Marine Corps Amphibious Combat Vehicle (ACV) and Marine Personnel Carrier (MPC): Background and Issues for Congress

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Summary

On January 6, 2011, after spending approximately $3 billion in developmental funding, the Marine Corps cancelled the Expeditionary Fighting Vehicle (EFV) program due to poor reliability demonstrated during operational testing and excessive cost growth. Because the EFV was intended to replace the 40-year-old Amphibious Assault Vehicle (AAV), the Pentagon pledged to move quickly to develop a "more affordable and sustainable" vehicle to replace the EFV. The Amphibious Combat Vehicle (ACV) is intended to replace the AAV, incorporating some EFV capabilities but in a more practical and cost-efficient manner. In concert with the ACV, the Marines were developing the Marine Personnel Carrier (MPC) to serve as a survivable and mobile platform to transport Marines when ashore. The MPC was not intended to be amphibious like an AAV, EFV, or the ACV but instead would be required to have a swim capability for inland waterways such as rivers, lakes, and other water obstacles such as shore-to-shore operations in the littorals. Both vehicles are intended to play a central role in future Marine amphibious operation.

The ACV is scheduled to enter service between FY2020 and FY2022 and the Marines currently plan on acquiring 573 ACVs. Total program and per vehicle costs have not yet been made public, with the Marines citing ongoing affordability and vehicle mix studies as the primary reason why definitive costs are not yet available.

On June 14, 2013, it was reported that Marine leadership had put the MPC program "on ice" due to budgetary pressures but the program might be resurrected some 10 years down the road. The Marines reportedly will continue to communicate with defense industry, so if the decision is made to restart the MPC program, it can be done in an expeditious and cost-efficient manner.

Both the House and Senate Armed Services Committees have recommended fully funding the Administration's FY2014 ACV Budget Request of $136.967 million in Research, Development, Test & Evaluation (RDT&E) funding. The House Appropriations Committee recommended a $14 million cut to the Administration's request due to program delay.

Potential issues for Congress include the possible operational impact of the deferment of the MPC as well as how feasible will it be to restart the MPC program after an extended delay? This report will be updated.

Contents

Contacts

Background

U.S. Code, Title 10, Section 5063, United States Marine Corps: Composition and Functions, dated October 1, 1986, states:

> The Marine Corps will be organized, trained and equipped to provide an amphibious and land operations capability to seize advanced naval bases and to conduct naval land campaigns.

In this regard, the Marines are required by law to have the necessary equipment to conduct amphibious operations and land operations. The ACV and MPC are considered integral systems by the Department of Defense (DOD) and Marine Corps to meet this legal requirement.

On January 6, 2011, after spending approximately $3 billion in developmental funding, the Marine Corps—with "encouragement" from DOD—cancelled the Expeditionary Fighting Vehicle (EFV) program. The EFV was intended to replace the 40-year-old Amphibious Assault Vehicle (AAV), which currently transports Marines from ships to shore under hostile conditions. The EFV was cancelled due to excessive cost growth and poor performance in operational testing. Recognizing the need to replace the AAV, the Pentagon pledged to move quickly to develop a "more affordable and sustainable" vehicle to take the place of the EFV. The Amphibious Combat Vehicle (ACV) is intended to replace the AAV, incorporating some EFV capabilities but in a more practical and cost-efficient manner.

In concert with the ACV, the Marines were developing the Marine Personnel Carrier (MPC) to serve as a survivable and mobile platform to transport Marines when ashore. At present, the Marines do not have a wheeled armored fighting vehicle that can operate as a dedicated infantry carrier with Marine maneuver forces inland. The MPC was not intended to be amphibious like an AAV, EFV, or the ACV but instead would be required to have a swim capability for inland waterways such as rivers, lakes, and other water obstacles such as shore-to-shore operations in the littorals. Because of a perceived amphibious "redundancy," some have questioned the need for both the ACV and MPC. In June 2013, citing budgetary pressures, the Marines reportedly put the MPC program "on ice" and suggested that it might not be resurrected for about 10 years.[1]

With the Marines involved in decades-long land conflicts in Iraq and Afghanistan and proliferating anti-access technologies such as guided missiles, some analysts questioned if the Marines would ever again be called on to conduct a large-scale amphibious assault operation. In response to these questions and the perceived need to examine the post-Iraq and Afghanistan Marine Corps, the Department of the Navy and DOD studied the requirement to conduct large-scale amphibious operations and in early 2012 released a strategic vision for how amphibious operations will be conducted in the future. The primary assertion of this study is that the Marine Corps' and Navy's amphibious capabilities serve a central role in the defense of the global interests of a maritime nation. The need to maintain an amphibious assault capability is viewed by Marine Corps leadership as establishing the requirement for the ACV and MPC.

