they will be able to fill crucial voids for both the Marine Corps and our sister Service to which they are attached—the two functions are by no means mutually exclusive.

Three years of experience have proven that there are indeed gaps in our coverage of amphibious C4 issues in the context of the D-30 process, but these gaps can be easily covered. We should confine our efforts to filling those gaps, not endlessly debating and redesigning structure based on simple polling data from various MEUs. It is clear that the root problems are the need for some type of unifying presence exclusively focused on injecting Marine Corps requirements into the D-30 process and the need to provide a mission statement explaining the purpose of the FACMs to those who work with and would evaluate them and their effectiveness. Without this central guidance and a clear mission statement, there can be no solution to the problems or the complaints we have encountered. If we address these two central issues, without deference to the personal feelings of some, we will give our Marines the tools they need to take full advantage of this unique opportunity to learn and grow as communications officers while maximizing the return on our C4 liaison expenditure. The problem is not that these Marines deploy and it is not that they are frequently given collateral duties as the PhibRon N-6. Let's fix the problems and leave the rest alone.

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>Capt Wyche served on PhibRon staffs during Operations SHINING HOPE and SHINING RESPONSE and Joint Task Force NOBLE ANVIL. After work at Amphibious Warfare School and Officer Candidates School, Capt Wyche is serving with the 7th Communications Battalion.

An Obsolete Capability

by Capt Christopher L. Phelps

Should the Marine Corps continue to invest limited dollars and time to train and equip small boats for missions that are only remotely possible?

It is now the 21st century, and the Marine Corps continues to deploy its Marine expeditionary units (MEUs) with an infantry company trained to conduct small boat operations. The idea of utilizing the combat rubber raiding craft (CRRC) to conduct a company-sized amphibious raid is obsolete given current threats to surface ships, technological advances made in coastal surveillance systems, and the speed and tempo of the modern battlefield.

Advocates of the venerable craft immediately point to the amphibious raid conducted by Carlson's Raiders on Makin Island in August 1942; never mind that the mission was a military failure. Since then, no military has utilized small rubber boats to move significant numbers of troops ashore for an amphibious raid or assault. Many would argue the probability of a MEU conducting any amphibious raid in today's casualty conscious world is remote, let alone conducting one with a small-boat company (SBC). Should the Marine Corps continue to invest limited dollars and time to train and equip MEU SBCs for missions that are only remotely possible?

In the future, MEUs will deploy with the new MV-22 Osprey, nearly doubling its current assault-support troop lift capability. The Osprey will fly over twice as fast and over twice as far as the CH-46E. With operational maneuver from the sea and ship-to-objective maneuver looming and the requirement to operate from over the horizon, it's time the Marine Corps drops the SBC capability within its MEUs.

There are several reasons why the SBC concept has become obsolete. Range, force size, firepower, logistics, and weather are all factors that detract from employing an SBC in an amphibious raid. Utilizing one 18-gallon fuel bladder and the Johnson 55 horsepower engine, a CRRC has a range of about 40 miles.[1] Using a 25-nautical-mile (nm) planning distance for launching CRRCs, two 18-gallon fuel bladders are required. The additional bladder takes up already limited space and adds a minimum of 100 pounds extra weight. The CRRC with the 55 horsepower engine is capable of speeds up to 12 knots in calm sea states. Figuring a realistic (and some may say optimistic) planning factor of 10 knots, it will take roughly 2 hours to reach the 4.1nm (7.5 kilometer) (km) point at which a CRRC comes into the line of sight of a 6-foot observer.[2] It will take an additional 23 minutes to reach the typical 0.5km dropoff point for the scout swimmers (not including any paddling time if engines are cut en route). Scout swimmers swimming at 1.2 knots will take 13 minutes to swim 500 meters to the beach.[3] It will take approximately 2.5 hours for the first elements of the SBC just to reach the beach, let alone the objective. This does not even account for the time to launch the 18 CRRCs from the ship or for the remainder of the raid force to negotiate the surf zone after the scout swimmers have conducted their reconnaissance of the beach landing site (BLS) and signaled that the BLS is secure. Addi-

tionally, if any engine fails (not at all uncommon), that CRRC will require towing, subsequently slowing the entire force.

