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United States Marine Corps
Command and Staff College
Marine Corps University
2076 South Street
Marine Corps Combat Development Command
Quantico, Virginia 22134-5068

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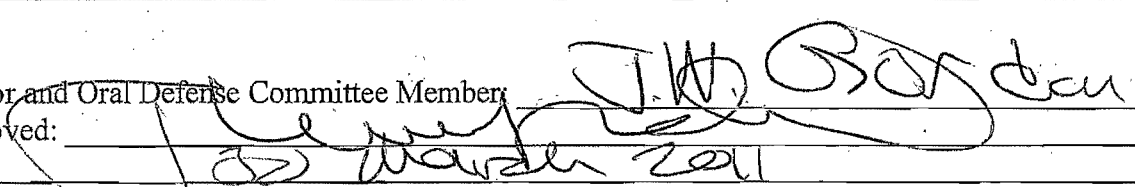
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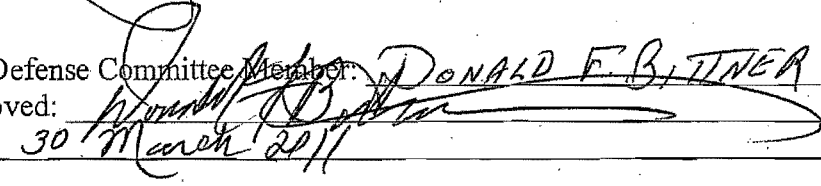
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LTCOL DOUGLAS S. MAYER


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Executive Summary

Title: Preserving Marine Corps Forcible Entry Capability in the 21st Century: Possible or Preposterous?

Author: Major Jeffrey W. Olesko

Thesis: Without the active development of doctrine and tactics aimed at overcoming littoral defenses, a refocusing of training on amphibious operations, and the procurement of weapon systems able to counter emerging anti-access technologies, the Marine Corps will lose its forcible entry capability in the 21st Century and, in so doing, jeopardize the security of the nation.

Discussion: After World War II, many strategists believed that the utility and feasibility of forcible entry operations, defined by Joint Publication 3-18 as “the seizing and holding of a military lodgment in the face of armed opposition,” had run their course. Much like trench warfare after the First World War, it was difficult to believe that a tactic requiring such complex coordination, immense logistical support, and perilous exposure to enemy fire would be a practical military option in future conflict. Specifically amphibious operations, including the deployment of waterborne tactical vehicles from shipping assets, vertical envelopment, and fire support from aviation assets, remains a significant part of the Marine Corps’ Congressional mandate as well as a necessary operational capability that we must continue to possess.

Conclusion: Failure by the Marine Corps to develop doctrine and tactics aimed at overcoming littoral defenses, refocus training on amphibious operations, and procure weapon systems able to counter emerging anti-access technologies will eliminate its forcible entry capability in the 21st Century and jeopardize the security of the nation.

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Preface

Since becoming engaged in protracted combat operations following the terrorist attack on the World Trade Center in 2001, the Marine Corps seems to have lost sight of its primary responsibilities as they apply to national security. This work contains my thoughts on refocusing the service's priorities and efforts in regaining and maintaining a forcible entry capability in the 21st Century.

While my conclusions may vary greatly from some of the individuals referenced, I am extremely grateful for their research and analysis. Thankfully, we are all working toward a common endstate – a Marine Corps able to fulfill its distinct role in protecting our nation.

I would also like to thank Dr. John W. Gordon for his guidance and mentorship during this work's compilation, as well as my son, JT, who sacrificed countless hours away from his Dad while I was researching and writing.

Preserving Marine Corps Forcible Entry Capability in the 21st Century:
Possible or Preposterous?

I have directed the QDR [Quadrennial Defense Review] team to be realistic about the scenarios where direct U.S. military actions would be needed – so we can better gauge our requirements. One of those that will be examined closely is the need for a new capability to get large numbers of troops from ship to shore . . . But we have to take a hard look at where it would be necessary or sensible to launch another major amphibious action again. In the 21st century, how much amphibious capability do we need?

-Secretary of Defense Robert Gates¹

In 1942, following the attack on Pearl Harbor and the subsequent entry of the United States into World War II, the Japanese Empire rapidly expanded their territorial control in southeast Asia. After a virtually unchecked advance through the Philippines, the Indies, a large portion of Melanesia, Wake Island, Guam, Singapore, and New Britain, Japanese forces landed on Guadalcanal in late June. Desiring a base of operation to support attacks on New Guinea and later Australia, Japan began building an airfield along the northern coast of the island. Recognizing this swift Japanese expansion as a threat to the lines of communication between the United States and Australia, an Allied offensive in the Pacific became a necessity. On 7 August 1942, an Allied Expeditionary Force comprised of aircraft carriers, warships, transport ships, and a 20,000 man landing team conducted an amphibious assault on Guadalcanal codenamed Operation WATCHTOWER. The Landing Force, comprising the reinforced 1st Marine Division, carried out the first large-scale opposed amphibious landing since Gallipoli. Six months of intense fighting followed until the Americans secured Guadalcanal on 9 February 1943 ending the Japanese advance in the Pacific.

