LCAC-1

Outlook

- Production of LCACs has ended
- Upgrade of the U.S. fleet of LCACs continues
- Air Cushion, Landing Craft design splitting between large and small types, with LCAC in the middle
- U.S. Navy developing Joint Maritime Assault Connector (JMAC) large landing craft
- Most export customers going for smaller types

Orientation

Description. A landing craft assault cargo (LCAC) capable of carrying a 60- to 75-ton payload.

Sponsor

U.S. Navy
Naval Sea Systems Command (NAVSEA)
2531 Jefferson Davis Hwy
Arlington, VA 22242-5160
USA
Tel: + 1 (703) 602-6920

Status. In production and service.

Total Produced. A total of 98 LCAC-1 class craft have been delivered to the U.S. Navy (91), Japan (6), and South Korea (1).

Platform. The following ships are capable of deploying the LCAC: the LHD-1 Wasp class (three craft per ship), the LHA-1 Tarawa class (one per ship), the Austin class LPDs (two per ship), the Anchorage class (four per ship), the Whidbey Island class (four per ship), and the Harpers Ferry class LSDs (two per ship).

Mission. The LCACs deliver cargo, personnel, weapons, equipment, and armored vehicles of the Marine Air-Ground Task Force's assault elements ship-to-shore and over the beach as part of amphibious operations. The U.S. Navy is also studying the possibility of using LCACs for mine-clearance functions.

The LCACs have also been effective in non-combat missions such as delivering emergency aid for disaster relief operations.

Price Range. Based on the last three contracts (which included training and documentation), the LCAC has a unit price of $14,483,995. The unit price increases to $26.4 million when it is based on the overall program cost spread over the 91 units.

Contractors

Prime

Northrop Grumman Ship Systems - Avondale Operations	http://www.ss.northropgrumman.com, PO Box 50280, New Orleans, LA 70150-0280 United States, Tel: + 1 (504) 436-2121, Fax: + 1 (504) 436-5200, Email: info@ngc.com, Prime

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Subcontractor

FN Herstal SA	http://www.fnherstal.com, Voie de Liège 33, Herstal, 4040 Belgium, Tel: + 32 4 240 81 11, Fax: + 32 4 240 88 99, Email: info@fnherstal.com (12.7x99mm (.50 caliber) M2HB Machine Gun)
Lycoming Engines, A Textron Company	http://www.lycoming.com/, 652 Oliver St, Williamsport, PA 17701 United States, Tel: + 1 (570) 323-6181 (TF40 Gas Turbine)

Comprehensive information on Contractors can be found in Forecast International's "International Contractors" series. For a detailed description, go to www.forecastinternational.com (see Products & Samples/Governments & Industries) or call + 1 (203) 426-0800.

Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 22 Commerce Road, Newtown, CT 06470, USA; rich.pettibone@forecast1.com

Technical Data

	Metric	**U.S.**
Dimensions		
Length overall	26.4 m	87 ft 11 in
Length between hard structures	24.7 m	81 ft
Beam (on-cushion)	14.3 m	47 ft
Beam between hard structures	13.1 m	43 ft
Height overall (on-cushion)	7.2 m	23 ft 8 in
Height overall (off-cushion)	5.8 m	19 ft 2 in
Draft (at rest)	0.9 m	2.9 ft
Cargo deck area	200 sq m	1,809 sq ft
Cargo deck width	8.2 m	27 ft
Ramp-width/angle (bow)	8.2 m/14°	27 ft/14°
Ramp-width/angle (aft)	4.5 m/14°	15 ft/14°
Displacement		
Light	88.60 tonnes	87.2 tons
Full load	172.73-184.92 tonnes	170-182 tons
Performance		
Maximum speed	85+ kmph	46+ kt
Speed (loaded) – Sea State 2	74+ kmph	40+ kt
Speed (loaded) – Sea State 3	55 kmph	30 kt
Range (loaded)	555 km at 65 kmph	300 nm at 35 kt
	370 km at 74 kmph	200 nm at 40 kt
Payload	60.95-76.2 tonnes (overload)	60-75 tons (overload)
Military lift capability	24 troops or 1 MBT	
Crew	5	