[1] Lee Hudson, "Marines Put Marine Personnel Carrier on Shelf Due to Budget Constraints," *InsideDefense.com,* June 14, 2013.

Significance for Congress

Congress is responsible for authorizing and appropriating funds for all weapon systems programs, including the ACV and the MPC. In its oversight role, Congress is concerned about how the ACV and MPC would enable the Marines to conduct not only amphibious operations but also operations ashore. Given past problems associated with EFV development, as well as current and future budgetary constraints, Congress is actively looking at the necessity, viability, and affordability of both programs.

Why the Marines Want These Vehicles

ACV

At present, the Marines use the AAV-7A1 series amphibious assault vehicle to move Marines from ship to shore. The Marines have used the AAV since 1971 and will continue to use it until replaced by the ACV or a similar vehicle. Over the years, the Marines claim the AAV has become increasingly difficult to operate, maintain, and sustain. As weapons technology and threat capabilities have evolved over the preceding four decades, the AAV—despite upgrades—is viewed as having capabilities shortfalls in the areas of water and land mobility performance, lethality, protection, and network capability. The AAV's two-mile ship-to-shore range is viewed by many as a significant survivability issue not only for the vehicle itself but also for naval amphibious forces.

MPC

While the AAV has some armor protection and can operate inland to a limited extent, it is not intended for use as an infantry combat vehicle. The Marines do have the LAV-25, Light Armored Vehicle-25, an eight-wheeled armored vehicle that carries a crew of three and six additional Marines. The LAV-25 is armed with a 25 mm chain gun and a 7.62 mm machine gun and is not fully amphibious as it cannot cross a surf zone and would get to the beach via some type of connector such as the Landing Craft, Air Cushioned (LCAC). The LAV-25 has been in service since 1983. According to the Marine Program Executive Office (PEO) Land Systems, the LAV is not employed as an armored personnel carrier and usually carries a four-person Marine scout/reconnaissance team in addition to its crew.[2] In this regard, the MPC was viewed as necessary by Marine leadership for the transport and enhanced armor protection of Marine infantry forces.

[2] Program Executive Office (PEO) Land Systems Marine Personnel Carrier Fact Sheet, 2010.

Intended Operational Capabilities

ACV[3]

The Marines' Request for Information (RFI)[4] to industry provides an overview of the operational requirements for the ACV. These requirements include the following:

- The proposed vehicle must be able to self-deploy from amphibious shipping and deliver a reinforced Marine infantry squad (17 Marines) from a launch distance at or beyond 12 miles with a speed of not less than 8 knots in seas with 1-foot significant wave height and must be able to operate in seas up to 3-foot significant wave height.
- The vehicle must be able to maneuver with the mechanized task force for sustained operations ashore in all types of terrain. The vehicle's road and cross-country speed as well as its range should be greater than or equal to the M-1A1 Tank.
- The vehicle's protection characteristics should be able to protect against direct and indirect fire and mines and improvised explosive device (IED) threats.
- The vehicle should be able to accommodate command and control (C2) systems that permit it to operate both at sea and on land. The vehicle, at a minimum, should have a stabilized machine gun in order to engage enemy infantry and light vehicles.

MPC[5]

The Marine Corps' Request for Information (RFI)[6] to industry provided an overview of the operational requirements for the MPC. These requirements included the following:

- The vehicle must accommodate nine Marines and two crew members and have a "robust tactical swim capability (shore-to-shore [not designed to embark from an amphibious ship]) and be capable of operating at 6 knots in a fully developed sea."[7]

[3] Unless otherwise noted, information in this section is taken from the Amphibious Vehicle Request for Information (RFI) issued by the Marine Corps Systems Command on February 11, 2011.

