual in the case of airborne systems, the high-end MPA platforms are not inexpensive to acquire,
‘operationalise’ and maintain. Once acquired, the cost of crew training and, more importantly, the command and control protocols that are needed at the strategic and operational levels to ensure their decisive employment, add to the total system cost. Maritime patrol is a complex mission that involves a number of systems functioning in harmony. A single MPA patrolling a vast ocean is only the visible end of a spear with an extremely long support shaft. Without exaggeration, it can be stated that an effective maritime patrol capability takes years to build, refine and effectively employ. Crew training is the first step to achieving this multifaceted capability.

The high costs associated with high-end systems such as the P-8, are driving manufacturers to provide cheaper options that are attractive to nations that are not well resourced, but still feel the need to have the capability. Considering the high cost of large MPA acquisition, the way forward for many nations may be the adoption of cheaper solutions through the acquisition of multi-role aircraft that have a ‘part-time’ maritime patrol role along with search and rescue, and even passenger/cargo carriage.

As the increasing importance of MPAs is being accepted, there is also recognition that many countries have to cope with decreasing manpower and difficulties in achieving their defence recruitment targets. Newer and smaller MPAs have factored this trend into their design philosophy. Accordingly, the emphasis has been on reducing maintenance upkeep by introducing self-diagnostic capabilities that perform automatic remedial actions within the mission systems. Of greater significance is the computerisation of mission systems that permit their fully automated functioning from target search, detection and tracking. Human interface takes place only at the final decision-making stage of prosecuting a target. This is a quantum jump in MPA mission capacity.

Advances in technology and miniaturisation have made it possible to gradually shift the focus from the platform to the mission system, which is being developed and integrated almost in a custom-built fashion. This has been welcomed by MPA operators, since one of the key challenges that they face is the effectiveness of the mission systems, which are capable of collecting vast amounts of data that could potentially overwhelm the operators. The latest systems are designed from the outset to discriminate and prioritise surveillance based on the rules, regulations and concept of operations of the customer. Such automation is becoming an increasingly common feature of many military platforms.

While the smaller-sized MPAs may be suitable as a cheaper option, they are unlikely to fully replace the larger ones, primarily because of the ability of the larger platforms to carry sufficient weaponry without having to sacrifice their range or endurance. Therefore, the larger platforms will continue to be relevant and sought after, within the resource and personnel constraints that most military forces face. What has emerged is a market of MPA options suited to a range of budgets and strategic geographic environments.

Most maritime nations are seeking to procure sophisticated sea-denial and anti-access assets while simultaneously attempting to enhance maritime patrol capabilities. Defence industries have responded accordingly—submarines have proliferated and a range of MPAs are being fielded, both in sizeable numbers. The cycle of trying to neutralise one capability with a countermeasure and then a counter-countermeasure evolving to counter it is never ending. This is equally visible in the development of MPAs. However, the fact remains that the protection of a nation’s maritime interests cannot be ensured without adequate maritime patrolling capabilities, irrespective of whether it has a credible submarine capability or not.

Key Points

- The proliferation of submarines has enhanced the ability of nations to achieve sea-denial, even with limited resources
- The importance of maritime patrolling capabilities has increased in a commensurate manner
- The maritime interests of a nation can only be protected when adequate maritime patrolling capabilities, resident in both small and large MPAs, are available