

# Think small

## Adding small combatant ships would beef up the Navy's capabilities

BY MILAN VEGO

**T**he Navy has a relatively large number of surface combatants capable of conducting a wide range of missions in a high-intensity conflict. However, the Navy lacks adequate capabilities to operate effectively in the littorals, in particular in enclosed and semi-enclosed seas (popularly called "narrow seas").

A force of the new Littoral Combat Ships (LCS), when they enter service in the next decade, will not significantly increase the Navy's capabilities in conducting littoral warfare. This bad situation can be changed by building or acquiring a force composed of multipurpose corvettes and missile combat craft.

However, the problem is that the Navy is traditionally opposed to operating small surface combatants in times of peace and in operations short of war. After World War II, and except briefly during the Vietnam War, the Navy did not, until recently, appreciate the potential value of small surface combatants. Perhaps the Navy has felt that if such a force were needed, it could quickly create one. It did this in World War II when, within a short time, some 426 patrol torpedo boats were built, organized and deployed in the most distant war zones. Only 42 of these PT boats were lost to enemy action. Modern small surface combatants are technologically sophisticated and relatively expensive, however. They cannot be built quickly once the conflict at sea starts. There is also the unfounded belief that small surface combatants are of little use in the modern era. Although that might have been true in the past, it is not the case today. Modern multipurpose corvettes and missile combat craft carry weapons and sensors and are fully

capable of conducting a wide range of combat and non-combat missions.

The primary threats to U.S. surface combatants in the littorals include quiet, conventionally powered submarines; land-based fixed and rotary-wing aircraft; small surface combatants; coastal gun batteries; smart mines; unmanned aerial vehicles medium- and long-range land-based surface-to-air missiles (SAMs); and tactical ballistic missiles. In addition, small, stealthy surface craft armed with small-caliber guns and short-range grenade launchers can, in some cases, threaten even U.S. missile cruisers or destroyers. The Navy also is concerned about potential attacks by the maritime suicide vehicle-borne improvised explosive devices used in Iraq, Yemen and Sri Lanka.

Perhaps among all potential threats, anti-ship cruise missiles (ASCMs) launched from small surface combatants, coastal batteries and aircraft pose the single greatest threat to large U.S. surface ships operating in the littorals. The number and sophistication of ASCMs has increased dramatically over the past decade or so. It is estimated that about 75,000 cruise missiles are in the inventories worldwide and are produced in 130 types. More than 80 countries, many of them in the Middle East and Asia, have sea- and land-launched ASCMs. Nineteen countries produce ASCMs and 11 of them are exporters.

The threat from small surface craft to the larger U.S. surface ships is illustrated by several incidents in the Persian Gulf and the Strait of Hormuz since the early 1980s. During the Iraq-Iran War, the Iranian Republican Guard Corps (IRGC) attacked the Kuwaiti-owned but U.S.-flagged tankers in the vicinity of Bahrain and Qatar. It also came in direct confrontation with the Navy. Several IRGC ships were sunk by the Navy in the late 1980s. However, the Iranians drew the lessons that U.S. large surface ships were vulnerable to air and missile

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**Sweden's 620-ton Visby-class corvettes employ stealth technology and are equipped for anti-surface and anti-submarine warfare as well as mine countermeasures missions.**

attacks. This, in turn, led directly to the adoption of so-called "swarming tactics" by the Iranians in future conflict with the Navy in the Gulf. Swarming tactics are nothing new; many armies used them in the past. The Iranian concept employs a large number of small boats to surprise and isolate a force of the enemy's large surface ships. The boats converge to their prospective targets from a large number of bases and attack using ambushing positions close to the Iranian coast or off-shore islands. The greatest potential problem here is with small craft in the 21-mile-wide Strait of Hormuz. On Jan. 7, five Iranian boats approached a three-ship U.S. formation (the cruiser Port Royal, the destroyer Hopper and the frigate Ingraham), maneuvering aggressively. Three of these boats approached within about 300 yards of the U.S. ships. This incident lasted about 20 minutes and no physical contact occurred. The U.S. ships conducted some evasive maneuvers and were ready to take appropriate action before the Iranian boats suddenly broke away.

Such swarming attacks were predicted by retired Marine Lt. Gen. Paul van Riper, who played the commander of the red enemy side during the Millennium Challenge exercise in July and August 2002. He creatively used swarming tactics that resulted in the sinking of an aircraft carrier and 16 other ships. The red small boats attacked with machine guns and rockets, reinforced with air- and ground-launched missiles. Some of the small boats were loaded with explosives to detonate alongside U.S. ships in suicide attacks. After the blue fleet was sunk,

the game was ordered to begin again. The blue ships were refloated and the blue team eventually was declared the victor. At this point, van Riper quit the game in protest because of his concern that the Pentagon was more interested in proving the superiority of the new transformational concepts than in learning from the exercise.

