Piracy on the high seas is not a new phenomenon, but in recent years it has become a serious challenge to maritime activities, which constitutes the major part of international trade and commerce. The sea off the Somali coast has evolved as the epicentre of such activities, although, the straits of Malacca is also pirate infested. Since 2008, the international community has deployed a large number of warships to the Indian Ocean near the east coast of Africa to counter the Somali pirates and stop the loss of shipping. While the initial phase of this initiative was successful in reducing losses, especially in close proximity of the Somali coast, it also resulted in extending piracy activities further out to sea by operating a mother ship concept similar to large fishing fleet operations.

The increasing efficiency of the naval task forces in patrolling the coastal areas, have forced the pirates to adapt and shift their activities outwards. In 2005, the furthest recorded attack was around 165 nautical miles (m) off the Somali coast, whereas in 2010, pirates were attacking ships as far away as 1500 m into the sea. This translates to an area of operations of about four million square kilometres—the size of mainland Europe—for the international naval task force to monitor and patrol. With the current level of asset availability, which is unlikely to increase, this is not a realistic task; the ships are limited in numbers and their average persistent radar range is 40 m. Although shipborne helicopters can, and do, increase the range of surveillance, this can only be done for very limited periods of time. Beset with these constraints the anti-piracy mission is gradually faltering.

The key to success is obtaining intelligence regarding pirate movements so that the ships can be at the right place at the right time. The key to gaining such intelligence is the ability to carry out persistent large area surveillance that could provide a wide enough pattern of activities to initiate actions in a timely manner. The newly developed Hybrid Air Vehicle (HAV), an optionally manned heavier-than-air airship, is a tool that offers a low-cost option to provide wide area surveillance to fight piracy.

The HAV, when operated in the uninhabited mode at about 20,000 feet above a host frigate, can remain aloft for 21 days, providing around-the-clock surveillance over about 325,000 square kilometres of sea. In comparison, a crewed fixed wing aircraft of the P-3 Orion class can provide about 18 hours of persistent surveillance over a much smaller area. The presence of HAVs will obviously also create deterrent effects.

Greatly increased persistence is achieved mainly through the airship design. Around 40 per cent of the lift required to stay aloft is provided by the aerodynamic design properties of the shaped hull, and the helium that fills the airship provides the remainder. This permits the HAV to conserve fuel in getting airborne and staying at height, allowing it to operate for a number of days without having to be replenished.

There is an added advantage to employing an HAV that is critical in the contemporary economic climate. The operating costs of these airships are a fraction (estimated to be a tenth) of those of other conventional maritime patrol assets. Persistence calculated in the number of days rather than in hours and extremely low operating costs is an unbeatable advantage.
combination for providing wide area surveillance over the high seas. Further, the technology required to operate an HAV is available off-the-shelf and its procurement costs are relatively modest, making it an attractive proposition to resource constrained governments and military forces.

There are other advantages to the employment of HAVs. First, when it is optionally piloted it can transit controlled airspace en route to the area of operations while an uninhabited vehicle cannot do so. Second, the HAV can be supplied and controlled directly by a frigate at sea, thereby negating the need to operate from a land base in a foreign location, avoiding the accompanying complexities. Third, the size of the hull permits the carriage of a much larger array of sensors than is possible with any other currently available maritime surveillance air asset. This not only allows greater coverage across a broader spectrum of sensors, but also provides greater sensitivity to the surveillance.

By using a number of HAVs in tandem, and all the surveillance pictures being combined with those of the host ships, it will be possible to create a corridor in the high seas that can be protected and within which all activities will be known at all times. Such corridors, when laid out optimally, can permit merchant shipping to route direct, as opposed to the current requirement to circumvent known pirate-infested areas, potentially saving large amounts money in operating costs.

There is a historic precedent to using airships in maritime surveillance—during World War II, airships operating over the US East Coast forced German submarines to confine themselves to the mid-Atlantic region. However, airships are still considered ‘new’ technology. The main challenge to the acceptance and employment of this concept of wide area surveillance with the use of heavier-than-air airships, therefore, would seem to be a cultural push back. However, the operational need for wide area surveillance and globally declining defence budgets could act as catalysts to changing the reluctance to open acceptance.

Understandably, the concept is outside the traditional line of thinking, but air power has always been innovative in its conceptual development, a fact demonstrated by the progress it has made in just a single century of existence. The need of the hour is for all nations to be able to carry out their legitimate trade and commercial activities unhindered by illegal and criminal activities such as piracy. It must be noted here that national sovereignty extends to a nation’s commercial shipping and therefore its protection is also a national responsibility. The policing of the high seas, therefore, cannot be left solely to the naval forces of a few countries. The current combined naval assets on anti-piracy duties are unequal to the task, and airborne wide area surveillance through airships will provide a mitigating capability that will permit the limited maritime assets to control large swathes of sea at minimal cost.

• Anti-piracy operations are inherently difficult because of the large area to be patrolled and the lack of sufficient assets
• Airborne wide area surveillance provided by HAVs could improve the safety of merchant shipping
• The use of airships in maritime surveillance is an innovative concept in the employment of air power

If you have 24/7 coverage over 21 days, which is as good as it gets [with today’s technology], then nobody can move without being seen.

Captain Willie Pennefather, Royal Navy (Ret) Executive Director Hybrid Air Vehicles Ltd, UK, 2011