



# Wind in the tunnels

BY KYLE SWENSON

Arnold Engineering Development Center flies high on some of the world's most advanced aviation projects

**Early** this summer, when an innovative short takeoff version of Lockheed Martin's F-35 Lightning II Joint Strike Fighter successfully took to the skies over Fort Worth, Texas, a sigh of relief passed through engineers and aviation experts far and wide. The plane's first test flight represented the success of what's on the books as the world's largest military project, employing more than 20,000 people across 11 different countries.

If anyone had a right to join in on the celebration, it was the staff at the Arnold Engineering Development Center (AEDC), located on Arnold Air Force Base in Coffee County. Besides logging more than 10,000 hours in AEDC's wind tunnels, the F-35 project managers worked hand-in-hand with the facility's experts to perfect the plane's systems, spending more than \$300 million on engine development alone.

With 58 advanced on-site testing facilities—valued at \$7.3 billion—AEDC is an essential stop for any high-profile aviation project.

"We basically touch everything high-tech that flies," says Claude Morse, the public relations manager for Aerospace Testing Alliance (ATA), the civilian contractor at Arnold. "From commercial airliners to NASA spacecraft, to essentially all the military performance rockets, and manned and unmanned aircraft in the inventory."

With its wind tunnels, space environmental chambers, ballistic ranges, and rocket

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and turbine engine test cells, the AEDC can replicate almost any scenario an aircraft or device may face in the sky. Twenty-seven of the facility's test cells are unmatched in the United States, while 14 units are the most advanced in the world. With such advanced offerings, the facility is in high demand, creating a persistent hum of activity in

ity's staff is nonmilitary and employed by ATA, a consortium of three firms: Jacobs Engineering, Computer Scientist Corp. and General Physics Corp. These contractors number around 2,500, depending on the facility's workload. An additional 300 employees are government and military staff.

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the region. In 2007, it was estimated the AEDC was responsible for \$653 million in economic impact on Coffee County.

But outside of the regular testing traffic, much more is in the works at Arnold. Like most of the defense industry, the center is also in the midst of a competitive scramble for talent, searching for a new and enthused generation of employees to replace aging Cold War-era experts.

In its day-to-day operations, the AEDC represents an intersection of commercial interests, government infrastructure and military oversight. The majority of the facil-

The projects arriving at Arnold are normally developed by a commercial company and sponsored by a government entity.

“A government entity might be an Air Force program office, the Navy, the Army, another Department of Defense entity, or NASA,” says Col. Arthur F. Huber, commander of the AEDC. “Typically, firms coming in are Lockheed Martin, Boeing, General Electric and Rolls-Royce.”

Recent projects tested at the facility include the Rolls-Royce engines for the new Boeing 787 Dreamliner, NASA's Space Shuttle replacement, the Constellation Project, and

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a congressionally mandated project searching for alternative jet fuels.

Despite the success the center continues to see, Huber also acknowledges the AEDC is facing the staffing problem the entire aerodynamics world is grappling with.



**Col. Arthur F. Huber**  
**Arnold Engineering**  
**Development Center**

In an age when high-end talent is increasingly drawn to big-spending super-innovators like Google and Microsoft, the defense industry has struggled to compete. According to a June 25 *New York Times* article, over the last 14 years the Air Force's core staff of civilian and uniformed engineers has decreased by 35% to 40%.

Following the finale of the Cold War, the government scaled down its engineering personnel, thinking the private industry would be able to maintain the workforce necessary for innovation, Huber explains. However, what no one considered was that with a lack of military demand in the '90s, those private industry

companies would also reduce their own talent pools.

"What we're seeing is a belated recognition of this within the government, so you are now seeing more and more initiatives trying to rebuild that organic expertise that's required to properly manage these programs," Huber says.

AEDC has introduced a Technical Excellence Initiative to address the issue by promoting continued education among engineers already on staff. Employees are now offered accelerated graduate degree programs thanks to a relationship with the University of Tennessee's Space Institute (UTSI) in nearby Tullahoma. Staffers are also now given more opportunities to publish and present conference papers.

The center is working to develop more relationships with area universities in order to drum up interest early in soon-to-be graduates.

"Commonly, the students will do their research here at the university but on a project funded by AEDC," says Bruce Bomar, UTSI's dean of academic affairs. "We have some students, occasionally, whose research assistantship is being paid for by AEDC, and they'll do research over there."

To ensure the continued excellence of the AEDC, Huber stresses that the talent pool must continue to be quality. "We're attacking it on various fronts."

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