After World War II, many strategists believed that the utility and feasibility of forcible entry operations, defined by Joint Publication 3-18 as “the seizing and holding of a military lodgment in the face of armed opposition,” had run their course.² Much like trench warfare after

the First World War, it was difficult to believe that a tactic requiring such complex coordination, immense logistical support, and perilous exposure to enemy fire would be a practical military option in future conflict. So widespread was this philosophy that in 1949, Secretary of Defense Louis Johnson stated, "There's no reason for having a Navy and Marine Corps. General Bradley tells me that amphibious operations are a thing of the past. We'll never have any more amphibious operations. That does away with the Marine Corps. And the Air Force can do anything the Navy can do nowadays, so that does away with the Navy."³ Less than one year later, the 1st Marine Division conducted an opposed amphibious landing at Inchon at the outset of the Korean War, codenamed Operation CHROMITE, that made the Secretary regret his claim.

"Amphibious operations are as old as warfare itself, yet throughout history military officials have repeatedly – and inexplicably – failed to recognize the need to develop the technology and expertise necessary to overcome an adversary's defensive capabilities and project power ashore."⁴ In spite of the lesson learned by one of his predecessors 60 years earlier, current Secretary of Defense Robert Gates has fallen prey to the same trap judging from his comments during an address at the Naval War College quoted in the introduction. Though there have been countless tactical and technological advances in warfare since World War II and Korea, the requirement still exists to establish potent ground forces ashore in hostile territory to close with and destroy the enemy in order to achieve policy aims. "Th[is] assertion is substantiated by history. In the past 20 years U.S. amphibious forces have responded to crises at more than double the Cold War rate, jumping from an average of 2.27 to 5.2 events per year."⁵

In fact, "[t]he way Marines fight is not substantially different from the way that they fought fifty years or one hundred years ago. The tools have been updated . . . but fundamentally it's still based on a smart and agile rifleman," notes General James Conway, former

Commandant of the Marine Corps.⁶ Specifically amphibious operations, including the deployment of waterborne tactical vehicles from shipping assets, vertical envelopment, and fire support from aviation assets, remains a significant part of the Marine Corps' Congressional mandate as well as a necessary operational capability that we must continue to possess. Without the active development of doctrine and tactics aimed at overcoming littoral defenses, a refocusing of training on amphibious operations, and the procurement of weapon systems able to counter emerging anti-access technologies, the Marine Corps will lose its forcible entry capability in the 21st Century and jeopardize the security of the nation.

Doctrine and Tactics

Operational maneuver from the sea is an amphibious operation that seeks to use the sea as an avenue for maneuvering against some operational-level objective. The concept recognizes the requirement for forcible entry – an amphibious landing in the face of organized military resistance.

-MCDP 3, Expeditionary Operations⁷

One can trace the roots of modern amphibious doctrine in the United States back to the reinvention of the Marine Corps during the interwar years. From Lieutenant Colonel Earl Hancock Ellis's penning of *Advanced Base Operations in Micronesia, 1921* to the development of the *Tentative Manual for Landing Operations and Defense of Advanced Bases* in 1934, Marine Corps leadership recognized a need to redefine the Corps' mission and its methodology for accomplishing it. Specifically, the Marine Corps was tasked to "[p]rovide and maintain forces for land operations in support of the fleet for the initial seizure of advanced bases and for such limited auxiliary land operations as are essential to the prosecution of a naval campaign."⁸ Many naysayers questioned the feasibility of such an operation after the Battle of Gallipoli based on improved enemy coastal defense technology and the belief that the world had seen the end of large-scale warfare.

“This phenomenon repeated itself in recent years. Personnel engaged in joint capability development efforts have often assumed that forcible entry capabilities are an area where the United States can accept risk and cut investments. The rationale for this assumption exactly replicates the two-fold 1930s argument: amphibious operations are far too dangerous in the face of modern anti-access weapons, and besides, scenarios that would require such operations are unlikely.”⁹ In spite of movements to minimize the need for such capability today, the reduction in U.S. bases overseas and the growing strategic importance of the littorals make forward-deployed forces with a forcible entry capability indispensable. Per Joint Publication 3-18, Joint Doctrine for Forcible Entry Operations, forcible entry is accomplished via three methods: amphibious assault, airborne assault, and air assault.¹⁰ From these, commanders may select one method or a combination of entry capabilities to achieve surprise, initiative, and tempo. As MCDP 3, Expeditionary Operations points out, “[o]perational maneuver from the sea is not merely a way of introducing an expeditionary force onto foreign soil, although it does that, but a way of projecting expeditionary power directly against some center of gravity or critical vulnerability.”¹¹ It is the ability to circumvent strengths and attack an enemy’s weakness that makes forcible entry invaluable. Regardless of the insertion method, gaining of a secure lodgment and rapidly building combat power ashore are essential to an amphibious operation’s success. These doctrinal principals remain unchanged.

