

A POSTER CHILD For NEXT-WAR-ITIS

By Craig Hooper

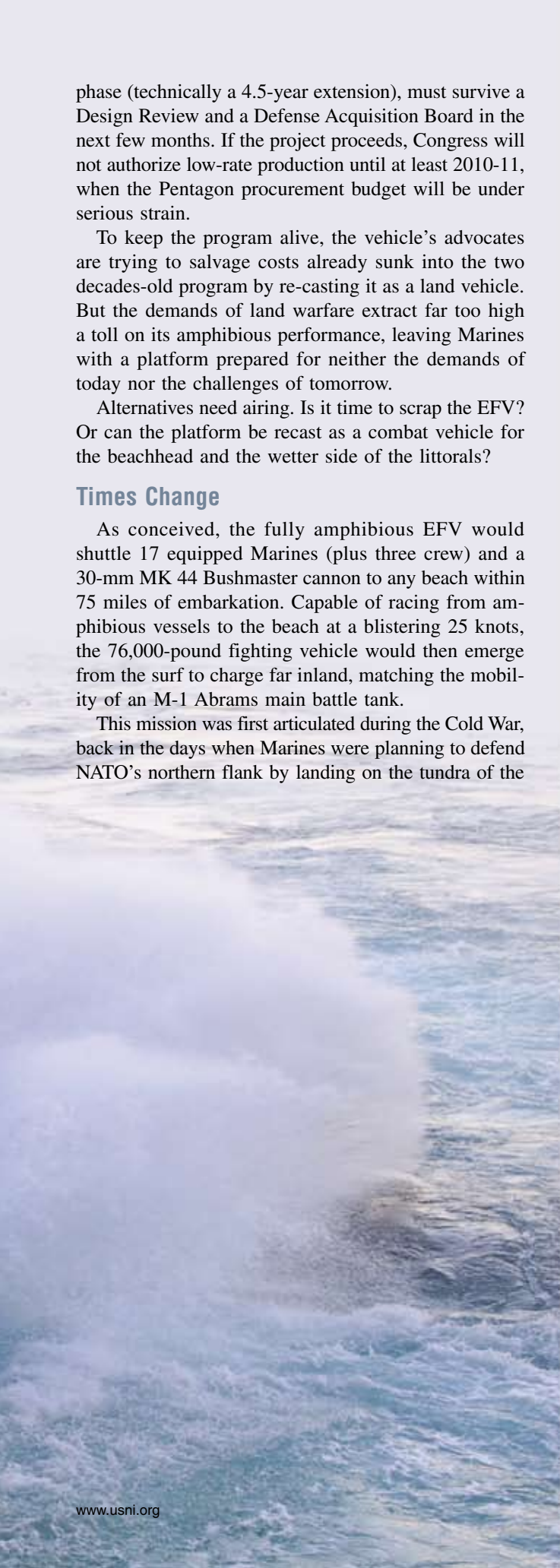
The \$22.7 million Expeditionary Fighting Vehicle (EFV)
has not lived up to the promise of its design.

Over the next few years a shrinking defense budget coupled with the cost of resetting the post-Iraq and Afghanistan force will severely crimp high-profile acquisition projects. For the Marine Corps, the future of the Expeditionary Fighting Vehicle—a \$22.7 million dollar amphibious armored fighting vehicle—is at risk.

With the EFV one of the few remaining means of ensuring America's forcible entry into contested hostile territory, Marines have fought hard for the platform, but the program, characterized by Representative Henry A. Waxman (D-CA) as “an embarrassment,” teeters on the brink of cancellation.¹

There is little room left for error. This platform, already enduring a second system development and demonstration





phase (technically a 4.5-year extension), must survive a Design Review and a Defense Acquisition Board in the next few months. If the project proceeds, Congress will not authorize low-rate production until at least 2010-11, when the Pentagon procurement budget will be under serious strain.

To keep the program alive, the vehicle's advocates are trying to salvage costs already sunk into the two decades-old program by re-casting it as a land vehicle. But the demands of land warfare exact far too high a toll on its amphibious performance, leaving Marines with a platform prepared for neither the demands of today nor the challenges of tomorrow.

Alternatives need airing. Is it time to scrap the EFV? Or can the platform be recast as a combat vehicle for the beachhead and the wetter side of the littorals?

Times Change

As conceived, the fully amphibious EFV would shuttle 17 equipped Marines (plus three crew) and a 30-mm MK 44 Bushmaster cannon to any beach within 75 miles of embarkation. Capable of racing from amphibious vessels to the beach at a blistering 25 knots, the 76,000-pound fighting vehicle would then emerge from the surf to charge far inland, matching the mobility of an M-1 Abrams main battle tank.