	Type	**Quantity**
Armament		
Guns	Browning M-2HB .50-caliber MGs	2, or
	Mk 19 Mod 3 40mm grenade launcher	2, or
	M-60 machine gun	2
Electronics		
Radar (surface search)	Marconi LN-66 navigation, I-band	1
Radios	VHF, UHF/VHF, HF, man-on-the-move	
Speed monitor	HSVL, Doppler speed sensor	
Pitch/roll/heading	AHRS with backup magnetic compass	

	Type	Quantity
Machinery		
Lift gas turbines	Avco Lycoming TF40B	2x 3,955 shp
Propulsion gas turbines	Avco Lycoming TF40B	2x 3,955 shp
Transmission gearboxes	Forward: offset fan drive; Aft: offset propeller drive	2+2
Propellers	Shrouded reversible and variable pitch, 11.75-ft diameter; four bladed	2
Lift fans	Double-entry centrifugal, 63-in diameter	4

Design Features. The LCAC has a straight-through design with forward-and-aft landing ramps, permitting unidirectional roll-on/roll-off capability. The craft is constructed of aluminum, with an all-welded hull featuring riveted rudders and propeller shrouds. The skirt for the air cushion is of "bag and finger" design, with stability trunks.

The loading deck provides 1,809 square feet of cargo space for vehicles. The bow ramp is 28 feet wide; the stern ramp is 15 feet wide. There are two cabins for the crew, one on each side of the vehicle deck. The starboard cabin houses the operator, navigator, engineer, group commander, and eight troops. The portside cabin provides seating for a deck hand/assistant engineer, loadmaster, and 16 troops.

The craft is powered by four Textron Lycoming TF40B gas turbines. Two of the gas turbines are used to generate the lift cushion, and the other two are for forward thrust. The U.S. Navy version of the vessel is equipped with one Marconi LN-66 radar for navigation.

Operational Characteristics. The high speed (40+ kt) of the LCAC permits the amphibious assault fleet to stand off at over-the-horizon (OTH) distances, which makes the unit less vulnerable to attack by hostile shore defenses. The high transit speed from ship to shore reduces the vessel's exposure time and adds a multi-beach attack capability for the assault unit; the number of beaches from which assaults can be made is growing an estimated fourfold. However, using traditional landing craft creates the need to spread out and dilute the impact of counterforces. Furthermore, the OTH launch position increases the surprise element of the assault. Because of the craft's ability to navigate both water and land, men and equipment can be brought farther inland to a solid landing spot.

The LCAC is capable of operating independently of tides, water depth, underwater obstacles, or beach gradients. It can traverse the surf zone and has minimal susceptibility to mines because it operates at high speed, sailing on an air cushion rather than directly on water or on land. According to the U.S. Marine Corps, the LCAC is capable of operating across 70 percent of the world's coastlines, as opposed to 15 percent for conventional landing craft. These craft do have some rough-weather limitations, however, and they are difficult to tow if disabled.

LCACs are carried aboard assault craft to perform helicopter-like landing deployments. The LCACs always belong to a parent organization at their home station, but for the purposes of embarkation are assigned to the specific ships from which they deploy. The Marines assigned to operate the vessel are from separate units, but once on board ship, they are fully integrated with the ship's company. The LCACs are usually pre-boated (i.e., the payload consisting of light armored vehicles, trucks, and other equipment is fully loaded and ready to go ashore with the Marines). A standard pre-boated load for the LCAC consists of four LAVs and one HMMWV. Under its own power and control, the LCAC enters and exits from the LSD well deck, both flooded and dry, while the LSD is either underway or anchored.

Conditions on the LCAC's tank deck during operations are generally not comfortable, but reports of extreme temperatures and vibrations are said to be unfounded. It is true that the high noise levels on the vehicle deck prohibit troops from being carried in the open on the deck. For that reason, modular troop shelters are being acquired to permit the LCACs to carry up to 180 troops or 150 litter patients on the deck.

The speed of the craft generates large amounts of spray, which permeates the vehicles on the deck. As a result, countermeasures are regularly taken to fight rust formation. Various loading procedures have been studied to cover the vehicles. During the 1990-91 Persian Gulf War, where the LCACs were key in the Allied amphibious operations, corrosion from salt spray was minimized by strict adherence to an established corrosion control program of preventative maintenance and frequent freshwater washdowns.

Nevertheless, spray water has a major impact on the operation and maintenance cycle of the craft's gas turbine engines. The air intake ducts are not capable of effectively separating air from water. The most significant issue concerns the intake of debris flying in the air close to the surface, which ends up in the engine, damaging the turbine blades. A number of alternative

filtering devices have been suggested and experimented with, but thus far, the results have not been satisfactory.