What has evolved dramatically since the Marine Corps’ last opposed amphibious landing is the enemy’s access denial capabilities. “[A]nti-access technologies have made power projection in the 21st century an extremely complex endeavor. But the path to overcoming them – identifying and thinking through likely scenarios, adversaries, and capabilities – remains timeless.”¹² Recognizing and analyzing current and developing enemy coastal defense

capabilities and the construct in which they are employed is the first step in neutralizing their lethality. Today, these technologies include low tech defenses such as mines, diesel submarines, engineering obstacles, and direct fire weapons, as well as emergent threats such as anti-ship missiles, integrated air defense systems, and suicide boats. "As the range and precision of weapons continually increase, future commanders will likewise have to discern their opponent's capabilities and tactics to devise appropriate means and methods for overcoming them."¹³ As with any military operation, gathering intelligence on enemy weapons system emplacements and analyzing their areas of influence is crucial to identifying safe havens, developing shaping requirements, and prioritizing targets.

One such safe haven may be found over-the-horizon (OTH), or operating dozens of miles off the coast and out of range from visual and audible acquisition. "Over-the-horizon operations hide intentions and capabilities, exploit the element of tactical surprise and expand the shoreline the enemy must defend."¹⁴ Specifically, the Navy and Marine Corps are "starting to field over-the-horizon capabilities designed to negate the effectiveness of widely proliferated first-generation anti-ship cruise missiles (ASCM)."¹⁵ By keeping high value targets such as amphibious ships out of the engagement area of ASCM systems, minefields, and coastal patrol craft, the risk of operating in a hostile littoral region is greatly reduced. From this perch of relative security, commanders may shape enemy defenses to create or exploit weaknesses while the landing force makes final preparations for an assault.

Obviously, "[t]he preferred tactic for amphibious forces operating against coastal defenses is to avoid or bypass the strong points if unable to exploit gaps in these defenses."¹⁶ If the enemy possesses a robust integrated air defense capability that makes approaching his coastline by air prohibitive, then projecting power ashore via an amphibious assault may by the

most desirable course of action. Conversely, if the enemy's strength lies in his surface coastal defense system, then an air assault into a lightly defended rear area may maximize opportunities for success. The potential for attack along a number of different axes via a variety of methods is the key. "As long as the potential for a forcible entry exists, the enemy must guard against that potential which results in fewer enemy assets available to other battles."¹⁷

Deception may also help to achieve the element of surprise and facilitate the application of combat power at the most advantageous location and time during a forcible entry. Here creativity is the primary element limiting a force's potential. For example, shaping can be used as a means of deception. "Central to most anti-landing defenses is the use of littoral mine warfare."¹⁸ A sizable amphibious force conducting surface borne mine countermeasure operations on one stretch of coastline may mask subsurface mine clearing at the actual beachhead to be utilized. Likewise, aerial interdiction missions targeting command and control and ASCM systems for days preceding the commencement of decisive operations may cover a force's true intentions of conducting a purely airborne assault. Feints and demonstrations are also incredibly effective deception tactics. By feinting with one method of forcible entry, such as an air assault, an enemy's defenses may be thinned along the main effort's axis of advance, perhaps the beachhead of an amphibious landing. A recent example of this occurred during Operation Desert Storm when the 13th MEU conducted an amphibious demonstration forcing Iraq to needlessly commit numerous battalions to defend the port of Ash Shuaybah. Taken one step farther, a well organized feint or demonstration that meets with little resistance may be identified as a branch plan with a be-prepared-to mission of exploiting success.

Training

A landing against organized and highly trained opposition is probably the most difficult undertaking which military forces are called upon to face. Amphibious Operations require a high degree of training to achieve proficiency.

-General George C. Marshall¹⁹

Because of the scope and duration of Operation Iraqi Freedom and Operation Enduring Freedom, the focus of training in the United States Marine Corps has been divided over the past decade between preparation for the current counterinsurgency fight and our standing mission of amphibious operations. As a result, Marine Corps leadership "... has expressed concern that its skills in amphibious warfare (projecting combat power from the sea) are atrophying."²⁰ While ongoing Marine Expeditionary Unit deployments have kept a small percentage of Marines engaged in the training, planning, and execution of amphibious operations, potentially for the first time in history, the preponderance of Marines have never operated aboard ship. "Marines that came before us battled to keep the Marine Corps as an amphibious fighting force capable of doing what no other was able: amphibious forcible entry."²¹ Unfortunately, that skill set has atrophied tremendously during the protracted land wars in Iraq and Afghanistan.

As a result, the Marine Corps must refocus on the basic tenets of amphibious operations if it wishes to be relevant in the 21st Century. Specifically, officers and senior enlisted personnel must re-familiarize themselves with doctrinal procedures and responsibilities associated with maneuver from the sea. Additionally, individual units must schedule and conduct planning evolutions that exercise every facet of the Marine Corps Planning Process based on amphibious assault and air assault scenarios. Furthermore, commanders must utilize Operation Risk Management (ORM) and put specific control measures in place to ensure that Marines safely resume operating in the amphibious environment. Finally, once units have regained the ability to

'crawl' and 'walk,' maneuver and live fire rehearsals will facilitate the 'run' phase of regaining amphibious operational prowess. These rehearsals must occur at both the tactical and operational levels "... rang[ing] in scope from joint force exercises (driven by resource, time, space, and force availability constraints), to distributed command post exercises supported by computer-aided simulations, to commanders and/or key personnel conferences."²²