[4] The Federal Acquisition Regulation defines an RFI as "a document used to obtain price, delivery, other market information, or capabilities for planning purposes when the Government does not **presently** intend to issue a solicitation. [FAR 15.202(e)]."

[5] Unless otherwise noted, information in this section is taken from Annex A: Marine Personnel Carrier (MPC) Family of Vehicles (FOV) Requirements Set to the Marine Personnel Carrier Request for Information (RFI), February 17, 2011.

[6] The Federal Acquisition Regulation defines an RFI as "a document used to obtain price, delivery, other market information, or capabilities for planning purposes when the Government does not **presently** intend to issue a solicitation. [FAR 15.202(e)]."

[7] Annex A: Marine Personnel Carrier (MPC) Family of Vehicles (FOV) Requirements Set to the Marine Personnel Carrier Request for Information (RFI), February 17, 2011.

- The vehicle must be able to operate on land with M-1A1 Tanks in mechanized task forces across the Marine Corps' mission profile.
- The vehicle shall provide protection for the occupants from the blasts, fragments, and incapacitating effects of attack from kinetic threats, indirect fire, and improvised explosive devices and mines.
- The vehicle shall be capable of firing existing Marine anti-structure and anti-armor missiles and should be able to accommodate existing command and control (C2) systems.

Is There a Need for a Marine Corps Amphibious Assault Capability?

As previously noted, Title 10 requires the Marines to have an amphibious and land operations capability. Marine involvement in protracted land campaigns in Iraq and Afghanistan and the growing acquisition of anti-access technologies, such as guided missiles, by both state and non-state actors, led some influential military thinkers to question if the Marines would ever again be called upon to conduct large-scale amphibious assault operations.[8] In a May 2010 speech, then Secretary of Defense Robert Gates noted rogue nations and non-state movements such as Hezbollah possessed sophisticated anti-ship guided missiles, such as the Chinese-designed C-802, which could destroy naval ships and force them to stay far off shore, thereby making an amphibious assault by Marines highly dangerous.[9] These and similar pronouncements by some defense analysts led to questioning the need for dedicated amphibious assault capabilities in light of growing "anti-access" technologies and weapon systems available to both hostile nations and non-state actors. This debate resulted in a series of DOD and academic studies examining the need for an amphibious assault capability.

In early 2012, DOD began publishing the results of studies and supporting concepts that it asserted affirmed the need for the Marine Corps to maintain an amphibious assault capability. In March 2012, the Army and Marine Corps issued *Gaining and Maintaining Access: An Army-Marine Corps Concept*, which expressed the views of the two services on how they would project and sustain military power world-wide in the face of growing challenges to access and entry.[10] The two services note:

> Marine Corps forces embarked on amphibious shipping are specifically designed to provide multi-domain capabilities that are employed from the sea. U.S. Army forces may also operate from the sea in some scenarios. Sea-based forces utilize littoral maneuver (via surface and/or vertical means) to exploit gaps and seams in enemy defenses, deceive adversaries, and maneuver directly to key objectives ashore.[11]

[8] Tony Perry and Julian E. Barnes, "U.S. Rethinks a Marine Corps Specialty: Storming Beaches," *Los Angeles Times*, June 21, 2010.

[9] Ibid.

[10] Information in this section was taken from "Gaining and Maintaining Access: An Army-Marine Corps Concept," authored by the United States Army's Army Capabilities Integration Center and the United States Marine Corps Marine Corps Combat Development Command, March 2012.

[11] Ibid., pp 9-10.

