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

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February 26, 2016

Congressional Research Service
7-....
www.crs.gov
R42723

CRS REPORT
Prepared for Members and
Committees of Congress

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 central roles in future Marine amphibious operations.

On June 14, 2013, Marine leadership put the MPC program "on ice" due to budgetary pressures but suggested the program might be resurrected some 10 years down the road when budgetary resources might be more favorable.

In what was described as a "drastic shift," the Marines decided to "resurrect" the MPC in March 2014. The Marines designated the MPC as ACV Increment 1.1 and planned to acquire about 200 vehicles. The Marines also plan to develop ACV Increment 1.2, a tracked, fully amphibious version, and to acquire about 470 vehicles and fund an ongoing high water speed study. Although ACV Increment 1.1 is to have a swim capability, another mode of transport (ship or aircraft) would be required to get the vehicles from ship to shore.

On November 5, 2014, it was reported the Marines released a draft Request for Proposal (RFP) for ACV Increment 1.1. The Marines are looking for information from industry regarding program milestones, delivery schedules, and where in the program cost savings can be achieved.

On November 24, 2015, the Marine Corps awarded BAE Systems and SAIC contracts to develop ACV 1.1 prototypes for evaluation. BAE's contract was for $103.8 million and SAIC's for $121.5 million, and each company is to build 16 prototypes to be tested over the next two years. Both vendors are expected to start delivering their prototypes in the fall of 2016 for testing, and the Marines expect to down select to a single vendor in 2018. On December 7, 2015, General Dynamics Land Systems filed a protest to the Government Accountability Office (GAO) about the award of the contract to BAE and SAIC, and GAO has until March 16, 2016 to decide on the protest.

The Administration's FY2017 budget request for the ACV was $158.7 million in Research, Development, Testing and Evaluation (RDT&E) funding. A potential issue for Congress is the Marines' new MPC/ACV acquisition strategy and its associated challenges and risks.

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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, as well as providing critical capabilities to execute the nation's military strategy.

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[1] 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.[2] While some have questioned why the Marines cannot simply "adopt" a U.S. Army personnel carrier, Marine requirements for a personnel carrier reflect the need for this vehicle to be compatible with amphibious assault craft, as well as to have an enhanced amphibious capability, which is not necessarily an Army requirement.

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

[1] An *amphibious capability* generally refers to a vehicle's ability to debark from a ship offshore at a considerable distance and then move under fire to shore. A *swim capability* refers to a vehicle's ability to traverse limited water obstacles such as streams, rivers, and smaller bodies of inland water.

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

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 (as discussed in greater detail below).

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 could be concerned about how the ACV and MPC enable the Marines to conduct not only amphibious operations but also operations ashore. Another possible congressional concern is to what extent a robust amphibious assault capability is a necessary component of U.S. national security.

The Marines' Justification for the ACV and MPC

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 expect to 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 but 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.[3] In this regard, the MPC was viewed as necessary by Marine leadership for the transport and enhanced armor protection of Marine infantry forces.

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

Desired Operational Capabilities

ACV[4]

The Marines' 2011 Request for Information (RFI)[5] 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.
- 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[6]

The Marine Corps' 2011 Request for Information (RFI)[7] 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."[8]
- The vehicle must be able to operate on land with M-1A1s in mechanized task forces across the Marine Corps' mission profile.

[4] 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.

[5] 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)]."

[6] 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.

[7] 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)]."

[8] 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 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. In addition to legal requirements, U.S. national security and military strategies imply a need to be capable of conducting forced entry operations from the sea. 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.[9] 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.[10] 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. With the proliferation of anti-ship missiles, sea mines, and anti-aircraft systems, anti-access and area denial capabilities are increasing worldwide and have become not only a strategic but also operational and tactical considerations when contemplating amphibious operations.

In early 2012, DOD published 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.[11] 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.[12]

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*

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

[10] Ibid.

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

[12] Ibid., pp. 9-10.

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.[13] 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."[14] 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.[15] 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."[16] 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.[17] 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.