Many naysayers will argue that there is not enough time to train between deployments to Afghanistan to attempt to re-familiarize units with amphibious operations. While "white space" on training plans is assuredly at a premium, every unit must balance theater-specific training requirements with those that offer universal benefit. Operations Officers can accomplish this by taking advantage of available amphibious training opportunities and attempting to create others. Though an amphibious forcible entry scenario may not possess direct applicability to Operation Enduring Freedom, it exercises critical intelligence, fire support, maneuver, logistics, and command and control principals that are enduring. While the rotation of battalions, squadrons, and logistics groups through the Marine Expeditionary Unit (MEU) cycle has met the minimum requirement for the Marine Corps' pre-planned deployment schedule, it has not maintained an acceptable level of service-wide resident forcible entry contingency capability. Furthermore, while deployed, MEUs at the peak of operational readiness all too often squander precious Theater Security Cooperation Activities (TSCA) performing mundane training and rehearsals instead of enhancing their level of proficiency achieved during work-ups. If such training does not re-enter individual unit Operations Officers' training repertoires, the downward spiral of Marine Corps forcible entry capability will continue indefinitely into the 21st Century.

Technology

[T]he debacle at Gallipoli in 1915 had convinced most military thinkers, – except for a handful of U.S. Marines toiling in obscurity – that modern weaponry gave the defender so many advantages that amphibious operations were not feasible. Furthermore, senior U.S. defense officials could not envision a scenario that would require amphibious capabilities and declined to invest limited resources in their procurement.

-Douglas King and John Berry²³

MV-22 Osprey

An equally innovative handful of military thinkers in 1981 recognized that, “[t]he growth of anti-access/area-denial capabilities must be accounted for in the Corps’ air operations [and] concept of ship-to-shore movement.”²⁴ They conceptualized a sea-based, tilt-rotor aircraft capable of executing a vertical envelopment from shipping assets operating hundreds of miles off a hostile coast. Such an aircraft could hover like a helicopter at terminal areas, eliminating the need for lengthy runways, and transit to and from objective areas rapidly like an airplane. Enter the MV-22. The Osprey’s “[i]ncreased speed, lift, range, and duration/endurance gives [a commander the] capability to put more combat power and sustainment into [the] objective area, faster, and at more locations.”²⁵ Since its first operational deployment in 2007, the MV-22 has brought a number of measurable improvements to the Marine Corps’ amphibious capabilities. Due to its 300 knot cruising speed and reduced fuel consumption in airplane mode, the Osprey has proved capable of transporting Marines and equipment nearly 400 nautical miles without refueling.²⁶ This has facilitated earlier and deeper insertion of Reconnaissance and Surveillance (R&S) Teams into hostile territory while dramatically improving the distances that ship-to-ship and ship-to-shore logistical support may be accomplished.²⁷ In more traditional range scenarios, the MV-22 has substantially increased the assault support loiter time available in the objective area, while dramatically enhancing the reaction time for standby missions like Casualty

Evacuation (CASEVAC) and Quick Reaction Force (QRF) employment.²⁸ Unexpectedly, endurance combined with a high altitude operating environment (facilitating farther line-of-sight communication) and Satellite Communication (SATCOM) capability have also given the Osprey a bright future as a Command and Control (C²) platform.

Seemingly, however, every advantage that the MV-22 brings to the Marine Air Ground Task Force (MAGTF) is accompanied by a host of shortfalls. During Marine Expeditionary Unit (MEU) operations aboard an LHD, "[t]he biggest friction point initially was just the lack of available space on the flight deck itself and also down in the hangar deck . . ."²⁹ A larger and more complex aircraft than the CH-46 it replaced, the MV-22 and its associated support equipment occupies thirty to forty percent more space than its predecessor.³⁰ On the flight deck, a spread MV-22 on any of spots 4, 5, 6, or 7 precludes the movement fore and aft of other aircraft, effectively isolating the forward and aft slashes with regard to aircraft staging.³¹ On the hangar deck, original support equipment space estimates for an embarked MV-22 squadron were 12,600 cubic feet and about 77,000 pounds. In actuality, the final assessment was a 90,000 pound and 15,000 cubic feet requirement.³²

Unfortunately, space limitations have also hampered the aircraft itself. Internally, "MV-22 seating blocks cabin egress windows. [Squadrons have] removed seats to provide unimpeded egress capability. This left 20 seats in the cabin of the MV-22, providing two seats for aircrew and 18 seats for embarked troops."³³ Due to the crash resistant seat configuration and limited cargo space, "... it is very time consuming for a Marine to embark or disembark from the aircraft. This has resulted in smaller sticks, more time to embark the Marines on board ship (adding to flight deck congestion), and a greater amount of time to disembark those Marines once you get them to the objective area increasing threat exposure."³⁴

In addition to the twenty-five percent reduction of available seating per aircraft, aerodynamic interaction with the island and adjacent aircraft have limited the number of aircraft per deck cycle. The Osprey is currently not authorized to conduct vertical takeoffs or landings on Spots 5 or 6. Additionally, a one spot separation is required between an MV-22 landing or taking off from on any spot and an H-1, severely hampering large wave launches of assault support aircraft.³⁵