The loading and unloading policies for the LCACs were modified in response to the lessons learned in the Persian Gulf War. Prior to deployment at the Marine base in Camp Pendleton, the preferred method had been to load port side, vehicles facing forward and starboard side, vehicles facing aft. Upon landing, the LCAC would turn parallel to the beach line and offload from ramps on both ends at the same time. This process eliminated the need to stagger the LAVs and took about five minutes.

The new policies were designed to meet the new threat doctrine and stipulated that the LCACs would touch down and remain perpendicular to the shoreline while offloading. As a result, the craft's profile was minimized and its guns were able to cover all shore threat areas and protect the LCAC's critical areas, such as main engines and auxiliary power units, from exposure to enemy fire. All preloaded vehicles were facing the bow of the craft and were offloaded through the bow ramp. The operation reportedly required no more time than using offloading ramps on both ends simultaneously.

The LCAC is powered by four TF40B gas turbines.

Source: Textron Inc

Variants/Upgrades

British LCAC Requirement. In 1992, the U.K. Royal Navy examined the U.S. LCAC as a potential vehicle for its new Albion-class assault ships, the proposed load-out being four per ship. Royal Navy requirements would be met by a size perhaps two-thirds that of the USN LCACs. However, the ship would have needed such extensive changes that the procurement was not considered economically feasible.

Japanese LCAC. The Japan Maritime Self-Defense Force bought two LCACs from Textron. One was authorized in the FY93 Japanese budget and a second in the FY95 budget to equip its new Osumi class LSD. The ship carries two LCACs side by side in its stern docking bay. The Japanese craft differs from the U.S. versions in minor details only. Two additional LCACs were authorized in the FY99 budget, and two more were authorized under the FY00 budget for the third Osumi-class amphibious warfare ship. Rumors that the budget allowed for two additional craft of this type may have been based on the presumption that a fourth Osumi-class amphibious warfare ship would be ordered.

Korean LCAC. Korea Tacoma built one LCAC locally for that country's navy in 1990. It bears a strong resemblance to the Textron LCAC-1 class. However, the dimensions of the Korean vessel are 82.7 x 39.4 feet (25.2 x 12 m), and it shows slight differences in the superstructure. The unloaded speed of the craft, powered by four gas turbines with a total output of 16,000 horsepower, is no less than 65 knots unloaded; range is said to be 500 nautical miles at 45 knots. The craft is equipped with a Vulcan 20mm Gatling gun, and

the navigation radar is a Raytheon SPS-64(V)2 unit operating in I-band.

More of these vessels may eventually be acquired, but no announcement has been made in open sources.

The relationship between the U.S.-made LCACs and this ship is unknown. It is not certain whether the Korean construction was done under a license from Textron or whether this version is uncannily similar to a design created by the Masan-based shipbuilder.

Korea has also declared plans to acquire a large number (upward of 20) of smaller hovercraft-type landing vessels.

LCAC Mk II. In the early 2000s, Textron Marine and Land Systems announced a major MCAC (Multirole Craft, Air Cushion) upgrade to expand the performance envelope of the design while reducing operating costs and crew workload. The upgrades extended the service life of the craft and improved its operational readiness rate.

The modifications included the installation of upgraded and more powerful engines, a new fuel system that extends range and improves trim capacity, an enhanced skirt that reduces weight by deleting the keel bag and employing a new lightweight material, upgraded communications and navigation equipment, and a modernized command module. Furthermore, structural enhancements were added to extend hull life and prevent corrosion.

Heavy Lift LCAC (HLLCAC). The Heavy Lift LCAC was first proposed in 2003 as a complementary vehicle to the existing LCAC. It was intended to provide rapid amphibious transport across a broad variety of terrain while carrying loads beyond the capacity of existing vehicles. The first Heavy Lift LCAC was planned for procurement in FY09. Instead, work on the HLLCAC was terminated, and work began in 2005 on the LCAC(X).