Expeditionary Force 21 and "Finding the Seams"

Navy and Marine Corps thinking on amphibious assault continues to evolve, most recently articulated in March 2014's *Expeditionary Force 21 - Forward and Ready: Now and in the Future*.[18] Regarding amphibious assault operations, *Expeditionary Force 21* notes:

> After World War II, the Marine Corps pursued the development of the helicopter as a tactical means to avoid fixed defenses, but the "Hogaboom Board" soon recognized that vertical maneuver capabilities alone would not fully replace surface maneuver, owing to weight and volume constraints. Since then, the Naval services have sought to develop complementary means of conducting vertical and surface littoral maneuver from increased distances, and via multiple penetration points, using the sea as maneuver space to offset the range and precision of modern weapons. In recent years, we have been very successful regarding vertical maneuver capabilities, but less so in the realm of surface maneuver. The Landing Craft Air Cushion (LCAC) has been effective but is nearing the end of its service life. Our recent attempts to field an affordable, high-speed, long-range amphibious vehicle capable of maneuver at sea and on land have not met the requirement. Fielding high-speed, long-range high-capacity system of connectors, amphibious vehicles, and boats are a critical necessity for amphibious operations.

[13] 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.

[14] Ibid., p. 12.

[15] Ibid., p. 48.

[16] Ibid., p. 49.

[17] Ibid.

[18] Department of the Navy, Headquarters U.S. Marine Corps, "Expeditionary Force 21 - Forward and Ready: Now and in the Future," March 4, 2014.

> We will continue to conduct future amphibious operations at the time and place of our choosing. We will maneuver through the littorals to positions of advantage, employ disaggregated, distributed and dispersed forces to secure entry points that allow us to rapidly build our combat power ashore and allow for the quick introduction of follow-on joint/coalition forces to maintain momentum and expand the area of operation. Mindful of limitations on resources, we need to develop a viable combination of connectors, landing craft, amphibious vehicles, and boats, as well as the ships—to include the well decks or davits—that project them exploring a mix of surface maneuver options that:
>
> - Are deployable, employable and sustainable given the power projection means available.
>
> - Operate with reduced signature to multiple penetration points.
>
> - In coordination with the Navy, employ low-signature landing craft and boats with increased range and speed, as well as the ability to penetrate an unimproved coastline.
>
> - Provide the means to conduct surface maneuver from amphibious ships beyond 65 nm offshore.
>
> - Provide the capability to maneuver through the complex terrain of the littorals.
>
> - Provide a mechanism to identify, bypass, and if required breach shore-laid obstacle belts (explosive and non-explosive) to secure entry points.
>
> - Provide maneuver options to extend operations within constraints of fuel resupply resources.
>
> - Increase ability to work with space assets and develop capabilities within the cyber realm.[19]

Marine leadership has emphasized the need for high-speed connectors—surface and air vehicles that can transport Marines, vehicles, and equipment from ships to shore—to accomplish these goals. Instead of confronting an enemy "head on," Marine leadership envisions using high-speed connectors and associated vehicles such as the MPC to "side step the full force of an enemy, instead penetrating its seam."[20] This concept of "finding" the seams is viewed as necessary to avoid confronting a growing array of "anti-access" technologies and weapon systems available to both hostile nations and non-state actors that could pose a significant threat to connectors associated with Marine amphibious operations.

The Shift Toward Connectors[21]

The Navy and Marines continue to refine their respective thinking on the changing nature of amphibious warfare. As the threat from long-range precision weapons continues to evolve, stand-off distances for naval vessels participating in amphibious operations could be as much as 100 nautical miles from shore. At these distances, ship-to-shore connectors[22] take on a much more

[19] Ibid., pp. 21-22.

[20] Lara Seligman, "Glueck: Marines Will Penetrate Enemy's "Seam" with Connector Strategy," *InsideDefense.com*, June 27, 2014.

[21] Information in this section is taken from Daniel Wasserbly, "Bridging the Gap: USMC Outlines Future Amphibious Assault Strategies, Equipment," *Jane's International Defence Review*, September 2014, pp. 38-39.

[22] The Marines define a connector as surface (via water) and vertical (via air) conveyances that transport personnel, supplies, and equipment from the seabase (ships and platforms) to the objective (ashore), within the seabase (from ship to ship), or from the objective (ashore), seabasehttps://marinecorpsconceptsandprograms.com/programs/amphibious-and-prepositioning-ships/connectors, accessed February 25, 2016.

prominent role in amphibious operations and ACVs will no longer need to be as capable in the water, as they are expected to traverse shorter distances to shore. With this being the case, the cost of producing ACVs would likely be less than originally envisioned.