The problematic issues do not end there. While the high cruising altitude of the MV-22 provides a relative safe haven in a low threat environment during the transit from amphibious shipping during an air assault, rotary and/or fixed wing fires in the objective area are almost always a necessity. However, as the distance to objective increases above 75 nautical miles, so does the need for a forward arming and refueling capability increase to enable rotary wing Close Air Support (CAS) in the objective area. As the range approaches 150 nautical miles, even fixed wing CAS coverage begins to degrade due to aerial refueling requirements.³⁶ Beyond 150 nautical miles, crew day restrictions for rotary wing aircrews further hampered the long range capability inherent with the MV-22.³⁷

However problematic aviation fire support logistics challenges may seem, they pale in comparison to the issues currently associated with landing the MV-22 in unimproved landing zones (LZ). The Osprey's relatively small rotor disc size combined with a high gross weight has dramatically increased its rotor disc loading compared to a CH-46. The resultant "[d]ownwash of MV-22s increases [the] chance of RVL (Reduced Visibility Landing) and brownouts."³⁸ Heliborne Unit Commanders (HUC) complain that "[b]rownouts can last for minutes and [travel] up to 300 meters from the aircraft depending on wind conditions, causing significant disorientation to troops as they move towards their objective during insertion and back to the

aircraft ramp during extraction.”³⁹ Aerodynamic safety concerns have also increased landing separation distances by 400% compared to the CH-46. The requisite “250’ lateral separation requirement between MV-22’s for simultaneous landings impacts [the] flow of aircraft into [an] LZ [and] restricts LZ selection. During the Pre-Deployment Training Program (PTP), [units also] learned that confined area landings (CAL) . . . with mixed/dissimilar T/M/S was not a good idea.”⁴⁰ These points are moot, however, if the aircraft are unable to accomplish the most important aspect of an aerial assault – inserting the warfighter in the right place at the right time. A recent OEF deployed Marine battalion observes, “[o]ften, [the MV-22] will be incapable of landing in certain zones, be it due to aircrew ability, aircraft limitations, or environmental surroundings . . . Marines will watch multiple failed landing attempts by USMC aircraft into a given zone, then watch a USAF or UK medevac platform land with little to no difficulty in that same area.”⁴¹

Few aircraft in history have proven to be the panacea that the MV-22 was built up to be during its development. In fact, “[b]ased on the time it took an MV-22 to pick up its combatants, take off from the LHD, transition out to airplane mode and then convert back to VTOL (Vertical Take Off and Landing) configuration to land in the LZ, its net increase over the capacity of a legacy aircraft was not very substantial. In some instances, . . . it was probably less efficient.”⁴² However, its tactics, techniques, and procedures (TTP) are still in their infancy. With proper weighting of effort and matching of mission with capability sets by the next generation of innovative military thinkers, the MV-22 will find an essential role in the forcible entry operations of the future.

Expeditionary Fighting Vehicle

An equally important element of the forcible entry equation is the capability of the landing force to roll off amphibious shipping in armored vehicles that transit under their own power ashore and establish a lodgment inland in the face of hostile fire. For the past forty years, the Amphibious Assault Vehicle AAV-7A1 and its predecessor variants have accomplished that mission for the United States Marine Corps. However, the aforementioned advancement of access denial technology during this period has rendered the eight knot waterborne speed and 5,000 yard ship-to-shore range of the AAV all but obsolete in a forcible entry scenario. So in 1988, the Department of Defense "initiate[d] the Concept Exploration/Definition Phase (CE/D) of what was then known as the Advanced Amphibious Assault Vehicle (AAAV) program."⁴³ After the Marine Corps awarded the contract to General Dynamics, the AAV replacement was renamed the Expeditionary Fighting Vehicle (EFV) in 2003.⁴⁴ "The EFV is an armored, fully-tracked infantry combat vehicle operated by a three-person crew that can carry 17 combat-equipped Marines. It is to be a self-deploying, high-speed amphibious vehicle capable of transporting Marines from ships to objectives inland and aims to have the speed, maneuvering capabilities, fire power, and protection to operate with main battle tanks on land. It is intended to have a 20-knot speed in the water and a 345 mile range ashore with a 45 kilometer-per-hour speed on hard-surfaced roads."⁴⁵ The technology that facilitates such impressive characteristics is a tread retraction feature that works in conjunction with an extendable bow plane. Working together, these elements transform the EFV into thirty-five ton flat-bottom boat powered through the water by a 2,700-horsepower, turbo-boosted engine. Additionally, "[T]he EFV possesses a fully integrated Global Positioning System (GPS), Integrated Navigation System (INS), compass, EPLRS, and moving map displays. This integrated system is crucial when executing

Ship-to-Objective Maneuver (STOM) because it enhances the situational awareness required to maneuver the distances to the Littoral Penetration Points (LPP) and inland objectives.” Able to rapidly build combat power ashore with speed, surprise, and lethality, “[t]he EFV is clearly a transformational lead in combat capability and provides maneuverability well beyond that of the AAV.”⁴⁶