#### **FORCE REQUIREMENTS**

Despite the lack of a commonly accepted view on the size of small surface combatants, it is generally understood that they are not capable of full-scale operations on the open ocean. Thus, it is generally considered that small surface combatants vary in size from about 500 tons to 1,500 tons. Almost any ship larger than 1,500 tons is fully capable of extended operations on the open ocean. Ships smaller than 500 tons are classified as combat craft.

In general, the optimal size for multipurpose surface combatants is between 1,000 tons and 1,500 tons. Such a size allows balanced capabilities for conducting anti-surface, anti-submarine warfare (ASW), air defense and mine-laying tasks. Small surface combatants less than 1,000 tons in displacement are usually dual-purpose, although they might be classified as multipurpose. Small surface combatants should have low draft, perhaps not greater than six feet. They should have high maneuverability in confined waters. They should have long range and high cruising speed combined with high endurance. The need for high speed is much more important for a small

## The best weapon to counter enemy small surface combatants is a force of small surface combatants.

surface combatant operating in the littorals for evasive maneuvering and quick withdrawal when facing a much larger enemy surface combatant. Small surface combatants should have a high degree of stealth with reduced radar, acoustic and magnetic signatures.

In the past, corvettes and light frigates were the principal small surface combatants. A frigate was smaller in size than a destroyer and larger than a corvette. It was employed primarily as an oceangoing convoy escort. A corvette was a small ASW ship, also used for convoying duties, but primarily in coastal waters. However, over the past three decades, the line between a frigate and corvette has progressively blurred because both types evolved into multipurpose combatants capable of conducting land attack, ASW and air-defense missions. Multipurpose corvettes can attain a maximum speed of more than 30 knots. Their range can vary from 1,500 to 3,500 nautical miles. Modern corvettes are armed with several launchers for anti-ship missiles, multi-purpose guns and ASW weapons. They also are fitted with a landing pad for helicopters.

### FAST ATTACK

Littoral waters are the ideal environment for the employment of fast attack craft (FAC) armed with ASCMs and/or torpedoes and guns. Modern missile-armed FACs range from 250 tons to 500 tons and have maximum speeds between 32 knots and 40 knots. Their cruising range varies from 1,500 to 4,000 nautical miles, and endurance ranges from several days up to almost 10 days. They normally carry four to eight anti-ship missiles, one 76mm or 57mm dual-purpose automatic gun and one or two 20mm to 40mm guns. Some also are fitted with tubes for 400mm or 533mm torpedoes.

The main tactical advantages of FACs are their versatility, high speed, great striking power, excellent maneuverability, small silhouette and high degree of immunity to mines. The main drawbacks of FACs lie in their lack of staying power, short range, modest ability to fight in poor weather, quick onset of crew fatigue, high likelihood of loss if hit and, most important, high vulnerability to enemy attacks from the air. Most of them are also unstable weapon platforms.

The great majority of U.S. surface combatants are too large and ill-suited for operations in the littorals. The Navy has in active service 22 of its original 27 Aegis Ticonderoga-class missile cruisers and 52 (plus 10 under construction or planned to be built) 8,950- to 9,155-ton Arleigh Burke-class



missile destroyers. The plan is to retain the Aegis cruisers until they reach the age of 35. The lead ship of the Arleigh Burke-class was commissioned in 1991; the last will enter service in 2010/2011. In addition, the Navy operates 30 4,100-ton Oliver Hazard Perry-class missile frigates. They will remain in service until the 2010s. The majority of the Navy's surface forces will be composed of the Aegis cruisers into the 2030s.

The Navy is working intensively to build and expand its capabilities for operations in inshore waters and on rivers. The greatest gap is for operations in the littorals and narrow seas. The smallest surface combatants comprise eight (out of originally 14 ships) 355-ton Cyclone-class patrol craft. These lightly armed craft (two 25mm guns and four machine guns) have a maximum speed of 35 knots. The maximum range of the Cyclones is about 2,500 nautical miles at a cruising speed of 12 knots. The Navy is experimenting with the new and highly maneuverable 45-ton surface craft dubbed M80 Stiletto, built for the Pentagon's Transformation Office as part of the Wolf PAC program. This 80-foot craft has a draft of 3 feet. Its range is about 500 nautical miles at a cruising speed of 40 knots. The Stiletto's maximum speed is reportedly 50 to 60 knots. The experiments are being carried out in cooperation with U.S. Special Operations Forces' Command to test command and control of geographically dispersed but networked and



**In an example of swarming tactics at sea, five Iranian small craft approached three U.S. Navy ships in the Strait of Hormuz on Jan. 7.**

autonomous or semiautonomous forces.