This increased dependence on connectors could prove problematic as current connectors—such as the Landing Craft Air Cushion (LCAC), Landing Craft Utility 1600, and even the Joint High-Speed Vessel (JHSV)—are mostly unprotected and would be vulnerable to enemy fire and need to operate outside the range of an enemy's small arms fire. Even the Navy's future Ship-to-Shore Connector (SSC)—the LCAC's replacement—is not planned to have the enhanced protection needed to operate close enough to shore to debark ACVs for a beach assault. This suggests the protection requirements for next generation connectors could play a prominent role in the development of future connectors.

Program Information

2013 Decision to "Shelve" the MPC

As previously noted, in June 2013, citing budgetary pressures, the Marines reportedly put the MPC program "on ice" and suggested it might not be resurrected for about 10 years.[23] At the time of the decision, the Marines' acquisition priorities were refocused to the ACV as well as the Joint Light Tactical Vehicle (JLTV).[24] While the Marines refocused budgetary resources to the ACV, difficulties in developing an affordable high water speed capability for the ACV continued to confront Marine leadership.[25]

Major Change to Marine Corps Modernization Strategy[26]

In what was described as a "drastic shift," the Marines decided in March 2014 to "resurrect" the MPC and designate it as ACV Increment 1.1 and initially acquire about 200 vehicles. The Marines also plan to develop ACV Increment 1.2, a tracked version, and to acquire about 470 vehicles and fund an ongoing high water speed study. Although ACV Increment 1.1 will have a swim capability, a connector will be required to get the vehicles from ship to shore.

Plans call for ACV Increment 1.1 to enter the acquisition cycle at Milestone B (Engineering and Manufacturing Development) in FY2016, award prototype contracts leading to a down select to one vendor in FY2018, and enter low-rate initial production. Marine budget documents do not address ACV Increment 1.2 program timelines, thereby effectively delaying the development of a fully amphibious assault vehicle.

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

[24] For information on the JLTV, see CRS Report RS22942, *Joint Light Tactical Vehicle (JLTV): Background and Issues for Congress*, by (name reda cted).

[25] Christopher J. Castelli, "General: Marine Corps Could Shelve Development of High-Speed ACV," *InsideDefense.com*, October 25, 2013 and Jason Sherman, "Marine Corps Dials back ACV, Capability, Defers High Water Speed Plans," *InsideDefense.com*, March 25, 2014.

[26] Information in this section is taken from Department of Defense Fiscal Year (FY) 2015 Budget Estimates, Navy, Justification Book, Volume 2, Research, Development, Test & Evaluation, Navy, Budget Activity 4, March 2014, pp. 417-421, and Lee Hudson, "Marine Corps Drastically Shifts Ground Vehicle Modernization Strategy," *InsideDefense.com*, March 14, 2014.

Marines Release Request for Information (RFI) for ACV Increment 1.1[27]

On April 23, 2014, the Marines released an RFI for ACV Increment 1.1. Some of the required capabilities included:

> ... operate in a significant wave height of two feet and sufficient reserve buoyancy to enable safe operations; a high level of survivability and force protection; operate in four to six feet plunging surf with ship-to-shore operations and launch from amphibious ships as an objective; land mobility, operate on 30 percent improved surfaces and 70 percent unimproved surfaces; ability to integrate a .50 calibre remote weapon station (RWS) with growth potential to a dual mount 40 mm/.50 calibre RWS or a 30 mm cannon RWS; carrying capacity to include three crew and 10 embarked troops as the threshold, 13 embarked troops as the objective, carry mission essential equipment and vehicle ammunition; and the ability to integrate a command, control and communications suite provided as government furnished equipment... [28]

The RFI includes a requirement for industry to deliver 16 prototype vehicles nine months after contract award in April 2016 at a rate of four vehicles per month.[29] The Marines estimate ACV Increment 1.1 will cost about $5 million to $6 million per vehicle, about $10 million less than what the previous ACV version was expected to cost.[30]

