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First 3D-printed aircraft component takes to skies at FRCSE

JACKSONVILLE, Fla. –Military pilots have to stay cool under pressure, and the first 3D-printed component at Fleet Readiness Center Southeast will help them stay that way.

The forearm-length piece of air duct tubing, constructed with a composite material known as Ultum 1085, marked a major step forward for the Navy command that is charged with maintaining, repairing and overhauling aircraft.

“This is an awesome milestone for our facility,” said FRCSE Commanding Officer Capt. Chuck Stuart. “It shows the innovative approaches our artisans and engineers incorporate to help support the U.S. military every day.”

The facility’s first 3D printer became operational in June 2014. Since then, artisans and engineers have put it to good use making parts for support equipment, for prototypes to save on costly material and for tooling – but never before for an actual piece of an aircraft.

That all changed in January when Matthew Hawn, an aerospace engineer at the facility’s trainer aircraft program, sought help from the manufacturing department after the original manufacturer of the T-44 Pegasus exhausted its supply of a piece of air duct used to circulate air throughout the planes cockpit. Randy Meeker, a tooling maker at the facility who runs the 3D printer, put forth another option.

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“We went over to manufacturing and took a look at making a vacuum form of the tube, which is how the original part was made,” Hawn said. “Then Randy brought up the possibility of 3D printing the part.

“From there, the cost analysis between the two showed 3D printing was cheaper and offered a better material.”

Not only did Meeker replicate the piece using the 3D printer, he improved on the design.

“The original piece was made out of two pieces of clear plastic tubing that had a flange all the way down its length,” he said. “I redesigned it to work better than the plastic model.

“It didn’t need to be two pieces when I could print it as one piece.”

Meeker, who works as a pit crewman on a racing team, said some teams have begun printing parts for race cars. However, the process for an aircraft demands a bit more caution because the plane most likely won’t be on the ground if a part fails.

“There is a lot of responsibility on the engineer for these parts that are actually used in aircraft,” he said. “It’s a whole new world of technology, and it’s their responsibility to make sure it can be used safely.

“That’s why this particular project was a good first candidate because it’s not a flight-critical part, but it’s a step forward in incorporating 3-D printed parts into aircraft.”