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The Marine Corps' Amphibious Combat Vehicle (ACV)

Background

The Marine Corps describes the Amphibious Combat Vehicle (ACV) as:

> ... The Corps' next-generation vehicle designed to move Marines from ship to shore (**Figure 1**). Designed to replace the Corps' aging Amphibious Assault Vehicle (AAV), which has been in service since 1972. The ACV will be the primary means of tactical mobility for the Marine infantry battalion at sea and ashore (**Figure 2**). The ACV will have the capability to provide organic, direct fire support to dismounted infantry in the attack.

There are currently four ACV variants planned: (1) a Personnel Variant (ACV-P), which can carry three crewmembers with 13 Marines and two days of combat equipment and supplies; (2) a Command and Control Variant (ACV-C); (3) a Recovery Variant; and (4) a 30-mm Gun Variant. The Marines intend for the ACV to provide effective land and tactical water mobility (ship-to-shore and shore-to-shore), precise supporting fires, and high levels of force protection intended to protect against blasts, fragmentation, and kinetic energy threats.

The ACV program delivered initial ACV-P variants in November 2020 and delivered initial ACV-C variants in FY2022. Plans call for delivery of Improved Lethality 30-mm Gun Variant ACVs in FY2025 and Recovery Variants in FY2026.

Figure 1. Amphibious Combat Vehicle in Ship-to-Shore Mode

Source: https://www.baesystems.com/en-us/multimedia/amphibious-combat-vehicle-11-acv-11, accessed February 3, 2021.

Figure 2. Amphibious Combat Vehicle Ashore

Source: https://www.baesystems.com/en-us/multimedia/amphibious-combat-vehicle-1-1—acv-1-1-, accessed February 3, 2021.

Current Program Status

In June 2018, the ACV entered Low-Rate Initial Production (LRIP) with BAE Systems selected for the first 30 vehicles to be delivered in fall 2019. In November 2020, the ACV achieved Initial Operational Capability (IOC). In December 2020, a Full-Rate Production (FRP) decision was reportedly made by the Marine Corps after having been delayed from September 2020 due to issues related to Coronavirus Disease 2019. The current planned acquisition objective of 632 ACVs would replace AAVs in Assault Amphibian Battalions. The previous acquisition objective of 1,122 ACVs was reduced in accordance with Marine Corps Force Design 2030 modernization efforts (see CRS Insight IN11281, *New U.S. Marine Corps Force Design Initiatives*, by Andrew Feickert). Reportedly, ACV production is to take place at BAE Systems facilities in Virginia, California, Michigan, South Carolina, and Pennsylvania.

Low-Rate Initial Production (LRIP) is a programmatic decision made when manufacturing development is completed and there is an ability to produce a small-quantity set of articles. It also establishes an initial production base and sets the stage for a gradual increase in the production rate to allow for Full-Rate Production (FRP) upon completion of Operational Test and Evaluation (OT&E).

Full-Rate Production (FRP) is a decision made that allows for government contracting for economic production quantities following stabilization of the system design and validation of the production process.

Initial Operational Testing Observations

During Marine Corps initial operational test and evaluation (IOT&E) conducted from June to September 2020, the Department of Defense Director of Operational Test and Evaluation (DOT&E) noted:

- The ACV demonstrated water mobility and the ability to self-deploy from the beach, cross the surf zone, enter the ocean, and embark aboard amphibious shipping. The

infantry rifle company equipped with the ACV was able to deploy from amphibious shipping, maneuver on the beach, and conduct subsequent offensive and defensive operations ashore.

- While the ACV demonstrated good operational availability and maintainability during IOT&E, it did not meet its 69-hour mean time between operational mission failures (MTBOMF) threshold. The government-furnished Remote Weapons System (RWS)—an internally controlled, exterior-mounted MK 19 automatic grenade launcher or M2 .50 caliber heavy machine gun was the source of the largest number of operational mission failures (OMFs).
- The ACV accommodated three crew and 13 embarked infantry. Due to the placement and number of blast mitigating seats, interior space within the ACV is limited, making rapid ingress and egress difficult.
- Infantry Marines noted that the troop seats were not contoured to fit body armor configurations, leading to discomfort during long-range ship-to-objective missions.

Reportedly, the Marines initiated corrective actions after the DOT&E report was published. In September 2021, the Marines suspended amphibious use of the ACV due to towing mechanism problems. In November 2021, the Marines began testing modifications to the towing mechanism in order to resume amphibious operations once the problem was rectified. Reportedly, in early 2022 after fixing the towing mechanism, the Marines began amphibious operational training with ACVs, including crew certification and training on a number of new safety-related procedures.

ACV Amphibious Operational Mishaps

Reportedly, on July 19, 2022, two ACVs were involved in accidents while training off the coast of California during high surf conditions. According to the Marines, "One ACV tipped onto its side in the surf zone and another became disabled during the training. Marines in both ACVs conducted their immediate action drills and safely returned to shore." After the incidents, the Marines suspended ACV amphibious operations while an internal review was conducted.

ACV Resumes Amphibious Operations

On September 23, 2022, the Marine resumed ACV operations in the open ocean. In addition, the Marines implemented new rules for surf conditions, noting, "The interim maximum surf conditions identified include a significant breaker height of four feet, which allows the ACV to operate safely while maintaining a high-state of readiness for the ACV community."

FY2023 ACV Budgetary Information

Table 1. FY2023 Navy Budget Request—ACV

Funding Category	Total Request ($M)	Total Request (Qty.)
RDT&E	$94.6	—
Procurement	$536.7	74

Source: Office of the Under Secretary of Defense (Comptroller)/Chief Financial Officer, Program Acquisition Cost by Weapon System: United States Department of Defense Fiscal Year 2022 Budget Request, April 2022, p. 3-10.

Notes: RDT&E = Research, Development, Test & Evaluation: **$M** = U.S. dollars in millions; **Qty.** = FY2023 procurement quantities.

Table 2. FY2023 Navy Authorizations and Appropriations—ACV

Funding Category	Authorized ($M)	Appropriated ($M)	Total Request (Qty.)
RDT&E	$94.6	$91.5	—
Procurement	$527.1	$527.1	74

Sources: Authorized: P.L. 117-263, H.R. 7776—James M. Inhofe National Defense Authorization Act for Fiscal Year 2023, December 27, 2022, p. 742 and p. 722. **Appropriated:** Fiscal Year 2023 Omnibus Appropriations Bill, H.R. 2617, Division C—Department of Defense Appropriations Act, 2023, December 19, 2022, p. 91J and p. 69A.

Considerations for Congress

Oversight questions Congress could consider include the following:

ACV Amphibious Limitations?

As a result of a Marine internal review following two July 2022 ACV mishaps, it appears the Marines have decided to limit ACV amphibious operations when breaker height exceeds four feet. Does this new guidance preclude ACV amphibious operations in surf zone conditions where breaker height exceeds four feet, or are there supplemental operational procedures that permit ACV operation in high surf zone conditions? If ACV amphibious operations are restricted to four feet or less breaker height, how might this affect the conduct of amphibious operations during a conflict?

Lessons Learned from the Ukraine Conflict

There are a number of military observations emerging from the current Ukraine conflict. One observation is Russian armored vehicles have allegedly proven highly vulnerable to anti-tank guided missiles (ATGMs). As ACVs are intended to "provide organic, direct fire support to dismounted infantry in the attack," how vulnerable to ATGMs are ACVs that are operating ashore supporting combat operations? Are the Marines considering ACV survivability modifications based on lessons learned in Ukraine?

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