

Army aviation engineers play role in helicopter rebuild

U.S. Army

REDSTONE ARSENAL, Ala. (June 13, 2013) -- The Army has upgraded the OH-58 Kiowa Warrior from 1980s equipment to the most current technology available.

With the Cockpit and Sensor Upgrade Program, Army engineers from the U.S. Army Research, Development and Engineering Command's aviation and missile center leading development efforts.

This accomplishment was marked with the April 30 ceremonial first flight of the first engineering and manufacturing design and demonstration model.

The OH-58F Cockpit and Sensor Upgrade Program, or CASUP, is the largest and most-comprehensive multi-system development program undertaken by the Aviation and Missile Research Development and Engineering Center's Prototype Integration Facility, or PIF.

The PIF completed system-level hardware integration development of more than 40 systems, subsystems, components and structures for the OH-58F airframe.

PIF CASUP Team Lead Brad Welch said one of their major tasks was a redesign and fabrication of the aircraft wiring harness. During the design phase of the aircraft wiring harness, the PIF recommended a new style of process-controlled wire as well as flat braid shielding be used throughout, resulting in approximately 32 pounds of weight shavings from the same harness design without the two material changes.

The total weight savings of all the changes made to the system was about 160 pounds.

Another major task worked by the PIF was an effort to minimize wiring runs by identifying the location of each line-replaceable unit, such as radios and computers, and reconfiguring wiring runs for optimal use of space.

"We spent a lot of time and effort moving boxes around the aircraft in an attempt to minimize wiring runs," Welch said. "Throughout the wiring harness design we made significant design changes to protect the wiring from electromagnetic interference. The changes will be verified during the system level testing on EMDD-2, but the expectation is that there will be significant improvement in EMI hardening of the aircraft design as a whole."

While the PIF led the CASUP development, the effort was helped along by many AMRDEC directorates.

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AMRDEC Director Eric Edwards said the OH-58F CASUP program shows that the AMRDEC is a viable capability for system level development and for meeting critical needs.

"Multiple AMRDEC directorates performed a critical role in this development by providing integrated design and technology, product integrity, airworthiness, and manufacturing instructions for the new system," Edwards said. "This is just another example of how the AMRDEC is technology driven and Warfighter focused."

The AMRDEC's Aeroflightdynamics Directorate, for example, assisted in the acquisition of aerodynamic data on the new design. CASUP Chief Engineer Dave Arterburn, who was responsible for the OH-58F design and build, recognized early on the lack of aerodynamic data that could be used to quickly obtain drag and performance data for the OH-58F.

Arterburn partnered with AFDD and NASA's Langley Research Center to conduct wind tunnel modeling and testing of the new design.

"The AMRDEC partnership is broad and focused from airworthiness and matrix support to manufacturing and engineering design work at the PIF to wind tunnel and handling qualities support at AFDD," Arterburn said. "It takes a team to be successful in today's acquisition environment, and AMRDEC personnel and organizations are a valued part of the PM ASH Team."

PIF Program Manager Jeff Carr described the CASUP as more than development but a true teaming arrangement between multiple Army agencies and offices.

"It's about airworthiness, product integrity, logistics, build instructions, [and] technical data packages, which all center around long term sustainment," Carr said. "This program has allowed the Aviation and Missile RDEC to grow deep and wide. We've had significant challenges, and our industry partners have helped us demonstrate that this is a viable material development process, and we did it on a critical program."

ABOUT AMRDEC

AMRDEC is part of the U.S. Army Research, Development and Engineering Command, which has the mission to develop technology and engineering solutions for America's Soldiers.

RDECOM is a major subordinate command of the U.S. Army Materiel Command. AMC is the Army's premier provider of materiel readiness -- technology, acquisition support, materiel development, logistics power projection, and sustainment -- to the total force, across the spectrum of joint military operations. If a Soldier shoots it, drives it, flies it, wears it, eats it or communicates with it, AMC provides it.

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