This mission was first articulated during the Cold War, back in the days when Marines were planning to defend NATO's northern flank by landing on the tundra of the

heavily-defended Kola Peninsula. The EFV was to fight on land, outmaneuvering relatively static Soviet formations. By 1991, the original mission had evaporated, but subsequent revisions of Marine Corps amphibious assault doctrine, embodied in "Operational Maneuver From the Sea" (OMFTS), kept the procurement focus on ever-faster, over-the-horizon means of ship-to-shore transit. Offering no new design guidance regarding alternative operations-other-than-war or military operations in urban terrain, OMFTS, in essence, froze the EFV concept. So the vehicle remained an expensive, highly specialized tool for maneuver—storming the missile-bristling Kola Peninsulas of the next big war.

Times have changed. The battlefield utility of this OMFTS-tailored platform is being questioned, with some observers wondering if features necessary to achieve high over-water speed—enormous size, a flat underbelly, and a complex, 2,700-hp power plant—will pose a problem once the maneuvering ends and longer-term expeditionary contingencies, urban warfare, or protracted counterinsurgency operations, begin.

Despite criticism, the Marine Corps stands by the vehicle, anticipating more than just high over-water speed, but better mobility, protection, and longer range than the aged AAV-7A1 assault amphibious vehicle.

Unfortunately the new vehicle's performance hasn't yet lived up to the promise of the design. Its prototypes are, according to House Armed Services Committee member Representative Gene Taylor (D-MS), "only going between 4 and 10 hours before breaking down."² Since 2006, the Government Accountability Office has warned that General Dynamics' prototypes were far too fragile for the battlefield.³ On the water, the EFV was only able to operate at high speed in a calm sea. Weight, leaks and corrosion, coupled with hydraulic issues and problems with bow flap design, risk keeping it from speeding—as originally required—through three-foot seas. Other operational constraints, including a complex high-to-low speed transition, may keep the vehicle from participating in modern-day high-speed riverine combat operations as well.⁴

Optimize for Land War?

Marine Corps planners insist that each vehicle will spend only 8.2 percent of its operational lifetime at sea. With that in mind, congressional boosters Taylor and Roscoe Bartlett (R-MD) have pushed the Marines to optimize its land role, proposing everything from changes in engine location to a shift of the passenger layout. This congressional pressure has already forced a hurried incorporation of armor modifications that offer a discomfiting "50 percent survivability improvement," according to Bartlett, over an indeterminate baseline. The interim modification, an armor appliqué, will be attached to the vehicle's underside some-

U.S. NAVY (ASHLEIGH S. TEITEL)

ITS RAISON D'ÊTRE High speed over water is the primary characteristic of the Expeditionary Fighting Vehicle, which dictates design requirements.

time after the vehicle's as-yet undefined logistical support elements reach shore.

Planning isn't very advanced. According to Bartlett, the service "would get a really thin, strong Marine who could scoot underneath that thing, because there's only about 18 inches of ground clearance, and he would bolt on an appliqué of some special aluminum which would now protect them."⁵

A more comprehensive refit, reshaping the vehicle's mine-vulnerable flat bottom, eliminates the platform's high-speed capability and makes the whole design unravel. A five-knot, non-planing EFV has little use for a powerful centerline power plant—one that generates 45 percent more horsepower than the 1,500-hp engine used to propel the 125,890-pound M1 Abrams tank. The need for a complex bow plate disappears and the parameters of the passenger compartment can change.



NEEDS BETTER PROTECTION Combat in Iraq and Afghanistan have pointed out a need for better protection for the EFV, shown here in testing. Armor kits for the hull bottom have been proposed.

In short, the EFV design is tied to achieving high over-water speed. Eliminate that requirement, and the Marines might as well start with a clean slate.

Even worse, a slower-swimming variant faces competition. At \$3.5 million, the Marines could buy several of South Korea's far less ambitious 25-ton, K-21 amphibious infantry fighting vehicles for the price of one fleet-of-foot EFV. Greece and Indonesia are already moving to purchase the Russian BMP-3F infantry fighting vehicle, with its low swimming speed offset, in part, by a cheap per-unit price and the promise of accurately utilizing the platform's 100-mm main gun in seas with two-foot significant wave height or less.⁶

Certainly, given present conflicts, pressure to make the Expeditionary Fighting Vehicle a better platform for land

warfare is hard to resist. In Iraq, AAV-7A1s are working hundreds of miles from the sea, and conventional wisdom, reinforced off the shores of Kuwait in 1991, suggests that grand-scale kicking-in-the-door via amphibious assault is unlikely to occur on a modern battlefield.