The Navy's capabilities in littoral warfare are expected to improve with the commissioning of the first highly maneuverable, fast and networked surface combatant, the LCS, in 2009. When the program was announced in November 2001, the Navy planned to build 55 2,800-ton LCSs as part of the 313-ship force. Originally, the LCS was to cost about \$220 million per ship (not including weapons and equipment). However, the combination of numerous changes in the LCS design and poor management escalated the costs by more than 100 percent of the ship's original price. By this spring, the cost of the lead LCS rose to about \$500 million. As a result, the original construction schedule has been slowed.

Two lead LCSs of different design are in the final stage of construction. LCS-1 Freedom, with a mono-hull, is built by Lockheed Martin, and LCS-2 Independence, with a trimaran hull, is built by General Dynamics. The Navy plans to select in 2010 a single design based on the testing of these two lead ships. Despite their different hull designs, both ships have the range of 4,500 nautical miles at cruising speed of 20 knots. Their maximum range at the top speed of 50 knots will be about 1,500 nautical miles. The LCS will be a multipurpose

ship carrying three mission modules: for antisurface warfare, ASW and mine countermeasures (MCM). However, the LCS will carry only two mission packages at any given time. The LCS is designed for missions in support of expeditionary strike groups (ESGs) or surface action groups (SAGs) in conducting anti-combat craft defense, ASW and MCM. They will use their high speed and off board systems to create a layered defense against small boats. Secondary missions for LCS include patrolling/surveillance, maritime intercept, special operations forces support, and logistics support for personnel and supplies.

The LCS is not really a littoral vessel but, rather, an ocean-going platform. Its draft of 20 feet is too large for maneuverability in the confined waters of a typical narrow sea such as the Persian Gulf. Its sprint speed is generally of little use around islands/islets and in shallow water. It is highly doubtful that a ship of 3,500 tons, no matter how well-armed and -equipped, could match the agility of hostile small boats, and suicide boats in particular. Another shortcoming of the LCS is that it has to move outside the littoral for refueling and rearming.

#### **POSSIBLE SOLUTION**

The best weapon to counter enemy small surface combatants is a force of small surface combatants. Aircraft can remain in the threat area for a limited time and are far more adversely affected by bad weather and night conditions than surface combatants. Large surface combatants such as the Burke class destroyers or the Aegis cruisers also have limited capabilities against the small, highly maneuverable and ASCM-armed surface combatants. They also would have significant problems against the threat of the swarming attacks by small boats, especially when transiting straits or narrows such as Bab el-Mandeb Strait or the Strait of Hormuz. The LCS also is too large to provide an effective defense for carrier strike groups, ESGs or SAGs in such seas. Radar systems on U.S. large surface combatants do not have sufficient accuracy or refresh rate to reliably track fast attack craft.

Small surface combatants are much more maneuverable and faster than their larger counterparts. Moreover, they can be employed for a greater diversity of missions than fixed or rotary-wing aircraft and they have greater staying power. Their ability to detect and track continuously their enemy counter-

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parts is also much greater than that of aircraft. Nevertheless, a combination of aircraft and small surface combatants is the best counter to the enemy small surface combatants threat.

The LCS program is too far into the production cycle to be canceled (although it might be further scaled down). The Navy would be well advised to complement LCS with a modest force of 1,200- to 1,500-ton multipurpose corvettes and 400- to 500-ton missile craft. Such a force would considerably enhance the Navy's capabilities to conduct operations in the area between the open ocean and inshore waters. They are better-suited than destroyers, frigates or cruisers for counterterrorism patrols, sanctions enforcement, counterpiracy and countermuggling (narcotics, weapons and humans) and choke-point patrols/surveillance. In times of tensions and crisis, small surface combatants can be used to screen larger ships during their transit through a strait/narrows. During a high-intensity conflict at sea, they can be employed for anti-combat craft defense, ASW, to escort friendly shipping, attack enemy shipping, mine-laying, and to support special operations forces. Finally, but not least, small surface combatants are much cheaper than their larger counterparts.