In April 2012, the Marine Corps published the results of an Amphibious Capabilities Working Group study on naval amphibious capability. The study, *Naval Amphibious Capability in the 21st Century: Strategic Opportunity and a Vision for Change*, contends the United States is a maritime nation with critical maritime interests, noting 90% of global commerce that travels by sea is most vulnerable where sea meets land in the littorals.[12] The study further finds "for a maritime nation with global interests, a minimal two brigade amphibious force represents a sound investment in ensuring access for the rest of the joint force."[13] While the study did not explicitly call for the development of the ACV or MPC—the study recommendations are characterized as *resource-informed, program-neutral*—the ACV and MPC are used in the study for evaluating the ability to project power ashore. While large-scale, World War II-type amphibious operations might no longer be the norm, the study suggests there are other roles for the ACV and MPC. Noting that emerging battlefield capabilities could mean that small teams might now have the ability to generate effects once associated with larger forces, the Marines propose that company landing teams (CLTs) might now be a more appropriately sized force for most amphibious operations.[14] CLTs are viewed as being small enough to be inserted in a single wave but large enough to provide a capable force immediately. Another alternative to large scale amphibious operations are small-scale amphibious raids described as "an historical forte of the Marine Corps."[15] These raid forces go ashore only for the duration of the operation and then return to the sea. These raids could be useful in denying terrorist sanctuary, securing potential weapons of mass destruction (WMD) sites, destroying pirate safe havens, or destroying threat capabilities in port.[16] In this sense, *Naval Amphibious Capability in the 21st Century: Strategic Opportunity and a Vision for Change* might be viewed as redefining thinking about the role of amphibious operations and making an argument for the need for the ACV and MPC.

Program Information

ACV Acquisition [17]

The ACV is currently in the Material Solution Analysis (MSA)[18] phase of development. DOD notes:

> The ACV provides the Marine Corps with an assault amphibian capability that is able to transition from forcible entry operations to sustained operations ashore. It will deliver

[12] Information in this section was taken from "Naval Amphibious Capability in the 21st Century: Strategic Opportunity and a Vision for Change," a report of the Amphibious Capabilities Working Group, April 27, 2012.

[13] Ibid., p. 12.

[14] Ibid., p. 48.

[15] Ibid., p. 49.

[16] Ibid.

[17] Information in this section is taken from Department of Defense, FY2014 Program Acquisition Costs by Weapon System, April 2013, p. 3-8.

[18] According to the Defense Acquisition University Glossary of Defense Acquisition Acronyms and Terms, 15th Edition, December 2012, MSA is the first phase of the Defense Acquisition Management System as defined and established by Department of Defense Instruction 5000.02. The purpose of this phase is to analyze and recommend materiel solutions for the capability need identified in the Initial Capabilities Document (ICD). During this phase, an Analysis of Alternatives (AoA) will be conducted and a Technology Development Strategy (TDS) and draft Capability Development Document (CDD) will be formulated.

> Marine Infantry from ship to shore and then maneuver with other combat vehicles in Marine Air Ground Task Force operations. The ACV will provide the Marine landing force with armored mobility from ship to objective for traditional warfare and other employment capabilities across the range of military operations. It will self-deploy from amphibious ships, deliver a 17 Marine Infantry squad from a launch distance of at least 12 miles from shore and transition from water to ground operations without tactical pause.[19]

How Many ACVs Do the Marines Intend to Procure?

According to Marine officials, the Marines intend to procure 573 ACVs.

When Is the ACV Scheduled to Enter Service?

The ACV is scheduled to achieve Initial Operating Capability (IOC)[20] between FY2020 and FY2022, depending on the outcome of the Analysis of Alternatives (AoA)[21] and final acquisition plans.

What Are the Estimated Total Program and Per Vehicle Costs?

According to Marine officials, "Per vehicle and total program costs will be informed by the cost studies conducted as part of the recently completed Analyses of Alternatives (AoA). There are various affordability courses that are being looked at as part of the Marine Corps overall combat vehicle mix. Those analyses are all pre-decisional and have not yet been briefed to senior officials."[22]

Postponement of ACV DOD Review[23]

A Defense Acquisition Board meeting previously scheduled for November 2012, which was expected to approve the release of RFPs for the ACV, has reportedly been delayed until 2013. This postponement is attributed to the Marines re-evaluating ACV requirements. Marine leaders are said to be debating if the ACV needs to have a high water speed. The pursuit of this high-speed capability adds complexity, limits industrial competition, and raises reliability and cost concerns—factors that contributed to the cancellation of the EFV. Beyond these concerns, developers contend if a high-speed capability becomes a requirement, then the Marines would be

[19] Ibid.

[20] IOC is attained when some units and/or organizations in the force structure scheduled to receive a system have received it and have the ability to employ and maintain it. Defense Acquisition University Glossary of Defense Acquisition Acronyms and Terms, 13th Edition, November 2009.