In spite of its vast capabilities, the EFV has shouldered a heavy amount of criticism during its development. The first sites the EFV’s susceptibility to Improvised Explosive Device (IED) attacks. Attributed to be the highest U.S. casualty-producing weapon system in our ongoing conflicts, IEDs tend to be much more effective against flat-bottomed vehicles like the EFV. “The lack of a V-shaped hull, which can mitigate underbelly IED explosions, is a long-standing concern . . .” with the Expeditionary Fighting Vehicle.⁴⁷ As a result, opponents to the EFV propose that procuring “ . . . a combat vehicle optimized for ground operations, with some limited ability to ford rivers, lakes, marshes . . . incorporat[ing] design characteristics intended to mitigate the lethal threats of IEDs, explosive formed penetrators, and advanced anti-tank guided missiles (ATGMs)” would be more beneficial to the Marine Corps.⁴⁸

Nothing could be further from the truth. In an amphibious assault, the Marine Corps is tasked with *initial* seizure of a beachhead. Attainment of that objective in an opposed landing scenario cannot be accomplished by sending an Army Stryker, or the like, ashore on some form of high-speed lighterage. Range, landing beach preparation requirements, and the necessity for immediate combat capability afloat and ashore make the two part solution to this problem unsupportable. The Marine Corps needs a specific capability to fulfill the niche mission it possesses – an armored amphibian with the ability to quickly project combat power ashore and

establish initial lodgment. Then, and only then, can the Navy move Maritime Prepositioning Ships (MPS) into port to offload the Army's more mine-resistant, non-expeditionary assets.

That being said, it would be remiss of the Marine Corps to assume away the IED or any other threat. "Because it must be accepted that an EFV will probably be hit by mines, RPG's, or anti-tank missiles when operating in a combat environment, additional survivability measures have [been] designed into the EFV to increase the ability of Marines onboard to survive."⁴⁹

Modular ceramic armor designed to withstand 14.5 mm armor piercing munitions at 300 meters and 30 mm armor piercing rounds at 1000 meters, a spall liner that reduces the effects of fragmentation inside the vehicle in case of an armor penetration, reinforced areas most susceptible to behind armor debris (BAD), mine blast protected seats, an automatic fire sensing and suppression system (AFSSS), and volatile fluid standoff all contribute to the survivability of the EFV against the most prolific threats on today's battlefield.⁵⁰

The other common criticism of the EFV is its poor mechanical reliability. "In 2006, the EFV was subject to an Operational Assessment – a series of tests to demonstrate that it could meet performance requirements – that, if successfully completed, would permit the program to move into the production phase. During this assessment, the EFV experienced numerous critical failures and, because of repeated breakdowns, the EFV failed to meet reliability requirements and failed the assessment."⁵¹ A 4.5 hour mean time between failure and an average 3.4 maintenance man hours per operating hour sent the Marines and General Dynamics back to the drawing board. The setback to the program was so significant that "[i]n February 2007, the EFV program office issued a 'sources sought' notice, requesting information from industry leaders on 'tracked combat vehicles that can provide an alternative design concept of the EFV.'"⁵² In spite of their waning patience, the Marine Corps signed an additional contract with General Dynamics

to produce seven new EFV prototypes whose Reliability Growth Testing (RGT) was completed in January of 2011. While the official results of this testing have not yet been released, officials from the program office stated that the latest batch of vehicles exceeded the established program reliability and performance benchmarks. Regardless of this demonstrated capability, Defense Secretary Robert Gates announced the cancellation of the Expeditionary Fighting Vehicle on January 6, 2011.

In a statement released after the Honorable Mr. Gates's announcement, General James Amos, Commandant of the Marine Corps, reaffirmed the EFV program's "critical amphibious and war-fighting capability," but characterized it as "not affordable given likely Marine Corps procurement budgets."⁵³ While the Marine Corps will now pursue a more affordable amphibious tracked fighting vehicle, the Secretary of Defense has taken a calculated risk to ostensibly negated the United States' capability to conduct a surface forcible entry operation indefinitely.

F-35 Lightning II Joint Strike Fighter (JSF)

"Marine forces . . . traditionally come 'from the sea' with limited organic fire support and mobility. As such, Marine forces rely heavily on the fires [and] fire support . . . provided by Marine aviation."⁵⁴ Accordingly, aviation fire support represents the final remaining variable in the forcible entry equation for the service. With two new rotary wing fire support platforms, the UH-1Y and AH-1Z, already in full rate production and proving valuable improvements from their legacy heritage, the Marine Corps is still searching for the right tactical aircraft (TACAIR) solution.