But optimizing the vehicle for land warfare sacrifices far too much investment for far too little gain. After working since 1988 to design a high-water-speed amphibian, it makes no sense to suddenly shift direction. Chopping amphibious capability leaves the Marines with nothing more than an overpriced and unsatisfactory tool for land warfare.

Other alternatives exist.

Integrated Platforms

Rather than accepting a vehicle superficially modified for land, Marines might find more success by coupling navalized versions of existing land warfare systems to next-generation landing craft. New boats like the future Sea Base Connector Transformable Craft (T-Craft) can be designed to move and apply their waterproofed cargo throughout the wetter part of the littoral zone.⁷ Though previous amphibious warfare studies rejected the tight integration of land warfare platforms and landing craft, such a step seems prudent in the current budget environment.

Economic pressures are already constraining purchases of single-service, super-specialized weapon systems, and if budgetary limitations become serious, both the Marines and the Army must anticipate increased demands for flex-

ibility, including requests to employ their land-war weapons on the water, in fire support, sea control, and other maritime missions.

Weapons of land warfare have been pressed into littoral service before. In the Normandy landings of World War II, armored vehicles on landing craft bolstered local fire support by simply firing over the gunwales, an on-the-cheap means to bulk up fire support. Tank-carrying LCT(A) (landing craft, tank, armor) paved the way. Bunker-buster variants carried Sherman tanks armed with 17-pounder high-velocity guns to crack concrete fortifications from just offshore. Indirect fire was provided from the LCT(SP) (self-propelled [gun]) with 155-mm gun platforms or LCT(HE) (high-explosive) vessels mounting 105-mm M7 self-propelled guns.⁸

This improvised means of boosting fire support persisted. In the mid-1960s, LCU (landing craft, utility) and LCM-8 landing craft made their debut, sporting low gun-wales to allow embarked armor to fire ashore. In Vietnam, Marines used these craft as ad-hoc monitors, putting M48A3 tanks or M67A2 flame-throwing tanks on board to add “another versatile weapon system without additional cost.” At the 1983 Grenada landings, two LCU/M60A1 tank combos were deployed to boost Operation Urgent Fury’s limited organic fire support assets.⁹

A host of technical and doctrinal reasons makes integration of land warfare systems with amphibious craft difficult. But moving from improvised hybrids to a more comprehensive partnership makes sense. Navalized land warfare systems, coupled with small craft, precision-guided munitions, and advanced data links, can contribute to the complex littoral seafights of tomorrow.

If the EFV stands in the way of enhanced joint littoral collaboration, it should go.

Send It to Sea

If cancelling the expeditionary vehicle is a non-starter, why not build on the vehicle’s strength and embrace the sea? The Navy and Marine Corps’ new maritime doctrine, *A Cooperative Strategy for 21st Century Seapower* suggests that Marines will be returning to sea, and may even hint that EFV designers go against conventional wisdom, retaining—and even building on—the assault vehicle’s swimming capabilities.¹⁰ The new doctrine recognizes that amphibious warfare is not a dead specialty. With an array of navies building amphibious forces and, at the same time, racing to deploy farther into the Pacific, Indian, and other oceans, base-worthy islands and other militarily useful sea features are going to be centerpieces of future conflict. A global race to redefine the continental shelf is also increasing the chance of island warfare by tying island occupation to exclusive economic control of resources, fisheries, and disproportionate swaths of sea floor.

This, in future disputes over valuable atolls, archipelagos, sea features and other shallow-water areas, is where a seaworthy, coral-crawling EFV can shine, supplementing airborne assets and helping keep Marines in the fight.

History is a good guide. Old-school World War II-era practitioners of amphibious assault, after spending a campaign attacking islands where sustained inshore mobility was less important, expected amphibious vehicles to spend 80 percent of the time at sea. If built to a similar requirement, the EFV suddenly becomes more than a forcible entry tool, but an innovative brown-water and littoral asset.¹¹

There is some precedent for building an amphibian that is happier on the water than on land. The post-World War II amphibious tank (LVTH6), a variant of the LVTP5 Amtrac, was a massive, 81,700-pound vehicle, wielding a 105-mm gyro-stabilized howitzer. Capable of surviving in towering surf, the vehicle could churn through up to 56 miles of ocean—though at a ponderous 6.8 knots.

When ordered away from the surf during Vietnam, however, these clumsy water-going behemoths evolved into hard-to-maintain, balky deathtraps that should have never strayed far from the beach. With a sea-friendly EFV, it will take command discipline to resist attempts to employ the vehicle outside the near-beachhead littoral and riverine environment, along with a wider appreciation that the Marines haven’t given up the wetter side of the littoral—even though the Marine Corps riverine warfare specialty, in the face of the fights in Iraq and Afghanistan, was handed off to the Navy last year.