Marines Release Draft Request for Proposal (RFP) for ACV Increment 1.1[31]

On November 5, 2014, it was reported that the Marines released a draft RFP for ACV Increment 1.1. The Marines were looking for information from industry regarding program milestones, delivery schedules, and where in the program cost savings can be achieved. Plans were for two companies to build 16 prototype vehicles each for testing. Companies who competed for the two contracts included BAE Systems, General Dynamics Land Systems (GDLS), Lockheed Martin, and Scientific Applications International Corporation (SAIC).[32]

Additional Details on 2015 ACV 1.1 RFP[33]

Under the provisions of the RFP, the ACV 1.1 is envisioned as an eight-wheeled vehicle capable of carrying 10 Marines and a crew of three and would cost between $4 million to $7.5 million per copy—a change from the RFI estimate of $5 million to $6 million per vehicle. In terms of

[27] Lee Hudson, "Marines Release Amphib Vehicle RFI, Seek Accelerated Schedule," *InsideDefense.com,* April 25, 2014.

[28] Ibid.

[29] Ibid.

[30] Lee Hudson, "Next-Generation Amphibious Vehicle Estimated to Cost $5-$6M Per Copy," *InsideDefense.com,* June 27, 2014.

[31] Information in this section is taken from Megan Eckstein, "Marines Expect ACV RFP in Spring; Will Choose 2 Winners for Prototype Production, Testing," *Defense Daily,* September 29, 2014, and Lee Hudson, "Marines Release Next-Gen Amphibious Vehicle Draft Request for Proposal," *InsideDefense.com,* November 6, 2014.

[32] Megan Eckstein, "Marines Expect ACV RFP in Spring; Will Choose 2 Winners for Prototype Production, Testing," Defense Daily, September 29, 2014.

[33] Information in this section is taken from Joe Gould, "Marine Amphibious Vehicle RFP Due in March," *Defense News,* February 16, 2015.

mobility, the ACV 1.1 would need to be able to travel at least 3 nautical miles from ship to shore, negotiate waves up to at least 2 feet, travel 5 to 6 knots in calm seas and be able to keep up with the M-1 Abrams tank once ashore.

Proposals would be due in April 2016 and the Marines reportedly plan to award two EMD contracts for 16 vehicles each to be delivered in November 2016. In 2018, the Marines would then down select to one vendor in 2018 and start full production.

ACV 1.1 Fielding Plan[34]

The Marines reportedly plan to acquire **204** ACV 1.1s, to be allocated as follows:

- 1st Marine Expeditionary Force, Camp Pendleton, CA—**67**;
- 2nd Marine Expeditionary Force, Camp Lejeune, NC—**46**;
- 3rd Marine Expeditionary Force, Okinawa, Japan—**21**;
- Assault Amphibian School, Camp Pendleton, CA—**25**;
- Exercise Support Division, Marine Corps Air Ground Combat Center, Twenty Nine Palms, CA—**25**; and
- Program Manager, Quantico, VA, and Amphibious Vehicle Test Branch, Camp Pendleton, CA—**20**.

Marines Award ACV 1.1 Contracts[35]

On November 24, 2015, the Marine Corps awarded BAE Systems and SAIC contracts to develop ACV 1.1 prototypes for evaluation. BAE's contract was for $103.8 million and SAIC's for $121.5 million, and each company is to build 16 prototypes to be tested over the next two years. Both vendors are expected to start delivering their prototypes in the fall of 2016 for testing, and the Marines expect to down select to a single vendor in 2018. Initial operational capability (IOC) is expected by the end of 2020, and all ACV 1.1 vehicles are planned to be fielded by the summer of 2023. Plans are to equip six battalions with ACV 1.1s and 392 existing upgraded AAVs.

Both BAE and SAIC reportedly have a long history related to amphibious vehicles, as BAE built the Marine's original AAV and SAIC has built hundreds of Terrex 1 vehicles used by Singapore, and both companies had Marine Corps contracts to modernize AAVs.

It should be noted that ACV 1.1 is intended to have some amphibious capability but would rely on ship-to-shore connectors, and ACV 1.2 is intended to have greater amphibious capability, including greater water speed and the ability to self-deploy from amphibious ships.

