

Texas aerospace engineers to test energy-efficient wing design

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A close-up of the experimental airfoil mounted under the wing of the Aggies' plane.

Aerospace engineers from Texas A&M University's Flight Research Laboratory are in Kansas this week testing a new design for an energy-efficient aircraft wing.

The Aggie team is led by aerospace engineering professor and newly elected member of the National Academy of Engineering Dr. William Saric. The researchers are testing a design for an energy-efficient airfoil,

or wing. In flight, air should flow smoothly and uninterrupted over the wing. A choppy, or turbulent, flow of air over a wing increases drag, and the plane has to work harder, using more energy.

The researchers use infrared thermography to detect whether airflow over the wing is turbulent, which the researchers want to avoid. Very sensitive infrared cameras provide images of the air as it flows over the wing.

Saric said the researchers have made their design work in a low-speed wind tunnel but now need to test their design in more realistic flow conditions. Saric said that colder temperatures make for different air flows and more realistic flight conditions for other aircraft.

"The predicted lows in Coffeyville this week are about freezing," Saric said. "That's ideal for us. You lose 3.6 degrees per 1,000 feet of altitude, so the operating temperatures during our flights will be in the high 20s."

The Aggie crew left Bryan-College Station last Saturday (March 11). Ph.D. student Celine Kluzek and Flight Research Laboratory mechanic Cecil Rhodes flew the lab's Cessna O-2 to Coffeyville. Two more students followed in Saric's truck and equipment trailer, and test pilots Roy Martin and emeritus professor Dr. Donald Ward met the team there.

Once in Kansas, the model was mounted to the plane underneath a wing. Test pilots will fly the Cessna, and infrared cameras on the plane will measure the airflow over the wing.

"It's an extension of our wind-tunnel work -- kind of like a laboratory or wind tunnel in the sky," Saric said.

"We're at the limits of what we can do here in the warmer weather of Bryan-College Station. We need to test in colder temperatures to

improve the demonstration."

Dr. Helen Reed, head of the Department of Aerospace Engineering, said, "Dr. Saric and his team are testing revolutionary new technologies that will enable future aerospace systems. His research involving students, both graduate and undergraduate, in these unique hands-on endeavors stimulates leadership and provides a good complement to their engineering education."

Source: Texas A&M University

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