Dear Editor/Reporter:

In July and August of 1992, NASA's Langley Research Center will flight-test advance-warning sensors that are being developed to detect windshear, a hazardous weather condition that has been blamed for hundreds of airline fatalities. This NASA and Federal Aviation Administration program will very shortly result in the installation of windshear warning systems on all commercial aircraft.

Because the program ultimately will make the skies safer for all airline passengers, it may be of interest to your audience. A media package follows this note, and interviews, graphics, photos and videos also are available. If you have any questions, please call and we will be glad to assist.
MAKING THE SKIES SAFE FROM WINDSHEAR
Langley To Flight-Test Advance-Warning Sensors

NASA's Langley Research Center is gearing up for its first flight tests, in July and August, of a laser-based sensor designed to give airline pilots advance warning of the sometimes-fatal weather condition known as windshear.

Langley scientists and engineers also expect the flights to provide additional data on other airborne windshear sensors tested last year.

Windshear, a hazard particularly during takeoff and landing, can force a plane to lose airspeed and altitude and has been blamed for hundreds of airline deaths. Putting advance-warning sensors on planes will give pilots time to avoid the treacherous downdrafts and wind changes.

Under strict safety criteria, flight tests will carry a NASA 737 research aircraft at low altitude directly into thunderstorms and other severe weather conditions to seek out the violent windshear "microbursts."
The flights will originate from Denver, Colo., and Orlando, Fla. The Denver deployment will take place from July 13 to 27. The Orlando flight tests will take place from early August through early September. During the deployments, the 737 research plane will be directed toward microbursts using experimental ground-based Doppler radar designed to spot windshear.

The flight tests are part of a more than $20-million research agreement signed in 1986 between NASA and the Federal Aviation Administration (FAA). The agreement calls for the development of technology for airborne windshear detection and avoidance, and the 737 flights are the final phase of the joint program.

Looking forward

Under a 1988 FAA directive, windshear detection devices are being installed on airplanes to meet a year-end 1993 deadline. But those systems do not detect windshear until a plane already has entered it — possibly too late to prevent a crash.

By contrast, the forward-looking remote sensor systems being test-flown by Langley can detect windshear from 15 to 40 seconds in advance, allowing time for avoidance maneuvers. The FAA has mandated that this type of windshear-warning system be installed on commercial aircraft by 1995.

Langley is testing three types of forward-looking systems:

- The laser-based system, called Doppler “LIDAR” (light detecting and ranging) measures the speed of aerosols—minute particles in the air, such as dust—as an indicator of changes in the wind. Langley will flight-test this system for the first time this summer.

- Another system uses microwave radar to locate microbursts by measuring sudden, large changes in the speed of raindrops in storm cells ahead of the airplane.

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Another system uses an infrared light sensor, which detects microbursts by measuring air temperature differences ahead of the aircraft.

The flights also will test a Langley-developed data link between ground weather radar and the 737. Researchers are developing a system for automatically transmitting windshear data from ground radar to a display in airplane cockpits. Currently, warnings from ground weather radar usually are relayed by voice — a slower and less precise method.

COLOR PHOTOS & VIDEO AVAILABLE

• The video (VHS or broadcast-quality Beta) is a compilation that includes a reenactment of a windshear-caused crash, with cockpit voices; time-lapse footage of a windshear microburst forming and hitting the ground; footage of NASA's 737 research aircraft flying through two windshear events; filler footage of the 737 taking off, landing, cockpit chatter and instrument closeups; and a 10-minute documentary.

• For glossy color prints of the photos in the fact sheets, order by "L" number:

Four-page fact sheet:
  Page 1 - L-90-1643
  Page 2 (top) - L-91-9964
  Page 2 (bottom) - L-91-1645
  Page 3 (top) L-92-386
  Page 3 (bottom) - L-89-11777
  Back page: L-92 - L-92-6965

One-page fact sheet:
  Page 1 - L-91-10089
  Back page - L-92-6965

• Other photos also are available and show: thunderstorm from airplane window; NASA's 737 research aircraft on runway with thunderstorm sky; and colorful computational fluid dynamics (computer-generated images) of windshear microbursts.

• To order photos or video, call (804) 864-6126 or 6120.
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