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SPOTLIGHT:

Army Heavy Lift: An Enduring Capability for the Great Power Competition



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Army Heavy Lift: An Enduring Capability for the Great Power Competition

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With the Army focused on FLRAA and FARA, the question of heavy lift under the Future Vertical Lift program won't be answered until the 2030-2035 timeframe. That means heavy lift modernization to help enable alldomain operations needs to progress soon.



An early test flight of the CH-47 Chinook Block II configuration at the Boeing Philadelphia facility.

Requirements around Joint All Domain Command and Control (JADC2) and the Great Power competition often focus on satellites, autonomous systems, and resilient networks, as well as next-generation platforms like the Army's Future Long Range Assault Aircraft (FLRAA) and the Navy's DDG(X) guided missile destroyer.

Less visible but still highly regarded in the future fight is the Army's heavy lift capability. Today's heavy-lift helicopters must handle heavier equipment and climb to higher altitudes at hotter temperatures.

The Army originally planned to develop a new, heavy lift platform under the Future Vertical Lift (FVL) program as part of a family of aircraft vehicles that also included FLRAA and the Future Attack Reconnaissance Aircraft (FARA). FLRAA and FARA are now both in development, but a FVL heavy lift program is still being contemplated by the Army and Congress.

ON THE COVER: The Army has three Engineering, Manufacturing, and Development (EMD) prototype aircraft for developmental testing of the C-47 Chinook Block II program.



Maj. Gen. David Francis, Commanding General, US Army Aviation Center of Excellence and Fort Rucker.

In the meantime, the Army continues to upgrade CH-47D Chinook helicopters to the CH-47F standard, which is primarily an avionics and digital systems upgrade not necessarily related to lifting performance. The best-case scenario for a potential heavy lift FVL platform is kickoff in the 2030-2035 timeframe.

To potentially fill that gap, both the Army and Boeing are testing a Block II upgrade to the CH-47F that will be able to lift heavier hardware such as a fully-armored Joint Light Tactical Vehicle and meet mission needs related to multi-domain operations.

"Future Vertical Lift is the Army's number-three modernization priority and part of the 31+4 (priority programs)," MG David Francis, commanding general, US Army Aviation Center of Excellence and Fort Rucker, AL, told Breaking Defense. "FARA and FLRAA are the aviation branch's number one and two modernization priorities and critical to the Army's ability to fight and win in multi-domain operations. Army aviation is focused on fielding those capabilities to our soldiers beginning in fiscal year 2030.

"CH-47 is the Army aviation's newest fleet of aircraft and will continue to fill the role of heavy lift in the Army for years to come. The Army will continue to analyze and experiment to evaluate capability gaps for vertical lift platforms. As we begin to field FARA and FLRAA, the Army will continue to analyze available technologies to fill the role of FVL heavy lift."

A KEY ROLE FOR HEAVY LIFT WITHIN GREAT POWER

Francis considers the Army's heavy lift capability as a key element that resides in one of three fundamental capabilities that Army aviation provides to the Joint Combined Arms Team. Those can be summarized in three broad categories:

- *See,* which addresses reconnaissance and security;
- *Move,* which includes air assault, air movement, and aeromedical evacuation; and
- *Strike,* which is close support and interdiction.

"Army aviation must continue to improve its reach, survivability, lethality, and sustainment in order to continue to provide these fundamental capabilities to the Army in the future operational environment," said Francis. "Heavy lift plays a critical role in the Army's ability to 'Move' or maneuver, providing an asymmetric advantage to our ground commanders now and in the future.
"By executing our current modernization strategy that includes FARA, FLRAA, and targeted modernization of the enduring fleet, Army aviation continues to be dominant in the lower tier of the air domain and provide the best capabilities to commanders and soldiers on the ground."

As mentioned, the Chinook will continue to serve as the Army's heavy lift helicopter for years to come. The Army has said it needs more lift, and the purpose of the CH-47F Block II is to deliver that lift and desired modernizations now—not a decade or more from now.