LCAC(X) (LCAC Replacement Tactical Assault Connector). This program was initiated in 2005 to replace the canceled Heavy Lift LCAC program. Research, development, test, and evaluation began in FY06, and Initial Operational Capability (IOC) of the first craft is projected for FY14. The target capability for the Assault Connector is to carry up to 150 tons, as compared with the 72 tons of the LCAC. This increase will maximize operational flexibility and enhance beach transit capacity without requiring additional platforms. The result will be to add capability while reducing manning requirements. One promising alternative would be a new Air Cushion, Landing Craft that will be 50 percent longer than the LCAC, with enhanced lift fans and propellers and composite materials technology. With the Assault Connector, the same combat buildup ashore can be accomplished with half the usable beach length, thus requiring fewer assault breaching lanes. However, the additional size of the new design may present problems with the loading docks on existing amphibious warfare ships that are sized around the LCAC.

Joint Maritime Assault Connector Craft (JMAC). In February 2006, the LCAC(X) was redesignated the Joint MaritimeAssault Connector (JMAC).

MCAC. The role of the LCAC had been expanded to include humanitarian efforts such as the flood relief mission in Bangladesh, which led the craft to be redesignated the MCAC (Multirole Craft, Air Cushion) in 1994. The name change reflected the possible use of the craft in mine clearance and other non-amphibious warfare roles as well. However, the term *LCAC* continued to be used both colloquially and in U.S. Navy documentation. However, one of the systems demonstrated for possible introduction on these LCACs was the Lockheed Martin GAU-13 four-barrel 30mm cannon, which is intended for obstacle destruction. The Advanced Lightweight Integrated Sweep System (ALISS), developed as a follow-on to the ASQ-14 mine countermeasure system, might be installed on the MCAC as well. For clearing mines and obstacles in a surf zone, the craft could be fitted with the Shallow-Water Assault Breaching System (SABRE), a joint Navy/Marine development. The MCAC designation appears to have faded, and the term LCAC remains.

New Skirt Designs. In 1999, two alternative skirt designs were proposed as part of the SLEP overhaul (see SLEP, below) to extend the service life of these vessels by about 10 years. One of the skirts (the rubberized canvas surrounding the underside of the craft that contains the air cushion on which it travels) places the craft 2 feet higher in travel mode than the standard skirt. This deep-skirt design provides more shock absorption than the standard skirt in rough seas, giving the craft a smoother ride. Also, the lower hydrodynamic drag in those conditions allows for a higher load capacity and is more forgiving in terms of the placement of cargo on board. However, the deep skirt does not offer any advantages in calm seas, and the higher stance may increase aerodynamic drag. The personnel who have ridden the LCAC with the deep skirt have preferred it to the standard skirt, though the test vehicle provides a different "feel" in operation.

The second alternative design, the advanced skirt, is the same height as the standard skirt but features a simpler design: the ducts are eliminated, reducing one source of

corrosion. The advanced skirt is based on a cone finger design, which extends down the side of the craft (in lieu of being underneath it). No decision has been made regarding which of the proposed skirt designs will be chosen for the SLEP, although there are indications that the deep skirt design is preferred.

SLEP. The Service Life Extension Program (SLEP) of the LCAC is now the major activity of this program. Without the SLEP, the first LCACs would have been retired as early as 2004; the SLEP adds an estimated 10 years of useful life to the existing craft. No funding has been made available for a succeeding craft class yet, leaving the Navy to rely on the LCAC to perform its amphibious warfare. In addition to extending service life, the SLEP is expected to reduce both the operating and maintenance costs of the LCAC force. Consequently, SLEP is a key component in the Navy/ Marine amphibious operations.

Because these craft are rapidly aging, corrosion problems are a primary concern. At the same time, the machinery needs to be improved and the craft's C3 and navigation systems enhanced. As for the engines themselves, the AlliedSignal TF40B gas turbines will be upgraded in order to boost their reliability and fuel consumption ratings. Furthermore, the fuel systems will be improved. Also, the inflatable skirt of the LCACs may be replaced with a new-technology material that would weigh less and reduce both the overall weight and maintenance costs. Finally, a structural overhaul is being considered to resolve the corrosion issues.

Meanwhile, pressure has been mounting from the Marines to accelerate the SLEP to maintain the capabilities that the LCACs provide to the service at current levels.

Unmanned Version. At one point, an unmanned version of the LCAC was proposed for MCMV duties as a substitute for the existing force of MH-53 Sea Dragon helicopters. The bridge would be modified for drone control capability, with a sled winch installed on the tank deck. The U.S. Navy purchased a series of eight modular mine warfare packages at a cost of $40 million each to test this concept. If trials are successful, another eight packages may be procured.