[21] The AoA assesses potential materiel solutions to satisfy the capability need documented in the approved Initial Capabilities Document (ICD). It focuses on identification and analysis of alternatives, measures of effectiveness (MOEs), cost, schedule, concepts of operations, and overall risk, including the sensitivity of each alternative to possible changes in key assumptions or variables. Defense Acquisition University Glossary of Defense Acquisition Acronyms and Terms, 13th Edition, November 2009.

[22] From an e-mail to CRS from the Marine Corps Office of the Program Manager for Advanced Amphibious Assault.

[23] Information in this section is taken from Christopher J. Castelli, "DOD Delays Key Review if Marine Corps" Amphibious Combat Vehicle," *InsideDefense.com,* October 17, 2012, and "Marines Debate Amphibious Vehicle Requirements Amid Cost Concerns," *InsideDefense.com,* November 7, 2012.

financially hard-pressed to put a turreted cannon on the ACV, which would permit it to destroy other armored vehicles and engage enemy troops with airburst munitions.

Congressional Activity

The Administration's FY2014 Budget Request[24]

The Administration's FY2014 Budget Request for the ACV was $136.967 million in Research, Development, Test & Evaluation (RDT&E) funding.

National Defense Authorization Act for FY2014 (H.R. 1960)[25]

The House recommended fully funding the Administration's FY2014 ACV Budget Request and also included the following provision:

Section 251—Annual Comptroller General Report on the Amphibious Combat Vehicle Acquisition Program

This section would require the Comptroller General of the United States to conduct an annual review of the Amphibious Combat Vehicle acquisition program and provide the results of the review to the congressional defense committees by March 1, 2014, and annually thereafter through 2018.[26]

National Defense Authorization Act for FY2014 (S. 1197)[27]

The Senate recommended fully funding the Administration's FY2014 ACV Budget Request.

Department of Defense Appropriations Bill, 2014[28]

The House recommended funding the FY2014 ACV Budget Request at $122.967 million—a $14 million decrease due to program delay.

[24] Information in this section is taken from Department of Defense, FY2014 Program Acquisition Costs by Weapon System, April 2013, p. 3-8.

[25] H.Rept. 113-102, National Defense Authorization Act for Fiscal Year 2014, Report of the Committee on Armed Services House of Representatives on H.R. 1960, June 7, 2013.

[26] Ibid., p. 110.

[27] S.Rept. 113-44 Report, National Defense Authorization Act for Fiscal Year 2014, Report to Accompany S. 1197, Committee on Armed Services, United States Senate, June 20, 2013, p. 337.

[28] Report 113-xxx, Department of Defense Appropriations Bill, 2014, Report of the Committee on Appropriations, June 7, 2013, p. 221.

Potential Issues for Congress

Operational Impact of the Deferment of the MPC

In various discussions about the future of Marine Corps operations, the MPC has featured prominently in terms of both amphibious operations and Marine operations ashore. Given the possibility that it might be another decade before MPC development efforts are restarted and a number of years after that before the vehicle reaches the force, Congress might wish to further explore the operational implications of the MPC deferment. How will the Marine Corps compensate during this period for not having the MPC? Will the Marines need to acquire additional vehicles, such as the Joint Light Tactical Vehicle (JLTV),[29] to fill the void created by not acquiring 579 MPCs? Another potential issue for examination could be if additional vehicles are not acquired to compensate for the MPCs, will the Marines need to modify how they conduct amphibious and ground operations?

How Feasible Will It Be to Restart the MPC Program?

Reports suggest the Marines will maintain close contact with defense industry should the budgetary situation improve to the point where the Marines can restart the program. While this might be achievable over the course over the next couple years, Congress might wish to examine the feasibility of restarting the MPC program after a prolonged deferment such as 5 to 10 years. Given technological advancements as well as emerging threat weapons systems and the constantly changing geo-strategic environment, it is difficult to imagine that current MPC developmental requirements would be valid or relevant 5 to 10 years from now and that a complete program restart would be required. Given this possibility, it might be prudent to establish some guidelines on restarting the program, perhaps establishing criteria on when it would be necessary to initiate a new MPC program as opposed to simply restating the existing program.

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[29] For additional information on the JLTV see CRS Report RS22942, *Joint Light Tactical Vehicle (JLTV): Background and Issues for Congress*, by Andrew Feickert.