BAE plans to team with Italian manufacturer Iveco (which owns Chrysler and Ferrari). BAE's prototype would accommodate 13 Marines and travel 11.5 miles at about 7 miles per hour (mph) in surf and 65 mph on land. BAE's version would incorporate a V hull design intended to protect passengers from underside blasts and have external fuel tanks for increased safety. BAE intends to produce its porotypes at its York, PA, facility.

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[34] Ibid.

[35] Dan Parsons, "Marine Corps Awards BAE, SAIC $225 Million Amphibious Combat Vehicle Contracts," *Defense Daily,* November 25, 2015; Lee Hudson, "BAE and SAIC Both Win Contracts for USMC Next-Gen Amphib Vehicle," *InsideDefense.com,* November 24, 2015; Jen Hudson, "BAE, SAIC Named as Finalists in Marines ACV Competition," *Defense News,* November 24, 2015; and Lance M. Bacon, "Inside the Amphibious Vehicles that Won the Marine's $225M Contracts," *Marine Corps Times,* January 4, 2016.

SAIC plans to team with Singapore Technology Kinetics to develop its prototype based on an existing design called Terrex. SAIC's version is said to travel 7 mph in water and incorporates a V hull design as well as blast-mitigating seats. It would carry a crew of three and can accommodate 11Marines. SAIC's version plans for a Remote Weapons System (.50 calibre machine gun and a 30 mm cannon), which could be operated from inside the vehicle while buttoned up, therefore not exposing crewmen to hostile fire.

General Dynamics Land Systems (GDLS) Protests Contract Awards to the Government Accountability Office (GAO)[36]

On December 7, 2015, it was reported that GDLS would protest the award of the ACV 1.1 contract to BAE and SAIC, claiming the Marines asked for particular capabilities and then evaluated vendors by a different set of standards. GAO has 100 days—or until March 16, 2016—to make a decision on the protest.

Budget Activity

FY2017 Budget Request[37]

The FY2017 budget request for the ACV was $158.7 million in RDT&E funding. Program activities planned for FY2017 include manufacturing and delivery of 32 EMD test vehicles and contractor development test activities.

Potential Issue for Congress

The Marines' New ACV/MPC Acquisition Strategy

Given Marine leadership's decision to alter their vehicle modernization strategy and pursue the MPC-based ACV Increment 1.1 in lieu of the ACV-based ACV Increment 1.2, Congress might decide to examine this issue in greater detail. Potential questions include but are not limited to the following:

- Because ACV Increment 1.1 is connector-dependent, are sufficient connectors presently available to support amphibious assault operations in the near term?
- Based on the operational concepts put forward in *Expeditionary Force 21* which are heavily dependent on having future, next-generation connectors available, are amphibious operations involving ACV Increment 1.1 at risk until a sufficient number of advanced connectors are procured?
- Will the Navy and Marines prioritize the development of advanced connectors and will sufficient budgetary resources be allocated to their rapid development?

[36] Jen Judson, "General Dynamics Protests ACV Contract Awards to BAE and SAIC," *Defense News*, December 7, 2015 and Dan Parsons, "In ACV Protest, GD Says Marines Corps Kept Requirements Hidden" *Defense Daily*, December 9, 2015.

[37] Office of the Under Secretary of Defense (Comptroller)/Chief Financial Officer, U.S. Department of Defense Fiscal Year 2017 Budget Request, Program Acquisition Cost by Weapon System, February 2016, pp. 3-9.

- Could the potential use of foreign suppliers for the ACV outright or major components of the vehicle cause difficulties in acquisition?
- Regarding the reported March 2015 RFP, the requirement to "negotiate waves up to at least 2 feet" might appear to some to be a low requirement, given the need to operate from ship or connector to shore from at least three nautical miles out. Does this requirement relegate ACV 1.1 use to relatively calm seas and is this a realistic requirement?
- Reportedly, the April 2014 RFI called for and ACV 1.1 cost between $5 million to $6 million per vehicle. The March 2015 RFP reportedly calls for a per vehicle cost between $4 million to $7.5 million per copy. What programmatic or design changes occurred between 2014 and 2015 to change the per vehicle cost range?

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