

National Aeronautics and Space Administration



SPINOFF

NASA Langley Research Center



2012

Pressure-Sensitive Paints Advance Rotorcraft Design Testing



Langley Research Center

*Innovative Scientific Solutions Inc. (ISSI)
Dayton, OH*

NASA Technology

- ◆ Pressure-sensitive paint (PSP) allows for air pressure measurements throughout the entire surface of the vehicle.
- ◆ NASA was seeking a technology that could gather instantaneous dynamic pressure data from surfaces moving at high speeds, such as rotor blades.



Technology Transfer

- ◆ ISSI, through Small Business Innovation Research (SBIR) funding, developed the Fast PSP program.
- ◆ Tests at Langley show that Fast PSP is able to show changes in the pressure of a single blade as it rotates around a helicopter.
- ◆ Fast PSP can collect 1,000 pressure measurements in the time it takes PSP to collect a single one.

Benefits

- ◆ Fast PSP has so far generated about \$200,000 in commercial sales.
- ◆ The product has generated interest from people working with helicopter rotors, wind turbines, and acoustic noise research.
- ◆ ISSI and NASA are working toward applying PSP technology to actual flight tests.



Speech Recognition Interfaces Improve Flight Safety

Langley Research Center

*VoiceFlight Systems LLC
Troy, NY*

NASA Technology

- ◆ Manually inputting letters on a GPS for flight plans can be distracting for pilots who should have their eyes on the sky.
- ◆ NASA's Vehicle Systems Safety Technology (VSST) at Langley supports new ways to mitigate aircraft safety risks.

Technology Transfer

- ◆ Through Small Business Innovative Research (SBIR) funding, the company that would become VoiceFlight created speech recognition software that interacted with GPS aviation devices.
- ◆ Using their voices, pilots enter waypoints ten times faster than those using traditional knob-turning devices.



Benefits

- ◆ In 2009 VoiceFlight's speech recognition technology was the first to be certified for use in civilian aircraft by the Federal Aviation Administration (FAA).
- ◆ In 2011 the company launched its products for use on smaller civilian planes, such as the Piper Arrow, Beechcraft Baron, and the FJ-4 Fury.



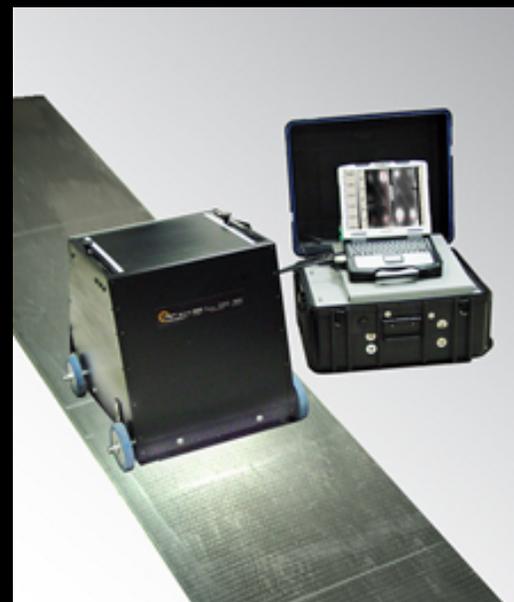
Camera Systems Rapidly Scan Large Structures

Langley Research Center

*MISTRAS Group Inc.
Princeton Junction, NJ*

NASA Technology

- ◆ Aging aircraft are being kept in service longer than their intended lifespans, and NASA was looking for new technology to assess aircraft structural integrity.
- ◆ NASA developed line scanning thermography (LST), whereby an infrared camera creates heat-based images that reveal areas of damage.



Technology Transfer

- ◆ MISTRAS acquired ThermTech Services Inc., the company that had originally licensed the LST technology, and integrated LST into its business portfolio.
- ◆ Defects in a structure are more easily discerned using thermography than with acoustic emission and ultrasonic tests, tools previously used by the company.

Benefits

- ◆ Because of LST's ability to cover a lot of area quickly, ships, boilers in power stations, and large equipment can be analyzed very quickly.
- ◆ On aircraft the technology is able to spot structural failures before it's too late, thereby eliminating the high prices and other losses associated with catastrophic failures.



Thin Films Protect Electronics from Heat and Radiation

Langley Research Center

*NeXolve Corporation
Huntsville, AL*

NASA Technology

- ◆ As part of NASA's efforts to create robust materials for space, the Agency researches polyimides, substances that are heat- and chemical-resistant.
- ◆ A NASA researcher discovered nearly color-free polyimides, which proved especially stable in simulated space environments.



Technology Transfer

- ◆ SRS Technologies worked with the researcher and Marshall Space Flight Center in validating the stability of Polyimide 1 and 2 in the extremes of space.
- ◆ SRS was acquired by ManTech International, and then spun off into NeXolve Corporation, which is providing the five-layer protective sunshields for the James Webb Space Telescope.

Benefits

- ◆ The company also sells its thin film products to Boeing, Lockheed Martin, and Northrop Grumman.
- ◆ The technology is useful on flexible printed circuit boards, for coating electronic test hardware, and for hard disk drives.