"Heavy lift is enduring and required no matter what the Army does, so modernizing heavy lift is just part of it," said Pat Donnelly, director for CH47 Program Management at Boeing, which is responsible for development of the Block II modernization program. "We don't want America's warfighters going into battle without being able to exceed the capabilities of our adversaries. We certainly support the Army's future vision, and we believe that the Block II is part of that future vision."

HEAVY LIFT UPGRADE STATUS

The Army and Boeing are currently executing the Engineering Manufacturing Development (EMD) phase of Block II. There are three CH-47F Block II aircraft operating today. Boeing is operating two of them at its flight test facility, in Mesa, AZ, where the focus is on air-vehicle flight-performance development.

Boeing is currently validating that Block II meets the requirements for the Army's specified operating envelope by validating that the helicopter can do a 30-degree bank turn at a specified gross weight, for example.

The Army is operating the third aircraft at its flight test facility at Redstone Arsenal, AL, where it is emphasizing system development and software validation.

The CH-47 Block II upgrade is one of several parallel programs the Army has engaged with to improve helicopter performance.

"The Block II program is designed to upgrade existing MH-47 and CH-47 aircraft to increase payload capacity and integrate other product improvements," said Francis. "Present-day



The CH-47F Block II Chinook.

thinking about keeping heavy lift relevant in the coming years is focused around incorporating targeted modernization of the enduring fleet and incorporating Modular Open System Architecture into AH-64, UH-60, and CH-47."

The Army expects that such improvements and open system approaches will not only improve the enduring fleet, but also inform and integrate into future vertical-lift platforms. Examples of targeted modernizations include the Improved Turbine Engine Program (ITEP), improvements to aircraft survivability equipment, operations in degraded visual environments, munitions, and upgraded radios.

"We have also executed other changes across the DOTMLPF-P (Doctrine, Organization, Training, Materiel, Leadership, Personnel, Facilities-Policy) to ensure our enduring fleet remains relevant for multi-domain operations," he said.

UPGRADES TO IMPROVE MISSION SUCCESS

The primary intent for the CH-47F Block II upgrade is to increase payload and to reduce operating costs on the battlefield so that the Chinook can continue to be an enabler of Army operations well into the future. Improvements include the following.

Block II includes a re-designed fuel tank. Explained Donnelly: "The CH-47F Chinook has three separate tanks on each side of the fuselage. With Block II, we went to a single fuel tank on each side, and it's proven very effective. By going to two tanks instead of six we've reduced the need for transfer pumps and eliminated a lot of plumbing. Taken together, we've reduced weight and added some more fuel capability."

Boeing also stiffened the fuselage in the backend, so the helicopter can accommodate bigger engines and can increase the lift capability of the aircraft by 4,000 pounds, according to the company.

The Block II configuration also has more in common with the Special Forces MH-47G model—especially the nose of the aircraft. The G model has a longer nose because Special Forces have more equipment that they store in that region. That extended nose, however, made the G model unique from the F model. Going to a common structure means the F and G models can benefit from greater commonality and interchangeability, creating more flexibility and cost savings for the Army in maintenance.

In addition, special operators have pushed the Chinook hard by operating them at a maximum gross weight of 54,000 pounds, which is greater than what Army CH-47F models operate fly at. That has caused the maintenance and logistical needs of the special-forces model to diverge from others in the Army's fleet.

"Something that Special Forces have struggled with is that they've been operating the Chinook at 54,000 pounds for many years now, putting more strain and stress on the drivetrain, transmissions, and hubs—so much so that the Army would not put them back in their own inventory. Now, with Block II also going to 54,000 pounds, the G model can take advantage of the drivetrain logistics that the Army uses," said Donnelly.

Finally, Block II includes an improved electrical system that manages electrical consumption better, and is more stable and efficient to better support the tactical network.