Boeing-Developed Composite Rotor Blade Spins Forward

High Technology to Make AH-64D Apache Longbow More Affordable, Efficient

The Boeing Company [NYSE:BA] has successfully completed testing of a newly developed composite rotor blade for use on the AH-64D Apache Longbow multi-role combat helicopter.

Developmental tests on the Affordable Apache Rotor Program (AARP) blade have shown that the blade not only meets the program's cost reduction target, but will be stronger and last longer than existing blades, an improvement expected to reduce overall operating costs for the AH-64A Apache and AH-64D Apache Longbow.

Flight tests at the Boeing rotorcraft facility in Mesa, Ariz., also verified the new blade design will achieve targeted improvements in aircraft performance with a higher cruise speed, more payload capability and a higher climb rate in combat mission configuration.

AARP blades incorporate stainless steel leading edges, providing structural strength and erosion protection. The blades are designed to have more than twice the fatigue life of the standard metal blades now in service on Apaches.

Based on the success of the development program, AARP blades will be added to the Apache Reliability & Sustainment and Recapitalization Program for the U.S. Army. Apache Project Manager Col. Ralph Pallotta has approved going forward with the qualification test program.

Eleven prototype blades and numerous smaller test articles were built during the development program. The blades have completed successful ballistic, structural and flight testing, according to Pierre Jouin, Boeing AARP lead in Boeing Mesa. Composite skins and spars, and honeycomb internal reinforcements were used to create consistent, high-quality composite blades with metallic root fittings, designed to fit fielded Apache rotorcraft.

A limited flight test included a variety of hover, forward, rearward and sideward maneuvers to verify that the flight loads and vibrations environment created by the blades will meet AH-64 requirements. The test also helped confirm that aircraft handling qualities with these new blades were as good as or better than with the current blades.

Testing also confirmed aircraft performance improvement goals could be achieved. Sixteen test articles -- four to nine feet long -- were also built and used for ballistic testing at the U.S. Army's Aberdeen Proving Ground, Md., early in the test program and as part of the design process.

The successful flight tests follow more than four years of development by Boeing and the U.S. Army/industry Apache team. The new blades use composite materials extensively throughout the structure instead of the metal-bonded construction used in current blades, first introduced more than 20 years ago.

Other advantages of composite construction include more aerodynamically efficient airfoil shapes and a higher overall twist rate, resulting in improved hover and forward flight performance. The blades are designed to perform at higher horsepower limits.

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