Testing,

St. Louis group resolves issues to ensure quality of military aircraft

By Kathy Cook

There's many a slip 'twixt the cup and the lip. So says the old English proverb. And so it is between the time one of Boeing's sophisticated military planes is constructed and the time it first flies.

"It's rare that an aircraft doesn't have some squawks, or issues, that need be resolved before first flight," said Don Rogers, Flight Operations superintendent in St. Louis, where the F-15, F/A-18, EA-18G and T-45 are built. "You can't just build a plane and deliver it. There are lots of things to test, check, even double- and triple-check after a plane is assembled and before it's safe and ready to perform hard-core military missions."

A group in St. Louis—comprised of teams from Ramp Operations and Flight Operations—is dedicated to ensuring that all the squawks are discovered and resolved in the factory, long before a plane is released for first flight. The work they do is behind the scenes, but it's critical when it comes to ensuring performance and safety for Boeing's military jets.

"Delivery timelines are important, but safety has to be our top priority," said Sherlin Lovett, T-45 Goshawk Flight Ramp Operations manager. "Of course that includes flight safety, but it also means safe performance of our jobs on the ground. The testing we do can be dangerous, so strict adherence to safety procedures is always on our minds."

Prior to first flight, there are five tests the group performs for the aircraft built in St. Louis. Each of the following tests is performed as many times and as long as is needed to ensure everything's perfect before the plane leaves the ground.

Compass calibration: Each aircraft has a manual compass in it. Matt Gerner calls it a pilot's last hope. "If instrumentation fails and all you have are your engines running, you can still get home using this compass," said Gerner, the Flight Ramp operations manager for F/A-18. The test team verifies that the compass settings are accurate. They tow the aircraft out to the tarmac and position it on a compass painted on the concrete. This painted-on image indicates true magnetic north and other key points on the compass. They line the jet up along the north-south line, and then check that the aircraft's compass points north. If it's not right on, a new compass is ordered and tested. It's a basic test, but an important one.

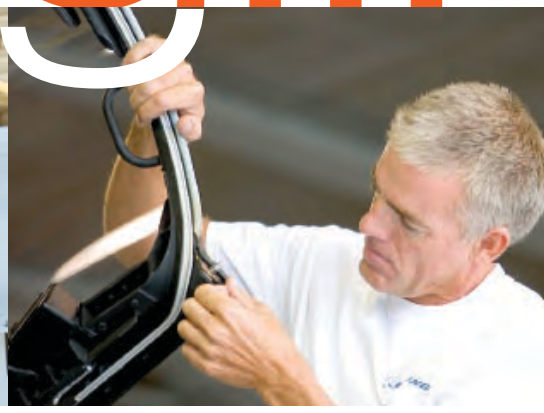
GPS calibration: The team also tests an aircraft's Global Positioning System to make sure it communicates properly with GPS satellites. The GPS allows the airplane to know where it is globally, which is critical in completing a mission and returning to base.

Fuel calibration: The aircraft have fuel bladders—large balloon-like structures that hold fuel within the wings and fuselage. The team verifies that the system doesn't leak, and that the valves for transferring fuel from the bladders to the engine work. On the T-45, they check to see that the manual fuel quantity gauges work and verify the accuracy of the fuel "bingo," an alarm a pilot can set to go off when the fuel level drops to a certain point.

Engine setup: A tiny scrap of metal can ruin a million-dollar engine. So before engine setup can begin, a check for foreign objects must be completed. On the F-15, the inlets that allow air to be pulled into the jet engine move, so an inlet shake is performed to release any debris that could be sucked into the engine. Also, the walls and floors of the building in which the plane is housed for engine setup are washed down.

Engine setup and engine runs are completed in the hush house, so called because of the 3-foot-thick walls and heavy doors that hush the roar of the engine being tested. The aircraft is brought in and tied down. Engine setup generally begins with a dry cycle in which the motor spins without fuel to get lubricating oil moving throughout the engine. Because the engines have likely been sitting for a while, they need to be adequately lubricated and checked for leaks before being fired up. Engine setups also allow the team to check, among other things, electronics and environmental control systems.

testing...



Preflight prep: After engine setup and a trip to the paint shop, preflight preparation, or prep, takes place. Preflight checks—both avionic and mechanical—are intricate inspections of the aircraft, beginning at the tip of the nose and moving aft, by mechanics, specialty inspectors and others. Once Boeing completes a 24-page inspection, a release sheet is prepared, indicating the aircraft is ready for the customer's inspection. Once the customer says a plane is ready to fly, it's towed outside for flight. For F/A-18 and T-45 aircraft, one last step—taking fuel samples to check for contaminants—is completed before a jet is turned over to the flight office.

The jet is almost ready for first flight. But the final arbiter of whether a jet is ready to fly is the pilot. And before the pilot climbs into the cockpit, he or she will also perform a walk-around inspection to look for any issues, such as excessive free play in the ailerons (control surfaces) of the jet. Pilots then check electrical systems, avionics displays and gauges. And of course, they make sure the engine starts up promptly.

OFF AND FLYING

And then, it's off to the skies! But the tests don't end after the aircraft leaves the ground. The Boeing team also performs recovery, or postlanding, operations, which include brake checks and correction of any issues discovered by the crew during flight.

"It's time-consuming, it's extensive, it can be exhausting," said F-15 Flight Ramp Operations Manager Jim Woelich, of the testing process. "But, it's worth it when you think that men and women of the armed forces—those who are safeguarding our freedom—are entrusting their lives to these planes. It's a job worth doing well." ■

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PHOTOS

From far left: Nondestructive testing inspector Anne Ford works on an F/A-18E; electricians Dave Gordon (left) and Tom Steel disconnect the tow bar from an F-15K moved to the ramp area; flight mechanic Dan Schwartz (left) and flight inspector Cliff Chandler check out the canopy of a T-45C Goshawk; flight mechanic Keith Pisetta (right) reviews a flight checklist with Boeing pilot Steve Schmidt before a test flight of a T-45C; flight inspector Dave Wallace (in cockpit) talks to flight operations mechanic Scott Marlett during the check-out of an F/A-18F; flight mechanic Dan Straeter works on the canopy of an F-15K. RON BOOKOUT/BOEING

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