"The service needs a new Short Take-Off/Vertical Landing (STOVL) aircraft to enable Operational Maneuver from the Sea as a viable doctrine and to support Marines on the ground no matter where they land. The F-35B is the only aircraft poised to fill that role . . ."⁵⁵ The

Lightning II is a fifth generation platform "intended to be of 'low observability to radar and sensors,' producing significantly smaller radar returns than those of today's fighter and attack aircraft."⁵⁶ To this end, the F-35B may be armed with two internal 1,000 pound munitions and two Advanced Medium Range Air-to-Air Missiles (AMRAAM) without affecting its minimal radar cross section. The STOVL variant is capable of taking off in 619 feet, conducting a wide array of missions within a 503 nautical mile range, and landing vertically with ordnance bring-back.⁵⁷ But what truly separates the F-35 from its predecessors is sensor fusion coupled with an unprecedented data communication capability.⁵⁸

While the kinetic and information capabilities of each Joint Strike Fighter variant are sure to prove indispensable on the battlefield, the Marine Corps requires a TACAIR solution with the flexibility to support a wide range of forcible entry scenarios. To maximize its relevance, the F-35 procured by the Marine Corps must be just as capable of operating from amphibious shipping and short austere fields as it is from often scarce 8,000 foot runways. "The STOVL JSF will be the only aircraft capable of operating in all of these environments and will offer the MAGTF [Marine Air Ground Task Force] Commander the flexibility to base his TACAIR assets in a position best suited to meet his requirements."⁵⁹ In addition to increased basing options, the F-35B's flexibility effectively shrinks the battlefield. An increased number of locations the STOVL variant JSF can refuel and rearm decreases off station time by eliminating long transits to a carrier or established airfield. The result is improved sortie generation rates and responsiveness in support of the Ground Combat Element (GCE).

Along with providing the most effective fire support for the MAGTF, the F-35B will also dramatically improve TACAIR efficiency. Procurement of the STOVL variant JSF will dramatically reduce the Marines' logistical and maintenance burden of supporting three series of

F/A-18 Hornets along with the AV-8B Harrier. "The Corps would indeed benefit from the efficiencies of a single model of F-35 Lightning II. Supply, maintenance, avionics, and ordnance support are simplified, and savings are made in training and assignment of personnel."⁶⁰ In addition to part universality, shrunken stock pools, and common support requirements, an all STOVL fleet would streamline training and standardization. This would facilitate the reduction or consolidation of training squadrons while improving the consistency of fixed wing air support provided to the Marine on the ground.

Procurement of the F-35B will also provide the Marine Corps with squadron interoperability. Currently, Marine F/A-18 squadrons augment Carrier Air Wings, while Harrier squadrons support MEUs aboard L-Class shipping. Though both aircraft are capable of supporting land based operations abroad, deployment schedules of Naval shipping dictate which Marine airframe, and ultimately which unit, must support each requirement. Lack of interchangeability adversely affects unit training cycles, maintenance recovery windows, and dwell time. By acquiring the STOVL variant F-35, the Marine Corps will regain TACAIR squadron interoperability and "[benefit] from having the largest pool of F-35B squadrons possible from which to draw units in support of its operations."⁶¹

Many would argue that the Marine Corps' willingness to sacrifice nearly 140 nautical miles of range and 2,000 pounds of payload by selecting the STOVL variant over the carrier-based version is operationally unsound. On the contrary, because L-Class shipping is capable of operating in much shallower water closer to hostile coastlines, the F-35B will yield a similar inland striking range to an F-35C launched from a deep-draft conventional carrier.⁶² While its smaller payload will reduce the number of engagements a STOVL version JSF makes per sortie when compared with a carrier-based variant, reduced off station time and improved sortie

generation rates due to closer basing options for the F-35B provide ample mitigation. "The net result is that both aircraft will be able to engage targets within 400 nm of the coastline. The advantage of the STOVL JSF is that it is more responsive under these conditions because it is located closer to the target."⁶³

Still others would contest that the Marine Corps' procurement of the F-35B will adversely impact Naval Aviation as a whole. "In April 2008, the Navy and Marine Corps signed the latest version of a Memorandum of Agreement governing the integration of their tactical air fleets." According to this document, "Naval Aviation force projection is accomplished by the balanced integration of Marine Corps TACAIR squadrons into Carrier Air Wings (CVW) . . ."⁶⁴ While the information is dated, AV-8Bs operating aboard the USS Franklin D. Roosevelt in 1992 proved that STOVL aircraft ". . . could be integrated into CV operations without major difficulties or reduction of CV capabilities."⁶⁵ In fact, individuals involved claimed that STOVL aircraft "can operate on the CV without impacting normal operations and [even] take advantage of times within the normal deck cycle unusable to other CV aircraft."⁶⁶ Regardless, according to Marine Corps doctrine, "[n]aval expeditionary forces combine the complementary but *distinct* capabilities of the Navy and Marine Corps . . . to deploy, land, and sustain expeditionary forces ashore."⁶⁷ That distinction is the ability to operate from the littorals and expeditionary fields consistent with forcible entry operations that the F-35B provides.

Recommendations

The United States not only has a continued strategic requirement for amphibious capabilities, we must adapt those capabilities to meet the challenges of a new era. Unfortunately, the term 'amphibious operations' all too often conjures up the image of large-scale World War II assaults, which were – however necessary and valorous – very costly affairs. This imagery inspires admiration for the fortitude of those involved, even as it generates aversion to repeating their sacrifice. We cannot let this aversion dissuade us from pursuing the amphibious capabilities the nation requires. We can, however, seek to develop them in a way that makes a similar level of sacrifice unnecessary.