Many advocates of the CRRC will be quick to point out that an intermediate transport vehicle (ITV) can be used to move the boats closer to shore before launching. The theory is that the ITV will reduce the physical demands and transit time of the inserting force. The classic ITV often suggested is the landing craft utility (LCU). CRRCs have been successfully launched from the LCU. The main problem with utilizing LCUs as an ITV for CRRCs on the MEU is what to do with the preboated gear on the LCUs (unless the CRRCs are strapped in and among the preboated gear and vehicles).[4] Unless the preboat can be offloaded prior (probably not possible due to safety and a ship's vehicle load out), the LCU as an ITV is a marginal capability at best. Additionally, the LCU will dramatically increase the radar cross-section of the force as it approaches the coast.

The 18 CRRCs typically deployed with the MEU allow the SBC to launch with 126 Marines. Once ashore, up to a platoon may be required to provide security for the boats and the BLS resulting in approximately two platoons to actually conduct the raid.[5] The end result is limited firepower. The company would likely bring its own 60mm mortars and machineguns, but would be unable to bring in any significant weapons systems such as a heavy machinegun or TOW system. The Javelin, inorganic to the SBC, may well provide a significant antiarmor capability, but it too will certainly complicate the mission with likely additional cross-decking requirements and additional small boat training for the Javelin teams during the MEU's workup. Assuming the reason for employing the boat company was due to a significant antiair threat, one would also need to assume that rotary-wing close air support (CAS) would also be endangered, and the force would be required to rely upon fixed-wing (FW) CAS dropping ordnance from outside threat envelopes. Dropping FW ordnance outside most threat envelops will significantly degrade the accuracy and effect of most CAS. Naval gunfire is likely also out of the question assuming one of the main reasons for employing the SBC was to avoid a significant coastal defense threat. Ultimately, the SBC must rely upon the very limited fire support it can bring in its 18 CRRCs. The use of a rigid hull inflatable boat with a mounted heavy machinegun will only increase the radar signature of the force as it approaches the shore.

Logistics creates another considerable challenge for the SBC. The amount of ammunition, water, and fuel brought is severely limited by the space and weight limits of the CRRC. The CRRC is limited to a capacity of 2,000 pounds. As was illustrated in the Makin raid, casualties (not to mention dead) create an extreme burden due to the limited space within the CRRC and renegotiating the surf upon extract. Again, we have to assume that the reason for employing the SBC was due to a significant air threat, and thus, the capability to bring in supplies or extract wounded creates a prohibitive risk to aircraft.

Weather is one of the greatest factors detracting from employing the SBC. The CRRC is limited to a maximum sea state three (16-knot wind and wave height of 2.9 feet) by U.S. Navy regulations, and under most circumstances limited to a modified surf index (MSI) of 6.0. Although the CRRC has been tested to an MSI of 10.0 and a sea state of six, these conditions would most likely be beyond the capabilities of most of the SBC's coxswains.[6] Even when operating within average weather conditions, a 2- to 3-hour trip to the BLS is very physically demanding. Many Marines in the average infantry company may not possess the physical strength to operate at the upper end of the sea state window over this period of time and still be combat capable upon reaching the shore.

In addition to winds and seas, water temperature also becomes a major factor. Because it is necessary for the Marines to ride the inflated sides of the CRRC, they will become completely soaked during the transit to the BLS. Without the aid of wetsuits or mustang survival suits (neither of which are issued to the SBCs), the combat effectiveness of an SBC will be severely degraded even with moderate water temperatures after a 2- to 3-hour transit to the BLS.