An examination of photographs shows a number of minor, insignificant differences between various craft of this class.

Program Review

Background. The LCAC-1 class (Landing Craft, Assault Cargo) program can be traced to the U.S. Navy's studies in 1965 of long-term landing craft requirements. These studies prompted the Navy to begin funding development of several different experimental air-cushioned landing craft. In 1969, the Navy selected the Jeff 50-knot/60-ton payload landing craft for further development (the name *Jeff* is not an acronym; it was adopted by the Landing Craft, Air Cushion program manager, who named the craft after one of his sons). Designated the Amphibious Assault Landing Craft, the vessel was to be competitively developed by two firms. The U.S. Navy awarded Aerojet General Corp and Bell Aerospace-Textron the initial development contracts in March 1971.

Prototype Evaluation

The Jeff-A was completed by Aerojet in December 1976, and the Bell Aerospace Jeff-B in March 1977. The U.S. Navy did not intend either design to serve as a precise model for the future class but rather as a prototype for the examination of alternative approaches that could be adopted for the follow-on design. Following extensive testing of the prototypes in Florida, the Navy issued a Request for Proposals for the system design of the new class in February 1980. Lockheed, Bell Aerospace, and Rohr bid for the contract, and in June 1980, contracts were awarded to Bell ($4.3 million) and Rohr ($3.4 million).

The initial production contract for the LCAC, in the amount of $39.9 million, was awarded to Bell Aerospace in June 1981. Procurement funding for the first three vessels was provided in the 1982 budget, and in September 1982, Bell Aerospace received a $22.5 million contract for the construction of the craft. This was followed in October 1982 by an additional $50.1 million award for the three craft funded in the FY83 budget. In January 1983, a $4.9 million contract was awarded to Bell to support the Jeff-B test program.

The U.S. Navy requested funding for an additional six LCAC vessels in the FY84 budget; Congress authorized the request. In March 1984, Bell Aerospace received a $72.6 million contract for these six craft. The U.S. Navy received funding for nine additional LCAC in FY85.

The LCAC program suffered several technical delays from 1985 through early 1987. However, the LCAC program was back on track by mid-1987. The U.S. Navy requested and received $19 million for landing craft in 1987, but none of the funding was for LCAC procurement. However, continued production orders

were received throughout the early 1990s; the most recent orders received were for seven craft in 1993.

The LCAC force first saw combat during the 1991 Persian Gulf War. A total of 17 LCACs out of the 34 available were committed to the operation and participated in the seizure of several offshore islands. Their capacity to lift heavy cargoes at high speed over long distances proved invaluable in supplementing other logistics functions. In addition, their ability to shift heavy armor to beachheads far behind Iraqi lines gave credibility to a threatened Marine amphibious landing that tied down large numbers of Iraqi troops.

The Need for Speed

This military contribution was followed by a major disaster relief operation in Bangladesh. Following a typhoon that resulted in severe flooding, U.S. Navy LCACs were used to carry emergency food, medical, and other supplies directly to the affected areas. Again, the LCACs' ability to carry large quantities of supplies for long distances at high speeds across terrain that prohibited the use of other surface vehicles was invaluable. The LCACs could go directly to the stricken population and place the needed supplies personally into their hands. This removed the time-consuming distribution, cargo-handling, and bureaucratic bottlenecks that usually impede such operations. As a result, the supplies were in victims' hands within hours of the disaster, preventing greater loss of life.

The expanding role of the LCAC caused it to be redesignated the MCAC (Multirole Craft, Air Cushion) in 1994, suggesting its possible use in mine-clearance and other non-amphibious warfare roles as well. However, as noted before, the term LCAC continues to be used both colloquially and by the U.S. Navy.

Upgrading the Fleet. In 1995 and early 1996, Congress directed the Navy to accelerate the proposed midlife upgrade of the LCAC/MCAC-1 class. The Navy was required to submit a plan for a Service Life Extension Program (SLEP) as early as January 1, 1996. The Navy, however, suggested that this decision could be deferred for at least two years and did not request funding for it at that time. An alternative suggestion, to procure more craft while transferring some of the older craft to other roles, remained in limbo for a long time.