A vehicle modified for the littorals would still remain a complex machine. But by committing to keep it between the sea base and the immediate beachhead, program managers can shed extraneous design features, focusing on building a stronger, more substantial and immediately reliable amphibious platform.

Streetfighter with a Zumwalt Punch?

If the new maritime strategy is adopted by the next administration, Marines will spend far more time embarked, “employed as detachments aboard a wider variety of ships and cutters for maritime security missions.”¹² This returns Marines to a legacy role, one that Lieutenant General Victor H. Krulak described as providing “security for the ships in which Marines were embarked.”¹³ But by broadly interpreting vessel security, a constellation of new missions await.

In particular, a more seaworthy fighting vehicle stands to enhance the utility of emerging logistical platforms. Cheap Joint High Speed Vessels, the Army’s Logistic Support Vessel fleet, or even minimally-militarized Roll-On-Roll-Off cargo vessels, if equipped to deploy, recover and service a small swarm of EFVs, emerge as low-budget littoral warfighters. With the Littoral Combat Ship evolving into a big ship escort, the space between the sea base



U.S. MARINE CORPS (JASON W. FUDGE)

A POWER HOG The EFV’s need for speed on water demands a 2,700-hp powerplant. This is 1,200-hp more than the one used to power the M1 Abrams tank, shown here, which weighs two-thirds again as much as the Marines’ projected vehicle.

and beach risks abandonment. A littoral-modified expeditionary vehicle, however, lets the Marine Corps vie for custody of the open near-coast niche.

This isn't a stretch. In November 1999, the first *Proceedings* article to spell out the littoral combat ship concept could as well have been describing an EFV for the littorals. If committed to roving in the enemy's "back alleys," working the "rugged coast, little islands, cliffs and forests, coves, shoals, and shallows where he can hide and where our blue-water Navy is not designed to operate," the expeditionary vehicle becomes a pint-sized version of Vice Admiral Arthur K. Cebrowski's Streetfighter.¹⁴

A sea-ready EFV can even poach missions from other pricey boutique platforms. With the Navy preparing to spend some \$3 to \$6 billion just to float two 155-mm guns on board the *Zumwalt* (DDG-1000) land-attack destroyer, a bigger-gun EFV, if sold to Congress as a complement to the ship, looks like a bargain.

It can be done. Modern 120-mm mortar systems, a natural fit for the vehicle, offer both indirect and direct fires. With these weapon systems, even relatively toothless amphibious assault, seabasing, or logistical craft can impact events ashore or serve as improvised sea-control platforms. The Finnish Defense Forces are putting this concept to the test, advancing,

disappeared after poor performances in the Pacific theater. These glorious failures were the cost of experimentation.

But times have changed. Today, procurement failure is no longer an option. With limited resources, the Pentagon can ill-afford to build-over procurement mistakes, and that means the EFV, when purchased, will strap Marine Corps amphibious assault doctrine into a 40-year capability strait-jacket. It had better be right.

Let's be honest. The vehicle, in its current guise, is a fragile, forcible entry weapon of little other use. A poster-child for next-war-itis, it is neither optimized for land warfare nor the contested maritime economic zones and militarily useful atolls expected to loom large in future Marine Corps operations. It deserves cancellation.

Between the Marines' increasing desperation to field an amphibious means of forcible entry and the unpopular option of cancellation, something has to give. The Corps can no longer afford to indulge in its traditionally rigid defense of their high-profile procurement projects. The EFV program is not a re-enactment of the Guadalcanal Battle of Bloody Ridge. Marines must start thinking strategically, give a little ground, and use what they get as best they can.

With a deft re-design along traditional World War II-era lines, a littoral-modified EFV remains a formidable forcible entry tool that also gives the Marine Corps an opportunity to master a handful of open operational niches. Making the EFV a useful tool for littoral and amphibious engagement grants the Marine Corps some singular capabilities and offers far greater flexibility than the unsatisfying platform currently on the drawing board. ✪



SURF AND TURF Many ideas founder at the border of sea and land. This canvas-sided modification—dubbed Duplex Drive—to make the M4 Sherman tank seagoing, was never seen after World War II.

in late August, a program to put a 120-mm Patria NEMO mortar onto a 10-ton Watercat M12 landing craft.

While the EFV's MK 46 30-mm turret is being used on the LPD-17, other efforts to press land warfare systems into naval service have, as yet, failed to take hold. But this is a technical challenge worth waging. Future finances dictate that tools of land and sea warfare must, in time, merge, and the EFV—and the Marines—could lead the way.

Many weapon systems founder at the intersection of surf and turf. The canvas-sided Duplex Drive tank was never seen again after World War II, while a different hybrid, using explosive bolts to blow off welded buoyancy tanks,

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