-Douglas King and John Berry⁶⁸

Because of the scope and duration of Operation Iraqi Freedom and Operation Enduring Freedom, the United States Marine Corps' focus on doctrine, training, and procurement has been divided over the past decade between preparation for the current counterinsurgency fight and our standing mission of amphibious operations. The lack of organizational synergy created by these competing priorities resulted in the stagnation of forcible entry doctrine and tactics, neglect of amphibious training and rehearsal, and the procurement, or lack thereof, technology necessary to defeat future enemy's access-denial capabilities. "The Navy and the Marines envision that future conflicts will require a 'persistent presence in littoral areas' characterized by land-based anti-ship cruise missiles, mines, and small, fast suicide boats."⁶⁹ While the superpower versus superpower matchup anticipated since the begin of the Cold War may never materialize, smaller nations supported by formidable opponents of the United States will continue to threaten our nation security. "... [E]ven those amphibious operations conducted for benign reasons – humanitarian assistance, disaster relief, or non-combatant evacuations – might be subject to interference from non-state actors or rogue states."⁷⁰ Therefore, the Marine Corps must adapt appropriately or risk the "... danger that many of the forces that [it] plans to acquire may prove to be unsuitable for dealing with future threats."⁷¹

On the whole, existing Marine Corps amphibious doctrine and tactics remain sound.

While the development of specific techniques and procedures will be required to integrate new technologies as they emerge, the concept of Operational Maneuver from the Sea as laid out by General Charles Krulak is as viable and relevant today as it was in 1996.

Rectifying the amphibious training shortfall within the Marine Corps requires substituting a block of theater-specific training requirements with a block of amphibious forcible entry evolutions. While these scenarios may not possess *direct* applicability to Operation Enduring Freedom, they will exercises critical intelligence, fire support, maneuver, logistics, and command and control principals that are enduring. Admittedly, aviation and naval shipping asset availability may make full dress rehearsals unavailable to all units, but even the moderate increase gained in forcible entry capability from planning and simulating an amphibious exercise would prove greatly beneficial.

“As it seeks to modernize its weapons systems, however, the Corps faces tough dilemmas. Most of its weapon acquisition dollars are tied up in a few, highly controversial programs such as the V-22 Osprey tilt-rotor aircraft and the expeditionary fighting vehicle, or EFV.”⁷² The technological implications are not only the most expensive, but they also require the greatest lead-time to correct. Based on numerous after-action reports, the Marine Corps must develop a weather-capable radar, dedicated plug-and-play command and control suite, and targeting-capable Forward Looking Infrared (FLIR) sensor with digital recording media and Beyond Line Of Sight (BLOS) data transmission architecture in order to maximize the MV-22’s niche capability.⁷³ While these enhancements will provide tiltrotor squadrons with additional utility, it will not produce “. . . an assault support platform that can land to pick up troops or cargo on request, such as a Huey on a preplanned JTAR, [that] would greatly benefit the GCE.”⁷⁴

Therefore, the Marine Corps should cease any further acquisition of the MV-22. Concurrently, the service should modify the composition of the MEU Air Combat Element (ACE) to form a composite squadron around a Marine Light Attack Helicopter (HMLA) squadron core with additional UH-1Ys and a smaller six aircraft MV-22 detachment. Incorporating these additional assault support assets within the ACE will regain most of the capability lost by the departure of the CH-46 while maintaining sufficient tiltrotor capability.

As for the Expeditionary Fighting Vehicle program, after accounting for the investment already made to date, there is not a more cost-effective program on the foreseeable horizon capable of delivering the performance of the EFV. The monetary savings recouped by purchasing additional UH-1Ys in place of planned MV-22s should be reinvested in the continuation of the Expeditionary Fighting Vehicle program.

Finally, only the STOVL variant of the F-35 Joint Strike Fighter should be purchased by the United States Marine Corps. "Without the F-35B to replace the aging Harrier fleet, Operational Maneuver from the Sea is a hollow shell of a concept."⁷⁵ The only plausible argument against "acquiring a single fixed-wing TacAir platform is if the Marine Corps encountered any fleet-wide aircraft issues once they transitioned to the STOVL JSF, they could potentially be without organic fixed-wing TacAir support."⁷⁶ Such a situation developed when "[t]he Rolls Royce F402-408 engine installed in the AV-8B was the cause of several mishaps and fleet wide Naval Air Systems Command (NAVAIR) groundings (Red Stripes) in 2000."⁷⁷ With current budgetary constraints in mind, the Marine Corps should consider procuring a low tech, low cost, short take-off and landing light attack platform to guard against this scenario instead of F-35Cs with seventy percent part commonality or any other carrier-limited TACAIR airframe.

As stated earlier, amphibious operations, including the deployment of waterborne tactical vehicles from shipping assets, vertical envelopment, and fire support from aviation assets, remains a significant part of the Marine Corps' Congressional mandate as well as a necessary operational capability that the service must continue to possess. Without the active development of doctrine and tactics aimed at overcoming littoral defenses, a refocusing of training on amphibious operations, and the procurement of weapon systems able to counter emerging anti-access technologies, the Marine Corps will lose its forcible entry capability in the 21st Century and jeopardize the security of the nation.

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