In November 1997, at the NDIA Expeditionary Warfare Conference in Panama City, Florida, it was noted that the Navy had agreed to pursue a modest SLEP involving 74 of the latest models, while the other 17 would be retired. The first-phase SLEP was intended to begin in FY00 and continue through FY05. A second stage would then be implemented by upgrading the engines of the existing craft with more powerful units.

In late 1998, the Navy presented the Secretary of Defense with a proposal for what was called "above core" funding for the SLEP, which, if granted, would double the rate of upgrades of the LCAC fleet.

Funds for SLEPing

The House National Security Committee began funding this program in 1996, with the understanding that it would be launched in 1998. However, the program's schedule went off course due to delays in the delivery of the last production LCACs. Those delays were attributed to management issues that occurred when the last copy was built to a slightly different standard than the rest of the fleet.

In mid-1999, production of the SLEP was expected to be carried out in two phases. The first phase involved the modernization of the crafts' communications and navigation suite, and the second, replacement of their rusted-out buoyancy boxes. Due to the Navy's current funding difficulties, it appears that the service's budget for the SLEP will be extended in an attempt to maintain a fleet of operationally realistic size. The schedule called for the SLEP to begin with one unit in FY99, followed by another in FY00 and then increasing up to two per year. Because the last new craft's delivery date was pushed back to FY00, the entire chain was moved up and the program's Phase I would continue beyond FY05. Phase II, however, was to remain on schedule, with two up for reconditioning in FY00, followed by one in the following year, two in FY02, three in FY03 and FY04, and four in FY05. The schedule was subsequently extended to increase the rate of upgrades to six per year in FY06 and FY07.

Reconstruction Program

The original plan was to upgrade 74 of the 91 LCACs; the program is expected to last until 2015. The LCAC requirements analysis was to be reassessed in 2005 and 2010 because of the changing technology and tactics of amphibian forces. However, delays in the SLEP and doubts that the planned upgrade rate could be achieved led to additional restructuring of the program in late 2000. The more extensive and costly elements of the SLEP are now confined to Phase I, whereas Phase II elements are primarily structural in nature. Further doubt was thrown on both the scope and scale of the SLEP by a Pentagon Comptroller report that claimed only 60 LCACs were actually needed for the U.S. Navy, and the entire SLEP effort could be stretched accordingly. In the end, a compromise appears to have

been accepted which slows down the overhaul rate but keeps the target at 74.

In February 2006, the Joint Staff approved the Initial Capabilities Document for a Ship-to-Shore Connector (SSC) capability to develop a replacement for the LCAC. According to the Marine Corps program documentation, the ensuing Analysis of Alternatives recommended an LCAC-sized SSC with a greater lift capacity and the ability to operate 25 miles or more from the coast. This materiel alternative, to be called the Joint Maritime Assault Connector (JMAC), was approved by the Navy pending a Joint Staff Milestone A decision. The JMAC will take advantage of advanced technology, materials, and design, thereby enhancing the nation's ability to project expeditionary forces from the sea-based platforms of the future.

Related News

LCACs to be Refurbished – The Marine Services Division of Oceaneering International Inc has been awarded a $14,095,184 firm-fixed-price contract from the U.S. Navy to conduct the Service Life Extension Program for three Landing Craft, Air Cushion (LCAC). The LCAC SLEP will extend the service life of LCAC from 20 to 30 years, sustain/enhance craft capability, replace obsolete electronics, repair corrosion damage, reduce life-cycle costs by improving reliability and maintainability, increase survivability, and establish a common configuration baseline. Work will include repair and upgrade of the buoyancy box, replacement of the gas turbine engine, installation of a new skirt, and installation of an integrated C4I equipment package. (Defenselink, 5/09)

Funding

A total of 33 LCACs were authorized and appropriated for the U.S. Navy between 1982 and 1986, with 15 more funded in FY89 and 12 in FY90 and FY91. Another 24 were preliminarily funded in FY92. Overall, 91 were built and delivered to the U.S. Navy.

The FY99 Defense Authorization Act (HR 3616) approved by the U.S. House of Representatives in May 1998 included an additional $16 million in budget authority to speed up a SLEP for the LCACs. Of that amount, $1 million was to fund integrated logistics support of the TF40B engine, concurrent with sea trials and a subsequent determination of engine requirements. For FY00, the SLEP requested $31.8 million to cover two craft.

Additionally, $5 million to $6 million a year is allocated for parts support for the LCAC-1 class. However, no funding has been requested for new craft of this class, nor has funding been requested for the design or early procurement of long-lead items for a successor craft.