One common falsehood about CRRCs is that they cannot be detected by radar systems. That may have been true 10 to 15 years ago. There are many systems such as the German produced BORder-Alcatel 550 radar by Alcatel Telecom that can detect rubber boats to an unspecified range (likely 5–10km). What is most significant about this system is that it is man-portable (probable crew of three) and requires less than 5 minutes to set up and 20 seconds to become active.[7] Although not man-portable, the Israeli EL/M-2226 Advanced Coastal Surveillance Radar is capable of detecting rubber boats out to 20km in sea state three.[8] Both of these systems are available for sale on the open market. There is an increasing market for radar systems capable of detecting small rubber boats not only for traditional military reasons, but also for antiterrorism and detecting coastal smuggling operations. Egypt utilizes a HMMWV-mounted coastal border surveillance system using "Signaal" Scout radars for detecting smugglers.[9] Most of the technology to detect small rubber boats from landbased systems is at least 5 years old.

Modern coastal patrol aircraft can now detect small rubber boats and even submarine periscopes. Israel's airborne EL/M-2022A(V)2 radar is capable of detecting a periscope at 55km in sea state three and, weighing less than 95 kilograms (kg), is easy to mount on many platforms, including some unmanned aerial vehicles.[10] In 1997, the Russian company, Systema, produced an airborne radar capable of detecting small rubber boats at 5km that weighed less than 50kg.[11] The exportable APS-134 Sea Vue produced by Raytheon is capable of

detecting rubber boats in sea state three out to 56km.[12] Many countries already possess airborne radar systems capable of detecting small rubber boats for search and rescue. It is naïve to think that potential enemies with advanced technologies (China, Iran, etc.) will not have the radar capability to detect CRRCs.

In addition to radar, passive thermal and acoustic technologies and night vision devices have enabled detection of small rubber boats. CNN used commercially available night vision and thermal devices to detect reconnaissance elements that launched 18nm from the shore during Operation RESTORE HOPE in 1994.[13] Our adversaries will likely have similar equipment. Eighteen CRRCs would create a fairly significant thermal signature against a cool water background. The U.S. firm, Science Applications International Corporation's "Underwater Sentry," designed to detect small boats, has been around since at least 1995. It relies on passive submerged hydrophones that can be remoted out to 10nm and is capable of operating in high sea states.[14] Although systems such as these are likely to be relatively expensive, the technology is already 7 years old and will likely become cheaper as time goes on. Passive optical, thermal, and acoustic coastal surveillance systems may present the most significant threat to company-sized small boat operations using the CRRC.

Due to the limited capabilities of the SBC, the amount of training (arguably the most time-intensive of the MEU's three rifle companies), and the current threats to detection, the Marine Corps should begin to move away from task organizing its MEUs with an SBC. One potential solution is to train the third rifle company to be a heliborne company as its primary means of insertion. This will require less specialized training and equipment for the MEU than an SBC. Realistic potential missions for this second heliborne company are embassy reinforcement, humanitarian assistance and noncombatant evacuation operations security, tactical recovery of aircraft and personnel, or a true company-sized reinforcement capability. Most of these missions are not within the immediate capability of an SBC.

Theoretically, using the MV-22, the MEU could put two rifle companies ashore in nearly the same amount of time it currently puts one rifle company ashore using the CH-46E. The MEUs may even consider placing this company aboard the "big decks" (for which there is room if other nonessential assets are transferred to one of the small ships). However, if kept on the small deck, a split amphibious ready group configuration would automatically have a company trained in heliborne operations as its primary mission.

The CRRC and SBC concept has been around since the 1930s. It is nostalgic for today's Marines to look back on LtCol Evans F. Carlson's Makin Island raid. We picture highly trained and physically fit Marines sneaking ashore under the cover of darkness and catching the enemy unaware. Most forget—or are ignorant of the fact—that LtCol Carlson was forced to leave behind 17 of his wounded, missing, and dead Marines. We forget that LtCol Carlson did entertain the idea of surrender.[15]

Although we should not forget the heroics of LtCol Carlson's Raiders, it's time the Marine Corps stops fighting our past enemies and begins focusing on our enemies of the future. Our current MEU SBCs are obsolete; it's time for a change. The MV-22 may well be the opportunity for that change.

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>Capt Phelps is the S-2 for the Special Operations Training Group with II MEF.