The quickest and cheapest way to create a capable force of small surface combatants is to build them at home or buy ships already in service with U.S. allies. Several classes of corvettes are built by friendly countries, such as the Israeli 1,295-ton Sa'ar 5 (Eilat), the German 1,685-ton MEKO A-100, the Swedish 620-ton Visby, South Korea's 1,200-ton Po Hang and the Italian 1,285-ton Minerva. For example, the Sa'ar 5-class multipurpose missile corvette — three of them were built at Litton's Ingalls shipyard in Pascagoula, Miss. — is one of the best designs of a small surface combatant today. These \$260 million corvettes have a maximum speed of 33 knots. Their range is about 3,500 nautical miles at 17 knots. The Sa'ar 5's endurance is between 24 and 30 days. They are armed with two quads for the 72-nautical-mile-range Harpoon surface-to-surface missiles

(SSMs), two 5.4-nautical-mile-range SAM systems and two triple 324mm torpedo tubes. The Sa'ar 5s are armed with a single 76mm gun or Mk 15 Phalanx Close-In Weapon System. They also can carry one or two helicopters. Another class of multipurpose corvette is the German MEKO A-100. The 1,850-ton K-130 Braunschweig-class has a maximum speed of 26 knots and range of about 2,500 nautical miles at a cruising speed of 15 knots. The Braunschweig is armed with four 108-nautical-mile-range ASCMs, two rolling airframe missile 21-cell launchers, a 76mm dual-purpose gun, a 30mm short-range gun and two .50-caliber machine guns. Two launchers can be installed for the 38-nautical-mile-range Exocet sea-skimming antiship missiles. The Braunschweigs also can carry one helicopter.

The Visby corvettes have a maximum speed of 35 knots on gas turbines and 15 knots on diesels. They are built of fiber-reinforced plastic in sandwich construction. The Visby was designed to drastically reduce optical and infrared signature, above water acoustic and hydroacoustic signature, underwater electrical potential, and magnetic signature. The Visby can be detected at the range of 7 nautical miles in rough seas and 12 nautical miles in a calm sea, without jamming. In a jammed environment, the Visby corvette will be detected at a range of 4.3 nautical miles in rough seas and 6 nautical miles in calm seas. They will carry SSMs. Other weapons include a 127mm rocket launcher, depth charges and three 400mm tubes for homing torpedoes, and a single 57mm general purpose gun plus mines.

Among more modern missile combat craft are the Israeli 490-ton Sa'ar 4.5 class, the Swedish 400-ton Goteborg class and the Finnish 270-ton Hamina class. The Sa'ar 4.5s have a maximum speed of 33 knots. Their range is 4,800 nautical miles at 19 knots or 2,200 nautical miles at 30 knots. They are armed with four launchers for Harpoons, sea-skimming missiles, a 76mm dual-purpose gun and a 20mm gun. The Sa'ar 4.5s also can carry one helicopter. The

Goteborgs have a top speed of 30 knots. They are armed with eight launchers for SSMs, a 57mm gun, four 15.75-inch torpedoes and four 127mm rocket launchers. The Goteborgs can also lay mines.

**THE CONCEPT**

The Navy needs a credible force of multipurpose corvettes plus a modest number of missile combat craft to effectively bridge the existing gap in its surface warfare capabilities in the littoral waters. As many as 32 multipurpose corvettes organized in eight squadrons of four ships each should be acquired. They should be forward-deployed in similar manner as are surface MCM ships. In addition, a force of perhaps 12 missile combat craft could be deployed within a striking distance of selected choke points. The most critical deployment areas are the Persian Gulf/Strait of Hormuz, Horn of Africa/Bab-el Mandeb Strait, the Strait of Malacca and the Caribbean. Two squadrons should be rotated within each area and in agreement with friendly countries and observing their sovereignty. For operations short of war, such as maritime counterterrorism or counterpiracy, this new force should operate jointly with allies and coalition partners. In a major crisis or high-intensity conflict, multipurpose corvettes and missile combat craft should be used jointly to provide screen for U.S. large surface combatants. They also can protect convoys and merchant shipping.

The Navy must urgently reconsider its traditional opposition to operating a credible force of small surface combatants in peacetime. For a relatively small investment, the Navy would increase the overall number of ships in its active fleet and close the gap in its capabilities in areas between the open ocean and inshore waters. The new Cooperative Strategy for 21st Century Seapower cannot be successfully executed without sound application of operational art. This requires a balanced force of surface combatants capable of conducting missions in peacetime, operations short of war, and low- and high-intensity conflicts. **AFJ**