Contracts/Orders & Options

Contractor	Award ($ millions)	Date/Description
Armstrong Data Services	14.9	Jul 22, 1998 – A cost-plus-fixed-fee, indefinite delivery/indefinite quantity contract for unspecified support for the LCAC as well as other amphibious, expeditionary, and special warfare programs.
Textron Marine	61.0	Jan 15, 2003 – SLEP contract for five LCACs to be delivered by fourth quarter of 2005.
L-3 Communications	22.9	Mar 2007 – LCAC-36, LCAC-50, and LCAC-69 become available via SLEP, at Assault Craft Unit 4.
Vericor	20.5	Aug 2008 – Manufacture, testing, and delivery of 16 TF40B marine gas turbine engines for the LCAC SLEP FY08 requirements.

Contractor	Award ($ millions)	Date/Description
Vericor	32.1	Apr 2009 – Manufacture, testing, and delivery of 24 TF40B marine gas turbine engines for the LCAC SLEP FY09 requirements.
Oceaneering Int	14.1	May 2009 – SLEP of three LCAC craft.

Timetable

Month	Year	Major Development
Mar	1971	Contract awarded to Bell and Aerojet for initial design
Dec	1976	Jeff-A rolled out
Mar	1977	Jeff-B rolled out
Jul	1978	Jeff-B delivered to Navy
Jun	1979	Jeff-A delivered to Navy
Jul	1981	LCAC pilot production awarded
	1982	Initial production contract awarded
Jan	1991	Involved in combat operations during Persian Gulf War
	1992	Involved in disaster relief operations in Bangladesh
Dec	1993	LCACs selected by Japan
	1994	MCAC version introduced
Dec	1995	Total number delivered to USN at 82
Dec	1998	Original date for completion of delivery of all 91 units to USN
Summer	1999	SLEP rearranged into two phases
Mar	2000	Revised delivery date for last LCAC
Jan	2003	LCAC SLEP contract awarded
	2005	R&D for successor landing craft started; reassessment of LCAC need
	2014	Follow-on class likely to enter service; renewed reassessment of total need
	2015	SLEP expected to be completed
FY	2018	Last craft to retire before implementation of SLEP
	2025-2030	Projected retirement of LCACs when overhauled under SLEP

Worldwide Distribution/Inventories

Japan	Six in service
South Korea	One
U.S.	91 delivered, 74 in service

Forecast Rationale

The LCAC program has now ended, although modernization and upgrades of the existing fleet will continue until the type starts to leave service in 2014. Although the type has seen a number of sales outside the U.S., it is too heavily optimized to U.S. operational concepts to achieve much success. The LCAC is classed as an LCAC-H (Heavy), offering great cargo-carrying capacity but at a cost in size that restricts deployability and tactical flexibility. It is simply too much landing craft for a navy with limited means. Other navies looking at the procurement of air cushion landing craft (notably, the British, Dutch, and French navies) prefer a smaller LCAC (the LCAC-M) that is approximately half the size of the U.S. Navy ship and is optimized for a company lift.

The distinguishing feature here is the precise role the LCAC-equivalent is due to take on. The European navies see them as assault craft, a way of getting the first wave of landing troops ashore as fast as possible. In the U.S. Navy, this function is carried out (currently)

by the AAV-7 and will be executed by the successors to that vehicle. The role of the LCAC in this operational environment is primarily logistical, bringing ashore the vehicles needed by the landing force and the equipment needed to run them. These operations required a larger craft, and it is interesting to note that other countries (for example Greece and China) with logistics requirements similar to those of the U.S. have also opted for the larger category of craft. Interestingly, both Greece and China have adopted a much larger design than the LCAC – the Russian Project 1232.2 – indicating that the demands of the logistics requirement can best be fulfilled by a bigger craft.

This also appears to be the decision of the U.S. Navy, which is looking at a design more than 50 percent larger than the LCAC for the LCAC(X) "Assault Connector," due to enter service in 2014. In 2006, this program was redesignated the Joint Maritime Assault Connector (JMAC). Thus, the LCAC might not be replaced by a single class, but its role may be divided into two classes – one significantly larger, the other smaller than the current design.

Ten-Year Outlook

No further production of the LCAC-1 class is projected. This report will be archived next year and replaced by a new report covering the JMAC.

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